Optimal Defaults with Normative Ambiguity

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Motivation: The Optimal Default Problem

- Default effects observed for important decisions
  - Retirement saving (Madrian and Shea, 2001; Choi et al 2004; Carroll et al 2009; Chetty et al 2014; Bernheim Fradkin Popov 2016)
  - Privacy controls (Johnson et al 2002; Acquisti et al 2013)
  - Healthcare choices (Chapman et al. 2010; Handel, 2015)
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  - Classic optimal policy analysis relies on Samuelson's (1939) revealed preference

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- Policy question: how to understand welfare?
  - Classic optimal policy analysis relies on Samuelson's (1939) revealed preference
  - Is revealed preference ok if we "rationalize" behavioral phenomena?
- Similar difficulties for several behavioral policy problems

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- Propose a simple model of the optimal default
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- Characterize welfare, optimal policy as a function of normative parameters
  - Are the “costs” that rationalize default effects welfare costs?
  - When people opt out of the default, do they make mistakes?

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  - Parameterize ambiguity over hard welfare questions
- Characterize welfare, optimal policy as a function of normative parameters
  - Are the “costs” that rationalize default effects welfare costs?
  - When people opt out of the default, do they make mistakes?
- Empirical application to optimal 401(k) default contribution rate

Basic Theoretical Result

Two key sources of normative ambiguity in the model

- Are opt-out costs normatively relevant?
  - Yes $\rightarrow$ minimize opt-outs (roughly/under regularity conditions)
  - No $\rightarrow$ active choices
- Do active choosers make good decisions?
  - Yes $\rightarrow$ min opt-outs or active choice (as above)
  - No $\rightarrow$ set a more paternalistic default to influence behavior

Related Literature

- "Robustness" and policy (Berneheim & Rangel, 2009; Hansen & Sargent, 2008; Green & Hojman 2007)
- Optimal 401(k) contribution defaults (Carroll et al 2009; Bernheim, Fradkin, Popov 2016; Chesterley 2017)
- Behavioral policy problems (Chetty, Looney, Kroft, 2009; Alcott & Taubinsky, 2015, many others)

Outline

- Set up model
- Nesting positive models
- Characterize welfare, optimal policy
- Application: optimal 401(k) defaults
- Extension in the paper: variable as-if costs
- Conclusion

Part 1

A Simple Model of Defaults and Welfare

Setup: Rationalizing Default Effects

$$\hat{u}_i(x, d) = u_i(x) - \gamma_i 1\{x \neq d\}$$

- γ_i is a fixed "as-if" cost to opting out of the default.

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Why Fixed As-If Costs?

Key testable implication consistent with our observation.

- Increase default from d to d':
  - Decrease $P(x_i = x)$ for $x > d'$
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- Variable costs can give the opposite implication
- Matches results in the literature:
  - Choi et al (2004) on 401(k) defaults
  - Haggag & Paci (2014) on default tips
  - Altmann et al (2014) on charitable giving
  - Brown et al (2013) on energy efficiency

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- This model makes non-trivial predictions borne out by data
- Are as-if costs real welfare costs?
  - Estimated in the thousands of dollars in multiple contexts (Handel 2015, Bernheim, Fradkin Popov 2016)
- Do active choosers make optimal choices?
  - e.g. for saving, does present bias lead active choosers to under-save (Laibson, 1997)

Setup: Behavior vs Welfare for Costly Opt-Out

- For simplicity, first assume active choosers make optimal choices
- Single friction: are opt-out costs real costs?
- Behavior $x_i(d)$ given by:

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- $\pi_i \in [0, 1]$: share of costs that are "normatively relevant."
- Utilitarian social welfare: $W(d) = \int_i v_i(d) di$, where $v_i(d) \equiv w_i(x_i(d))$ is the indirect utility function.

Definitions, Behavior

- *Optimal default*: a default $d^* =\in X$ s.t. $W(d^*) \geq W(d)$ for any $d \in X$.
- Optimal choice for ind. i: $x_i^* = \arg\max_{x \in X} u_i(x)$
- (As-if) benefit to active choice: $a_i(d) \equiv u_i(x_i^*) - u_i(d) - \gamma$

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- Ind. i is *active* if $a_i(d) > 0$.
- Ind. i is *passive* if $a_i(d) \leq 0$.

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- Identification: $x_i(d) \neq d \implies x_i(d) = x_i^*, a_i(d) > 0$

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  - Exogenous attention $\implies$ types model, nested
  - Rational attention: attention cost

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  - Rational attention: attention cost
- Advice/anchoring and adjustment mostly ruled out (but see extensions)

Dodging Infinite Regress

Do people really know the costs and benefits of choosing actively? What if part of the costs are to learn x_i^*?

- Uncertainty/belief about net benefit of active choice is OK if we reinterpret the normative parameters.
- One possibility: active choosers pick x_i^*
  - Forecasting errors/biased beliefs $\rightarrow$ some are passive when they should be active or vice versa
  - All such mistakes load onto π_i in our model
  - Could have $\pi_i > 1$ for some i
- Additional possibility: "lazy opt-outs"
  - e.g. low transaction cost to switch, high cost of learning x_i^*
  - Could lead someone to opt out of the default and choose their best guess at x^*.
  - Can allow for this when we allow active choosers to make mistakes, later.

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- ...but some judgment is always required
- e.g. a novel experiment by Blumenstock Callen & Ghani (2018) suggests "cognitive costs" are important.
- $\implies$ Are cognitive costs real welfare costs?

A Useful Decomposition

Recall (as-if) benefit to active choice is

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Define sets of Active (A) and Passive (P) choosers according to $a_i(d) \gtrless 0$.

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Welfare at a given default is given by:

$$W(d) = E[u_i(x_i^*) - \pi_i\gamma_i|A]P(A) + E[u_i(d)|P]P(P).$$

- Active choosers get $u_i(x_i^*)$, incur cost $\pi_i\gamma_i$

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- Active choosers get $u_i(x_i^*)$, incur cost $\pi_i\gamma_i$
- Passive choosers get $u_i(d)$
- $P(A)$ and $P(P)$ determined by cdf of $a_i(d)$.

Illustration

Homogeneous γ, $u_i(x) = u(x - x_i^*)$

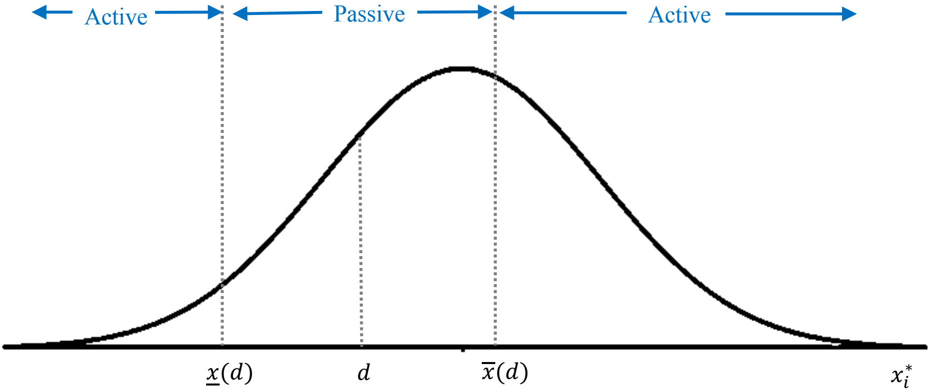

Illustration: Increase Default to d'

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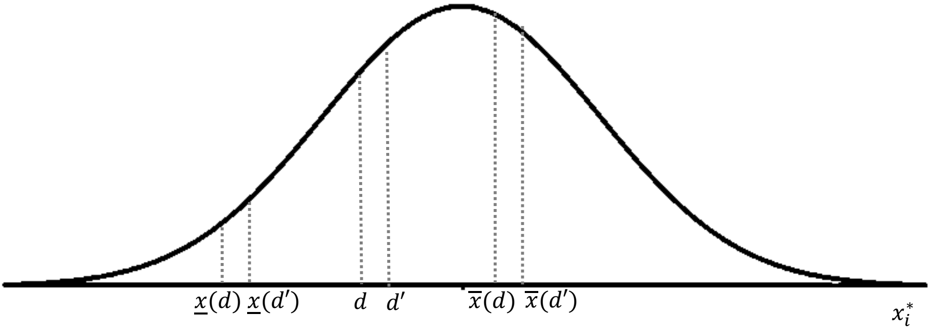
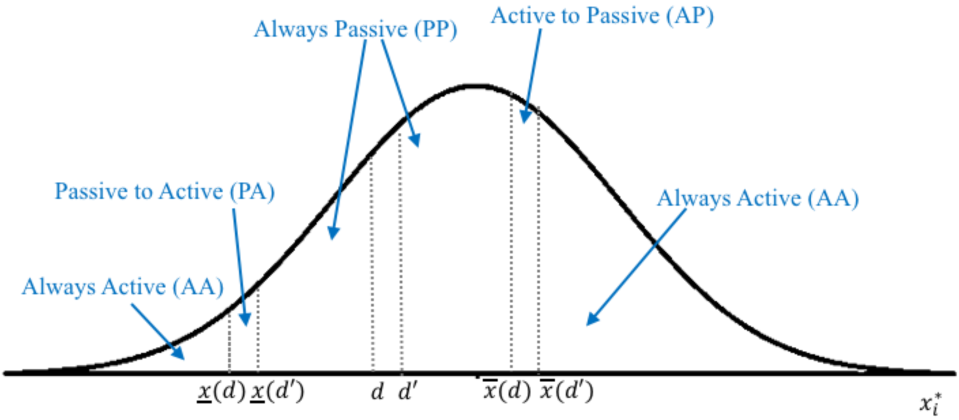


Illustration: Defining Groups



The Welfare Effect of a Default Change

Proposition:

$$
\begin{aligned}
W(d_1) - W(d_0) &= E[u_i(x^*) - u_i(d_0) - \pi\gamma_i | PA] p_{PA} \\
&- E[u_i(x^*) - u_i(d_1) - \pi\gamma_i | AP] p_{AP} \\
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- Analogous but opposite-signed effects for AP group
- PP group just move from one default to the next

First-Order Condition for an Optimal Default

Assume X is real-valued, a_i and u_i are differentiable at d:

$$\begin{aligned} 0 = W'(d^*) &= E[(1-\pi_i)\gamma_i \mid PA]\ P_{PA} \\ &- E[(1-\pi_i)\gamma_i \mid AP]\ P_{AP} \\ &+ E[u'(d^*) \mid PP]\ P_{PP} \end{aligned}$$

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- When $\pi_i = 1$ the welfare effect of a marginal change in the default depends only on the always passive group (PP).
- With $\pi_i << 1$, effect on PA and AP groups' welfare is first order

Rules of Thumb in the Literature

- Forcing active choices (Carroll et al, 2009, other work by these authors)
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- Forcing active choices (Carroll et al, 2009, other work by these authors)
- Minimizing opt-outs (Thaler & Sunstein 2003; Choi et al 2003)
- These two rules intuitively describe optimal policy *when active choosers make optimal decisions*
- Which is better depends on π_i's.

Active Choice / Penalty Defaults ▸ Details

- Often feasible to force active choice or set a "penalty default" (Carroll et al 2009)
- Q: When is this desirable?
- A: It depends on π!

Proposition: There are cutoffs $\underline{\pi}$ and $\overline{\pi}$ such that

- When $\pi_i \leq \underline{\pi}$ for all i, forcing active choice *maximizes* social welfare
- When $\pi_i \geq \overline{\pi}$ for all i, forcing active choice *minimizes social* welfare.

Intuition: Active Choice

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  - Take any other default d.
  - If i is passive under d, $u_i(d) > u_i(x_i^*) - \gamma_i$.
  - By revealed preference, i better off under d than d_{active}.

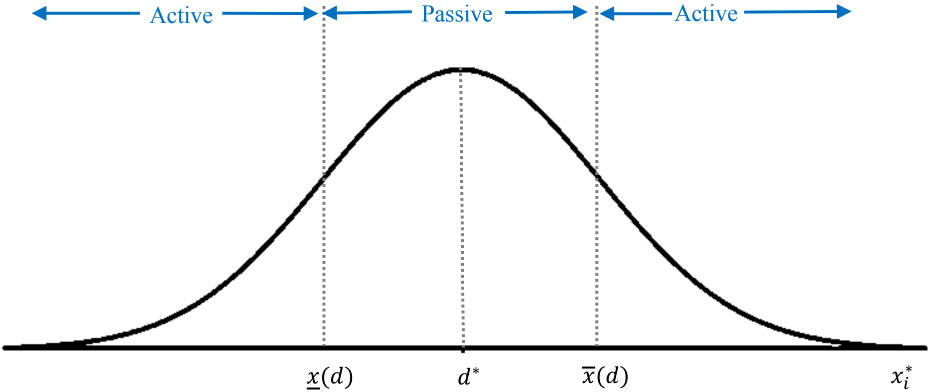
Characterizing optimal policy ▸ detials

- When opt-out costs are not normative ($\pi \to 0$): active choice
- What about when a large share of costs is normative ($\pi \to 1$)?
  - Intuition: set a default close to the ideal option for many people, so that relatively few people opt out.
  - Under some symmetry/independence assumptions, this is the default that *minimizes opt-outs* (Thaler and Sunstein, 2003).

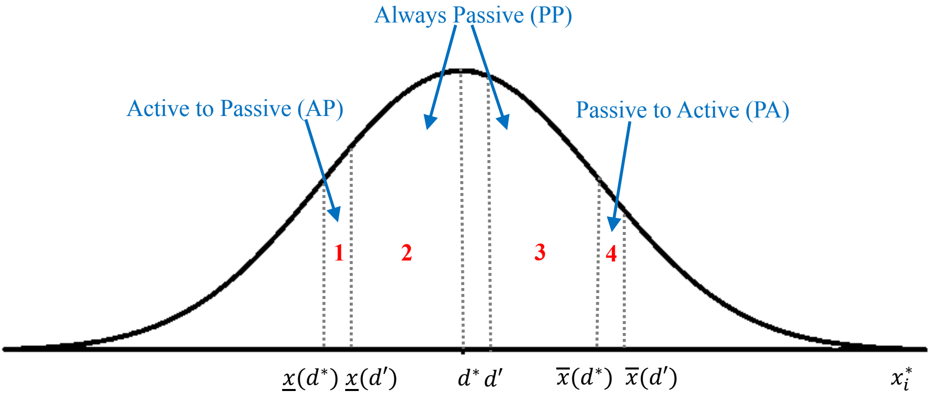
Illustration

Homog. γ, homog. π

Quadratic $u_i(x) = -\alpha(x - x_i^*)^2$, normal distn of x_i^*



Increase the default from d^*



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- **2** and **3** cancel

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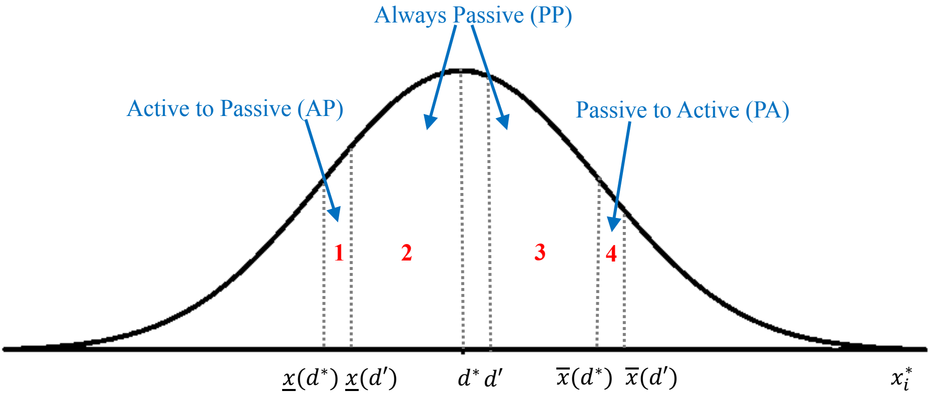

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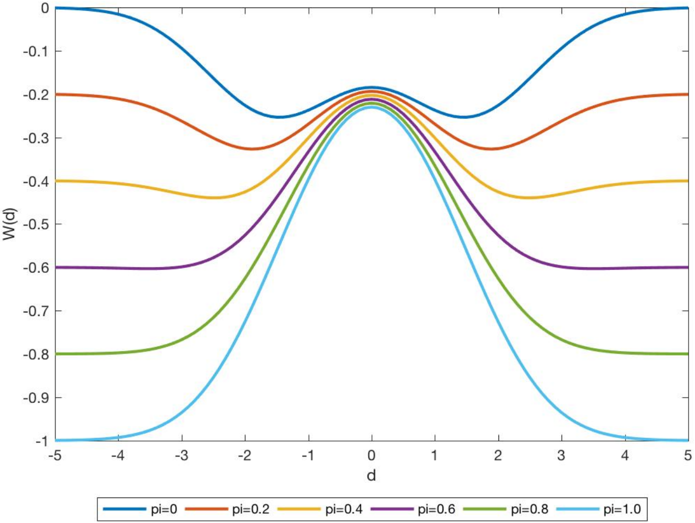
- **2** and **3** cancel
- $\implies W'(d^*) = 0$

Simulated Social Welfare



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- Example: under-saving
- Behavior maximizes $u_i(x) - \gamma_i 1\{x \neq d\}$ like before
- Welfare: $w_i(x) = u_i(x) + m_i(x) - \pi_i \gamma_i 1\{x \neq d\}$
  - $m_i(x)$ is an *internality*
  - x_i^* maximizes $u_i(x)$ not $u_i(x) + m_i(x)$

Marginal Welfare Effects with Internalities

Effect of a marginal increase in the default:

$$
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W'(d) &= E[(1-\pi_i)\gamma_i + m_i(x_i^*) - m_i(d) \mid PA]\; P_{PA} \\
&- E[(1-\pi_i)\gamma_i + m_i(d) - m_i(x_i^*) \mid AP]\; P_{AP} \\
&+ E[u'(d) + m_i'(d) \mid PP]\; P_{PP}
\end{aligned}
$$

- Discrete internality for PA, AP groups
- Envelope theorem does not make these groups irrelevant when $\pi_i = 1$

Marginal Welfare Effects with Internalities

Effect of a marginal increase in the default:

$$\begin{aligned} W'(d) &= E[(1-\pi_i)\gamma_i + m_i(x_i^*) - m_i(d) \mid PA]\; P_{PA} \\ &- E[(1-\pi_i)\gamma_i + m_i(d) - m_i(x_i^*) \mid AP]\; P_{AP} \\ &+ E[u'(d) + m_i'(d) \mid PP]\; P_{PP} \end{aligned}$$

- Discrete internality for PA, AP groups
- Envelope theorem does not make these groups irrelevant when $\pi_i = 1$
- Marginal internality for PP group

Example: More Saving is Always Better

- Suppose x_i is saving, $m_i' > 0$ for all relevant values of x
- For a marginal increase in the default:
- PA, AP groups both decrease saving discretely $\implies m_i$ decreases
- PP group increase save more $\implies m_i$ increases

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Proposition If $m_i(x) = \mu_i * x$ with μ_i independent of other primitives, then $W(d) = W_{old}(d) + E[\mu_i] * E[x_i(d)]$

Extension: Should Defaults be Sticky?

- When active choosers make optimal choices: always decrease costs/frictions (Chesterley, 2017).
  - Size of the benefits depends on π but not the sign.
  - Direct effect: reducing normative costs on the always-active
  - Indirect effect: encouraging active choices improves welfare
  - $\pi = 1 \implies$ indirect effect vanishes (env. thm. again)

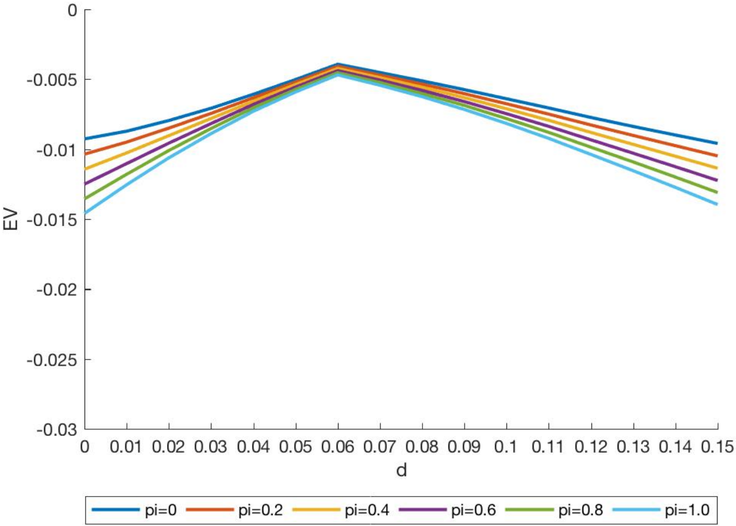
- When active choosers make sufficient mistakes and the default is paternalistic, increasing frictions can be optimal.
  - With a well-chosen paternalistic default, encouraging active choice is undesirable.
  - Must balance this on the margin against any real costs incurred by always-active choosers.

Application: Optimal 401(k) Defaults

Use structural model from Bernheim et al (2016) on default enrollment rates at 3 companies.

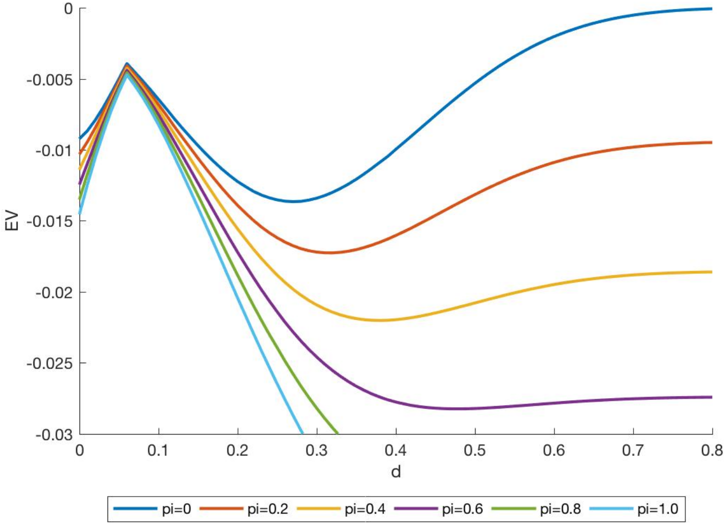
- Model includes utility over savings rate x with heterogeneity in preferred savings rate and a fixed opt-out cost γ_i
- Add our welfare cost $\pi\gamma_i$.
- Add reduced-form internality $m_i(x) = \mu x$.
- As before, begin by assuming active choosers choose optimally $m_i = 0$.

Welfare for different values of π (Company 3)



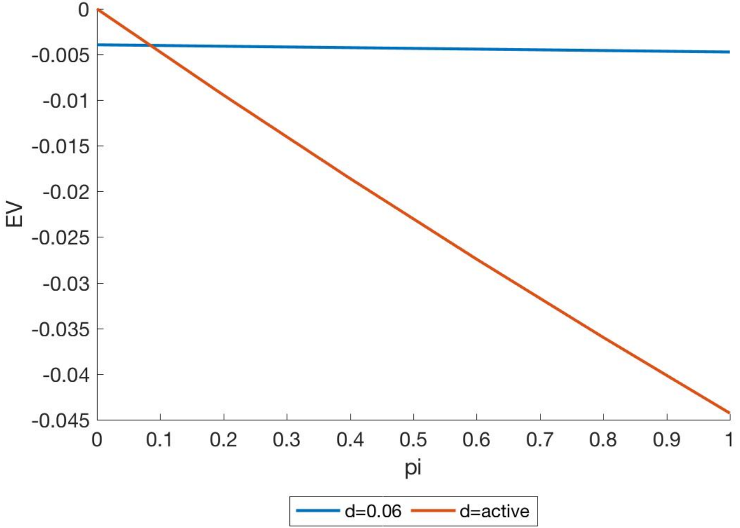
- $\implies$ 6 % is robust optimum. Maximizes emp. match and minimizes opt-outs.
- Generalizes main result of BFP to a wide array of models.

Expanding the policy space



- $\implies$ 6 % is no longer a robust optimum.
- Forcing active choice dominates for lower values of π

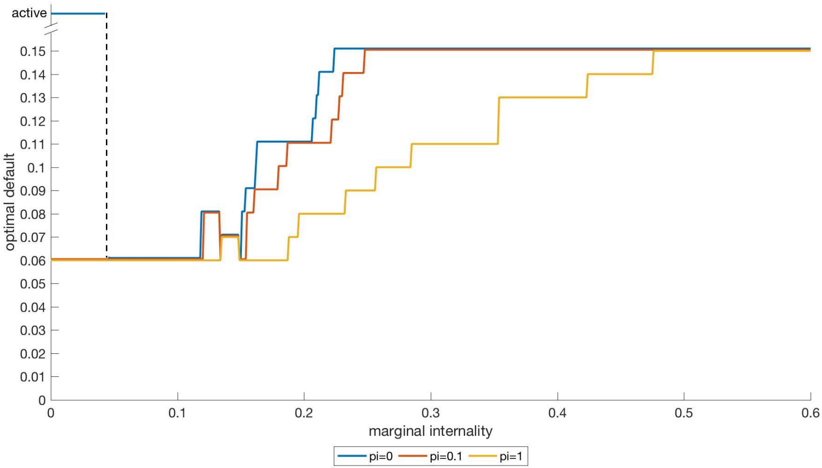
Active choice versus minimizing opt-outs



- When $\pi < 0.08$, active choice dominates
- $\pi = 0.08 \implies \pi\gamma \approx \$160$ at the mean

Internalities: Application to 401(k)

Add a constant, uniform marginal internality, plot $d^*(\pi, \mu)$



Note: marginal internality μ= 0.1 $\implies$ a 10 pp increase in savings rate $\equiv$ a 1% lump-sum transfer

What Have We Learned?

- Described the *map* from normative judgments to the optimal default policy
- When is the optimal default robust?
  - Never, when active choice is available
  - Never, when active choosers may make bad decisions

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- Described the *map* from normative judgments to the optimal default policy
- When is the optimal default robust?
  - Never, when active choice is available
  - Never, when active choosers may make bad decisions
  - Some robustness with restrictions on policy space/frictions
- Normative costs, optimal active choices: minimize opt-outs
- Non-normative costs, optimal active choices: active choice
- Suboptimal active choices: paternalistic defaults
- More behavioral frictions: more normative ambiguity

Moving Forward

- Effects of policy interventions in behavioral settings can often be rationalized with extra costs, frame-contingent preferences...
- What other behavioral optimal policy problems be fruitfully studied in this way?
- Parallel to normative judgments in other models of optimal policy, e.g. the social value of equity

THANK YOU!

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