

Econ 219B
Psychology and Economics: Applications
(Lecture 1)

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Outline

1. Introduction
2. Psychology and Economics: The Topics
3. Psychology and Economics: Empirical Methods
4. Psychology and Economics by Field
5. Methodology: Reading the Psychology Journals
6. Defaults and Retirement Savings: The Facts
7. Comparison to Effect of Financial Education
8. Default Effects in Other Decisions

1 Introduction

- *Who am I?*
- Stefano DellaVigna (call me Stefano)
- Professor, Department of Economics
- Bocconi (Italy) undergraduate (Econ.), Harvard PhD (Econ.)
- Psych and Econ, Applied Microeconomics, Media Economics, Political Economy, Behavioral Finance
- Evans 515 – OH schedule by email

- *Who are you?*
- PhD student. Graduate courses in
 - Micro Theory
 - Econometrics
 - Psychology and Economics – Theory (219A)
- Interest in
 - Psychology and Economics
 - Applied, empirical microeconomics (io, labor, public finance, finance)

- *What is this class?*

- Reading list:
 - No textbook, but read “Psychology and Economics: Evidence from the Field” (*Journal of Economic Literature* 2009)

 - Updated reading list on course webpage

 - 11 Methodological Topics

 - Please email me (sdellavi@econ.berkeley.edu) for any issue with class and to schedule a meeting

- Grade:
 - 2 or 3 problem sets on models and empirics (30% weight)
 - Final exam (40% weight)
 - Your choice of:
 - * 10-15 page paper that uses field evidence (30% weight)
 - * An empirical problem set (30% weight)
- I encourage you to write a paper
- Information Sheet

2 Psychology and Economics: The Topics

- Prototypical economist conception of human behavior (Rabin, 2002a):

$$\max_{x_i^t \in X_i} \sum_{t=0}^{\infty} \delta^t \sum_{s_t \in S_t} p(s_t) U(x_i^t | s_t).$$

- X_i is set of “life-time strategies”, S_t is set of state spaces
- $p(s_t)$ are rational beliefs, $\delta \in (0, 1)$ is time-consistent discount factor
- $u(\cdot, s, t)$ is true utility at time t in state s

- **Step 1. Non-Standard Preferences**

1. Present-Biased Preferences: time inconsistency (β, δ)
2. Reference Dependence: $U(x_i|r, s)$ with r reference point
3. Social Preferences: $U(x_i, x_{-i}|s)$ where x_{-i} is allocation of others

- **Step 2. Non-Standard Beliefs:** beliefs $\tilde{p}(s) \neq p(s)$

1. Overconfidence: wrong $E(p)$ or wrong $Var(p)$
2. Law of Small Numbers: Wrong forecast of $p(s_{t+1}|s_t)$
3. Projection Bias: wrong forecast of utility: $\hat{u}(\cdot, s)$
4. Experience Effects: excessive updating of $p(s_t|s_{t-1})$

- **Step 3. Non-Standard Decision-Making**

1. Limited Attention: maximization set $\neq X_i$ (neglect less salient alternatives)
2. Framing
3. Menu Effects: Do not $\max U$
4. Mental Accounting
5. Persuasion
6. Emotions
7. Happiness

- **Step 4. Market Response to Biases**

- Integrate these findings into a market

1. Firms (Behavioral IO)
2. Employers (Behavioral Labor)
3. Investors (Behavioral Finance)
4. Managers (Behavioral Corporate Finance)
5. Politicians (Behavioral Political Economy)
6. ...

3 Psychology and Economics: Empirical Methods

- Psychology and Economics is
 - Idea from Psychology (Self-control, Reference Dependence, Overconfidence, Inattention, Social Preferences, Persuasion,...)
 - Setting in Economics (Asset Pricing, Charitable Giving, Consumption and Savings, Job search, ...)
- Each setting has specific methodologies → Variety of methodologies
- Defining feature for the field is idea, not technique or methodology
- However: Five main methodologies in Field P&E

1. **Menu choice**

- (a) Example 1. Sydnor (*AEJ Applied*, 2008) on small-scale risk aversion
- (b) Compare behavior in a menu (Ex.: deductible)
- (c) Given a model, make inferences about preferences, beliefs, etc. (Ex.: Risk aversion)

2. **Natural Experiments**

- (a) Example 4. Huberman and Regev (*JF*, 2002) on limited attention
- (b) Treatment vs. Control comparison
- (c) Quasi-random Naturally occurring events(Ex.: timing of article publication)

3 **Field experiment**

- (a) Example 2. Gneezy and List (*EMA*, 2006) on gift exchange
- (b) Treatment vs. Control comparison
- (c) Explicit randomization in a field setting (Ex.: Additional pay)

4 **Correlational studies**

- (a) Example 5. Iyengar, Huberman, and Lepper (2006) on choice overload
- (b) Test correlation of two variables (Ex.: No. options and participation)
- (c) Derive conclusion – Correlation, not causality here

5 **Structural Identification**

- (a) Example 3. Conlin, O'Donoghue and Vogelsang (*AER*, 2007) on projection bias
- (b) Estimate parameters of the model (Ex.: projection bias)

4 Psychology and Economics by Field

1. Public Finance

- (a) Present-bias (addiction, sin taxes, retirement savings)
- (b) Limited attention (incidence of taxes, low take-up of benefits)
- (c) Social preferences (charitable contributions)

2. Development Economics

- (a) Present-bias (commitment devices in savings, choice of crops)
- (b) Social preferences (group savings, trust, ethnic hatred)
- (c) Risk preferences (crop insurance)

3. Asset pricing

- (a) Overconfidence (overtrading)
- (b) Limited attention (footnotes in accounting, demographics, large events)
- (c) Market Reaction (noise traders)

4. Corporate finance

- (a) Overconfidence (investment, mergers, options)
- (b) Reference dependence (mergers)
- (c) Limited attention (media)

5. Labor Economics

- (a) Reference dependence (labor supply, wage setting, job search)
- (b) Social preferences (wage setting)
- (c) Money Illusion (wage setting)

6. Health Economics

- (a) Present-Bias (default effects; obesity; commitment devices)
- (b) Menu choice and confusion (health plan choices)

7. Industrial organization

- (a) Present-bias (Credit cards)
- (b) Reference dependence (sales)
- (c) Demand estimation + Profit maximization

8. Marketing

- (a) Menu effects (Strategic pricing of products)
- (b) Present-bias (Placement of tempting products)

9. Environmental Economics

- (a) Social comparisons (energy savings)
- (b) Reference dependence (WTA/WTP)
- (c) Framing effects (value of a life)

10. Law and Economics

- (a) Present-bias (Cooling off period)
- (b) Emotions (litigation)

11. Political Economy

- (a) Market Reaction (manipulation of hatred or inattention)
- (b) Welfare Enhancement (SMRT plan)

12. Macro – Consumption/Savings

- (a) Present-bias (low saving + mostly illiquid wealth)
- (b) Reference dependence (nominal wage rigidity)
- (c) Limited attention (menu costs)

5 Methodology: Reading Psychology Journals

- One strategy for papers in Psychology and Economics:
 - Get idea from reading psychology literature
 - Think of economic setting to apply to
 - * Model new phenomenon
 - * Test with economic experiments
 - * Apply using field data
- How to start with psychology literature?

- **Step 1.** Choosing your Psychology. Not all kinds of psychology are equally useful!
 - *Social Psychology* (attribution errors, emotions, discrimination). YES!
 - *Cognitive Psychology* (Kahneman and Tversky agenda). YES!
 - *Personality Psychology* (Big Four personality types). Not very optimistic (Michigan and NYU group more optimistic)
 - *Developmental Psychology* (Development of skills in children). Not much so far, may become important (see Bill Harbaugh's experiments)
 - *Comparative Psychology* (Example: Asians not overconfident). Difficult to test empirically, but promising

- **Step 2.** Where to start?

- Read a good introductory book

- * On social psychology I strongly recommend L. Ross and R.E. Nisbett, *The Person and the Situation*, McGraw-Hill, 1991-2011.

- * On cognitive psychology a classic is Daniel Kahneman, Paul Slovic, and Amos Tversky. *Judgment Under Uncertainty: Heuristics and Biases*, Cambridge University Press, 1982

- Attend a graduate (or undergraduate) class in social or cognitive psychology. Check listing in Psychology, GSPP (Jack Glazer), and Haas (OB/Marketing)

- Recommended: Podcasts by Robb Willer, even on iTunes

- **Step 3.** Continuing education – Choosing the psychology journals

- Look for the top psychology journals:

1. *Journal of Personality and Social Psychology (JPSP)*

- * Mostly very high-quality experiments

- * Go directly to design—Do not stop at summary

- * Skip the Section on personality psychology

2. *Psychological Science*

- * Recent journal, extremely successful

- * Publishes short articles, like *Science*

3. *Psychological Bulletin*

- * Publishes mostly reviews

4. *Psychological Review*

- * Publishes 'theoretical' contributions, i.e., attempts to summarize existing experimental evidence. No Greek letters!
- Top marketing journals can be useful too
1. *Journal of Consumer Research*. Generally the most psychology-based
 2. Also *Journal of Marketing Research*

- **Step 4.** Reading a psychology article

- Do not go for the newest finding.

- * Look for findings that have been replicated, preferably by different researchers

- * Use Google Scholar for that

- Reading group: Reading the articles in a group of 2-3

- Psych articles will contain typically 3-6 experiments. Focus on strongest one or two

- Classical issues to look for:

- * Sample sizes too small?

- * Effect too *large*?

- * Are outcome variables interesting to economists?
- * Deception?
 - Psych authors tend to claim that they found a new effect – Look for unifying theme instead
 - Read meta-analyses (summaries of experiments in an area) — But be wary that many bad experiments do not make a good one
 - Also, check out recent debate on replication in psychology (and other social sciences): <http://datacolada.org/>

- **Step 5.** Apply it to economics

1. Criticize the findings

- Are they relevant for economics?
- Can existing economic models explain it? (information stories often successful)

2. Find economic problem could apply to

- Brainstorm: charitable giving, yes-men in companies, shopping behavior,...

3. Look for related papers in economics (and psychology)

- It may not work, but you will learn much

6 Defaults and 401(k)s: The Facts

- 401(k) savings most common voluntary savings vehicle in the US
 - Set aside money for retirement
 - Choice of percent contribution, and stocks/bonds composition
 - Penalty for early withdrawal
 - Sometimes: Company matching of contribution up to a threshold
- Patterns of 401(k) investment (Highly recommended survey: Choi et al., 2006 – “*Saving for Retirement on the Path of Least Resistance*”)
- Today: Default Effects

- **Fact 1. Close to 50% of investors follows Default Plan**
- Madrian and Shea (QJE, 2001): Single most important piece of field evidence on P&E
 - Health Care company
 - Paper-and-pencil 401(k) choice
 - Can enroll any day
 - 50 percent match up to 6% contribution
- Design (Table 1)
 - Discontinuity of 401(k) plan defaults depending on date of hire
 - After 4/1/1998 investment by default

TABLE I
401(k) PLAN FEATURES BY PLAN DATE

	Before 4/1/1998	After 4/1/1998
<i>Eligibility</i>		
Eligible employees	All except union and temporary employees	All except union and temporary employees
First eligible	After one year of employment	Immediately upon hire
Employer match eligible	After one year of employment	After one year of employment
<i>Contributions</i>		
Employee contributions	1 percent to 15 percent of compensation ^a	1 percent to 15 percent of compensation ^a
Employer match	50 percent of employee contribution up to 6 percent of compensation ^a	50 percent of employee contribution up to 6 percent of compensation ^a
<i>Vesting</i>		
Vesting of employee contributions	Immediate	Immediate
Vesting of employer contributions	2-year cliff	2-year cliff
<i>Participation</i>		
Default participation decision	No	Yes
Default contribution rate	None	3 percent of compensation
Default fund allocation	None	Money market fund

- OLD Cohort hired 4/1/96-3/31/97:
 - default: no enrollment
 - 1-year wait period for eligibility

- WINDOW Cohort hired 4/1/97-3/31/98:
 - default: no enrollment
 - wait period for eligibility till 4/1/98

- NEW Cohort hired 4/1/98-3/31/99:
 - default: enrollment in 3 percent money market fund
 - immediate eligibility

	OLD	WINDOW	NEW
Dates of hire ^a	4/1/1996 to 3/31/1997	4/1/1997 to 3/31/1998	4/1/1998 to 3/31/1999
First eligible to participate in 401(k) plan	One year after date of hire	4/1/1998	Date of hire
First eligible for employer match	One year after date of hire	One year after date of hire	One year after date of hire
Automatically enrolled in 401(k) plan	No	No	Yes
Default contribution rate	None	None	3 percent
Default fund allocation	None	None	Money market fund

- Step 1. Check Design (endogeneity issues)
 - Compare different cohorts: No large differences

TABLE III
COMPARISON OF WORKER CHARACTERISTICS

	Study company				
	OLD cohort	WINDOW cohort	NEW cohort	All workers	U. S. workforce
<i>Average age (years)</i>	37.2	36.0	34.5	37.6	38.8
<i>Gender</i>					
Male	25.4%	23.9%	22.0%	22.1%	53.1%
Female	74.6	76.1	78.0	77.9	46.9
<i>Ethnicity^a</i>					
White	77.1%	71.7%	68.8%	75.1%	74.6%
Black	12.5	16.8	18.9	14.1	11.3
Hispanic	7.1	8.2	6.7	6.6	9.5
Other	3.3	3.4	5.6	4.2	4.6
<i>Hours</i>					
Full-time (HPW > 35)	96.7%	95.6%	95.8%	94.6%	78.8%
Part-time (HPW < 35)	3.3	4.4	4.2	5.4	21.2
<i>Compensation^b</i>					
Mean	\$41,970	\$38,424	\$34,264	\$40,180	\$28,248
Median	\$33,470	\$30,530	\$26,519	\$31,333	\$20,400

- Step 2. Compare plan choices:

1. *Participation* rates in 401(k) by June 30, 1999 (Figure I and Table IV):

- OLD: 57%, WINDOW: 49%, NEW: 86%

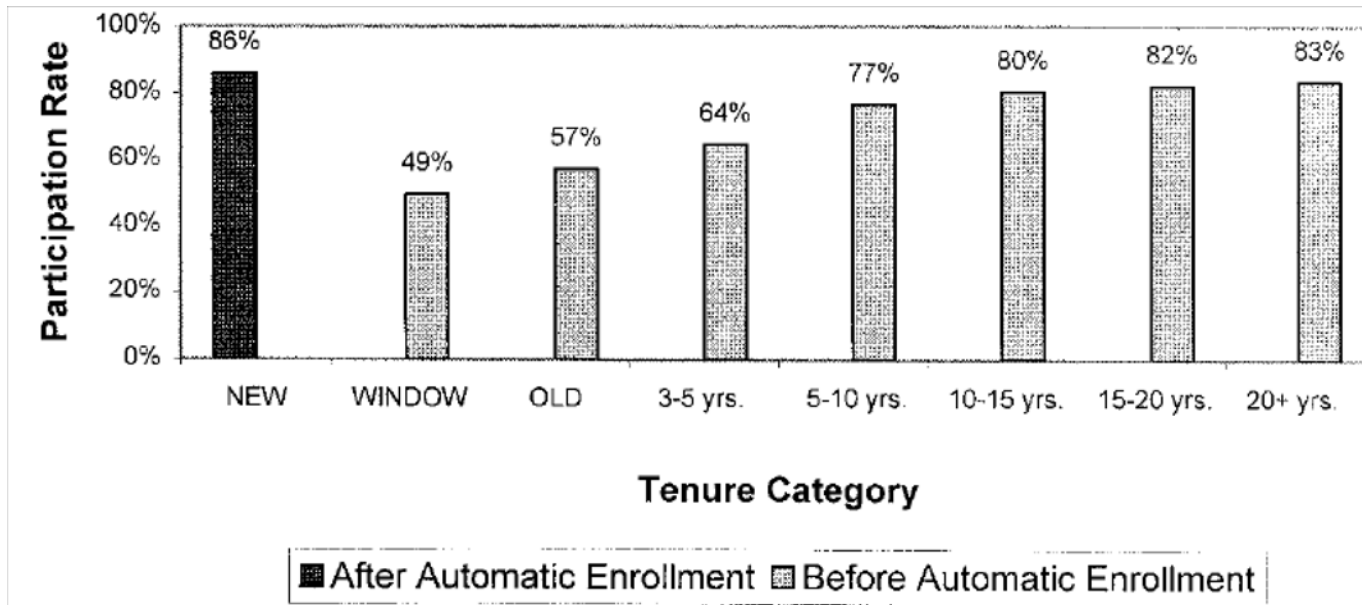


TABLE IV
THE EFFECTS OF AUTOMATIC ENROLLMENT AND IMMEDIATE ELIGIBILITY
ON 401(k) PARTICIPATION

	Automatic enrollment		Immediate eligibility	
	Participation rate of Window cohort on 6/30/98	Participation rate of New cohort on 6/30/99	Participation rate of Old cohort on 6/30/98	Participation rate of Window cohort on 6/30/99
<i>Overall</i>	37.4%	85.9%	48.7%	49.4%
<i>Gender</i>				
Male	42.3	85.7	56.1	55.9
Female	35.9	86.0	46.3	47.4
<i>Race/ethnicity</i>				
White	42.7	88.2	53.4	54.4
Black	21.7	81.3	30.7	32.6
Hispanic	19.0	75.1	27.8	34.5
Other	46.2	85.2	55.0	62.9
<i>Age</i>				
Age <20	—	73.6	25.0	33.3
Age 20–29	25.3	82.7	36.7	36.9
Age 30–39	37.2	86.3	47.9	50.3
Age 40–49	47.3	90.1	54.9	58.0
Age 50–59	51.8	90.0	64.3	64.3
Age 60–64	60.0	86.0	60.6	70.0
<i>Compensation</i>				
<\$20K	12.5	79.5	20.0	21.2
\$20–\$29K	24.5	82.8	31.7	35.3
\$30–\$39K	42.2	88.9	50.1	55.4
\$40–\$49K	51.0	91.8	61.6	64.5
\$50–\$59K	61.6	92.8	70.2	75.2
\$60–\$69K	59.7	94.7	79.2	75.1
\$70–\$79K	57.9	91.5	76.3	71.6
\$80K+	68.3	94.2	76.3	82.6
<i>Sample size</i>	N = 4249	N = 5801	N = 3275	N = 4247

1. *Contribution* rates (Figures IIc):

- WINDOW: 63% are at 0 percent, 4% at 3 percent
- NEW: 65% are at 3 percent (Default)

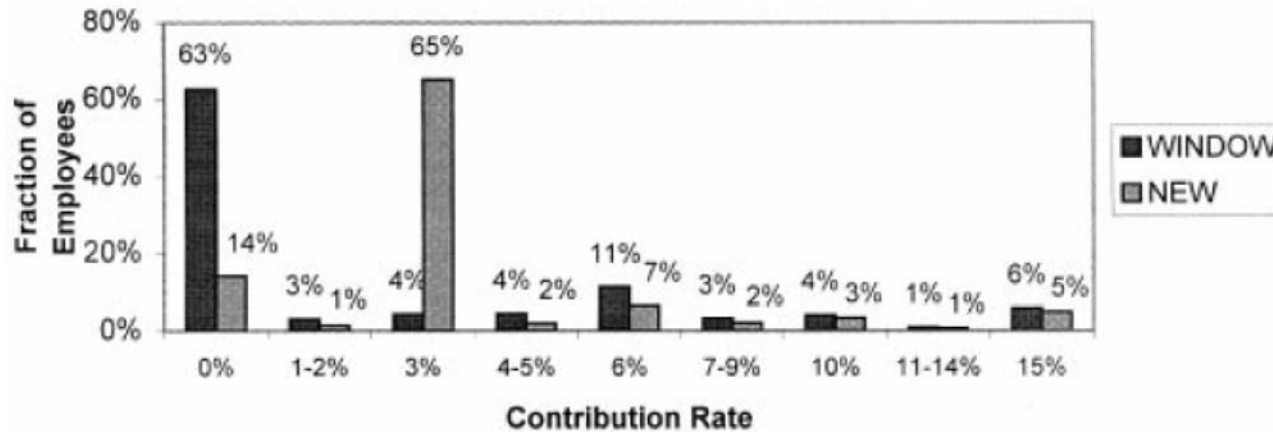
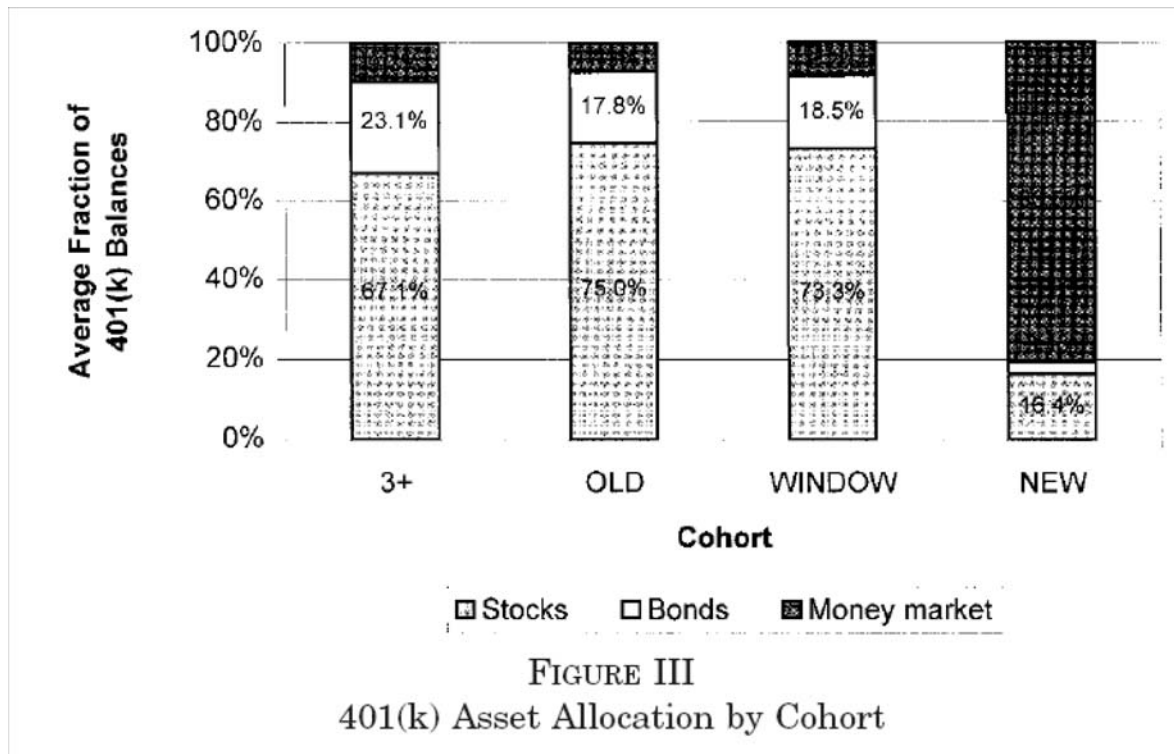


FIGURE IIc

Distribution of 401(k) Contribution Rates for the WINDOW and NEW Cohorts Including Nonparticipation

1. Allocation of funds in stocks (Figure III):

- OLD: 75%, WINDOW: 73%, NEW: 16%

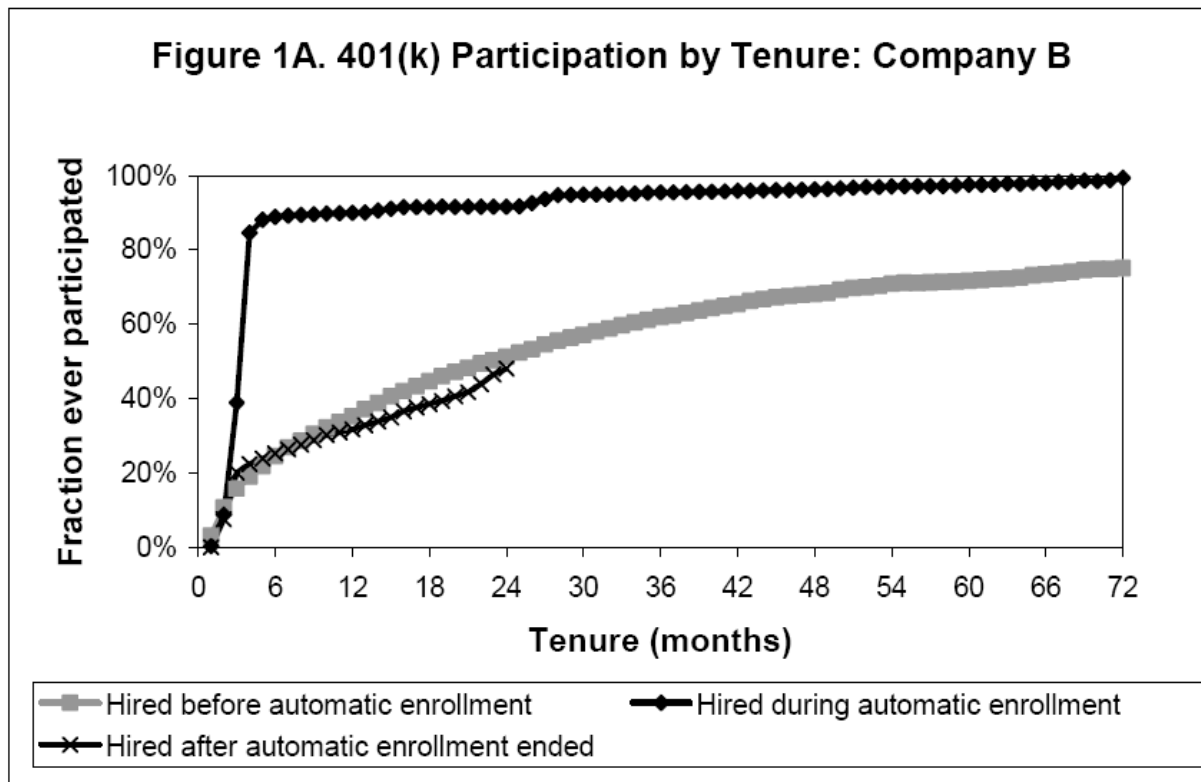


- Results equally strong with controls (Table VI)

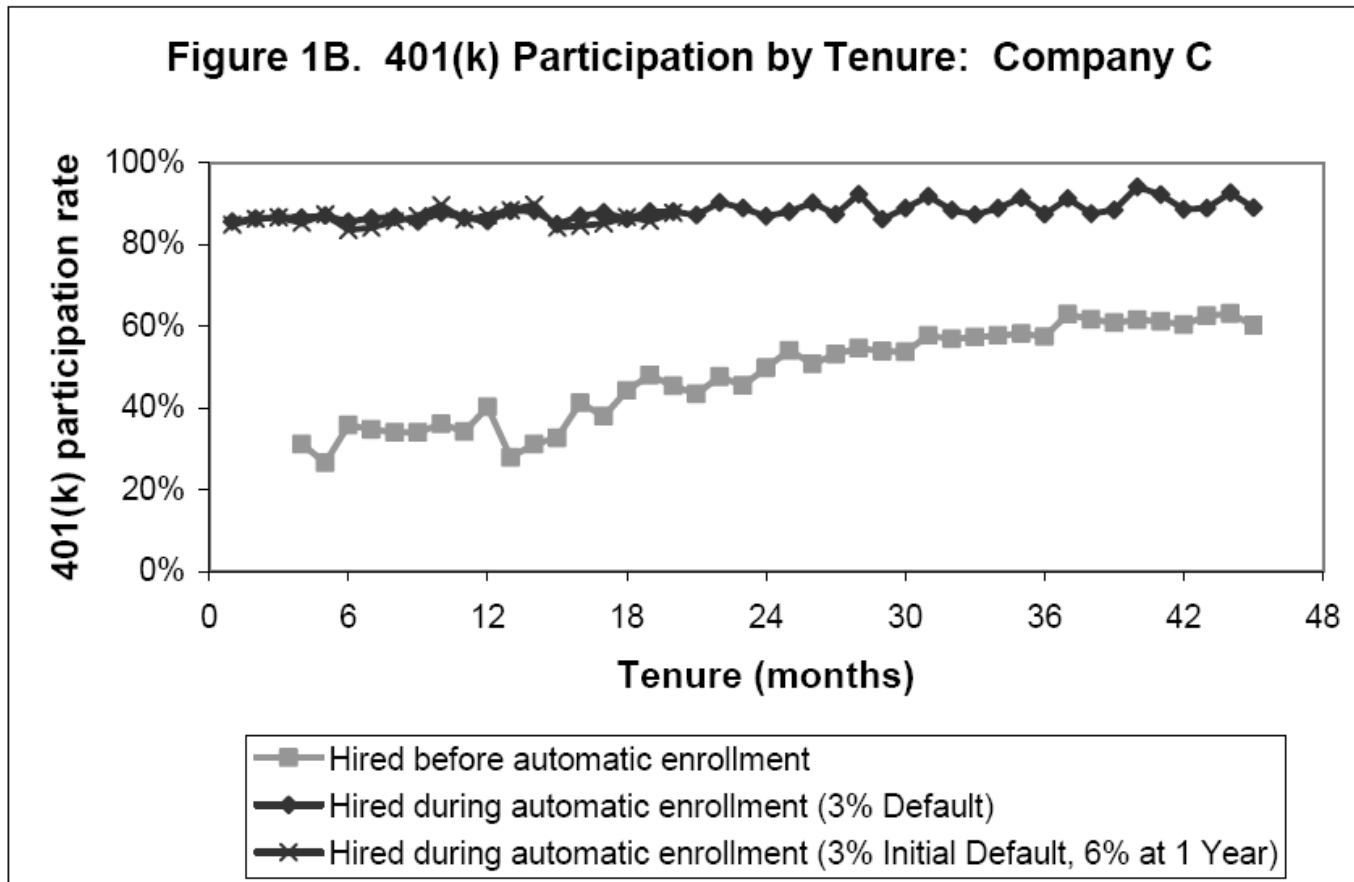
TABLE VI
RAW AND REGRESSION-ADJUSTED EFFECTS OF AUTOMATIC ENROLLMENT
AND IMMEDIATE ELIGIBILITY

	Effect of Automatic enrollment: Window cohort on 6/30/98 vs. New cohort on 6/30/99	Effect of Immediate eligibility: Old cohort on 6/30/98 vs. Window cohort on 6/30/99
<i>401(k) Participation rate</i>		
Raw difference	48.5%*	0.6%
Regression-adjusted difference	50.4%*	4.1%*
<i>401(k) Contribution rate</i>		
Raw difference	-2.9%*	-0.1%
Regression-adjusted difference	-2.2%*	0.2%

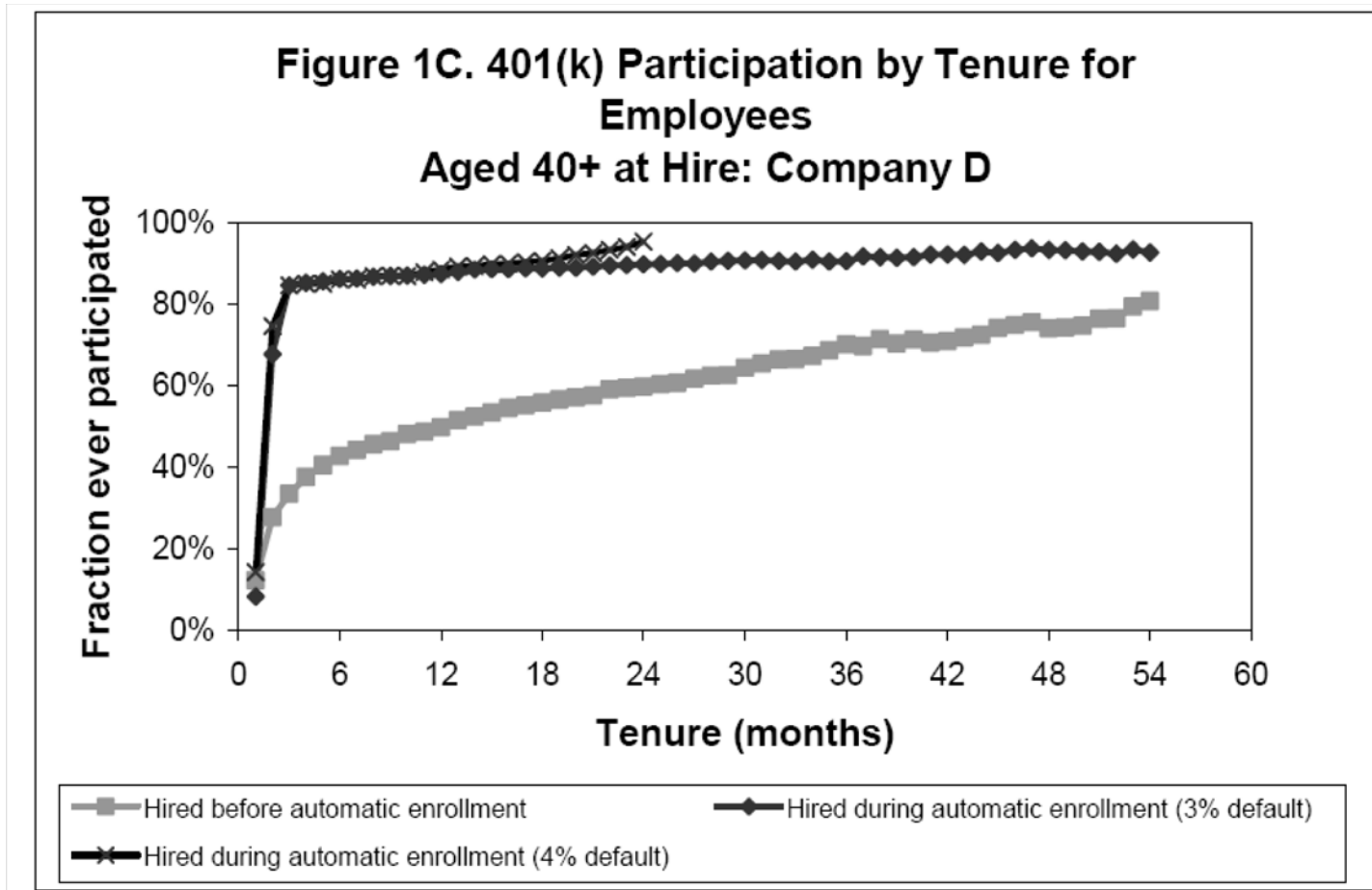
- Results very robust. Choi et al. (2004) Survey paper:
- Company B switches from OLD to NEW to OLD



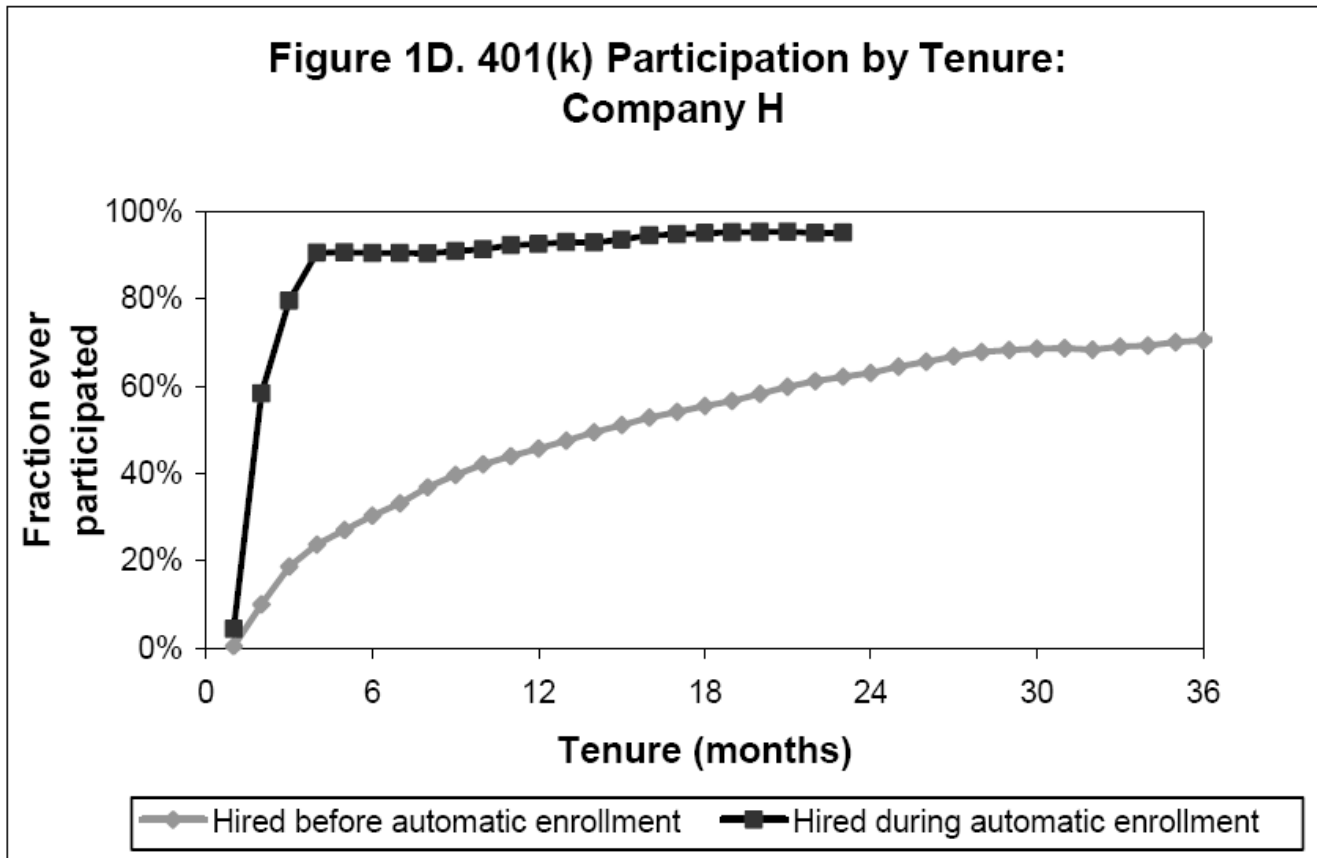
- Company C switches from OLD to NEW to NEW2



- Company D switches from OLD to NEW to NEW2



- Company H switches from OLD to NEW



- Summary.
 - OLD and NEW cohorts invest very differently one year after initial hire
 - * Fact 1. **Fact 1. 40% to 50% of investors follow Default Plan**
 - * Fact 1a. Applies to participation (yes/no)
 - * Fact 1b. Applies also to contribution level and allocation

 - (Less commonly cited) WINDOW cohort resembles OLD cohort
 - * Fact 2. **'Suggested choice' not very attractive unless default**

- BUT: Default effects not informative of optimal saving plans.
 - Is OLD cohort under-saving?
 - Or is NEW cohort over-saving?
- Introduction of Active Choice (Carroll et al., *QJE* 2009) – Large Fortune-500 Company, Financial sector
- Comparison between Active Choice (before) and No Enrollment (after)
- **Fact 3. Active Choice resembles Default Investment**

Table 1. 401(k) plan features by effective date

	Effective January 1, 1997	Effective November 23, 1997
<i>Eligibility</i>		
Eligible employees	U.S. employees, age 18+	U.S. employees, age 18+
First eligible	Immediately upon hire	Immediately upon hire
Employer match eligible	Immediately upon hire	Immediately upon hire
<i>Enrollment</i>		
	First 30 days of employment or January 1 of succeeding calendar years	Daily
<i>Contributions</i>		
Employee contributions	Up to 17% of compensation	Up to 17% of compensation
Non-discretionary employer match	50% of employee contribution up to 5% of compensation	50% of employee contribution up to 5% of compensation
Discretionary employer match	Up to 100% of employee contribution depending on company profitability (50% for bonus-eligible employees); 100% in 1997.	Up to 100% of employee contribution depending on company profitability (50% for bonus-eligible employees); varied from 0% to 100% for 1997-2000.*
<i>Vesting</i>		
	Immediate	Immediate
<i>Other</i>		
Loans	Not available	Available; 2 maximum
Hardship withdrawals	Available	Available
Investment choices	6 options. Employer stock also available, but only for after-tax contributions.	8 options + employer stock (available for before- and after-tax contributions)

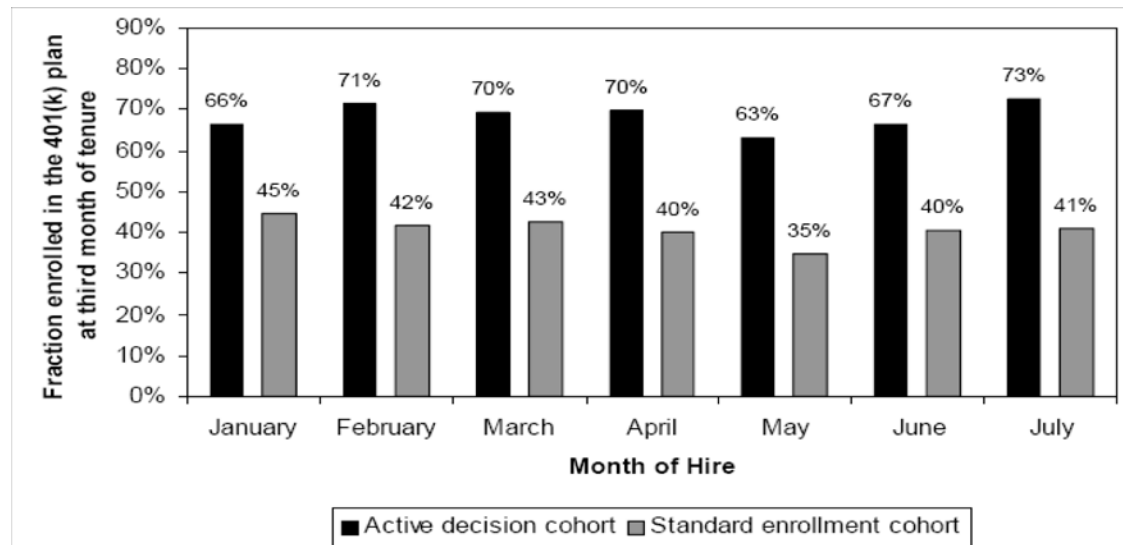
- ACTIVE Cohort, hired 1/1/97-7/31/97
 - 30 days to return 401(k) form with legal packet
 - Next enrollment period: January 1998
 - Paper-and-pencil form
- OLD2 Cohort, hired 1/1/98-7/31/98
 - Standard, no-saving-default (like OLD)
 - Can enroll any time
 - Telephone-based enrollment, 24/7

- Step 1. Check Design

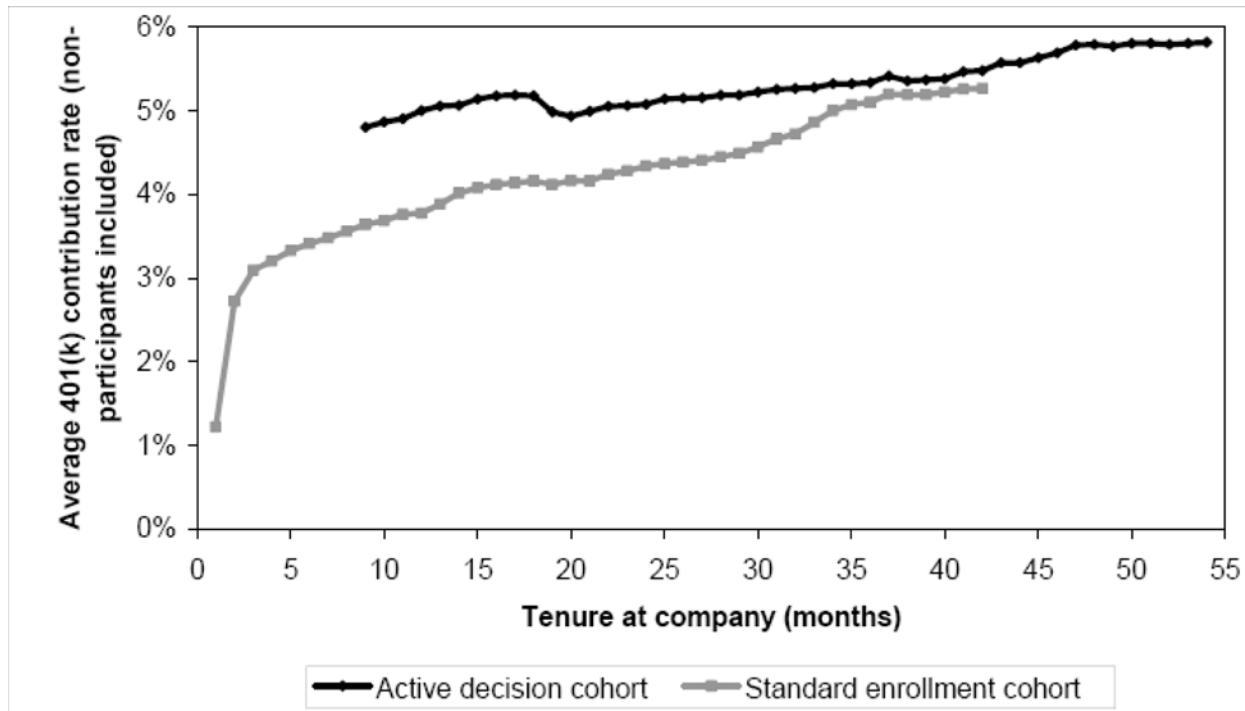
- Summary Stats (Table 2)–No substantial difference across cohorts

Table 2. Comparison of worker characteristics				
	Study company			U.S. workforce (3/98 CPS)
	Active decision cohort on 12/31/98	Standard enroll. cohort on 12/31/99	All workers on 12/31/99	
<i>Average age (years)</i>	34.1	34.0	40.5	38.8
<i>Gender</i>				
Male	45.4%	43.4%	45.0%	53.1%
Female	54.6%	56.6%	55%	46.9
<i>Marital Status</i>				
Single	42.8%	47.8%	32.4%	39.0%
Married	57.2%	52.2%	67.6%	61.0%
<i>Compensation</i>				
Avg. monthly base pay	\$2,994	\$2,911	\$4,550	--
Median monthly base pay	\$2,648	\$2,552	\$3,750	--
Avg. annual income ^a	\$34,656	\$34,001	\$52,936	\$32,414
Median annual income ^a	\$30,530	\$29,950	\$42,100	\$24,108

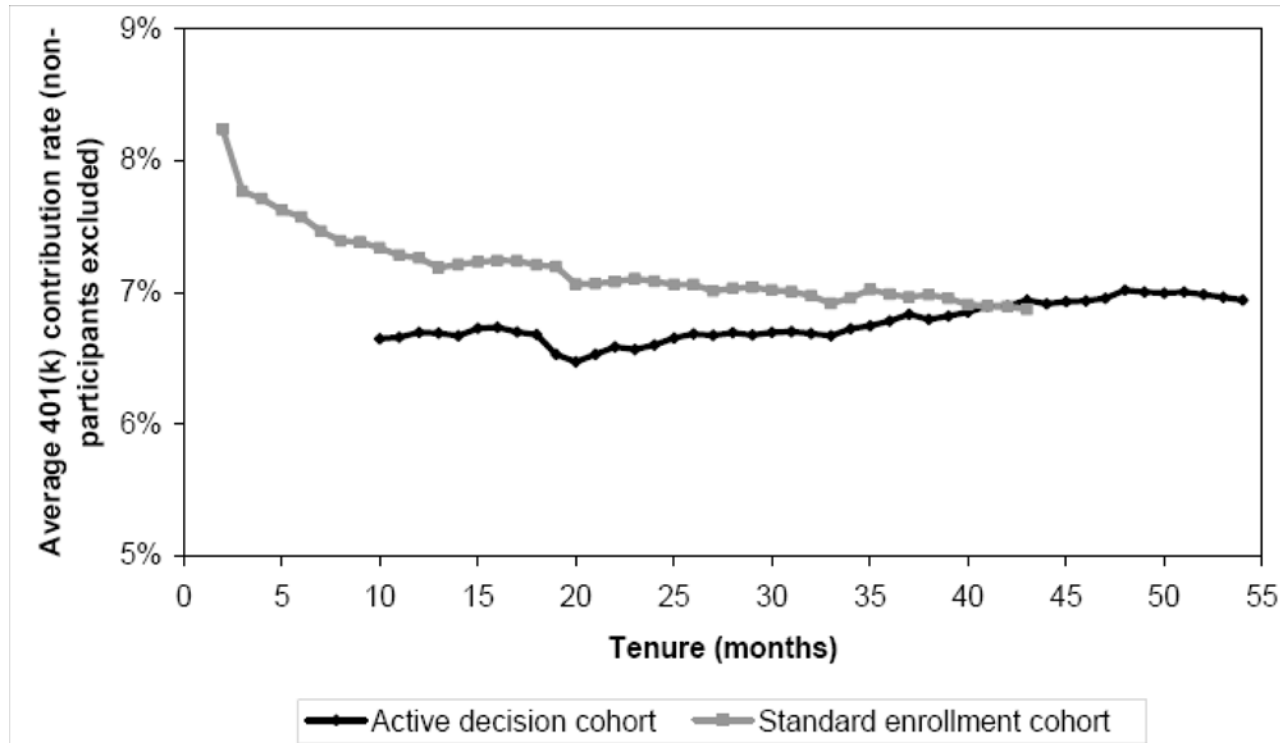
- Step 2. Compare plan choices (Figures 1 and 2)
 - *Participation* rates in 401(k) using cross-sectional data (Figure 1):
 - * ACTIVE: 69% – OLD2: 41% (at month 3)
 - * Compare to NEW (86%) and OLD (57%) in MS01 after >6 months
 - * Does not depend on month of hire (see below)



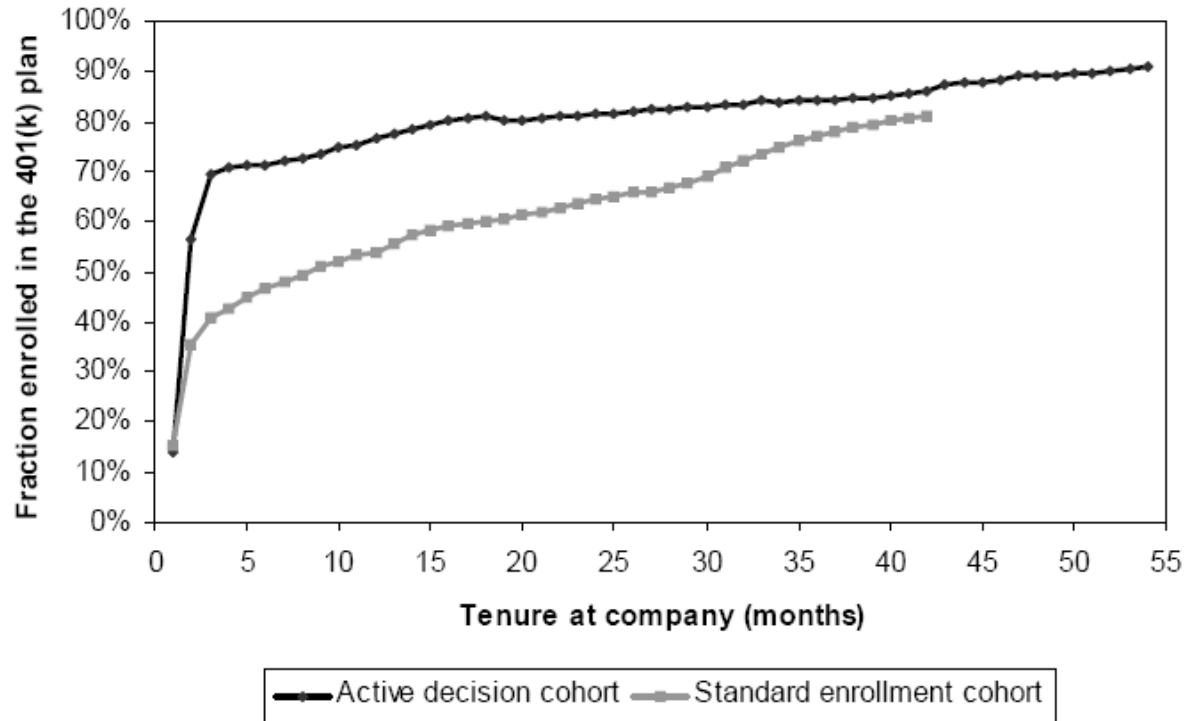
- – *Contribution rates (including zeros) (Figure 3)*
 - * ACTIVE: 4.8% – OLD2: 3.5% (at month 9, when longitudinal data becomes available)



- – *Contribution* rates (excluding zeros) (Figure 4)
 - * ACTIVE: 6.8% – OLD2: 7.5% (at month 9)
 - * Selection effect: Marginal individuals are lower savers



- – Differences between ACTIVE and OLD2 disappear by year 3 (Figure 2)
- Still: Important because no catch-up in levels, and because of frequent changes in employers



- Summary.
 - ACTIVE is close to NEW and differs from OLD and OLD2
 - * **Fact 3. Active Choice resembles Default Investment**
 - * Fact 3b. Month of Hire does not matter

 - **Fact 4. Effect of default mostly disappears after three years**
- Prevalence of OLD Default can (at least in part) explain under-saving for retirement

- Other evidence on default effects in choice of savings: Cronqvist and Thaler (2004, AER P&P)
 - Privatization of Social Security in Sweden in 2000
 - 456 funds, 1 default fund (chosen by government)
 - Year 2000:
 - * Choice of default is discouraged with massive marketing campaign.
 - * Among new participants, 43.3 percent chooses default
 - Year 2003:
 - * End of marketing campaign.
 - * Among new participants, 91.6 percent chooses default

- Side point for us (but key point in paper): Portfolio actively chosen in year 2000 does much worse than default

TABLE 1—COMPARISON OF THE DEFAULT FUND
AND THE MEAN ACTIVELY CHOSEN PORTFOLIO

Portfolio characteristic	Percentages ^a	
	Default	Mean actively chosen portfolio
Asset allocation		
Equities	82	96.2
Sweden	17	48.2
Americas	35	23.1
Europe	20	18.2
Asia	10	6.7
Fixed-income securities	10	3.8
Hedge funds	4	0
Private equity	4	0
Indexed	60	4.1
Fee	0.17	0.77
Beta	0.98	1.01
<i>Ex post</i> performance	−29.9	−39.6

7 Comparison to Effect of Financial Education

- Studies of the effect of financial education:
 - Cross-Sectional surveys (Bernheim and Garrett, 2003; Bayer, Bernheim, and Scholz, 1996)
 - * Sizeable impact
 - * BUT: Strong Biases (Reverse Causation + Omitted Vars)
 - Time-series Design (McCarthy and McWhirter 2000; Jacobius 2000)
 - * Sizeable impact
 - * BUT: Use self-reported desired saving
 - Need for plausible design

- Choi et al. (2005):
 - Financial education class (one hour) in Company D in 2000
 - Participation rate: 17 percent
 - People are asked: *“After attending today’s presentation, what, if any, action do you plan on taking toward your personal financial affairs?”*
 - Administrative data on Dec. 1999 (before) and June 2000 (after)
 - Examine effect:
 - * participants (self-selected) – 12% of them were not saving before
–> Demand for financial education comes from people who already save!
 - * non-participants
- Effect likely biased upwards

**TABLE 5. Financial Education and Actual vs. Planned Savings Changes
(Company C)**

Planned Action	Seminar Attendees		Non-Attendees
	Planned Change	Actual Change	Actual Change
Non-participants			
Enroll in 401(k) plan	100%	14%	7%
401(k) participants			
Increase contribution rate	28%	8%	5%
Change fund selection	47%	15%	10%
Change fund allocation	36%	10%	6%

The sample is active 401(k)-eligible employees at company locations that offered financial education seminars from January-June 2000. Actual changes in savings behavior are measured over the period from December 31, 1999 through June 30, 2000. Planned changes are those reported by seminar attendees in an evaluation of the financial education seminars at the conclusion of the seminar. The planned changes from surveys responses of attendees have been scaled to reflect the 401(k) participation rate of seminar attendees.

- Result: Very little impact on changes in savings, compared to non-attendees or to control time period

- Duflo and Saez (*QJE* 2003)
 - Target staff in prestigious university (Harvard? MIT?)
 - Randomized Experiment in a university:
 - * 1/3 of 330 Departments control group
 - * 2/3 of 330 Departments treatment group:
 - 1/2 not-enrolled staff: letter with \$20 reward for attending a fair
 - 1/2 not-enrolled staff: no reward
- Measure attendance to the fair and effect on retirement savings

TABLE 1
DESCRIPTIVE STATISTICS, BY GROUPS

	Treated departments			Untreated departments (group $D = 0$)
	All (group $D = 1$)	Treated (group $D = 1,$ $L = 1$)	Untreated (group $D = 1,$ $L = 0$)	
	(1)	(2)	(3)	(4)
PANEL A: BACKGROUND CHARACTERISTICS				
TDA participation before the fair (Sept. 2000)	0.010 (.0015)	0.009 (.0021)	0.011 (.0022)	0.012 (.0024)
Observations	4168	2039	2129	2043
Sex (fraction male)	0.398 (.0076)	0.400 (.0109)	0.396 (.0107)	0.418 (.011)
Years of service	5.898 (.114)	5.864 (.161)	5.930 (.16)	6.008 (.157)
Annual salary	38,547 (304)	38,807 (438)	38,297 (422)	38,213 (416)
Age	38.3 (.17)	38.4 (.24)	38.2 (.24)	38.7 (.24)
Observations	4126	2020	2106	2018
PANEL B: FAIR ATTENDANCE (REGISTRATION DATA)				
Fair attendance rate among non-TDA enrollees	0.214 (.0064)	0.280 (.01)	0.151 (.0078)	0.049 (.0048)
Observations	4126	2020	2106	2018
Fair attendance rate for all staff employees	0.192 (.0132)			0.063 (.0103)
Observations	6687			3311
PANEL C: TDA PARTICIPATION (ADMINISTRATIVE DATA)				
TDA participation rate after 4.5 months	0.049 (.0035)	0.045 (.0049)	0.053 (.0051)	0.040 (.0045)
Observations	3726	1832	1894	1861
TDA participation rate after 11 months	0.088 (.005)	0.089 (.0071)	0.088 (.007)	0.075 (.0065)
Observations	3246	1608	1638	1633

- Summary of effects:
 - Large effect of subsidy on attendance (including peer effect)
 - Small effects of attendance on retirement savings

TABLE II
REDUCED-FORM ESTIMATES (OLS)

	Dependent variable		
	Fair attendance (1)	TDA enrollment after	
		4.5 months (2)	11 months (3)
PANEL A: Average effect of department treatment			
Treated	0.166	0.0093	0.0125
Department dummy <i>D</i>	(.013)	(.0043)	(.0065)
Observations	6144	5587	4879
PANEL B: Effect of letter and department treatment			
Letter dummy <i>L</i>	0.129	-0.0066	0.0005
	(.0226)	(.0061)	(.0102)
Treated	0.102	0.0125	0.0123
Department dummy <i>D</i>	(.0139)	(.0054)	(.0086)
Observations	6144	5587	4879

- Results:

- Approximately: Of the people induced to attend the fair, 10% sign up
- Compare to Default effects: Change allocations for 40%-50% of employees

- Summary:

- Just explaining retirement savings not very effective at getting people to save
- Effect of changing default much larger
- Interesting variation: Re-Do this study *but* give opportunity to sign up at fair

8 Default Effects in Other Decisions

- Additional evidence of default effects in other contexts:
 1. SMRT plan for savings (Thaler and Benartzi, *JPE* 2004)
 2. Health-club contracts (DellaVigna and Malmendier, *AER* 2006)
 3. Car insurance plan choice (Johnson et al, 1993)
 4. Car option purchases (Park, Yun, and MacInnis, 2000)
 5. Consent to e-mail marketing (Johnson, Bellman and Lohse, 2003)
 6. TV channel choice (Esteves-Sorenson, 2008)
 7. Organ donation (Johnson and Goldstein, 2003; Abadie and Gay, 2006)

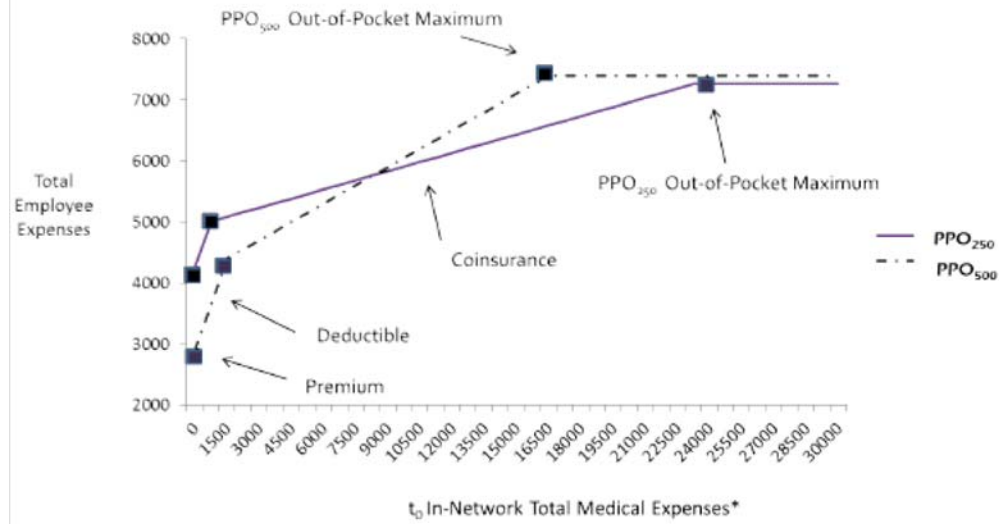
- Ben Handel, “Adverse Selection and Switching Costs in Health Insurance Markets: When Nudging Hurts”, *AER* 2013
 - Administrative data on health insurance choice within a company
 - Observe data in years t_{-1} , t_0 and t_1
 - Year t_0 : introduction of new plans, *active choice* required
 - Year t_1 : choice by default, but plan benefits changed substantially
 - Restrict choice to only PPO plans, *all offered by same insurer*
 - Only difference is financial details (premiums, co-pay, etc.)
 - Estimate individual risk characteristics using t_{-1} data, consider t_0 active choice, then inertial choice at t_1 *as option attractiveness varies*

- Options offered

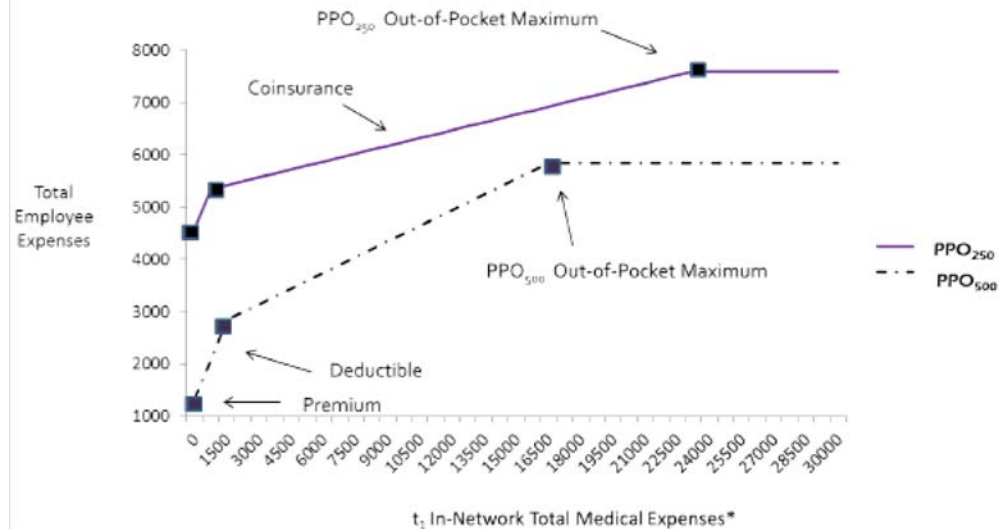
Choice Behavior	t_{-1}	t_0	t_1
<i>PPO</i> ₂₅₀	-	2,199 (25%)	1,937 (21%)
<i>PPO</i> ₅₀₀	-	998 (11%)	1,544 (18%)
<i>PPO</i> ₁₂₀₀	-	876 (10%)	824 (9%)
<i>HMO</i> ₁	2,094 (25%)	2,050 (23%)	2,031 (22%)
<i>HMO</i> ₂	701 (8%)	1,273 (14%)	1,181 (13%)
<i>PPO</i> ₋₁	3,264 (39%)	-	-
<i>HMO</i> ₃	668 (8%)	-	-
<i>HMO</i> ₄	493 (6%)	-	-
Waive	1,207 (14%)	1,447 (16%)	1,521 (17%)

- In particular, in year t_1 for a group *PPO*₂₅₀ is dominated – do employees still choose it? Yes,

PPO Health Insurance Plan Characteristics, t_0
Low Income Family



PPO Health Insurance Plan Characteristics, t_1
Low Income Family



- Do employees in the dominated plan still choose it? Yes, a majority still after two years

Dominated Plan Analysis

	t_1 Dominated Stay	t_1 Dominated Switch	t_2 Dominated Stay	t_2 Dominated Switch
N	498	61	378	126
Minimum Money Lost*	\$374	\$453	\$396	\$306
<i>PPO</i> ₅₀₀	-	44 (72%)	-	103 (81%)
<i>PPO</i> ₁₂₀₀	-	4 (7%)	-	6(5%)
Any <i>HMO</i>	-	13 (21%)	-	17 (14%)

- Descriptive evidence of strong inertia effects when comparing new enrollees

New Enrollee Analysis			
	New Enrollee t_{-1}	New Enrollee t_0	New Enrollee t_1
N, t_0	1056	1377	-
N, t_1	784	1267	1305
t_0 Choices			
PPO_{250}	259 (25%)	287 (21%)	-
PPO_{500}	205 (19%)	306 (23%)	-
PPO_{1200}	155 (15%)	236 (17%)	-
HMO_1	238 (23%)	278 (20%)	-
HMO_2	199 (18%)	270 (19%)	-
t_1 Choices			
PPO_{250}	182 (23%)	253 (20%)	142 (11%)
PPO_{500}	201 (26%)	324 (26%)	562 (43%)
PPO_{1200}	95 (12%)	194 (15%)	188 (14%)
HMO_1	171 (22%)	257 (20%)	262 (20%)
HMO_2	135 (17%)	239 (19%)	151 (12%)

- Model estimation
- Assumes individuals have a value for insurance based on previous risk
- Allows for asymmetric information
- Models the switching cost in reduced form as a cost k paid to switch – no cost in year t_0 when active choice

Empirical Model Results

Parameter	Primary	Base	MH Robust	γ Robust	ϵ Robust
Switching Cost - Single, η_0	1729 (28)	1779 (72)	1859 (107)	2430 (116)	1944 (150)
Switching Cost - Family, $\eta_0 + \eta_2$	2480 (26)	2354 (62)	2355 (113)	3006 (94)	2365 (34)

- Estimated cost of about \$2,000 is very unlikely to capture administrative costs
 - More likely to capture procrastination, or limited attention
 - Notice though: If no choice by deadline, can make no change until one year later
 - In this setting (see below), no procrastination expected even for naives
- However, consider alternative model:
 - Naive agent forgetful of deadline date
 - Then procrastinate until deadline, with probability of missing the deadline

- Paper also considers impact of *debiasing* which reduces switching costs
- All else equal, this is good for consumers
- BUT: inertia had side effect of limiting the adverse selection into contracts
→ Enables more pooling and therefore 'better' contracts
- Removing the inertia may make things worse in general equilibrium

9 Next Lecture

- Interpretation of default effects using present-biased preferences
- No problem set, but prepare for class doing exercise posted
- Present Bias and Consumption Choices
 - *Investment Goods*
 - *Leisure Goods*