

OPT IN? OPT OUT?

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IOEA 2026

BACKGROUND

- ▶ Over 100,000 Americans are waiting for an organ transplant.
 - A new person is added to the list every ~ 8 minutes.
 - $\sim 5,679$ died waiting for an organ in 2022.
- ▶ Buying / selling organs is illegal.
- ▶ The lion's share of transplanted organs come from deceased donors.
 - Some organs (such as hearts / lungs) cannot be donated by a living person.
- ▶ Most people do not communicate their donation preferences to family members.

MOTIVATION

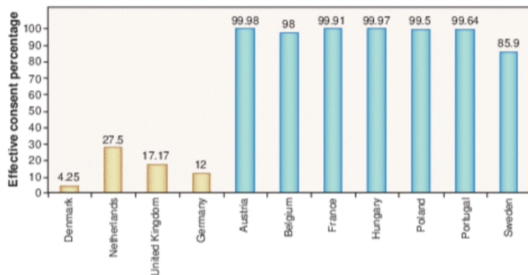
- ▶ Some countries (like the United States) use an **opt in** policy.
 - Willing individuals need to register to become organ donors.
 - Individuals who do nothing are not on the donor list.
- ▶ Other countries (like France) use an **opt out** policy.
 - Everyone is registered as a donor by default.
 - Unwilling individuals can remove themselves from the donor list.
- ▶ Conventional wisdom suggests that opt out policies are a behavioral nudge that can increase organ donations.

SUMMARY

- ▶ Construct a novel dataset of actual donation rates across countries.
- ▶ Show that opt out does **not** always increase donations.
 - Many jurisdictions allow family members to overturn presumed consent.
- ▶ Use a simple signaling model to study the donation rate under different policies.
 - Opt in policies allow willing donors to credibly signal their true preference.
 - Not opting out conveys very little information to the decision proxy.
- ▶ Use a lab experiment to test our model.
 - Opt in policies often result in more donations.

EMPIRICAL EVIDENCE

DONOR REGISTRATIONS



Effective consent rates, by country. Explicit consent (opt-in, gold) and presumed consent (opt-out, blue).

- ▶ Johnson and Goldstein (2003) showed that opt out countries have a higher rate of donor registration.
 - But registration does not always result in donation.

EVENT STUDY

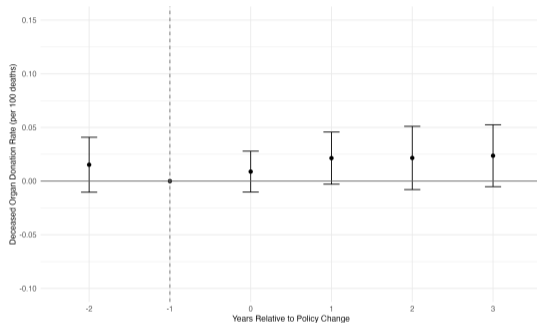
- ▶ Compare countries that switched policy regimes to countries that did not.
- ▶ Treatment group is countries that switched from opt in to opt out.
 - Austria (1982), Belgium (1986), Luxembourg (1982), Finland (1985), Uruguay (2013), Chile (2010), and Sweden (1996).
- ▶ Control group is other countries in the same continent.
 - Require at least three control countries with data that extend 2 years before and 3 years after the policy change.

ESTIMATING EQUATION

$$Y_{ct} = \sum_{k \neq -1} \beta_k \cdot \tau_{ct}^k + \gamma_c + \delta_t + \mathbf{X}'_{ct} \boldsymbol{\theta} + \varepsilon_{ct}$$

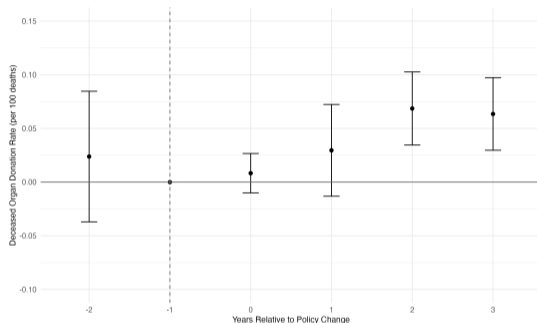
- ▶ Y_{ct} is the donation rate in country c in year t .
- ▶ $\tau_{ct}^k = 1$ if country c is k years from the policy change.
- ▶ γ_c and δ_t are country and year fixed effects.
- ▶ \mathbf{X}_{ct} includes time-varying controls.

RESULTS – ALL COUNTRIES



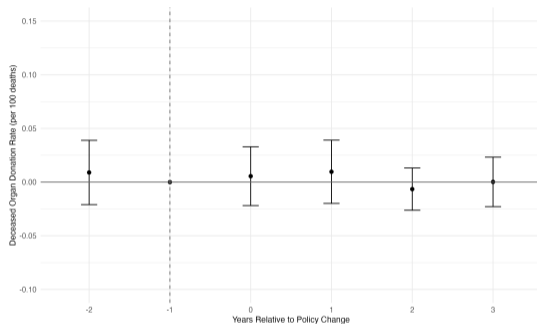
- ▶ Small positive effect?
 - Significant heterogeneity within the treatment group.

RESULTS – STRICT CONSENT COUNTRIES



- ▶ A country has **strict** consent if it is very difficult for the family to block donation.
 - Strict consent countries are Austria, Luxembourg, and Belgium.

RESULTS – WEAK CONSENT COUNTRIES



- ▶ A country has **weak** consent if it is easy for the family to block donation.
 - Weak consent countries are Finland, Sweden, Chile, and Uruguay.

THEORETICAL MODEL

PRELIMINARIES

- ▶ Simple signaling model with two players.
- ▶ Player 1 is the potential donor / deceased individual.
 - Type given by $d \in \{0, 1\}$.
 - $d = 1$ indicates that Player 1 is a willing donor.
- ▶ Player 2 is the decision proxy / family member.
 - Does not observe d but knows $p = \Pr[d = 1]$.
 - Assume p is common knowledge.

ACTIONS

- ▶ Player 1 picks $s \in \{0, 1\}$.
 - $s = 1$ indicates that Player 1 opted in / out.
- ▶ $c \geq 0$ is the cost (to Player 1) of opting in / out.
- ▶ Player 2 observes s and picks is $D \in \{0, 1\}$.
 - $D = 1$ indicates that the organs are donated.
- ▶ $\epsilon \geq 0$ is the “emotional” cost (to Player 2) of donation.
- ▶ $\delta \geq 0$ is the cost (to Player 2) of overturning consent.
 - Incurred if Player 2 blocks donation when Player 1 opted in / did not opt out.

PAYOFFS – PLAYER 1

Under both policy regimes:

$$u_1(d, D, s) = x \mathbf{1}\{D = d\} - c s$$

- ▶ $x > 0$ is Player 1's utility when the outcome matches his type.
 - Can be interpreted as anticipatory utility.

PAYOFFS – PLAYER 2

Under the opt in regime:

$$u_2^{OI} = X \mathbb{1}\{D = d\} - \epsilon D - \delta (1 - D) s$$

Under the opt out regime:

$$u_2^{OO} = X \mathbb{1}\{D = d\} - \epsilon D - \delta (1 - D) (1 - s)$$

- ▶ $X > 0$ is Player 2's utility when she matches Player 1's type.
 - Assuming that people want to honor their relative's preferences.

EQUILIBRIA

- ▶ Solution concept is pure strategy Bayes Nash Equilibrium.
 - Large multiplicity.
- ▶ Focus on “intuitive” or “reasonable” outcomes.
 - Use the experiment to validate these predictions.
- ▶ Player 1 opts in / out to communicate his preferences.
- ▶ Player 2 donates if her posterior belief is sufficiently high.

OUTCOMES

| | | <u>OPT IN</u> | | <u>OPT OUT</u> | |
|------------------------------------|--|--|----------------------------|--|----------------------------|
| P2 belief, p | | | | | |
| $\frac{X + \epsilon}{2X}$ | | P1 signals if $d = 1$, p donated No signal, 100% donated | No signal, 100% donated | P1 signals if $d = 0$, p donated | No signal, 100% donated |
| $\frac{X + \epsilon - \delta}{2X}$ | | P1 signals if $d = 1$, p donated | No signal, 0% donated | P1 signals if $d = 0$, p donated | No signal, 100% donated |
| | | P1 signals if $d = 1$, p donated | No signal, 0% donated | P1 signals if $d = 0$, p donated No signal, 0% donated | No signal, 0% donated |
| | | x | Cost of signal, c | x | Cost of signal, c |

COMPARISON

- ▶ Player 1 never opts in / out when $c > x$.
 - Player 2 chooses D based only on her prior.
 - The cutoff for donation is **lower** under opt out.
- ▶ Both policies admit a fully separating equilibrium when $c < x$.
 - Player 2 donates if and only if $d = 1$.
- ▶ Both policies also admit a pooling equilibrium when $c < x$.
 - No donation equilibrium under opt out.
 - Full donation equilibrium under opt in.

INTUITION

- ▶ Willing donors have no way to signal their preference under opt out.
 - Doing nothing leaves Player 2's prior unchanged.
 - Opting out tells Player 2 that $d = 0$.
- ▶ Opt in results in at least p donations when signaling is cheap.
 - Willing donors can communicate their true type by opting in.
- ▶ Opt out results in more donations only when p is moderate and $c > x$.
 - Player 2 has to pay $\delta > 0$ to block donation under opt out.
 - Otherwise indifferent family members allow donation.

EXPERIMENTAL RESULTS

WHY?

- ▶ Verify that we are focusing on the “right” equilibria.
- ▶ Make counterfactual predictions.
- ▶ Policy makers tend to be more receptive to experimental results.

EXPERIMENT DESIGN I

- ▶ Online experiment via Prolific.
 - 1004 participants.
 - ~ 18 minutes long.
- ▶ Participants assigned to treatments in a 2x2x2 factorial design.
 - Opt in or opt out.
 - High or low signaling cost.
 - High or low cost of overturning consent.

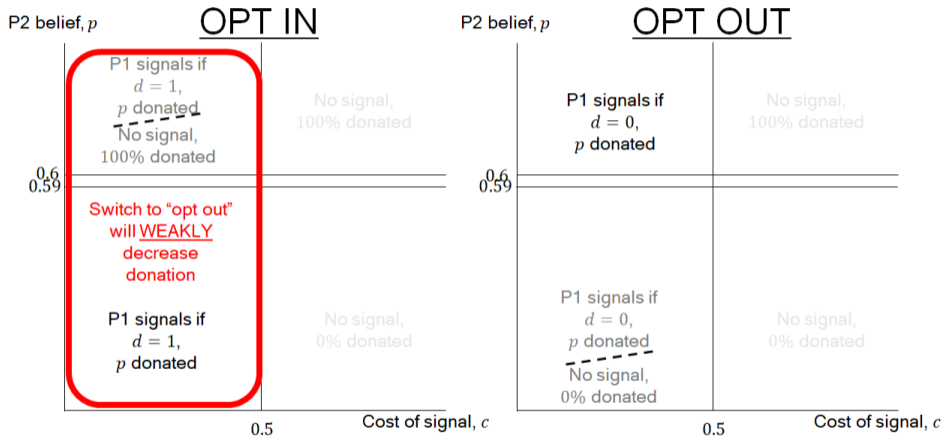
EXPERIMENTAL DESIGN II

1. Each participant given a neutral object called a “wug”.
 - Chosen to avoid the emotional or moral connotations associated with human organs.
2. Randomly assigned a type.
 - Donors receive an extra \$0.50 if their wug is eventually donated.
 - Non-donors receive an extra \$0.50 if their wug is not donated.
3. Participants choose to opt in or opt out.
 - High cost is \$0.75.
 - Low cost is \$0.25.

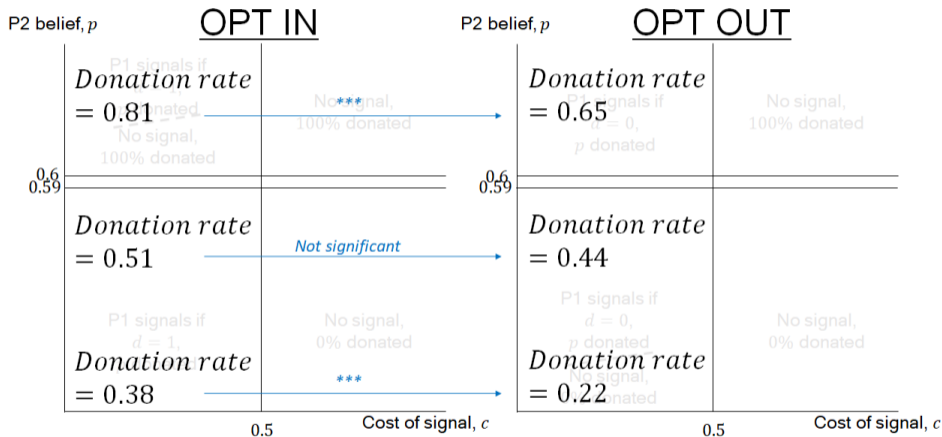
EXPERIMENTAL DESIGN III

4. Each participant matched with exactly one other participant.
 - Matched partner serves as the decision proxy.
5. Proxy decides whether to donate the wug.
 - Decision proxies receive \$0.50 if their decision matches the wug owner's type.
 - Pay \$0.10 if they decide to donate.
 - Overturning consent incurs an extra cost (\$0.01 or \$0.19).
6. Donation decisions are elicited under different values of p .

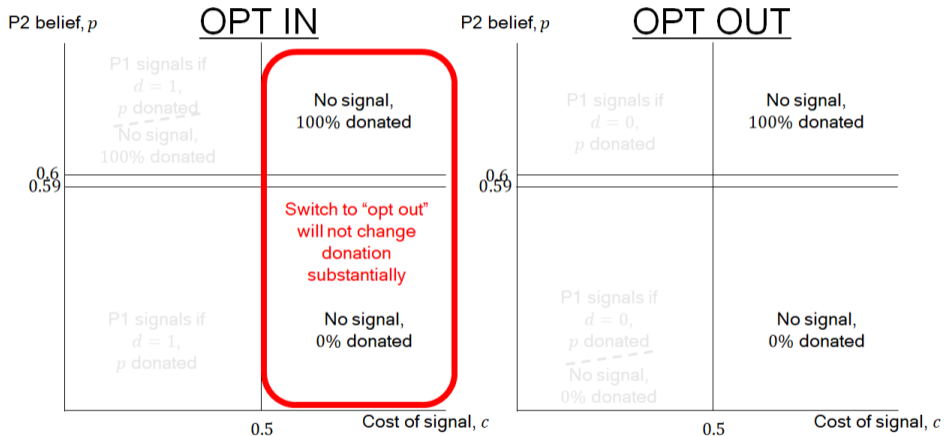
THEORETICAL PREDICTIONS – $\delta = 0.01$



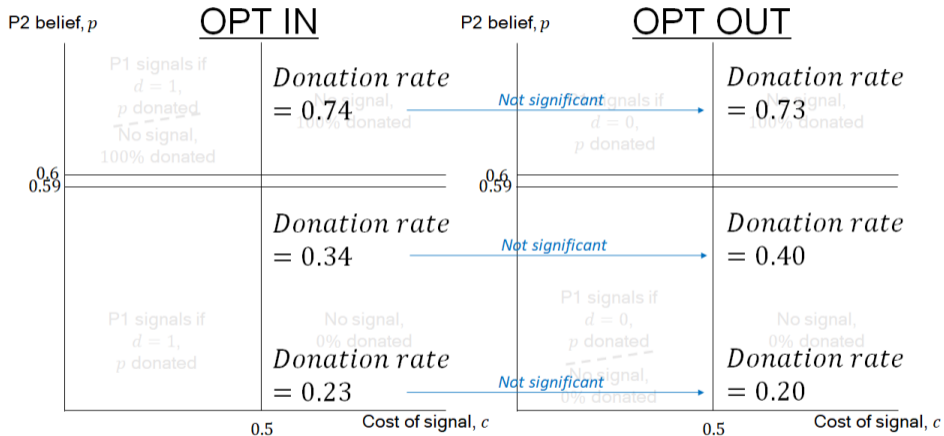
RESULTS – $\delta = 0.01$



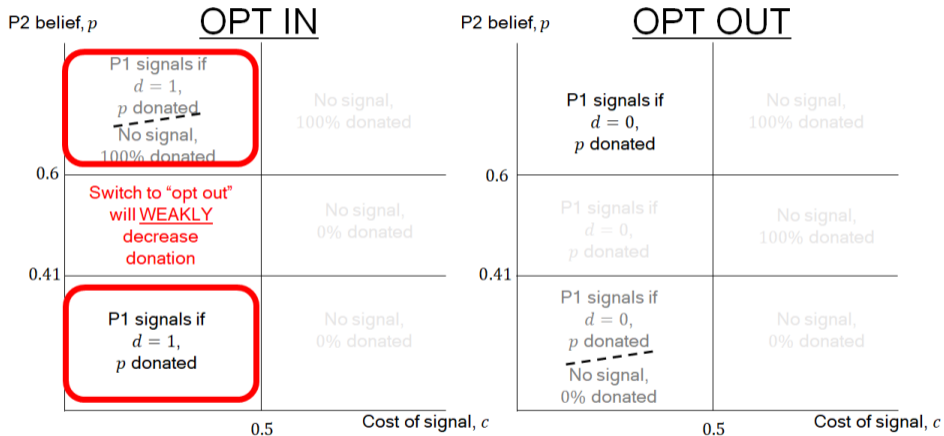
THEORETICAL PREDICTIONS – $\delta = 0.01$



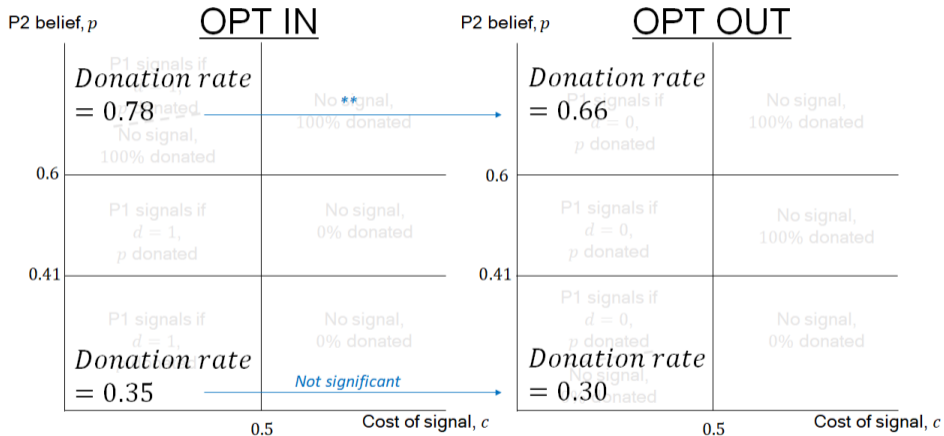
RESULTS – $\delta = 0.01$



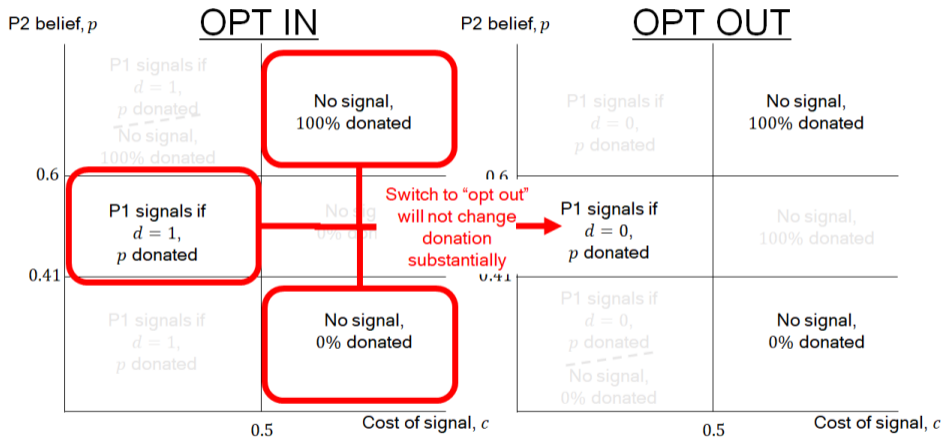
THEORETICAL PREDICTIONS – $\delta = 0.19$



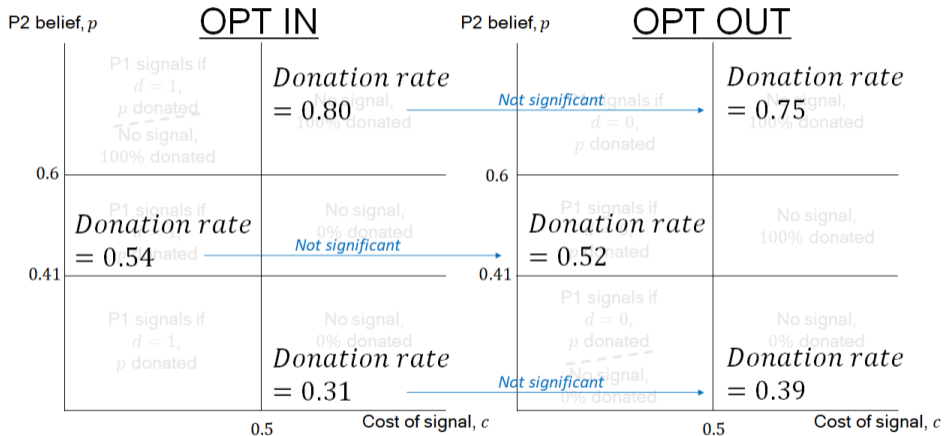
RESULTS – $\delta = 0.19$



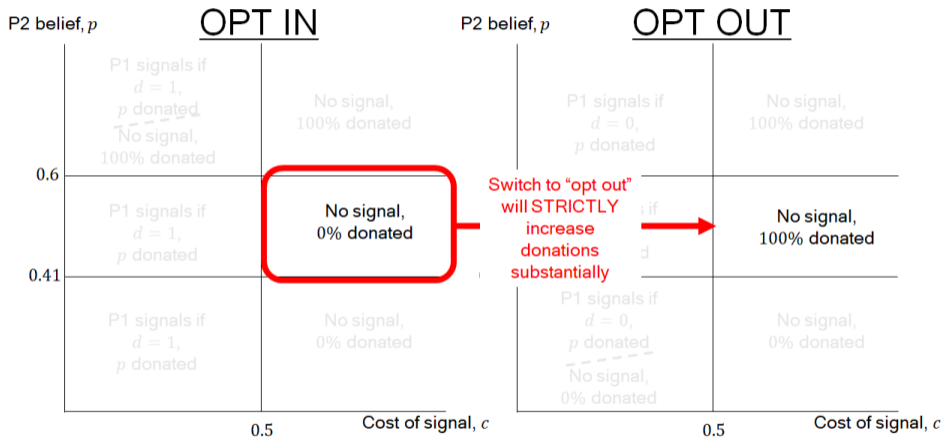
THEORETICAL PREDICTIONS – $\delta = 0.19$



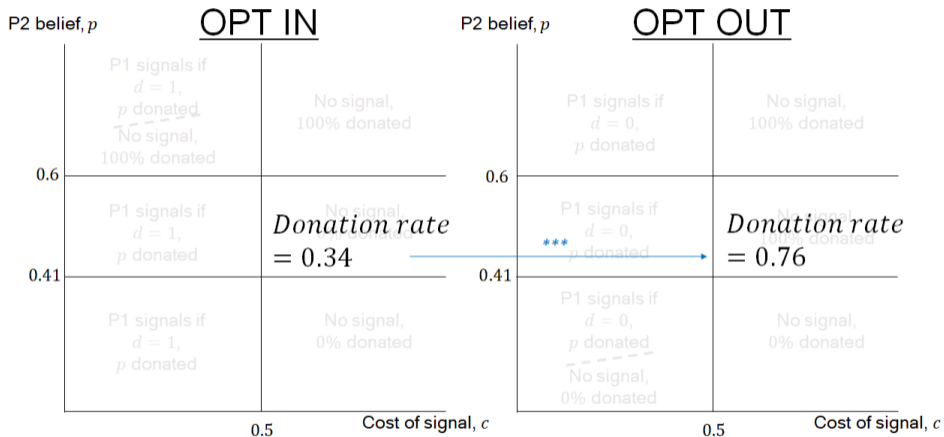
RESULTS – $\delta = 0.19$



THEORETICAL PREDICTIONS – $\delta = 0.19$



RESULTS – $\delta = 0.19$



CONCLUSION

- ▶ Opt out **typically** does not increase the rate of donation.
- ▶ The distinction between strict and weak consent is critically important.
- ▶ Recent international experiences corroborate our findings.
 - England and Wales recently switched to a *de facto* opt in policy.
- ▶ Our results also contribute to the broader literature on market design and behavioral economics.
 - Defaults do not always shift outcomes in the expected direction.

APPENDIX

You are given a “wug”. You can choose to invest some tokens from your show-up payment to grow your wug and earn more earnings.



THIS IS A WUG.