Online Appendix for "Motivating Effort In Contributing to Public Goods Inside Organizations: Field Experimental Evidence"

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Abstract

In section A of this online appendix, we present a formal proof of the result of sorting based upon costs in the extended model with heterogenous costs discussed in the Predictions section of the main paper. In section B, the graphics used in the challenge website are shown, as well as tables with additional results are presented.

A Extended model with heterogenous costs

Proof. Consider the case of two types of individuals $j = 1, 2$ forming two groups of equal size $n_1 = n_2 = n$. Individuals can decide to contribute with

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a single proposal or not. When an agent of type j decides to contribute, the expected utility is as follows.

$$u_1^j = \gamma \hat{Y} + \delta_j + \sum_{k_j=1}^{n} \sum_{k_l=0}^{n} \Pr(Y = k_j + k_l) \frac{R}{k_j + k_l} - c_j.$$

The utility of not contributing is as follows.

$$u_0^j = \gamma(\hat{Y} - 1).$$

Equating these two conditions for all individuals gives the following mixed-strategy equilibrium condition:

$$\sum_{k_j=1}^{n} \sum_{k_l=0}^{n} \Pr(Y = k_j + k_l) \frac{R}{k_j + k_l} = c_j - \delta_j + \gamma$$

for all $j = 1, 2$. To examine differences in equilibrium probabilities p_1^* and p_2^*, we use the ratio between the above equilibrium condition for individuals of type $j = 1$ and the same expression for agents of type $j = 2$. This gives:

$$\frac{\sum_{k_1=1}^{n} \sum_{k_2=0}^{n} \Pr(Y = k_1 + k_2) \frac{R}{k_1 + k_2}}{\sum_{k_1=0}^{n} \sum_{k_2=1}^{n} \Pr(Y = k_1 + k_2) \frac{R}{k_1 + k_2}} = \frac{c_1 - \delta_1 + \gamma}{c_2 - \delta_2 + \gamma}.$$

The left hand side can be rearranged as follows.

$$\frac{\Pr(k_2 = 0) \sum_{k_1=1}^{n} \Pr(Y = k_1) \frac{R}{k_1} + \sigma R}{\Pr(k_1 = 0) \sum_{k_2=1}^{n} \Pr(Y = k_2) \frac{R}{k_2} + \sigma R}$$

where $\sigma = \sum_{k_1=1}^{n} \sum_{k_2=1}^{n} \Pr(Y = k_1 + k_2) \frac{1}{k_1 + k_2}$. Using $1 - p_2 = \Pr(k_2 = 0)$ and $1 - p_1 = \Pr(k_1 = 0)$ together with the density of the binomial distribution, we obtain the following simpler expression.

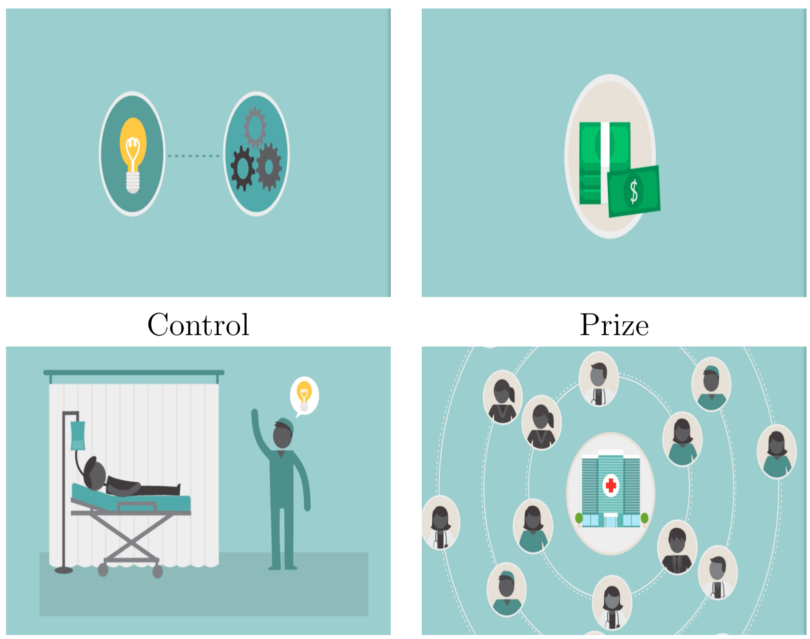
$$\frac{(1 - p_2) \frac{(1-(1-p_1)^n)}{np_1} R + \sigma R}{(1 - p_1) \frac{(1-(1-p_2)^n)}{np_2} R + \sigma R}.$$

If $c_1 - \delta_1 > c_2 - \delta_2$, then the above expression in equilibrium needs to be larger than one. This inequality can be expressed as follows:

$$\frac{p_2(1 - p_2)}{(1 - (1 - p_2)^n)} > \frac{p_1(1 - p_1)}{(1 - (1 - p_1)^n)}.$$

Hence, the inequality is satisfied only if p_2 is greater than p_1. *Q.E.D.*

B Graphics and tables with additional results



Control | Prize | Patient care | Workplace

Figure B.1: *Graphics displayed on the website of the challenge at the login matching the randomly assigned treatment.*

Table B.1: Probability of an employee making a submission – Subsample with survey

	$SUBMIT_{ij}$					
	(1)	(2)	(3)	(4)	(5)	(6)
PCARE	1.95	1.90	1.93	1.19	1.94	1.16
	(3.65)	(3.68)	(3.68)	(3.67)	(3.69)	(3.70)
WPLACE	8.52**	8.54**	8.54**	7.71*	8.61**	7.85*
	(4.16)	(4.20)	(4.17)	(4.23)	(4.16)	(4.33)
PRIZE	10.78**	10.78**	10.96**	10.06**	11.08**	10.43**
	(4.70)	(4.71)	(4.71)	(4.67)	(4.72)	(4.79)
Physician		−1.30				−4.68
		(4.89)				(5.21)
Nursing		−1.11				3.35
		(3.61)				(4.83)
Male			1.39			3.55
			(3.99)			(4.91)
Office				6.97**		7.25*
				(3.06)		(4.07)
age18-25					−6.78	−7.91
					(12.11)	(12.54)
age26-35					−6.20	−6.56
					(11.50)	(11.50)
age36-45					5.02	3.55
					(12.02)	(12.01)
age46-65					1.58	0.68
					(11.72)	(11.76)
age65+					7.46	5.91
					(14.33)	(14.70)
Constant	5.49**	6.26*	5.16**	1.36	5.56	0.41
	(2.42)	(3.38)	(2.48)	(2.43)	(11.16)	(12.60)
N	378	378	378	378	378	378
Log Likelihood	−92.01	−91.95	−91.95	−89.91	−87.39	−85.37
Akaike Inf. Crit.	192.03	195.90	193.90	189.81	192.79	196.75

Note: This table reports coefficients from a linear probability model for the probability of an employee contributing with a submission using the subsample of 378 employees who have taken an online survey. Heteroskedasticity robust standard errors are in parenthesis. Coefficients and standard errors are multiplied by 100 so that readers can interpret them as percentage point change in the probability.

*** *Significant at the 1 percent level.*

** *Significant at the 5 percent level.*

* *Significant at the 10 percent level.*

Table B.1: Proposal ratings, submissions' word count and number of proposals

	Submission length	Proposals	Proposal ave. rating
	(1)	(2)	(3)
PCARE	0.05	-25.02	1.00
	(0.11)	(40.56)	(1.27)
WPLACE	0.11	26.13	0.37
	(0.11)	(40.36)	(1.25)
PRIZE	0.02	-8.97	0.17
	(0.11)	(38.50)	(1.19)
Constant	3.13^{***}	127.37^{***}	1.57
	(0.10)	(33.70)	(1.04)
N	113	60	60
R^2	0.01	0.05	0.02
Adjusted R^2	-0.01	-0.004	-0.04
Residual Std. Error	0.03 (df = 109)	77.82 (df = 56)	2.75 (df = 56)
F Statistic	0.55 (df = 3; 109)	0.93 (df = 3; 56)	0.33 (df = 3; 56)

Note: This table reports coefficients from a linear regression model for submission length as measured by the word count of the proposals made (column 1), the number of proposals per submission (column 2) and the proposal's average rating (column 3).
****Significant at the 1 percent level.*
***Significant at the 5 percent level.*
**Significant at the 10 percent level.*