Private Paternalism, the Commitment Puzzle, and Model-Free Equilibrium

ASSA Ely Lecture

GFLEC/GWSB & FRB Financial Literacy Seminar Series

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Classroom laptop bans

Partially paternalistic?

If externalities were the sole motivation, we would segregate the laptop users, rather than banning laptop use altogether.

How else do we constrain our students?

- Pop quizzes
- Attendance requirements
- Cold calling
- Frequent graded problem sets (I now give 2 per week)
- Gratuitously early deadlines

- Do our students ask for this?

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- Do schools advertise such paternalistic policies?

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- Do schools advertise such paternalistic policies? Mostly not.

Private Paternalism

- Paternalism is a policy that advances an individual's interests by restricting his or her freedom.
- Private paternalism is paternalism implemented by private institutions.

- Private paternalism is often shrouded.
- You don't see marketing materials like this:

"Apply to State U because we have frequent pop quizzes."

"Work at our Firm, because we are strict about making you show up to work on time."

"Take our mortgage, because we don't give you flexibility on your repayment schedule."

Questions

- Is private paternalism possible in equilibrium?
- Is private paternalism an equilibrium, even without demand from the beneficiaries (students, workers, customers)?
- Why is private paternalism often shrouded?
- What are the benefits of private paternalism relative to public paternalism?
- Where will private paternalism fail?
- Should we expand its scope?
- And, if so, how?

Industrial Revolution
Clark (1994)

“Whatever the workers themselves thought, they effectively hired the capitalists to discipline and coerce them. Even in the factories of the Industrial Revolution they were the ultimate masters of their fate, but weakness of will meant they delegated that mastery to the capitalists.”

20th century work relations
Clark (1994)

"When we look at the organization of work from the perspective of the twentieth century, the prevailing system, factory discipline, seems the natural and timeless way of organizing work. Under factory discipline workers face a very constrained choice. In return for their wage, they surrender to the employer complete command of their labor for a fixed period each day. The employer sets the pace of work and also dictates how workers will conduct themselves on the job."

Outline

1. Present-biased discounting: an example
2. Sophistication and commitment
3. Naiveté and freedom
4. The commitment puzzle
5. When do naïve agents "choose" commitment?
   - Model-free equilibrium ("experienced utility" drives choices rather than structural forecasts of future behavior)
6. Private paternalism
7. The limits and scope of private paternalism

Present-bias
(aka quasi-hyperbolic discounting)

$$U_t = u_t + \beta\delta u_{t+1} + \beta\delta^2 u_{t+2} + \beta\delta^3 u_{t+3} + \ldots$$
$$U_t = u_t + \beta[\delta u_{t+1} + \delta^2 u_{t+2} + \delta^3 u_{t+3} + \ldots]$$

- Assume $\beta < 1$.

Present-bias
(aka quasi-hyperbolic discounting)

$$U_t = u_t + \beta[\delta u_{t+1} + \delta^2 u_{t+2} + \delta^3 u_{t+3} + \dots]$$

- To build intuition, assume $\delta = 1$ and $\beta = 1/2$.
- Discounted utility becomes

$$U_t = u_t + \frac{1}{2}[u_{t+1} + u_{t+2} + u_{t+3} + \dots]$$

- Discounted utility from the perspective of time $t+1$.

$$U_{t+1} = u_{t+1} + \frac{1}{2}[u_{t+2} + u_{t+3} + \dots]$$

- Discount function reflects *dynamic inconsistency*: "preferences held at date t do not agree with preferences held at date $t+1$."

Example

- Assume $\beta < 1$ and $\delta = 1$.
- Effort, e, has immediate cost $\frac{1}{2}e^2$ and delayed benefit e.
- In anticipation, agent plans to maximize: $\beta\left[-\frac{1}{2}e^2 + e\right]$
- So optimal effort is $e = 1$.

- In the moment, agent maximizes: $-\frac{1}{2}e^2 + \beta e$
- So effort is $e = \beta < 1$.

Agent plans to work hard, but…

- A period in advance, the agent prefers $e = 1$.
- But, when the time to work arrives, the agent chooses $e = \beta < 1$.

Essence of the self-regulation problem

- Self t and self $t+1$ don't agree on how to behave.
- Self t wants self $t+1$ to work hard.
- Self $t+1$ wants instant gratification.

Beliefs about the future?
Strotz 1957; O'Donoghue and Rabin 1999a

- Sophisticate: knows that her own current plans to be patient in the future won't pan out. Understands that future selves will keep being present-biased.
  - "I won't quit smoking next week, though I wish I would."
- Naif: mistakenly believes that her current plans to be patient in the future will be carried out.
  - "I will quit smoking next week, though I've failed to do so for many years."
- Partial naifs: [illegible]

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Commitment

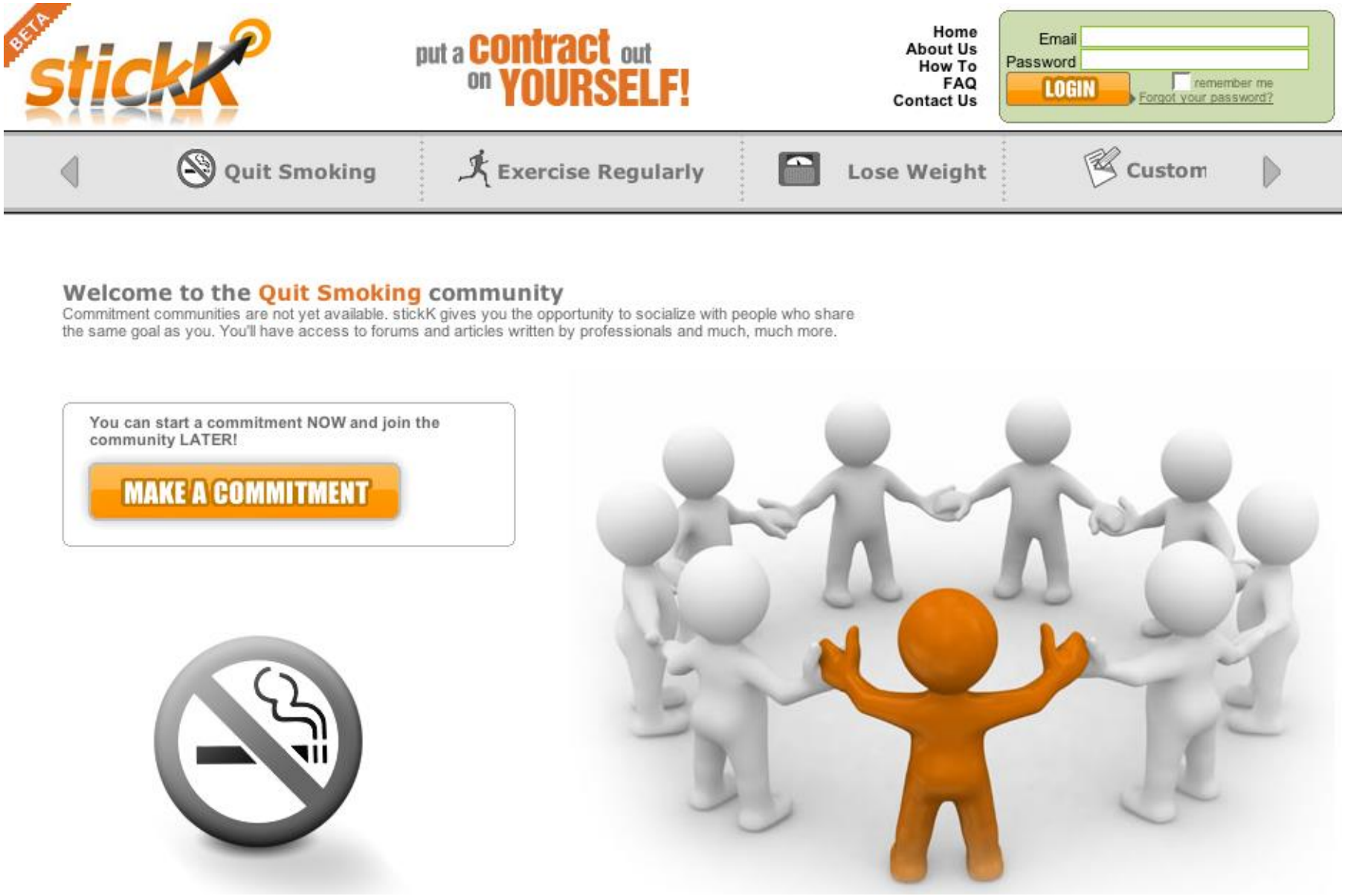
- Effort, e, has immediate cost $\frac{1}{2}e^2$ and delayed benefit e.
- Without present bias, agent maximizes: $-\frac{1}{2}e^2 + e$
- Optimal effort: $e = 1$.

- Sophisticates know that they'll exert less effort ($e = \beta$), unless they commit to $e = 1$.

Examples

“James, John, and Brigitte: I commit to give you each $1000 if I fail to finish the paper draft by 11:59 pm Friday.”

“Sign up to give a brown bag presentation as a commitment device.”



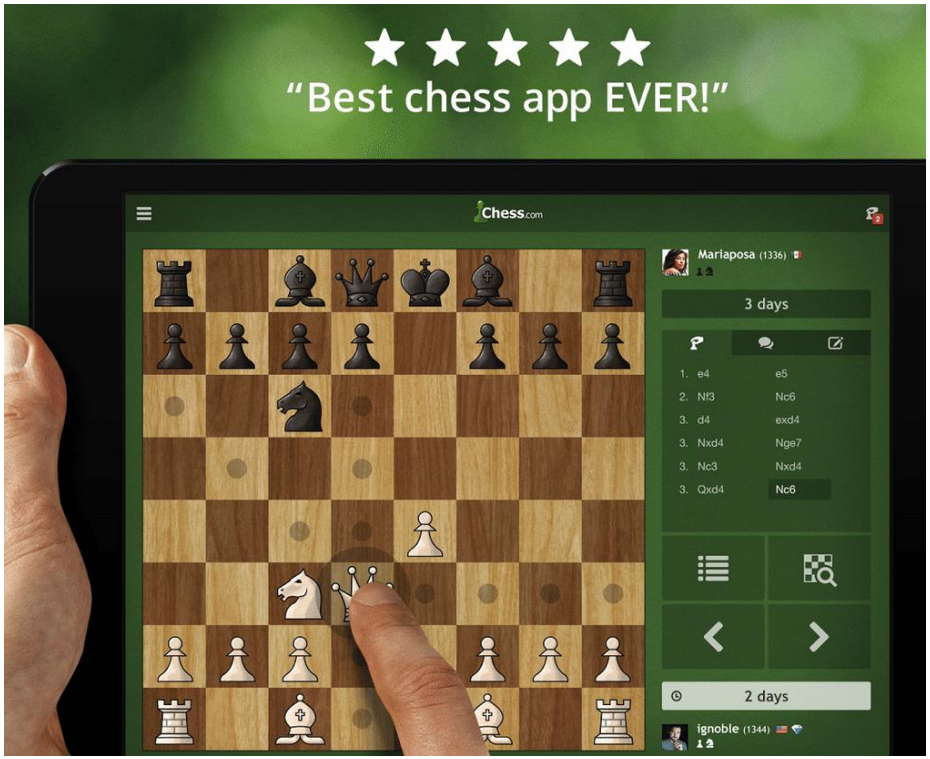
Ayres, Goldberg and Karlan: Stickk.com

Clocky

Tocky

Common pure commitments

1. Web blocker software
2. Removing the distracting app from my iPad
3. Buying a pint rather than a gallon of ice cream?



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Naïve agents prefer freedom

- All else equal, naïve agents prefer freedom.
- Would never choose to bind themselves (unless there was some compensating tradeoff).

Evidence for at least partial naivite.

- Dellavigna and Malmendier (gyms; 2004)
- Acland and Levy (gyms; 2015)
- Goda, Levy, Manchester, Sojourner, and Tasoff (retirement savings; 2015)
- Augenblick and Rabin (experimental effort task; 2017)
- Levy et al (smoking cessation; 2017)
- Kuchler and Pagel (credit cards; 2017)

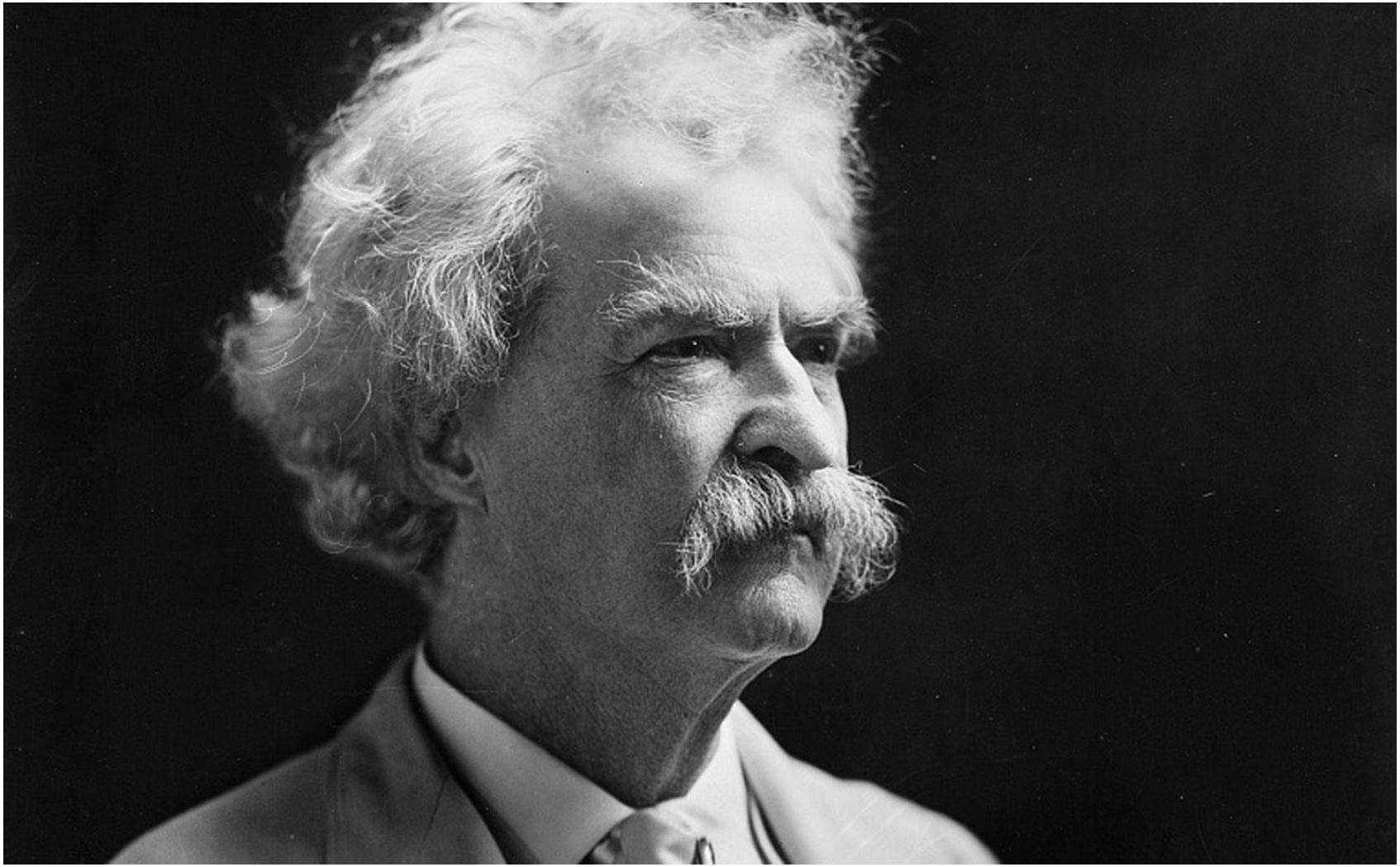
“Now don’t say you can’t swear off drinking; it’s easy. I’ve done it a thousand times.”

W.C. Fields,

The Temperance Lecture, 1938.

Some evidence for asymmetric naiveté Fedyk (2017)

- In a classroom survey, students systematically underestimate how late they will turn in an assignment, but hold much more accurate beliefs about their classmates.
- In an online experiment, participants engage in a real-effort task (a la Augenblick, Niederle and Sprenger 2015 and Augenblick and Rabin 2017).
  - Fedyk estimates $\beta = 0.82$.
  - Participants **perceive** others' β to be 0.87, implying interpersonal sophistication, contrasted with 1.03 for themselves, implying naiveté.



“Nothing so needs reforming as other people’s habits.”

Mark Twain

Some indirect evidence for naiveté

The commitment industry is missing in the sense that very few (explicit) commitment products are being marketed.

When commitment is present, it is impure: bundled with other features (e.g., deadlines, work norms, constraints in mortgage contracts).

So what if people are naïve?

- What will equilibrium look like?
- Assume that people are forward looking naïve agents (Dellavigna and Malmendier 2004, 2006).
- Firms will exploit workers/customers.

Equilibrium with naïve agents is exploitative

- Recall previous example:

  with effort cost $\frac{1}{2}e^2$ workers can produce output e
- Assume that workers have outside option z
- Firms choose e^*, $w(e^*)$, $\hat{e}$, $w(\hat{e})$, to maximize:

$$e^* - w(e^*)$$

- Subject to the constraints:

$$\beta w(e^*) - \frac{1}{2}(e^*)^2 \geq \beta w(\hat{e}) - \frac{1}{2}(\hat{e})^2 \qquad \text{IC}$$

$$w(\hat{e}) - \frac{1}{2}(\hat{e})^2 \geq z \qquad \text{IR}$$

Result

- Firms offer a wage schedule that makes workers anticipate working at maximal feasible effort level:

$$\hat{e} = e_{MAX}$$

- It is bait and switch. Once the worker joins the firm, and it's time to work, the worker reverts to

$$e^* = \beta$$

- Worker may end up with a lower payoff than her outside option

Theory predicts exploitative equilibria and they do exist in many markets

Dellavigna and Malmendier (2004, 2006)
Ausubel and Shui (2005)
Spiegler and Eliaz (2006, 2008)

- credit cards
- gambling
- health clubs
- life insurance policies
- mail order businesses
- mobile phones
- vacation time-sharing

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The commitment puzzle (cf Laibson 2015)

Three stylized facts that appear to be jointly inconsistent:

1. People have self-control problems: $\beta < 1$.
2. Lots of institutions have bundled commitment features that appear to be specifically designed to help agents with self-control problems.
3. Firms don't market these commitment features.

A few examples of bundled commitments:

- Teachers make problem sets count
- Teachers ban laptops
- Doctoral programs force students to meet milestones
- Mortgages require full monthly payments (contrast with Option Payment ARMS)
- Mortgages require payments that repay interest and principle (contrast with interest-only loans)
- Employers make workers punch the clock
- Employers set (intermediate) deadlines
- Employers provide non-fungible retirement benefits
- Employers provide non-fungible health benefits

The commitment puzzle (cf Laibson 2015)

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- If people are sophisticated, they will want commitment (and firms should market commitment).

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- If people are sophisticated, they will want commitment (and firms should market commitment).
- If people are naïve, they won't want commitment.

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1. **Present-biased discounting: an example**
2. **Sophistication and commitment**
3. **Naiveté and freedom**
4. **The commitment puzzle**
5. **When do naïve agents "choose" commitment?**
   – **Model-free** (vs. Model-based) **equilibrium**
6. **Private paternalism**
7. **The limits and scope of private paternalism**

Two polar cases for thinking about choice:

- Model-Based Reasoning (classical economics)
  - Agents use models to predict the future and to evaluate the offers that are presented to them.
- Model-Free Reasoning.
  - Agents use “naïve” empirical analysis to predict the future and to evaluate the offers that are presented to them.
  - O’Donoghue and Rabin (1999b): experienced utility
  - Dayan and Niv (2008): naïve empiricism
  - Also, the history of behaviorism (e.g., Skinner)

Model-based reasoning for a naïve agent

- Evaluate the contracts that are offered to me using a complete theory of my own behavior
- This is the approach that is overwhelmingly taken in the behavioral literature (e.g., Dellavigna and Malmendier 2004, 2006; Spiegler and Eliaz (2006, 2008; Gabaix and Laibson 2006).

Model-based reasoning leads naïve agents to be exploited

- In the illustrative example that we have been studying, firms hire workers who expect to work $e_{MAX} > \beta$, but instead work $e = \beta$, and may end up doing worse than their outside option.

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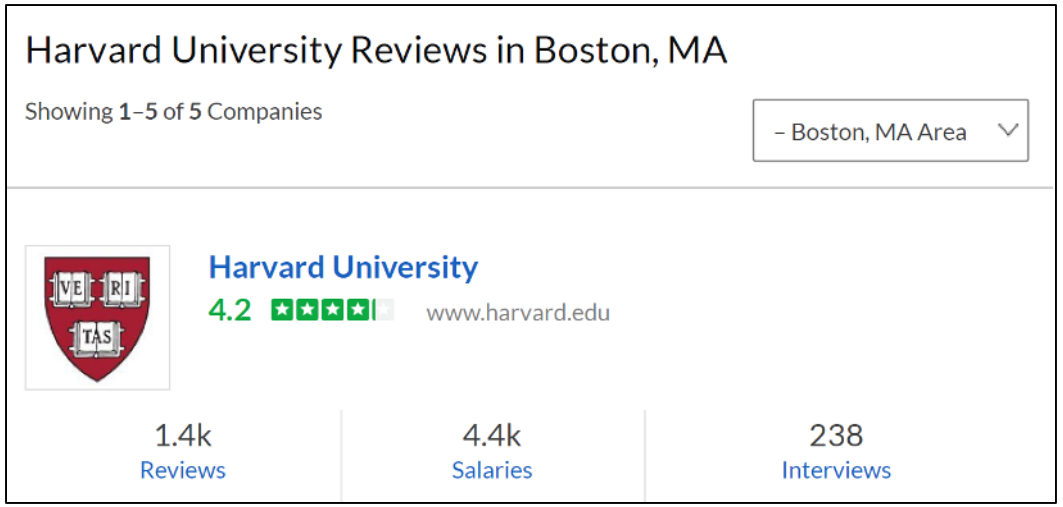
Model-free reasoning

- Ask people about their personal experiences.
- Reputational comparison: “workers at firm A are retrospectively happier than workers at firm B.”
- Or use other summary measures, like income, hours, or ratings.



O’Donoghue and Rabin (1999b)

“Reputational pressures may induce firms to offer incentive contracts that are ex post acceptable to agents, which would imply that firms wish to induce efficient behavior.”

A general setting

Timing

1. Firms choose a schedule of compensation: $w(a_w)$
2. Worker chooses a firm (employer)
3. Worker chooses action vectors a_w^* and a_h^* :

$$\max -e^w(a_w) + \beta u^w(w(a_w)) - e^h(a_h) + \beta u^h(H(a_h))$$

Experienced utility: $-e^w(a_w^*) + u^w(w(a_w^*)) - e^h(a_h^*) + u^h(H(a_h^*))$

Firm profit: $F(a_w^*) - w(a_w^*)$

Model-based reasoning

Observation 1: Assume that agents use model-based reasoning and that they are partially or fully naïve. Then competitive equilibrium is generically inefficient both in workplace production and in home production.

Proof: Firms exploit naïve agents, as in the example that we analyzed earlier. In home production, workers make choices that reflect present bias.

Model-free reasoning

- Workers pick firms by observing experienced utility associated with each compensation function, $w(a_w)$.

Model-free reasoning

Observation 2: Assume workers use (steady state) experienced utility to pick employers. Then socially efficient actions and allocations are implemented in the work relationship. Workers take action a_w^* and are paid $F(a_w^*)$, where

$$a_w^* = argmax\{-e(a_w) + u(F(a_w))\}$$

Proof: firms will not attract workers unless they deliver the maximally feasible allocation of rents to workers, as measured by experienced utility.

Model free equilibrium

Model-free equilibria arise when agents use model-free retrospective evaluations – i.e., experienced utility to make choices.

In our setting, model-free equilibrium implies that equilibrium formal-sector employment relationships will be characterized by efficient commitment, even if agents are partially or fully naïve.

Resolution of the commitment puzzle

Three facts that are jointly consistent in the presence of model-free reasoning:

1. People have self-control problems: $\beta < 1$.
2. Lots of institutions have bundled commitment features that appear to be specifically designed for agents with self-control problems.
3. Firms don't market these commitment features.

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Private paternalism

- Paternalism that is implemented by private institutions (without government intervention).
- Private paternalism may occur even if agents are naïve.
- Private paternalism will be shrouded if a substantial fraction of agents are naïve.
  - Employee/customer satisfaction will be made salient instead.

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Limits of private paternalism

- Results break down when benefits or costs come at long horizons, so that experienced utility is an incomplete measure of total utility.
  - Savings, health, human capital acquisition

Limits of private paternalism

Informational requirements are significant. We assumed that experienced utility dominates other decision-making tools.

- Unbiased (Glassdoor is highly selective)
- Accurate (low noise, large samples)
- Comprehensive (short- and long-run consequences)

This data is much more likely to be obtained when you take a new job, than when you obtain a new credit card or buy a gym membership.

Market Failure and Experienced Utility

- Data on experienced utility will be undersupplied in equilibrium.
- Agents over-estimate the accuracy of their self forecasts and under-estimate the relevance of other people's experiences (recall Fedyk 2017).
- Also data on experienced utility is a public good, so it will be undersupplied even if people understand its value.
- In most settings, reputational information is not provided: e.g., average frequency of gym attendance or debt accumulation with credit cards.
- Experienced utility data is a public good that could be subsidized or mandated.

Do consumers have a correct expectation of their likely usage rate of this $3,000 home exercise machine?

I once purchased a $3,000 treadmill that I used <10 times before giving it away.

Limits of private paternalism

Home production is not efficient

- Who will provide enforcement?
- Some spouses/partners provide efficient commitment.

Nina Zipser

Dean for Faculty Affairs and Planning

“Turn off email at 10 pm and lights out at 10:30 pm.”

Limits of private paternalism

Home production is not efficient

- Who will provide enforcement?
- Some spouses/partners provide efficient commitment.
- Some spouses/partners don't have control rights.
- Partner selection isn't efficient ("no" switching, poor data on experienced utility – would you ask your partner's ex?)
- Partners aren't always present (I visit McDonalds frequently without my spouse)
- Partners aren't scalable (and firms are)
- Many people don't have partners

Public paternalism should be more active where private paternalism isn't operative

- Decisions with long-run consequences (retirement savings, health care, disability insurance)
- Decisions that are outside of the employment relationship (cigarette taxes, soda taxes, helmet/seatbelt laws, UI, financial services regulation)

Virtues of **Private Paternalism**

- Help us overcome present bias (and other biases)
- Not universal and not imposed by the government
- Flexibility creates more scope for competition/innovation
- Can appeal to naïve agents (and sophisticated agents)
- Succeed in spreading if and only if they raise welfare (pass this basic welfare criterion)
- Optional at low frequency, but binding at high frequency (which is an ideal correction for agents with naïve present-bias)

Summary

- Private paternalism is paternalism implemented by private institutions.
- Private paternalism will often be shrouded
  - naïve agents with model-free equilibrium
- Private paternalism resolves the commitment puzzle
- Private paternalism is most likely to be operative:
  - In the formal labor market
  - When payoffs are clearly tied to actions
  - When employment relationships are long-lived
  - When experienced utility guides choice
- The scope for private paternalism is enlarged when we
  - Expand the scope of the formal sector
  - Increase access to data on experienced utility

Thanks.
Feedback welcome:
dlaibson@harvard.edu

Read, Loewenstein & Kalyanaraman (1999)

Choose among 24 movie videos

- Some are “low brow”: *Four Weddings and a Funeral*
- Some are “high brow”: *Schindler’s List*

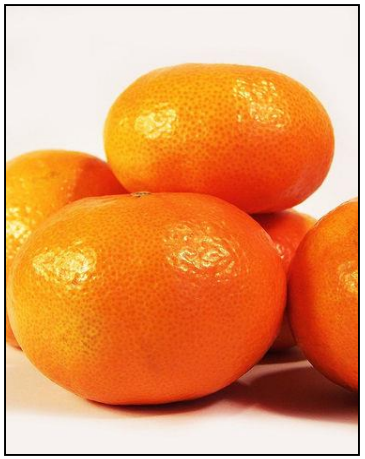
- Picking for tonight: 66% of subjects choose low brow.
- Picking for next week: 37% choose low brow.
- Picking for two weeks: 29% choose low brow.

Tonight I want to have fun…
next week I want things that are good for me.

Read and van Leeuwen (1998)

Choosing Today → Eating Next Week → *Time*

If you were deciding today, would you choose fruit or chocolate for next week?

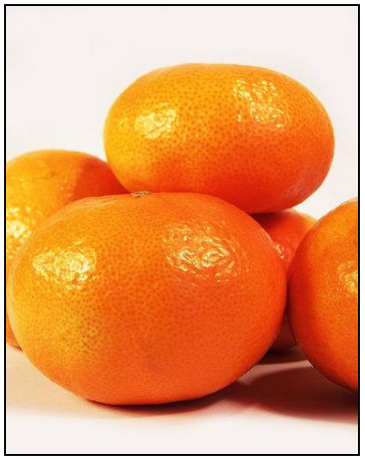


Patient choices for the future:

Choosing Today → Eating Next Week → *Time*

Today, subjects typically choose fruit for next week.

74% choose fruit



Impatient choices for today:

Choosing and Eating Simultaneously

Time

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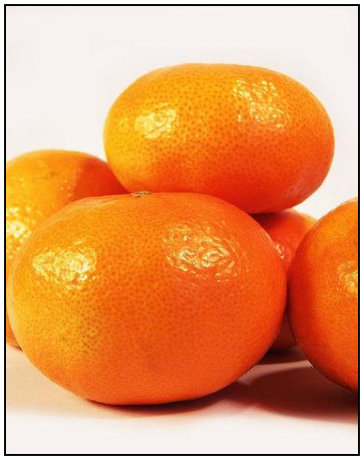
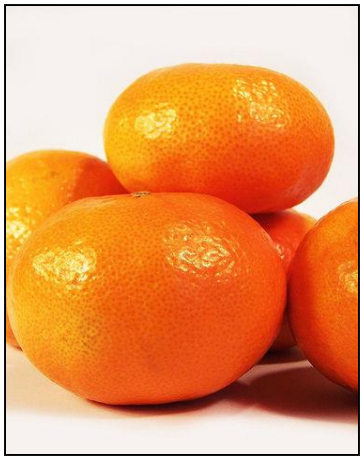


Time Inconsistent Preferences:

Choosing and Eating Simultaneously

Time



70% choose chocolate

Extremely thirsty subjects

McClure, Ericson, Laibson, Loewenstein and Cohen (2007)

- Choosing between,

  juice now or **2x juice in 5 minutes**

  60% of subjects choose first option.

- Choosing between

  juice in 20 minutes or **2x juice in 25 minutes**

  30% of subjects choose first option.

- We estimate that the 5-minute discount rate is 50% and the "long-run" discount rate is 0%.

Augenblick, Niederle, and Sprenger (2015) "Three period work experiment: 0, 2, 3"

- At date 0: How hard do you want at work at 2 and at 3?
- At date 2: How hard do you want to work at 2 and at 3?

- At date 2, subjects tend to shift work from 2 to 3.
- Estimated parameters: $\beta = 0.927;\ \delta = 0.997$
- Subjects are willing to commit at date 0 (48/80 commit).
- But they are generally unwilling to pay to commit.
- For those who commit: $\beta = 0.881;\ \delta = 1.004$

Outline

1. Present-biased discounting
2. Preference reversals
3. Pure commitments (experimental evidence)
4. Other evidence
5. Paternalism and freedom
6. Embedded commitments

Ashraf, Karlan, and Yin (2006)

- Offered a commitment savings product to randomly chosen clients of a Philippine bank
- **28.4%** take-up rate of commitment product (either date-based goal or amount-based goal)
- Subjects with more present-bias are more likely to take up the product
- After twelve months, average savings balances increased by 81% for those clients assigned to the treatment group relative to those assigned to the control group.

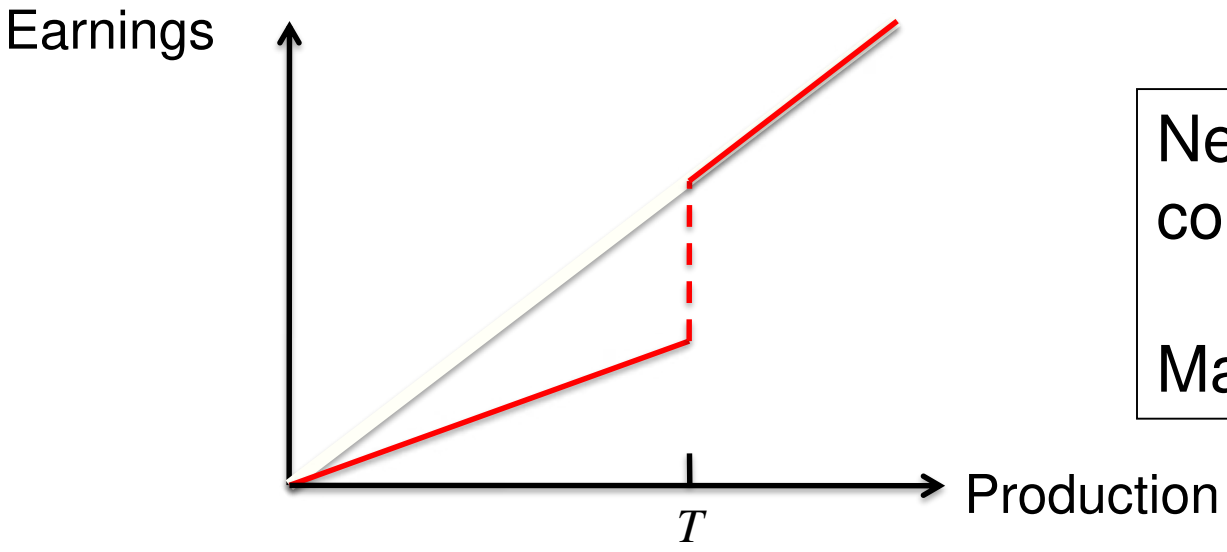
Gine, Karlan, Zinman (2009)

- Tested a voluntary commitment product (CARES) for smoking cessation.
- Smokers offered a savings account in which they deposit funds for six months, after which take urine tests for nicotine and cotinine.
- If they pass, money is returned; otherwise, forfeited
- **11%** of smokers offered CARES take it up
- Among all smokers randomly *offered* CARES, the smoking quit rate was 3 percentage points higher than the control group (quitting = pass the 6-month urine test)
- Effect persisted in surprise tests at 12 months.

Kaur, Kremer, and Mullainathan (2010):

Compare two piece-rate contracts:

1. Linear piece-rate: w per unit produced
2. Linear piece-rate with penalty if worker does not achieve production target T ("Commitment")
   - Earn $w/2$ for each unit produced if production < T
   - Jump up at T, returning to baseline contract



Never earn more under commitment contract

May earn ½ as much

Kaur, Kremer, and Mullainathan (2010):

- Demand for Commitment: Commitment contract (Target > 0) chosen **35%** of the time
- Effect on Production: Being *offered* commitment contract increases average production by 2.3 percentage points relative to control

Houser, Schunk, Winter, and Xiao (2010)

- In a laboratory setting, **36.4%** of subjects are willing to use a commitment device to prevent them from surfing the web during a work task

Royer, Stehr, and Sydnor (2011)

- Commit to go to the gym at least once every 14 calendar days (8 week commitment duration)
- Money at stake is choice of participant.
- Money donated to charity in event of failure.
- **Fraction taking commitment contract:**
  - **Full sample: 13%**
  - **Gym Members: 25%**
  - **Gym Non-members: 6%**
- Average commitment = $63; max = $300, 25th pct = $20; 75th pct = $100.

Study of rickshaw peddlers who are given access to commitment technologies Schilbach (2015)

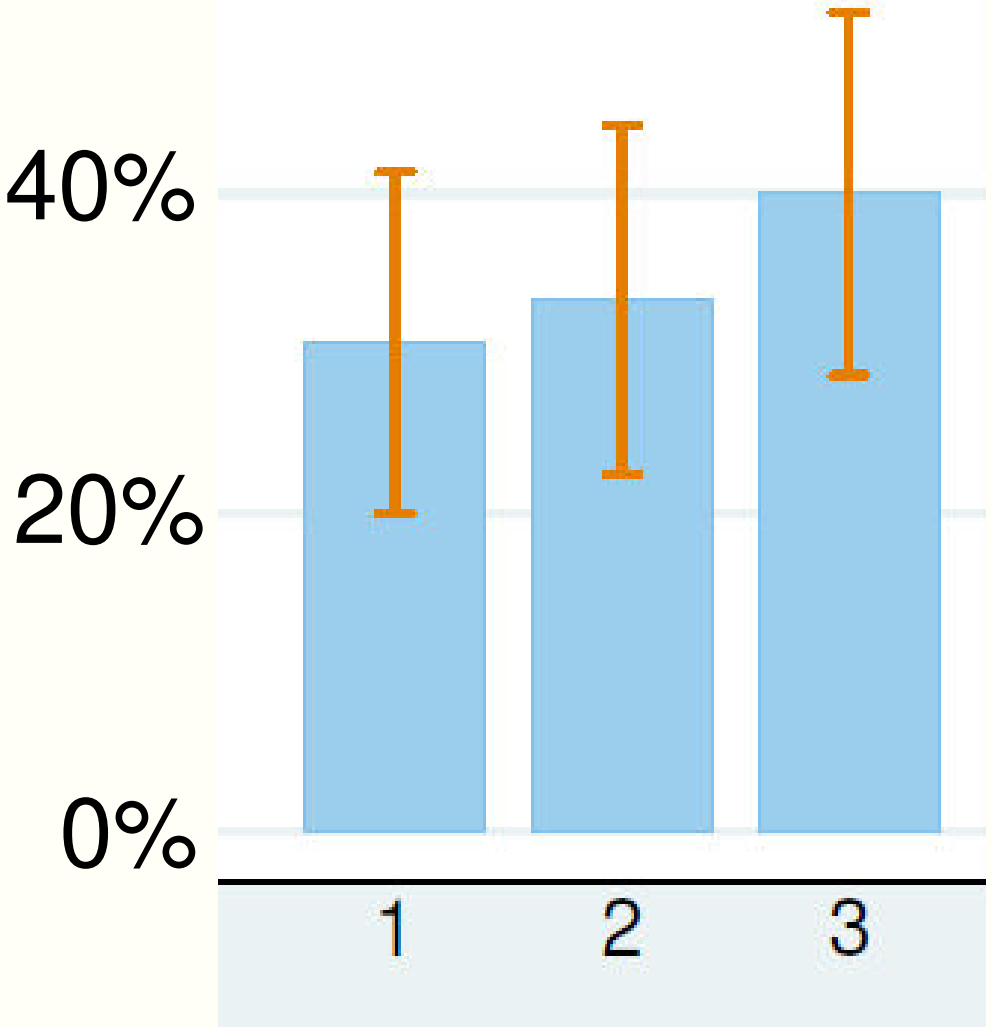
- Alcohol commitment (sobriety contingent payments)
- Savings commitment (lockbox)

Commitment Technology for Alcohol Avoidance

Rickshaw cyclers choose **either** an **incentive payment** based on $B_{lood}A_{lcohol}C_{ontent}$ or an **unconditional payment**.

Incentive Payment		**Unconditional Payment**
$BAC > 0$	$BAC = 0$	regardless of BAC
Rs. 60	Rs. 120	Rs. 150

Fraction of rickshaw peddlers committing (i.e., choosing the **incentive payment**) by week of study



Allocate across two accounts

Goal Account	Freedom Account
Subject picks a goal date ❖ **Illiquid** before goal date ❖10% early withdrawal penalty ❖ Liquid after goal date, just like freedom account ❖ 22% interest per year	❖Liquid – can withdraw money any time within the period of experiment (1 year) ❖ 22% interest per year

Beshears, Choi, Laibson, Madrian, Sakong (2016)

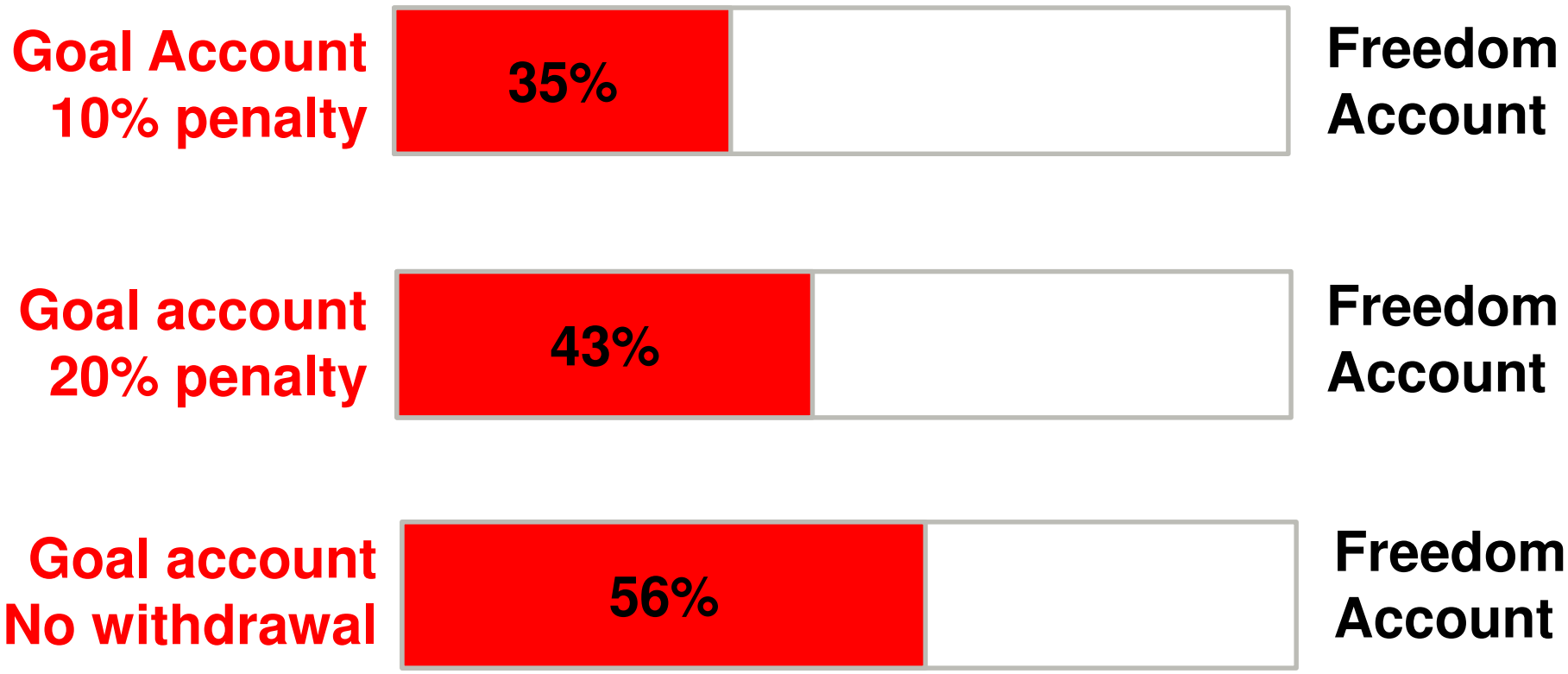
How to design a commitment contract

Beshears, Choi, Laibson, Madrian, Sakong (2016)

Participants divide $100 between:

- Freedom account (22% interest)
- Goal account (22% interest)
  - withdrawal restriction before goal date

Initial investment in goal account



Outline

1. Present-biased discounting
2. Preference reversals
3. Pure commitments
4. Other evidence
5. Paternalism and freedom
6. Embedded commitments

Dellavigna and Malmendier (2004, 2006)

- Average cost of gym membership: $75 per month
- Average number of visits: 4
- Average cost per vist: $19
- Cost of “pay per visit”: $10

Shapiro (2005)

- For food stamp recipients, caloric intake declines by 10-15% over the food stamp month.
- To be resolved with exponential discounting, requires an annual discount rate of close to 100%.
- Survey evidence reveals rising desperation over the course of the food stamp month, suggesting that a high elasticity of intertemporal substitution is not a likely explanation.
- Households with more short-run impatience (estimated from hypothetical intertemporal choices) are more likely to run out of food sometime during the month.

Estimating discount functions with consumption choices over the lifecycle

Laibson, Maxted, Repetto, Tobacman (2017)

Demographics:

- mortality, child dependents, adult dependents, three educational groups, stochastic labor income with life-course variation

Dynamic Budget Constraint

- credit cards with credit limit, liquid and partially illiquid assets

State variables:

- liquid wealth, illiquid wealth, autocorrelated labor income

Preferences:

- Quasi-hyperbolic discounting (focus on naïve case) and constant relative risk aversion

Methodology

Method of simulated moments.

- Solve for the preference parameters (discounting and risk aversion) that minimize the weighted squared difference between 12 simulated and empirical balance sheet moments.

Empirical Moments used in Method of Simulated Moments

% Visa 21-30	0.815
% Visa 31-40	0.782
% Visa 41-50	0.749
% Visa 51-60	0.659
mean Visa 21-30	0.199
mean Visa 31-40	0.187
mean Visa 41-50	0.261
mean Visa 51-60	0.276
wealth 21-30	1.23
wealth 31-40	1.86
wealth 41-50	3.24
wealth 51-60	5.34

STRUCTURAL ESTIMATION RESULTS

	Present Biased
Parameter estimates	
$\hat{\beta}$	**0.5054**
	(0.1481)
$\hat{\delta}$	**0.9872**
	(0.0089)
CRRA	**1.2551**
	(0.1564)

STRUCTURAL ESTIMATION RESULTS

	Present Biased	Exponential
Parameter estimates		
$\hat{\beta}$	**0.5054**	**1**
	(0.1481)	-
$\hat{\delta}$	**0.9872**	**0.8926**
	(0.0089)	(0.0083)
CRRA	**1.2551**	**1.0047**
	(0.1564)	(0.2857)

STRUCTURAL ESTIMATION RESULTS

	Present Biased	Exponential
Parameter estimates		
$\hat{\beta}$	**0.5054**	**1**
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CRRA	**1.2551**	**1.0047**
	(0.1564)	(0.2857)
Second-stage moments		
% Visa 21-30	0.598	0.704
% Visa 31-40	0.607	0.693
% Visa 41-50	0.588	0.654
% Visa 51-60	0.569	0.601
mean Visa 21-30	0.232	0.204
mean Visa 31-40	0.237	0.225
mean Visa 41-50	0.217	0.210
mean Visa 51-60	0.196	0.193
wealth 21-30	1.299	0.441
wealth 31-40	1.819	0.015
wealth 41-50	2.925	-0.047
wealth 51-60	5.020	-0.035

STRUCTURAL ESTIMATION RESULTS

	Present Biased	Exponential	Data
Parameter estimates			
Beta	**0.5054**	**1**	-
	(0.1481)	-	-
Delta	**0.9872**	**0.8926**	-
	(0.0089)	(0.0083)	-
CRRA	**1.2551**	**1.0047**	-
	(0.1564)	(0.2857)	-
Second-stage moments			
% Visa 21-30	0.598	0.704	0.815
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wealth 51-60	5.020	-0.035	5.34

Some Other Studies

- Della Vigna and Paserman (2005): job search
- Duflo (2009): immunization
- Duflo, Kremer, Robinson (2009): commitment fertilizer
- Meier and Sprenger (2010): correlation with credit card borrow
- Milkman et al (2008): video rentals return sequencing
- Oster and Scott-Morton (2004)
- Sapienza and Zingales (2008,2009): procrastination
- Shui and Ausubel (2006): credit cards
- Trope & Fischbach (2000): commitment to medical adherence
- Wertenbroch (1998): individual packaging
- Willis (2016): farmers want to buy crop insurance in the future

Outline

1. Present-biased discounting
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5. Public paternalism
6. Private paternalism

Paternalism: an attempt to influence or control people's conduct *for their own good* (so the motivation for the intervention is not about externalities).

Optimal Illiquidity

Beshears, Choi, Clayton, Harris, Laibson, Madrian (2017)

- Solve for the optimal retirement savings system in an economy with present bias
- Fundamental challenge: an information asymmetry
  - Public knows their own tastes and the government doesn't

Model Set-Up

- Households live for 2 periods
  - Period 1 = working life
  - Period 2 = retirement
- Consumption in period 1, c_1, produces utility $\theta u(c_1) = \theta \log(c_1)$
- θ is random variable representing how valuable pre-retirement spending is
  - Lies between positive numbers $\underline{\theta}$ and $\overline{\theta}$
- Consumption in period 2, c_2, produces utility $v(c_2) = \log(c_2)$

Benevolent social planner

- Social planner's preference over household's consumption given by

$$\theta \log(c_1) + \delta \log(c_2)$$

- δ is discount factor representing how much less valuable future utility is
  - Lies between 0 and 1

- θ can't be observed by planner, but planner knows population-wide distribution of θ

Household preferences

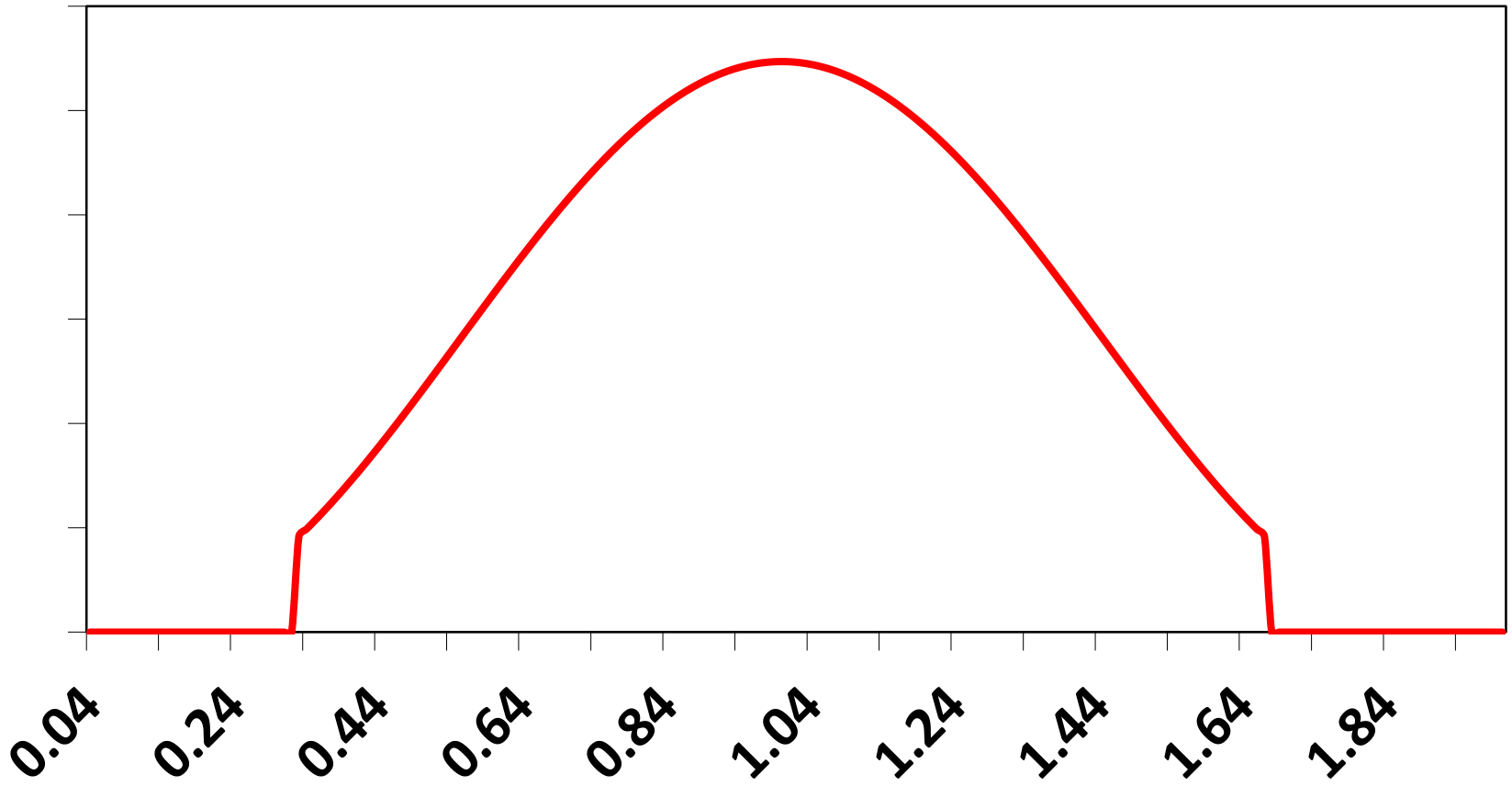
- Household's preference over consumption given by

$$\theta \log(c_1) + \boldsymbol{\beta} \delta \log(c_2)$$

- Present bias term β is between 0 and 1

θ distribution

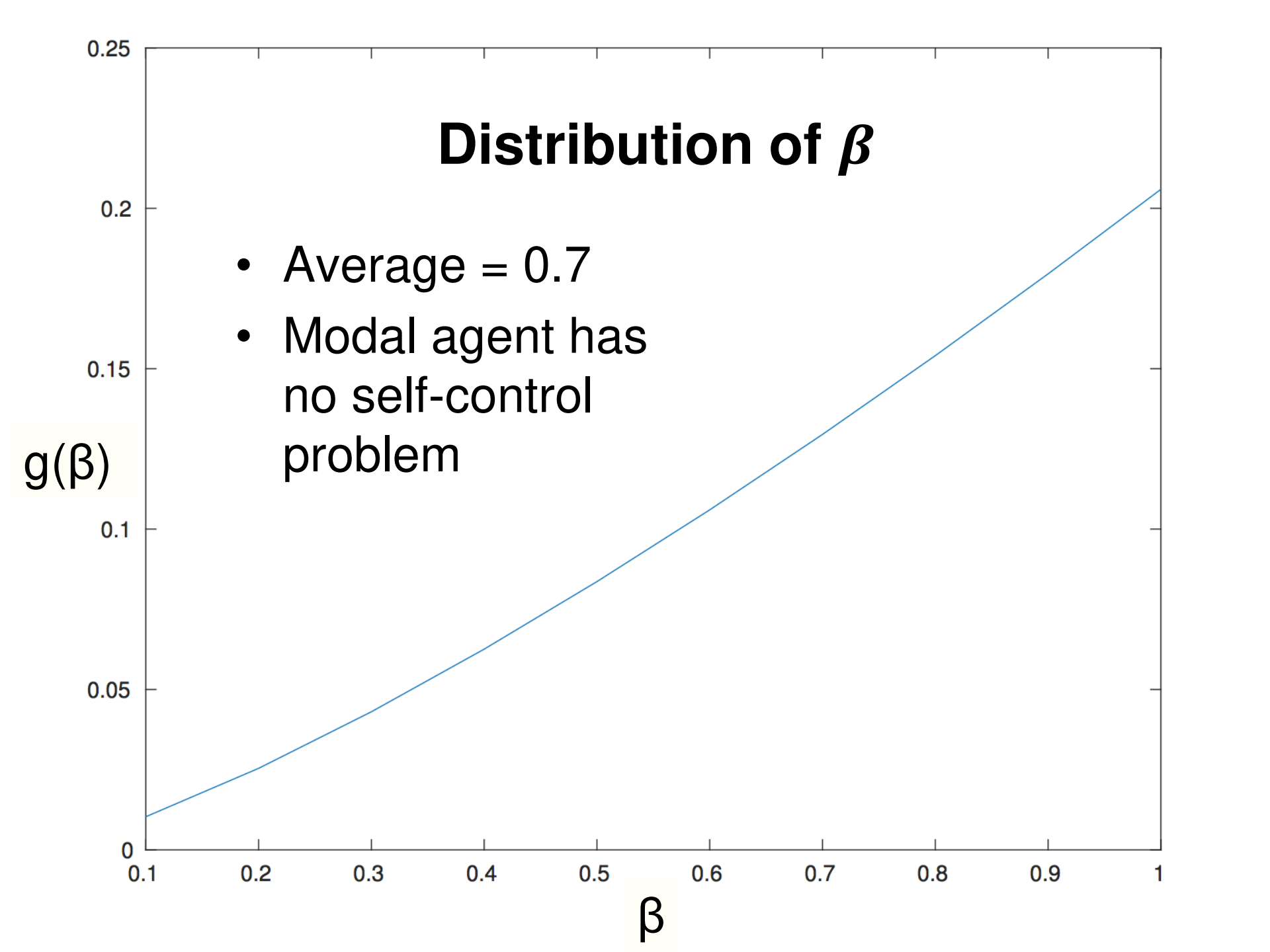
Normal distribution with mean 1, standard deviation 0.25, truncated at 1/3 and 5/3



Savings accounts

Planner chooses for *N* accounts

- How much to put in each account
- Early withdrawal penalty (for period 1)


Distribution of β
Average = 0.7
Modal agent has no self-control problem
g(β)
β
0.25
0.2
0.15
0.1
0.05
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Results from numerical simulations

- Optimal 2-account system
  - 1 completely liquid account
  - 1 completely illiquid account
  - Welfare gain of 3.4% of income relative to system with only one completely liquid account
- Optimal 3-account system
  - 1 completely liquid account
  - 1 completely illiquid account
  - 1 account with early withdrawal penalty = 9%
- **Incremental** welfare gain from third account is only 0.018% (less than 2/100 of 1%) of income

Leakage

- Planner puts 14% of partially and fully illiquid assets in partially illiquid account
  - Retirement accounts represent 12% of (retirement accounts + DB pension + Social Security) for the median married household in 2008.

- 74% of dollars in partially illiquid account leaks in period 1

Takeaways

Within **highly simplified** model:

- Completely illiquid layer like Social Security is optimal and achieves almost all possible welfare gains from policy
- 401(k)/IRA system adds only a little to welfare
- 10% withdrawal penalty from 401(k)/IRA system is about optimal
- High leakage from 401(k)/IRA system is optimal
  - Some of that leakage is for legitimate purposes
  - Penalties paid by early withdrawers benefit the rest of us

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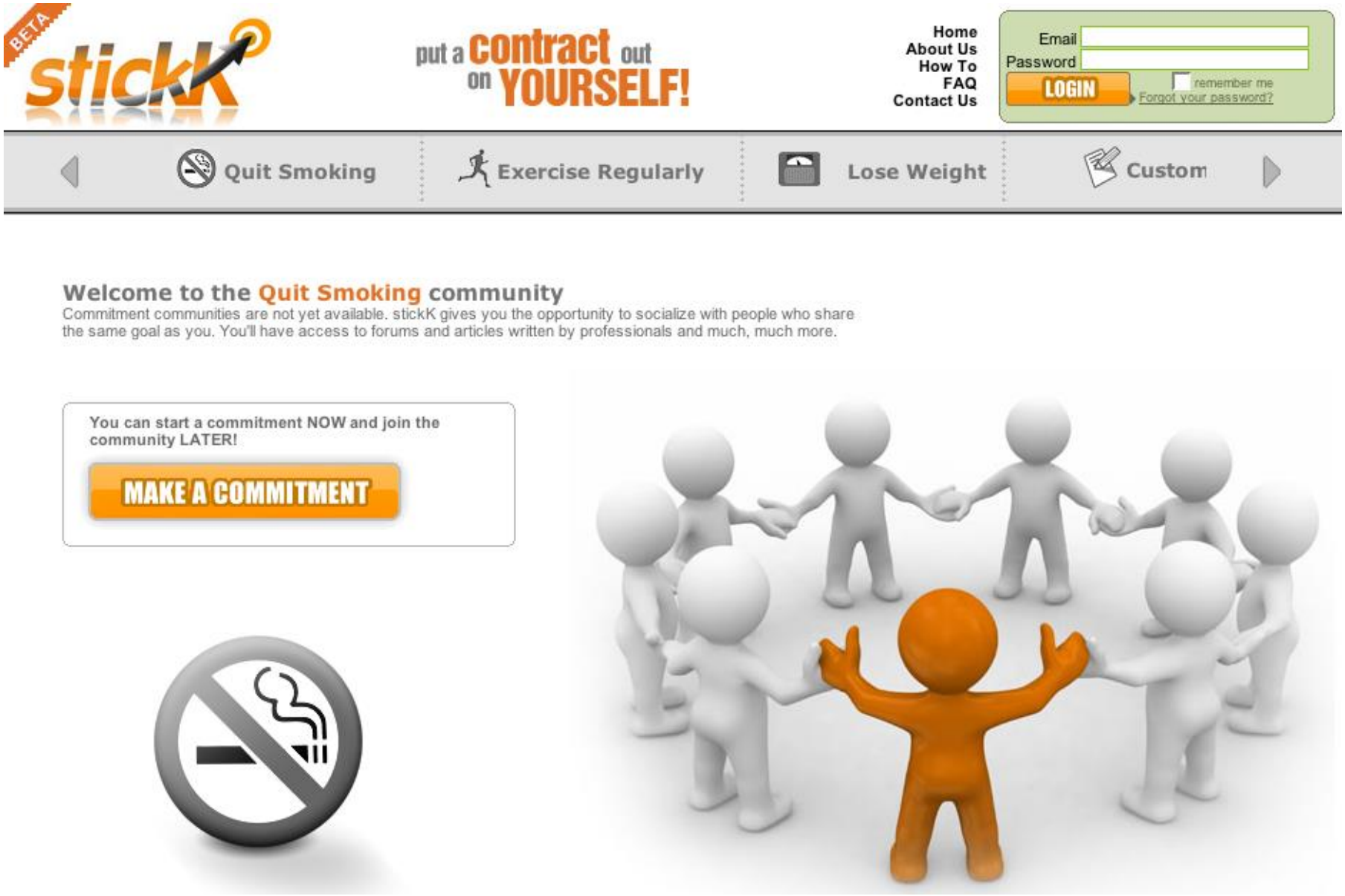
5. Public sector paternalism
6. Private sector paternalism

Private paternalism comes in two forms:

1. Sophisticated commitments
   - This is paternalism in a multiple-self model
   - Some might not count this as paternalism because it is self-generated
   - I don’t care whether you call it paternalism or not



Ayres, Goldberg and Karlan: Stickk.com

Clocky

Tocky

Other sophisticated commitments…

- Web-blocker software
- Deletion of chess app from my iPad
- ???

Open question

- Why is there so little (unambiguously) sophisticated commitment in the world?
- See Laibson 2015: naivite, uncertainty, and costs.
- See Fedyk 2017: asymmetric naivite

Private paternalism comes in two forms:

1. Sophisticated commitments
2. Naive commitments
   - Commitment that arises in general equilibrium, even for naïve agents.

How does private paternalism arise in a market with **naïve** present-biased agents?

- Consider a business in which output has benefit b
- Assume $0 < b < 1$
- Assume worker effort cost c is time-varying
- Let c be distributed uniformly on $[0,1]$
- Then optimal contract (without present bias) is piece-rate payment of b
- In equilibrium, the agent will only work when $c < \beta b$.
- This yields *average* payoff per period:

$$\int_0^{\beta b} [b - c] dF(c) = \beta b^2 \left(1 - \frac{\beta}{2}\right)$$

What about a bundled commitment contract?

- They come in many different forms (depending on what the employer knows about β).
- Here's one: do the project no matter what.
- Then the *average* payoff per period is

$$\int_0^1 [b - c] dF(c) = b - \frac{1}{2}$$

- As b goes to one, this is better for the individual.
- As β goes to zero, this is better for the individual.
- For high values of b and low values of β, the restrictive contract will engender higher retrospective utility then the flexible contract.

Why would a naïve worker take up this contract?

- Reputational information: “workers at the second firm are retrospectively happier than workers at the first firm”
- Contrast this with ‘model-based’ predictions: “these work rules aren’t theoretically optimal”
- If retrospective evaluations are sufficiently influential, equilibrium contracts will be characterized by commitment (even if agents are naïve).

Virtues of **Private Paternalism**

- Help us overcome present bias (and other biases)
- Not universal and not imposed by the government
- Flexibility creates more scope for competition/innovation
- Can appeal to naives (and sophisticates)
- Succeed in spreading if and only if they raise welfare (pass this basic welfare criterion)
- Optional at low frequency, but binding at high frequency (which is an ideal correction for agents with naïve present-bias)

A few other examples:

- Schools don't need to make midterms or problem sets count toward the final grade
- Mortgages don't need to require full periodic payments (e.g., Option Payment Arms)
- Employers don't need to provide mandatory (defined benefit) retirement benefits

This are examples of private paternalism that will succeed with both naives and sophisticates.

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