Why Are Firms Slow to Adopt Profitable Opportunities?

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Lab for
Inclusive
FinTech

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- Across many domains:
  - Manufacturing (Atkin, Chaudhry, Chaudry, Khandelwal, and Verhoogen, 2017; Giorcelli, 2019)
  - Banking (Mishra, Prabhala, and Rajan, 2021)
  - Retail (DellaVigna and Gentzkow, 2019)
  - Healthcare (Celhay, Gertler, Giovagnoli, and Vermeersch, 2019)

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  - Healthcare (Celhay, Gertler, Giovagnoli, and Vermeersch, 2019)
- And across various types of opportunities:
  - Cost-saving technologies (Atkin, Chaudhry, Chaudry, Khandelwal, and Verhoogen, 2017)
  - Management practices (Bloom, Eifert, Mahajan, McKenzie, and Roberts, 2013; Bruhn, Karlan, and Schoar, 2018)
  - Optimal pricing (DellaVigna and Gentzkow, 2019)

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  - Large retail chains in DellaVigna and Gentzkow (2019) forgo $16M in annual profits (2% of revenue)

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- Several things may be contributing:
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  - "Stickiness in organizational structures and practices" (Mishra, Prabhala, and Rajan, 2021)

This Project

Research question: Why do firms exhibit inertia in organizational practices even though these behaviors reduce their profits?

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Method:

- Randomized controlled trial (RCT) in Mexico to test three potential explanations:
  - Limited memory
  - Present bias
  - Lack of trust
  - …as well as potentially distorted beliefs about these
- Offer lower merchant fee to 33,978 firms already using FinTech payments technology
- For the median firm, expected reduction in fee equal to 3% of profits ▸ Variation

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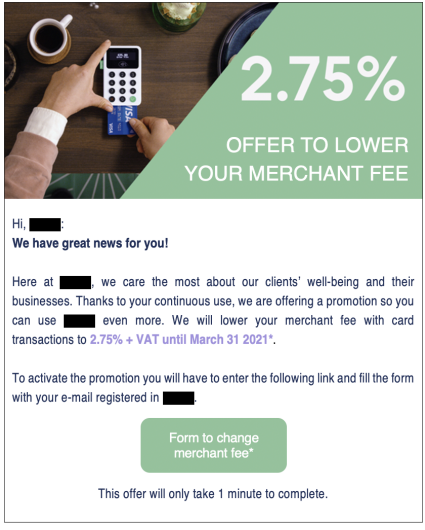
Method:

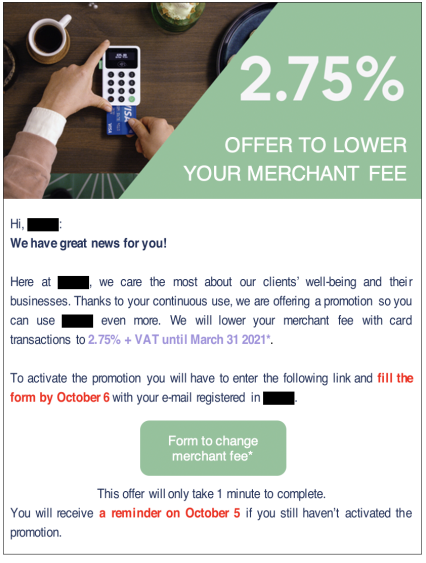
- Randomize:
  - Value of offer (how much we reduce merchant fee)
  - Deadlines
  - Reminders
  - Whether FinTech says in advance that it will send a reminder ("anticipated reminder")
- RCT design motivated by augmented version of Ericson (2017) model
  - How present bias and limited memory affect task completion
  - We augment the model to include trust

This Project: Examples of Treatments

No Reminder/Unanticipated Reminder, No Deadline



Anticipated Reminder, Deadline



Preview of Findings

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- Anticipated reminders ↗ final take-up more than unanticipated reminders
  - By an additional 7%
  - Anticipated reminders change firms' perceptions of the offer's value
  - Effect of anticipated reminder concentrated among low-trust firms

Experimental Setting

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Research Partner

- FinTech payments company wanted to offer lower merchant fee to measure elasticities
- Firms in sample were already users of FinTech's point-of-sale (POS) hardware and app

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Merchant Fee

- Merchant fee is a percent of the sale that firm pays to accept e-payments
- Prior to our experiment, firms paid 3.5% or 3.75% merchant fee ▸ Knowledge of fee
- In experiment, offer 2.75% or 3% fee (randomly determined) for next 6 months

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Logistics

- Messages sent by FinTech company via email and SMS
- Online form to accept lower fee; takes about one minute to complete
- Owner of firm was email recipient for 88% of sample

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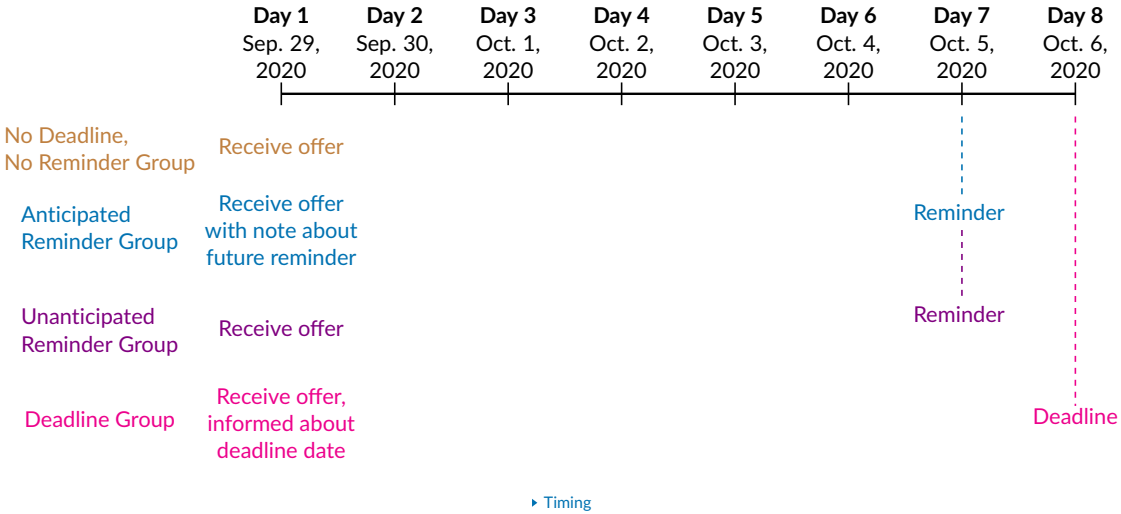
  - To ensure that offer would be sufficiently valuable
- Main outcome is take-up from administrative data
- Survey a small subsample of firms ($N = 429$) to explore mechanisms

▸ Number of employees ▸ Firm characteristics ▸ Percent of sales through FinTech platform

Example of a Firm

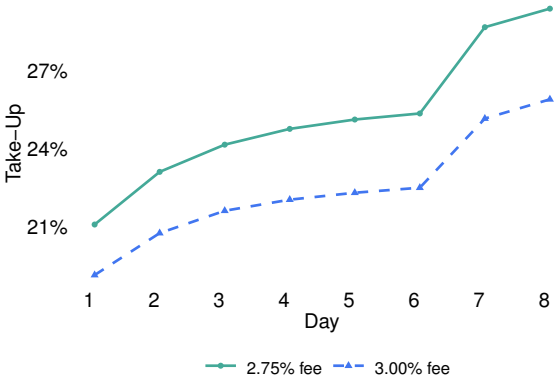
Experimental Design and Timeline

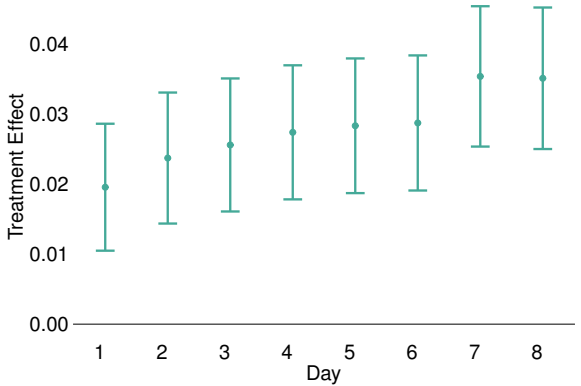


Results

Higher Value Increases Take-Up

- Random variation in value of offer (2.75% fee better than 3% fee)

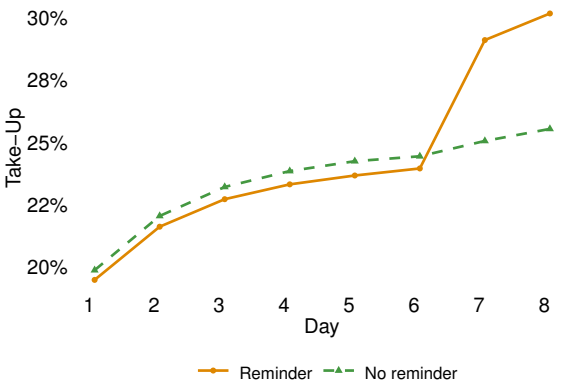


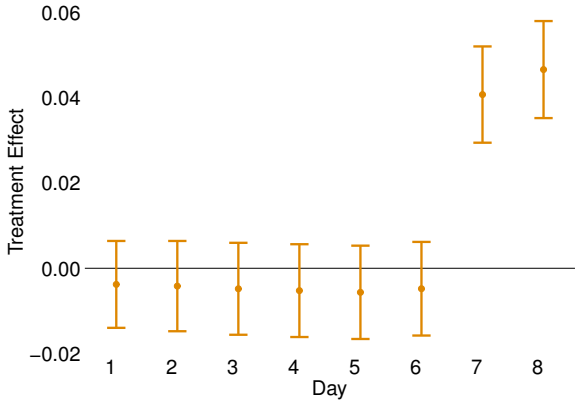


- Opened first email
- Longer-term take-up
- Not 100%

Reminders Increase Take-Up

- Reminder ↗ take-up 5 pp compared to ∼26% in no reminder group

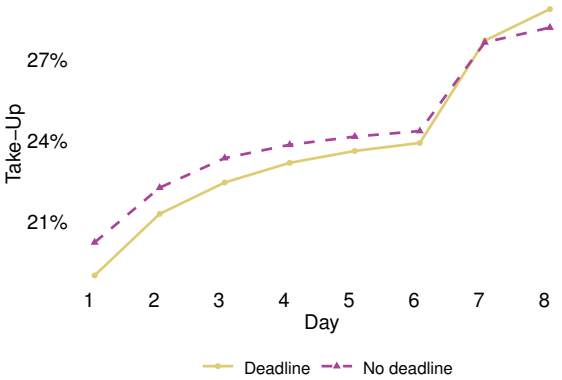


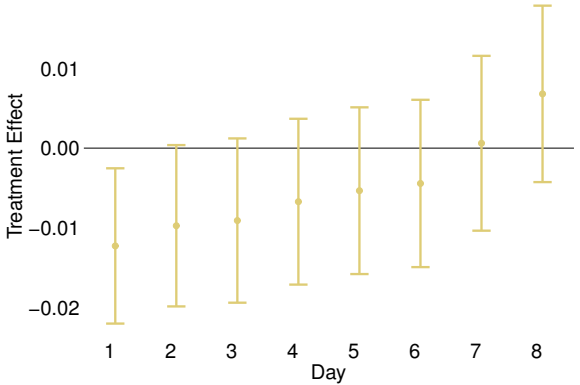


- Opened first email
- Longer-term
- By value of offer
- By deadline vs. no
- By baseline sales
- Not 100%

Deadlines Do Not Increase Take-Up

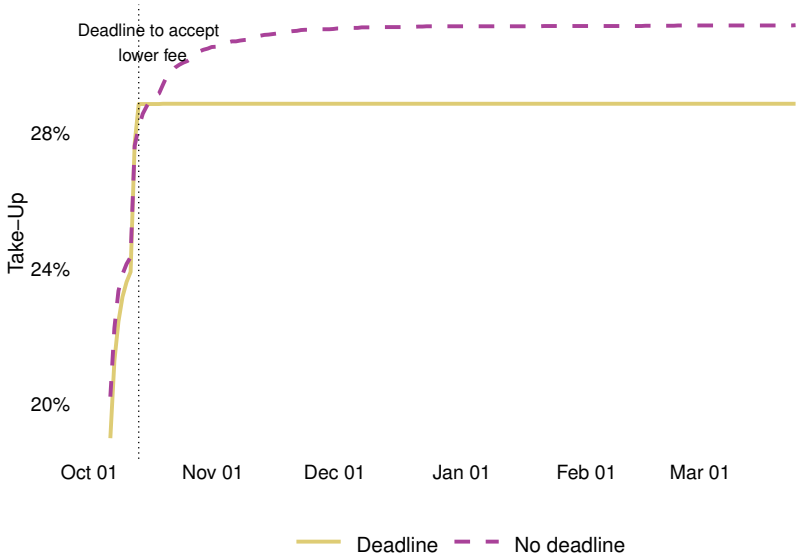
- Deadline ↘ day 1 take-up, but no difference by day 8
- Positive point estimate on day 8, but no deadline catches up quickly after deadline





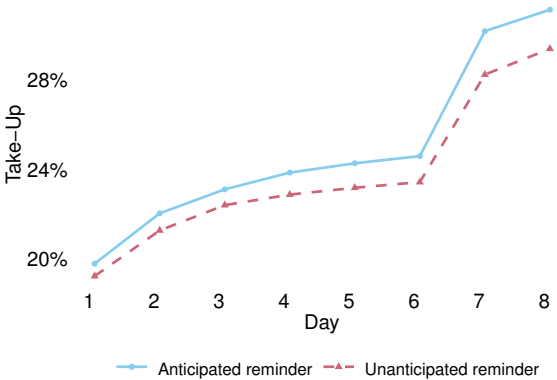
▸ Opened first email ▸ By value of offer ▸ By reminder vs. no ▸ By reminder type ▸ By baseline sales ▸ Not 100%

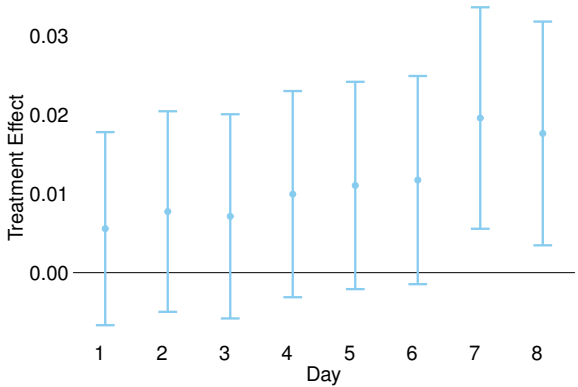
Continued Take-Up After Deadline in No Deadline Group



Anticipated Reminders Increase Take-up

- Anticipated reminders do not reduce take-up on day 1
- Anticipated reminders ↗ take-up 2 pp more than unanticipated by day 8





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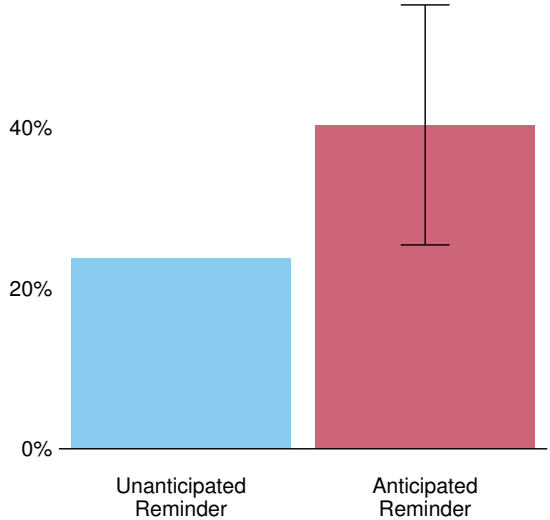
Mechanisms Behind Anticipated Reminder Effect

Anticipated Reminders Increase Perception of Offer's Value

- Survey question: "Did the reminder change your perception of the offer's value?"

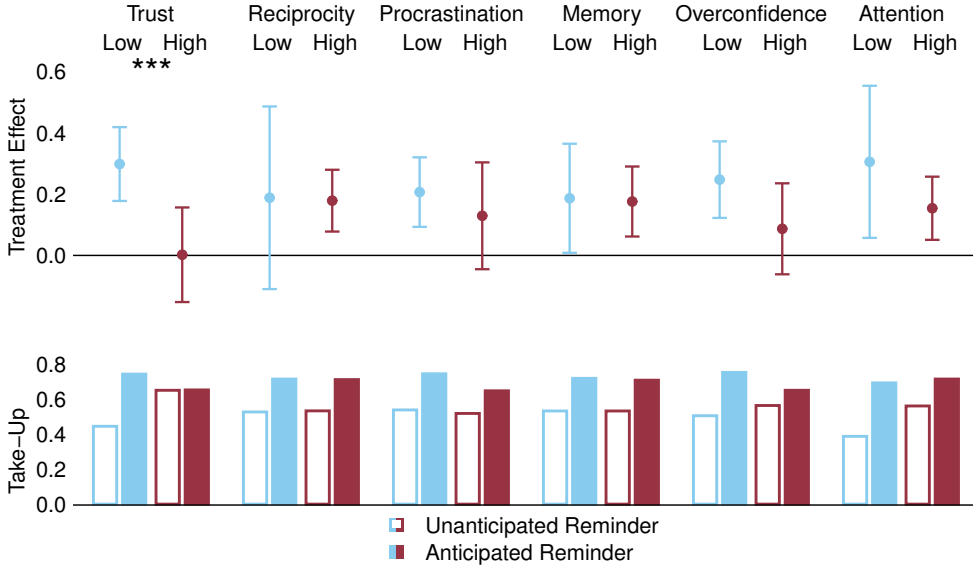
▸ Logins ▸ Survey balance ▸ Survey response balance



Heterogeneity Tests Using General Survey Measures

- **Trust**: I trust advertised offers
- **Reciprocity**: I am more inclined to do business with people who live up to their promises
- **Procrastination**: I tend to postpone tasks, even when I know it is better to do them immediately
- **Memory**: I tend to have good memory about pending tasks that I have to do and complete
- **Overconfidence**: I tend to think my memory is better than it really is
- **Attention**: I can focus completely when I have to finish a task
- 1–5 scale; code dummy as “High” if agree or completely agree, “Low” otherwise

Anticipated Reminder Effect Concentrated Among Less-Trusting



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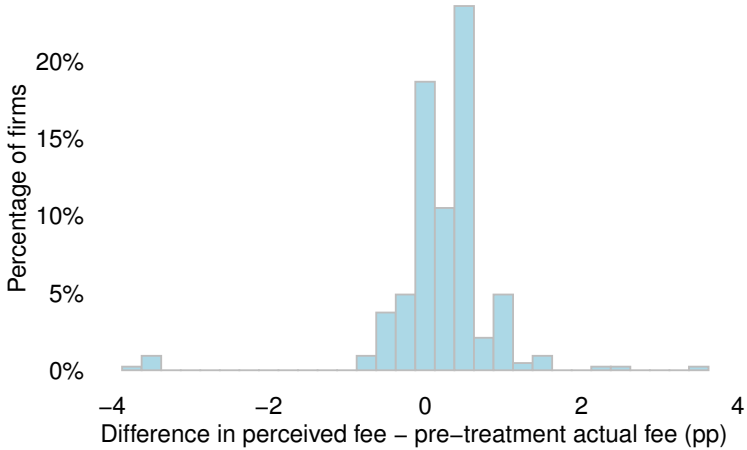
  $\Rightarrow$ profitable for FinTech partner to lower merchant fee
- Analysis of slow firm adoption of profitable opportunities will benefit from considering mechanisms beyond standard economic frictions
  - Well-known behavioral determinants of individuals failing to act can affect firms
  - Evidence that lack of trust is a key friction
  - Lack of trust may be prevalent in many firm-to-firm interactions

Appendix

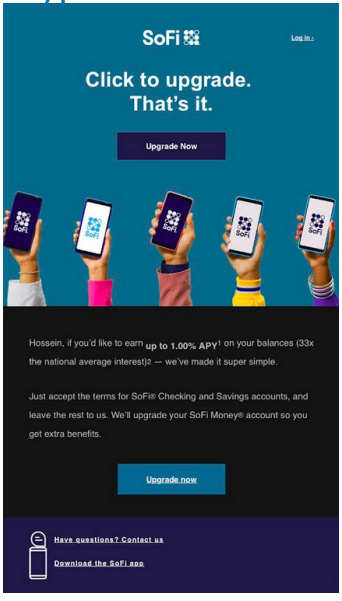
Firms have a good sense of their current fee

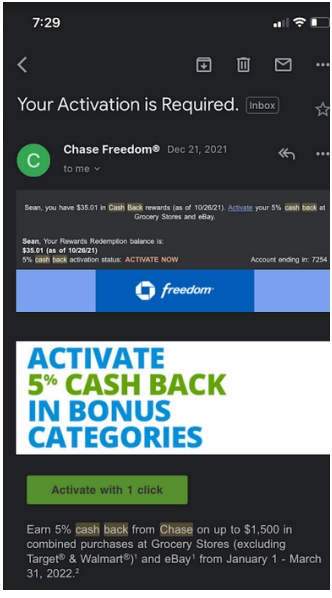
- And are more likely to overestimate current fee
  - Which would make them think offer is even more valuable

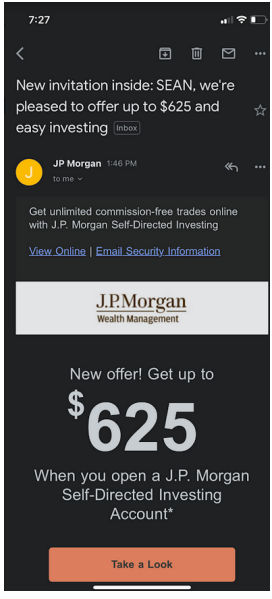


▸ Emails ▸ Experimental setting

This Type of Email is Common







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5. Anticipated reminders and post-reminder take-up:
   - Do not affect overall take-up compared to unanticipated reminder if firms inherently trust the offer
   - ↗ post-reminder take-up compared to unanticipated reminder if some firms distrust offer and if anticipated reminder ↗ trust

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- We add the probability the firm assigns to the offer being true, $\alpha_t \in [0, 1]$

Model

- Cost c_t drawn each period from a known distribution $F(c)$
- Agent decides to act based on current value function:

$$V_t = \begin{cases} \beta\delta\alpha_t y - c_t & \text{if act} \\ \hat{\rho}_{t+1}\beta\delta E_t[\hat{V}_{t+1}] & \text{if do not act} \end{cases}$$

- $E_t[\hat{V}_{t+1}]$ is the perceived continuation value
  - E_t denotes expectations over future cost draws
  - The hat on $E_t[\hat{V}_{t+1}]$ denotes that it's a function of $\hat{\beta}$ rather than β

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$$E_{t-1}\left[V_t\right] = F\left(\hat{c}_t^*\right)\left[\delta\alpha_t y - E\left[\hat{c}|\text{act}\right]\right] + \left(1 - F\left(\hat{c}_t^*\right)\right)\delta\hat{\rho}_{t+1} E_t\left[V_{t+1}\right]$$

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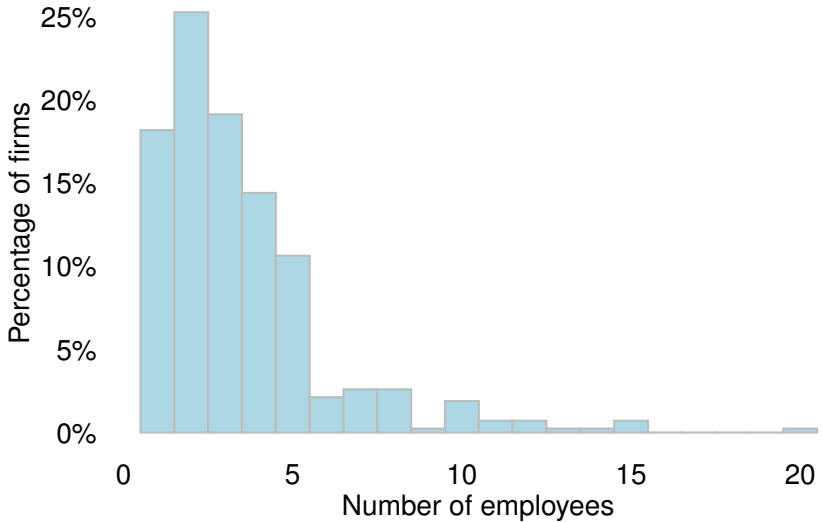
$$E\left[\hat{c}|\text{act}\right] = \int_0^{\hat{c}_t^*} c \; dF(c)$$

- The probability of adopting at period t is:

$$\Pr\left(\text{adopt at } t\right) = \underbrace{\prod_{j=1}^{t} \rho_j}_{\Pr(\text{remember})} \underbrace{\prod_{k=0}^{t-1}\left(1 - F\left(c_k^*\right)\right)}_{\Pr(\text{not adopted before } t)}$$

Firm characteristics: Number of employees ▸ Sample

- Mean = 3.5 employees; median = 3 employees (from survey data)



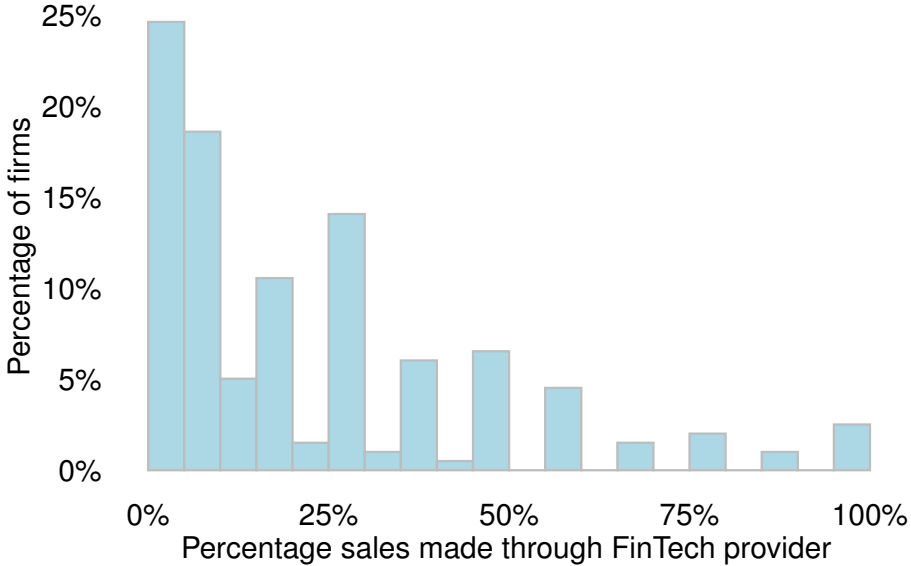
Firm characteristics and balance

$$y_i = \beta_0 + \beta_1 \mathbb{1}(\text{Ant. remind})_i + \beta_2 \mathbb{1}(\text{Unant. remind})_i + \beta_3 \mathbb{1}(\text{Deadline})_i + \beta_4 \mathbb{1}(\text{2.75\% Fee})_i + \varepsilon_i$$

	Intercept	Anticipated reminder	Unanticipated reminder	Deadline	2.75% Fee	F-stat p-value
Owner characteristics						
Owner sex female	0.442***	0.002	-0.003	-0.003	0.002	0.925
Owner age	39.40***	0.29*	0.23	-0.01	-0.03	0.367
Business type						
Beauty	0.087***	0.000	0.000	0.002	0.000	0.988
Clothing	0.089***	0.000	0.001	0.000	0.000	1.000
Professionals	0.239***	-0.001	-0.001	0.001	0.000	0.999
Restaurants	0.123***	0.001	0.002	0.000	-0.001	0.996
Small retailers	0.260***	-0.001	-0.001	0.001	0.000	0.999
Other	0.202***	0.002	0.000	-0.003	0.001	0.969
Pre-treatment sales variables						
Months since first transaction	24.11***	0.10	0.11	-0.08	0.12	0.930
% months business made sales	0.819***	-0.001	-0.001	0.002	0.001	0.939
Log average monthly sales volume	8.794***	-0.020	0.008	0.008	-0.005	0.501
Log average monthly transactions	2.059***	-0.009	0.001	0.008	0.003	0.968

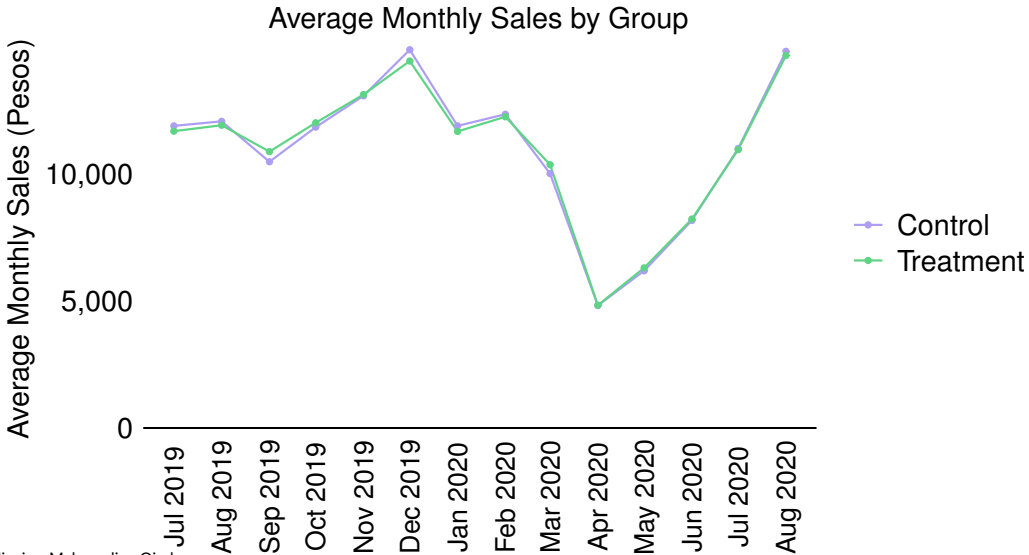
▸ Sample ▸ Percent of sales through FinTech platform

Percent of sales made through FinTech provider last week

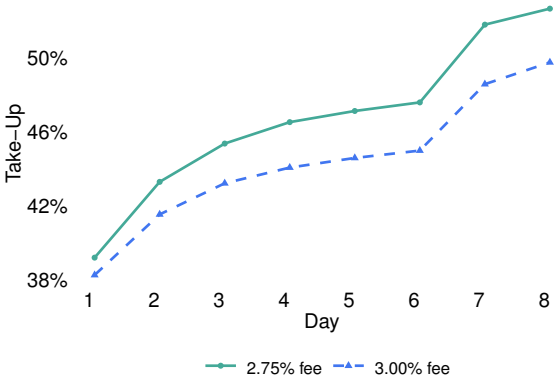


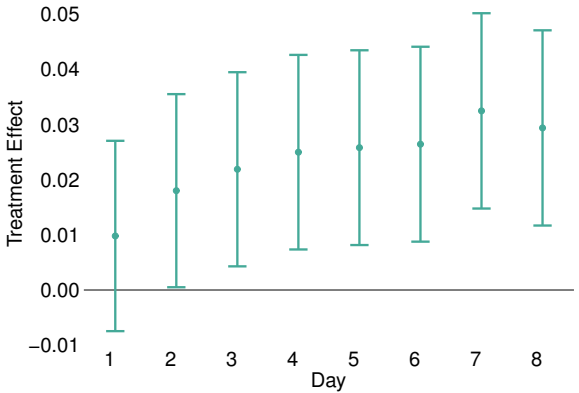
Experimental Timing ▸ Design and timeline

- Offers sent when sample on average back to pre-pandemic sales



Higher Value Increases Take-Up Conditional on Opening First Email

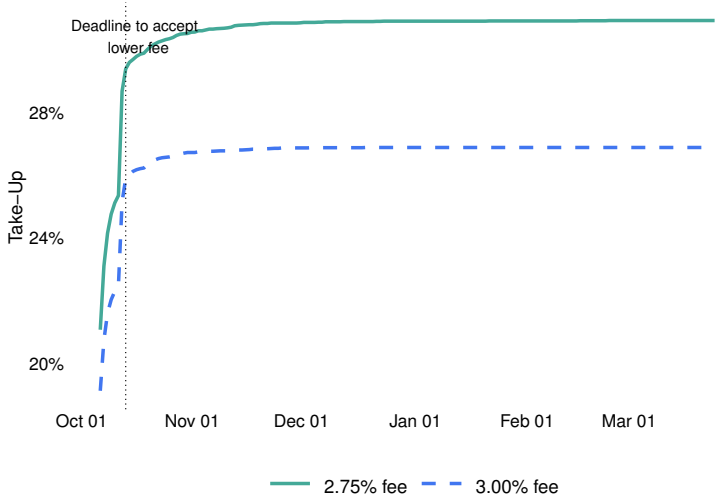




▸ Unconditional

Higher Value Increases Take-up Beyond Deadline

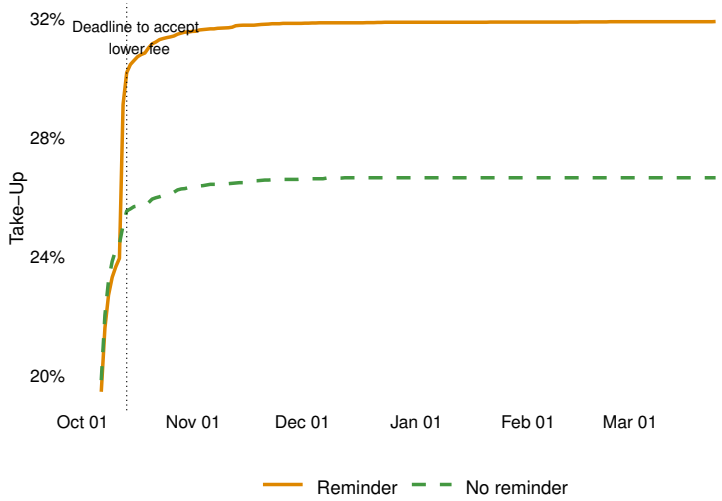
- Higher value effect persists over time



▸ By deadline

Reminders Increase Take-Up Beyond Deadline

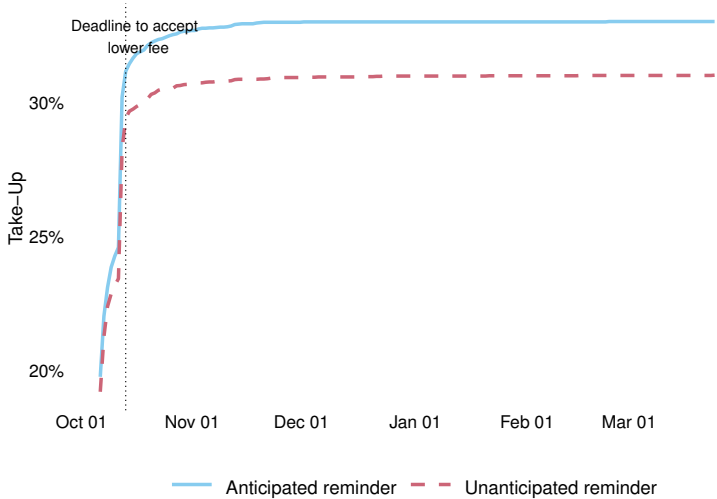
- Reminder effect persists over time



▸ By deadline

Anticipated Reminders Increase Take-up Beyond Deadline

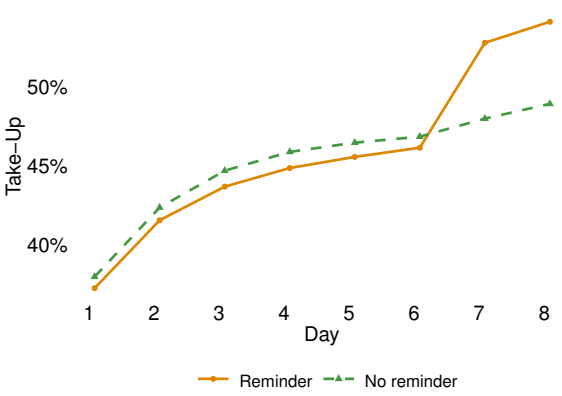
- Anticipated reminder effect persists over time

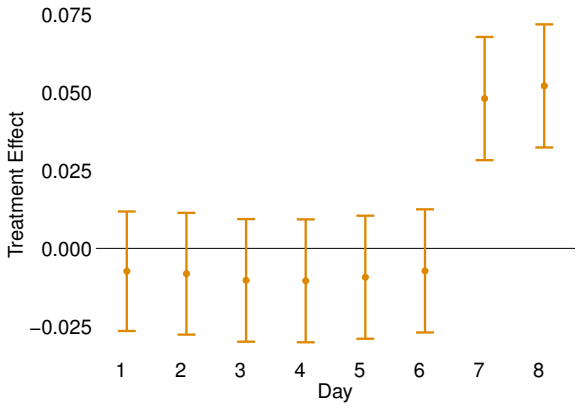


▸ By deadline

Reminders Increase Take-Up Conditional on Opening First Email

- Reminder ↗ take-up 5 pp conditional on opening first email

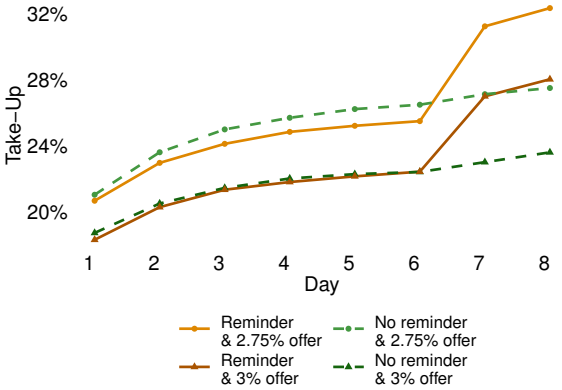


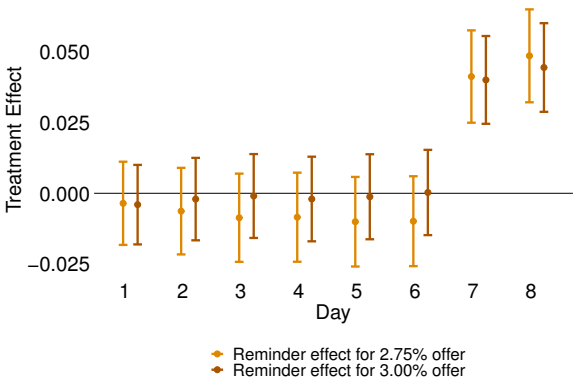


▸ Unconditional

Effect of Reminder by Offer Value

- Reminders ↗ take-up regardless of offer value

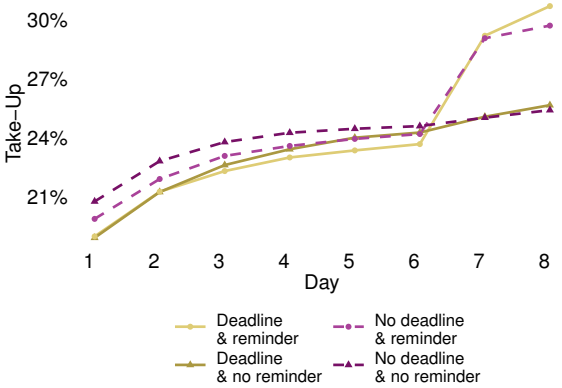


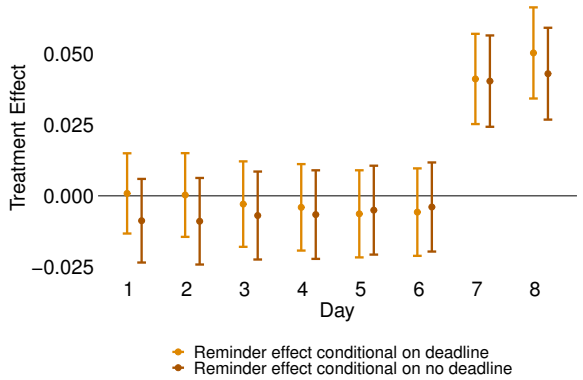


▸ Pooled across value of the offer ▸ Opened first email

Reminder Conditional on Deadline

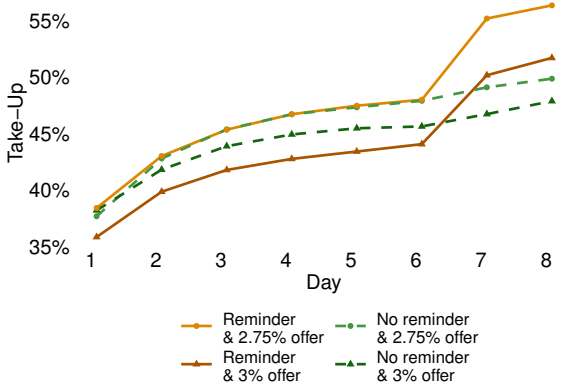
- Reminders ↗ take-up regardless of deadline

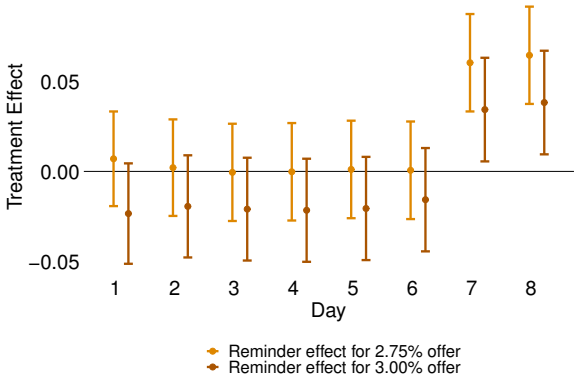




▸ Effect of reminder ▸ Effect of deadline

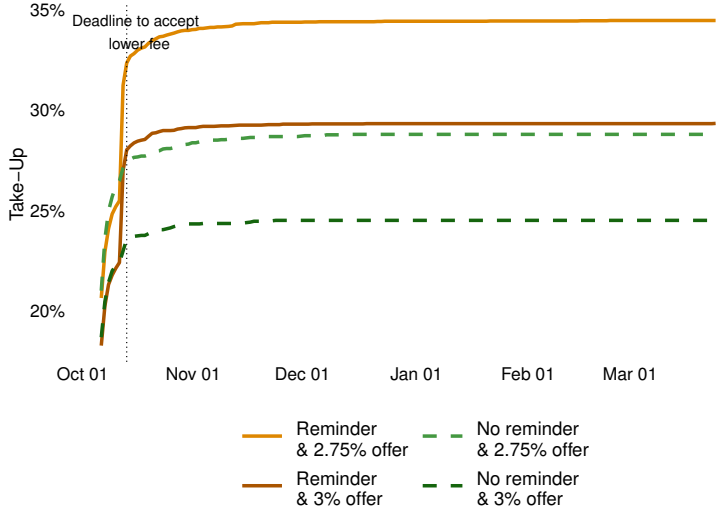
Effect of Reminder by Offer Value Conditional on Opening Email





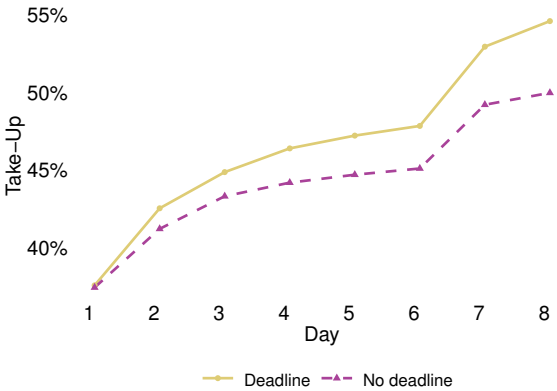
▸ Unconditional

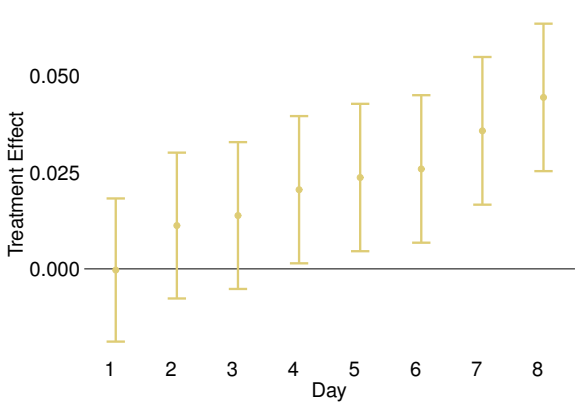
Six-Month Effect of Reminder by Offer Value



▸ By deadline

Effect of Deadline Conditional on Opening Email

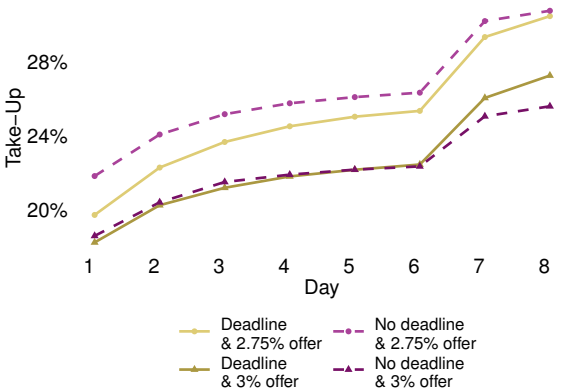


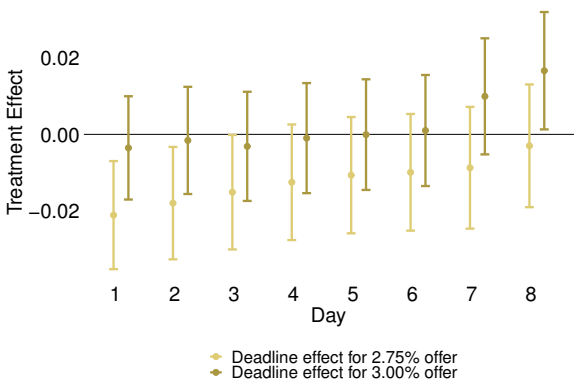


▸ Unconditional

Effect of Deadline by Offer Value

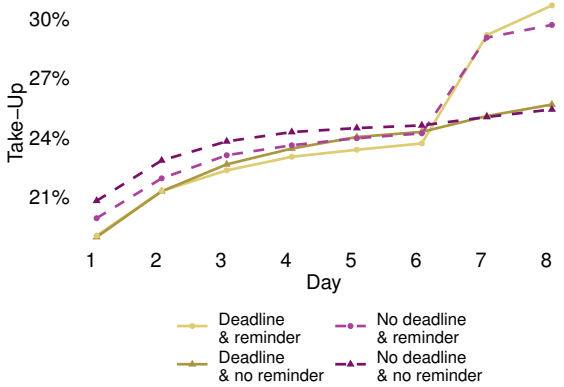
- Within lower-value offer (3.00% fee), deadline ↗ take-up 2 pp
- Within higher-value offer (2.75% fee), deadline has no effect

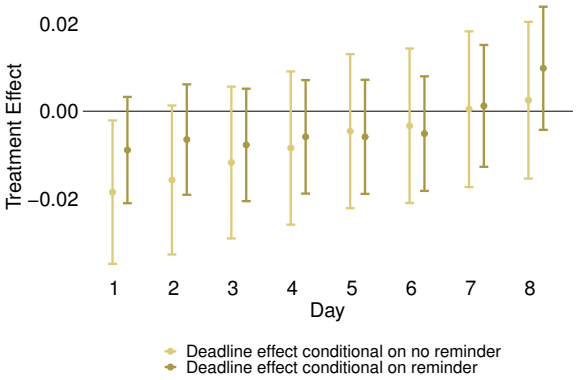




▸ Pooled across value of the offer ▸ Opened first email ▸ Longer-term

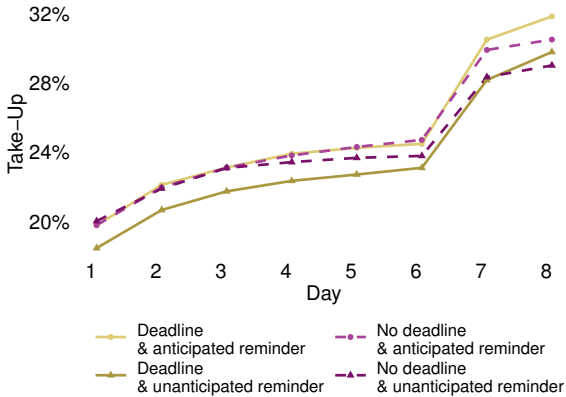
Deadline Conditional on Reminder

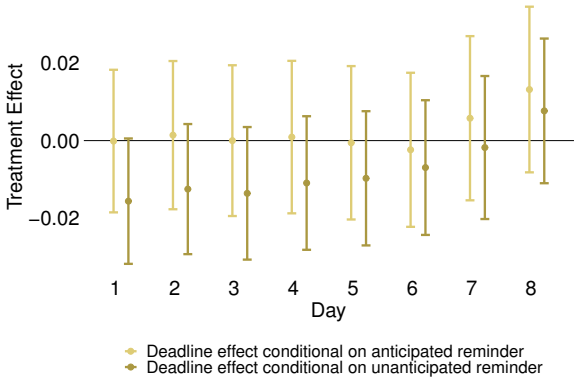




- Effect of reminder
- Effect of deadline

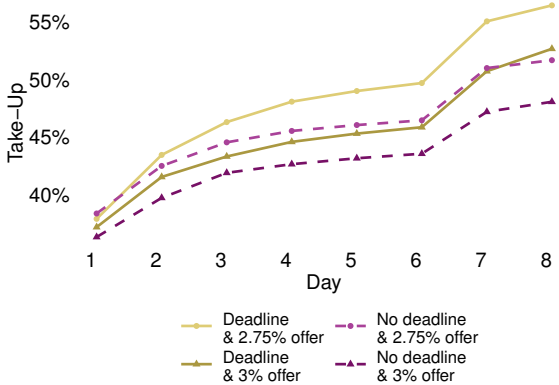
Deadline Conditional on Anticipated Reminder

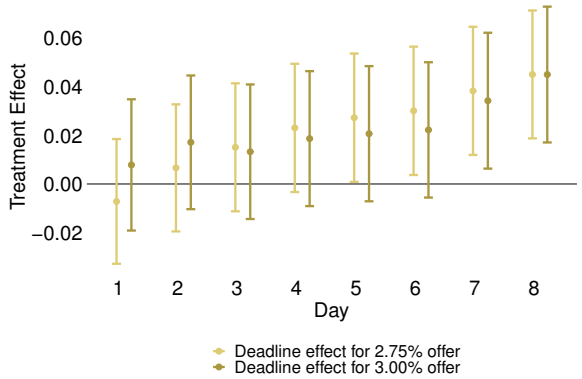




▸ Effect of anticipated reminder ▸ Effect of deadline

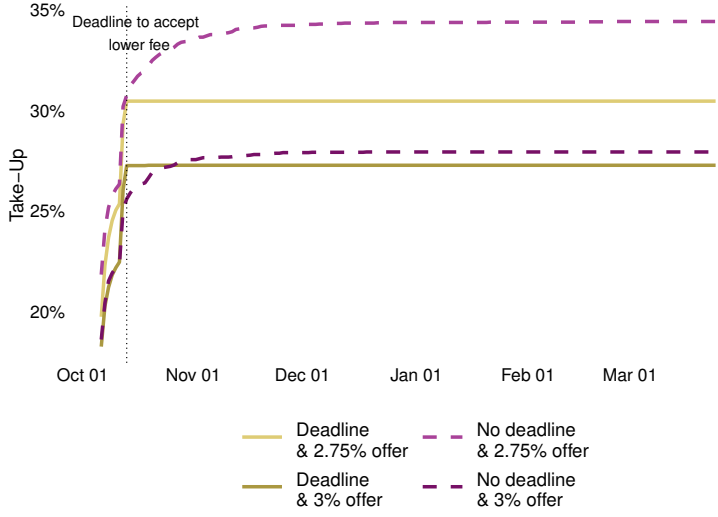
Effect of Deadline by Offer Value Conditional on Opening Email





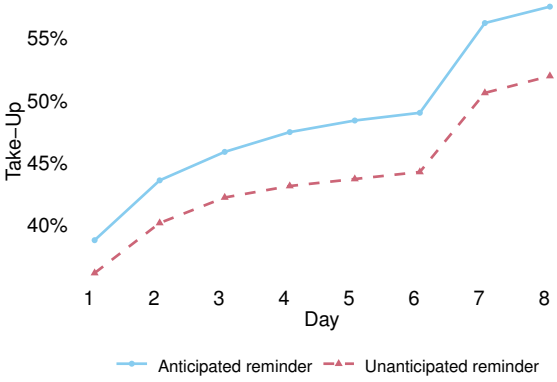
▸ Unconditional

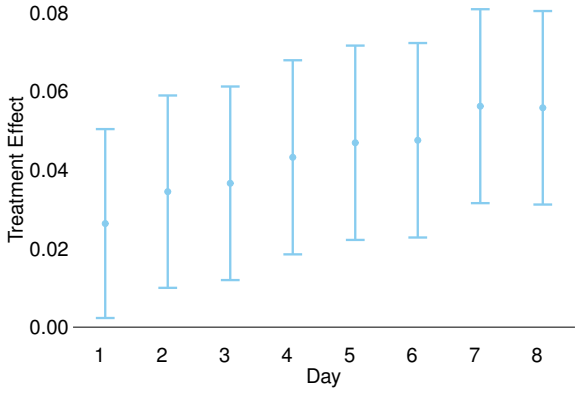
Six-Month Effect of Deadline by Offer Value



▸ By deadline

Anticipated Reminder ↗ Take-Up Conditional on Opening Email

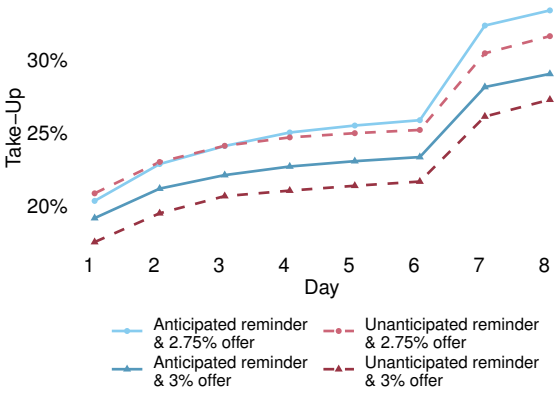


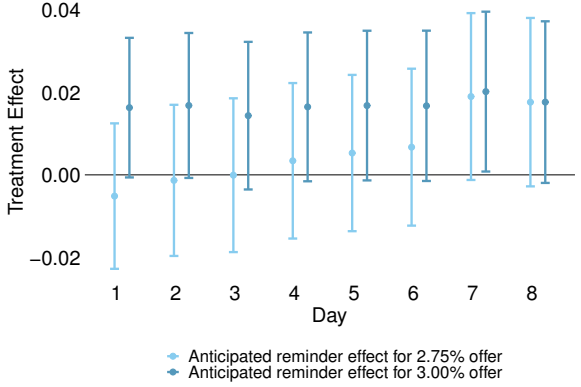


▸ Unconditional

Effect of Anticipated Reminder by Offer Value

- Anticipated reminders appear to ↗ take-up regardless of offer value
  - Cannot reject that effect is the same regardless of deadline

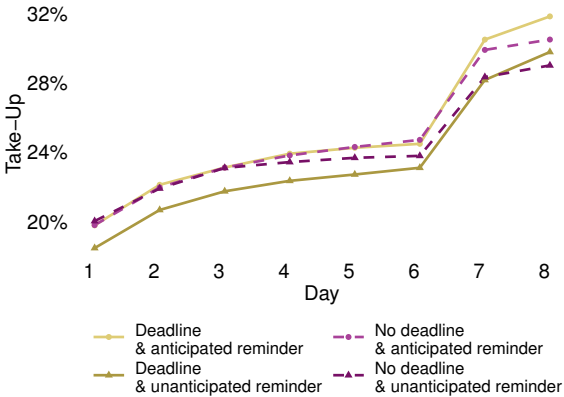


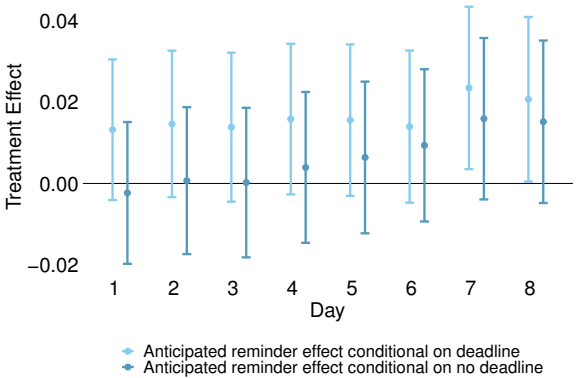


- Pooled across value of the offer
- Opened first email
- Longer-term take-up

Anticipated Reminder Conditional on Deadline

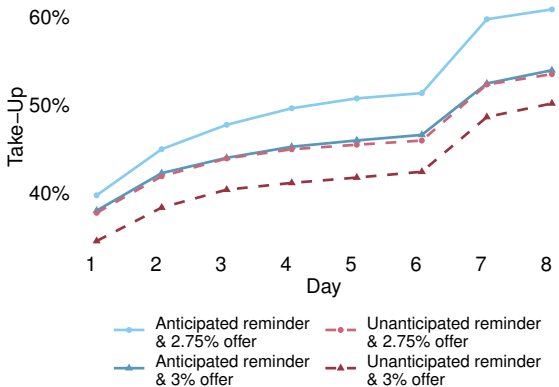
- Anticipated reminders appear to ↗ take-up regardless of deadline
  - Cannot reject that effect is the same regardless of deadline

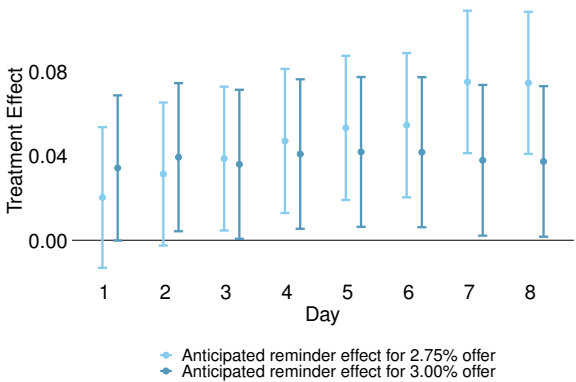




▸ Effect of anticipated reminder ▸ Effect of deadline

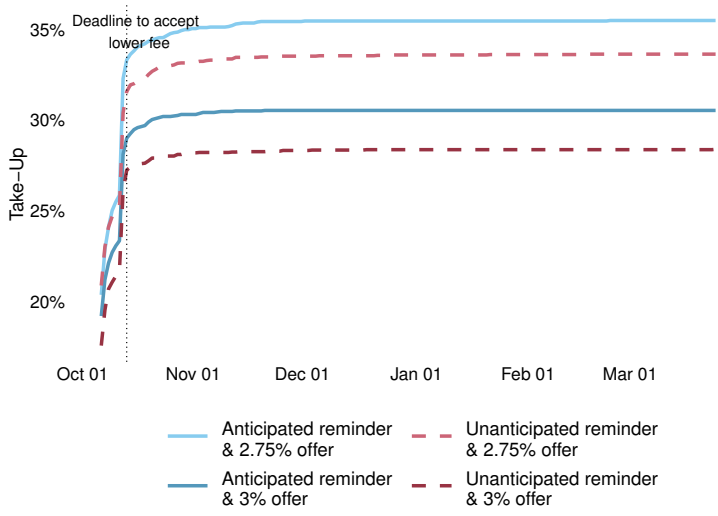
Effect of Anticipated Reminder by Offer Value | Opening Email





▸ Unconditional

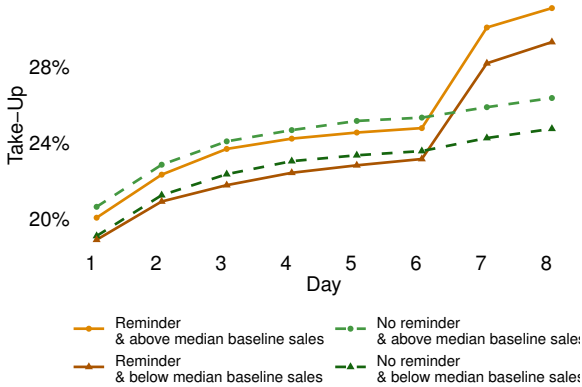
Six-Month Effect of Anticipated Reminder by Offer Value

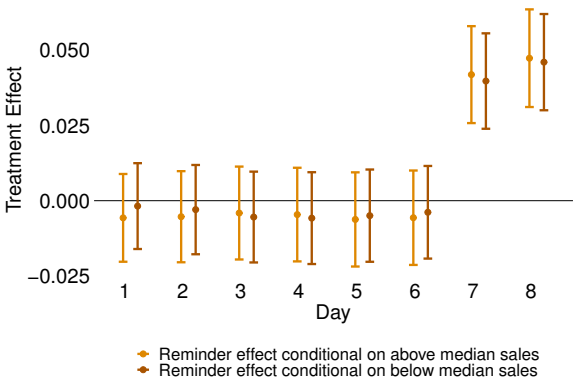


▸ By deadline

Effect of Reminder by Baseline Sales

- Reminders ↗ take-up regardless of baseline sales

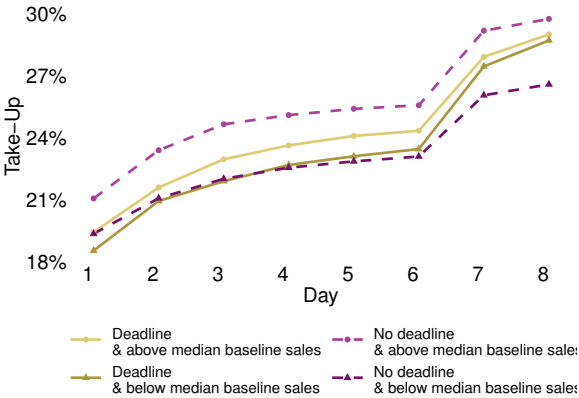


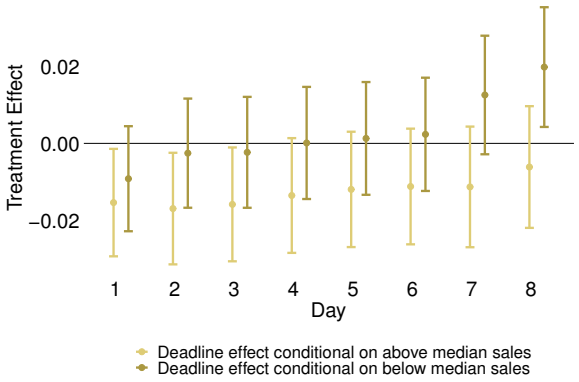


▸ Pooled across baseline sales

Effect of Deadline by Baseline Sales

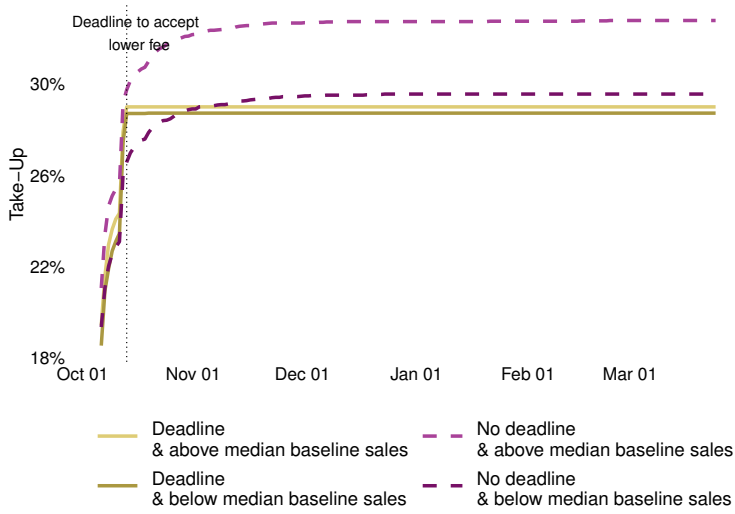
- For below-median sales, deadline ↗ take-up 2 pp by deadline
- For above-median sales, deadline has no effect





▸ Pooled across baseline sales

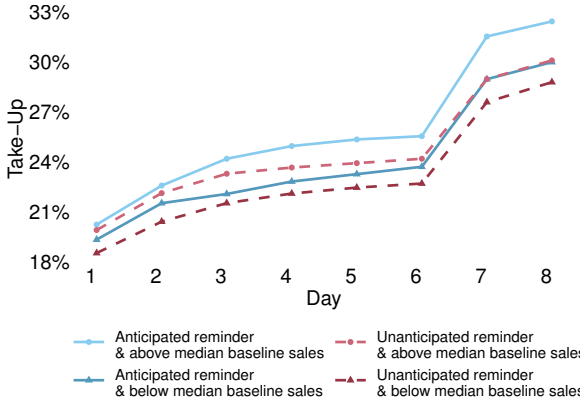
Six-Month Effect of Deadline by Baseline Sales

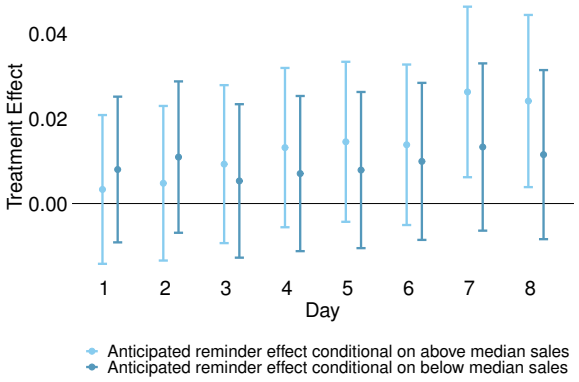


▸ Pooled across baseline sales

Effect of Anticipated Reminder by Baseline Sales

- Anticipated reminders appear to ↗ take-up regardless of baseline sales
  - Cannot reject that effect is the same regardless of baseline sales





▸ Pooled across baseline sales

Survey balance

$$y_i = \beta_0 + \beta_1 \mathbb{1}(\text{Ant. remind})_i + \beta_2 \mathbb{1}(\text{Unant. remind})_i + \beta_3 \mathbb{1}(\text{Deadline})_i + \beta_4 \mathbb{1}(\text{2.75\% Fee})_i + \varepsilon_i$$

	Intercept	Anticipated reminder	Unanticipated reminder	Deadline	2.75% Fee	F-stat p-value
Owner characteristics						
Owner sex female	0.400***	-0.079	-0.071	0.084*	0.122**	0.037
Owner age	41.23***	-1.40	-0.79	0.16	-0.70	0.887
Business type						
Beauty	0.158***	-0.096	-0.087	-0.034	0.018	0.115
Clothing	0.034	0.065*	0.062*	0.002	-0.022	0.626
Professionals	0.218***	0.027	0.058	-0.002	0.070	0.486
Restaurants	0.108**	0.031	0.043	0.001	−0.071**	0.182
Small retailers	0.344***	−0.142*	-0.108	0.017	0.047	0.299
Other	0.137*	0.115*	0.032	0.016	-0.042	0.130
Pre-treatment sales variables						
Months since first transaction	21.48***	0.61	2.92	1.92	-0.24	0.516
% months business made sales	0.854***	-0.035	-0.031	0.007	-0.014	0.841
Log average monthly sales volume	8.585***	0.104	0.159	-0.026	0.097	0.774
Log average monthly transactions	2.053***	-0.158	-0.041	0.135	-0.001	0.736

▸ Perception of offer's value ▸ Anticipated reminder compliers ▸ Unanticipated reminder compliers ▸ Deadline compliers

Survey response balance by characteristics

$$y_i = \beta_0 + \beta_1 \mathbb{1}(\text{Respond})_i + \varepsilon_i$$

	Did not respond	Responded	Difference	P-value
Owner characteristics				
Owner sex female	0.423	0.438	0.016	0.589
Owner age	39.83	39.94	0.11	0.867
Business type				
Beauty	0.085	0.068	-0.017	0.261
Clothing	0.085	0.082	-0.003	0.853
Professionals	0.258	0.291	0.034	0.197
Restaurants	0.116	0.105	-0.012	0.520
Small retailers	0.260	0.263	0.004	0.888
Other	0.197	0.191	-0.006	0.801
Pre-treatment sales variables				
Months since first transaction	25.16	23.89	-1.27	0.221
% months business made sales	0.817	0.820	0.003	0.824
Log average monthly sales volume	8.745	8.741	-0.004	0.944
Log average monthly transactions	2.015	2.029	0.014	0.866

▸ Perception of offer's value ▸ Anticipated reminder compliers ▸ Unanticipated reminder compliers ▸ Deadline compliers

Survey response balance by treatment arm

$$y_i = \beta_0 + \beta_1 \mathbb{1}(\text{Ant. remind})_i + \beta_2 \mathbb{1}(\text{Unant. remind})_i + \beta_3 \mathbb{1}(\text{Deadline})_i + \beta_4 \mathbb{1}(\text{2.75\% Fee})_i + \varepsilon_i$$

	Responded
Intercept	0.300***
	(0.000)
Anticipated reminder	-0.005
	(0.913)
Unanticipated reminder	-0.013
	(0.769)
Deadline	0.002
	(0.920)
2.75% fee	0.028
	(0.252)
Num.Obs.	1399

▸ Perception of offer's value ▸ Anticipated reminder compliers ▸ Unanticipated reminder compliers ▸ Deadline compliers

Survey response correlated with take-up

$$\mathbb{1}(\textit{Respond})_i = \beta_0 + \beta_1 \mathbb{1}(\textit{Accept})_i + \varepsilon_i$$

	Responded survey
Intercept	0.251***
	(0.000)
Firm accepted offer by deadline	0.125***
	(0.000)
Number of firms	1399

▸ Perception of offer's value ▸ Anticipated reminder compliers ▸ Unanticipated reminder compliers ▸ Deadline compliers

Logins to Check Current Fee or Sales

- Administrative data on logins to partner's platform to check current fee or sales
- Compare anticipated and unanticipated reminder groups

	Log in	Viewed deposits
Intercept	0.095***	0.037***
	(0.003)	(0.002)
Anticipated reminder	-0.003	0.000
	(0.005)	(0.003)
Num.Obs.	16254	16254

▸ Perception of offer's value ▸ Anticipated reminder compliers ▸ Unanticipated reminder compliers ▸ Deadline compliers

Anticipated Reminder Effect Concentrated Among Less-Trusting

$$\mathbb{1}(\text{Adopt})_i = \beta_0 + \beta_1 \mathbb{1}(\text{Survey measure})_i + \beta_2 \mathbb{1}(\text{Ant. remind})_i + \beta_3 \mathbb{1}(\text{Survey measure})_i \times \mathbb{1}(\text{Ant. remind})_i + \varepsilon_i$$

- Comparing anticipated to unanticipated reminder

Survey measure	Firm accepted offer by deadline					
	Trust	Reciprocity	Procrastination	Memory	Overconfidence	Attention
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.243***	0.305***	0.316***	0.311***	0.289***	0.202***
	(0.036)	(0.098)	(0.038)	(0.063)	(0.041)	(0.060)
Survey measure	0.177***	0.006	-0.019	-0.001	0.046	0.133*
	(0.068)	(0.103)	(0.068)	(0.073)	(0.064)	(0.070)
Anticipated reminder	0.123**	0.031	0.052	0.028	0.088	0.111
	(0.059)	(0.146)	(0.060)	(0.087)	(0.065)	(0.110)
Survey measure	-0.269***	-0.012	-0.080	-0.012	-0.152	-0.114
× Anticipated reminder	(0.096)	(0.154)	(0.096)	(0.103)	(0.093)	(0.121)
Number of firms	389	389	389	389	389	389
Prop. survey measure = 1	0.301	0.897	0.348	0.626	0.386	0.787
Prop. firms took up treatment	0.300	0.300	0.300	0.300	0.300	0.300

▸ Graph ▸ Weighted ▸ Survey balance ▸ Survey response balance ▸ Logins

Unanticipated Reminder Effect Concentrated Among Low-Memory

$$\mathbb{1}(\text{Adopt})_i = \beta_0 + \beta_1 \mathbb{1}(\text{Survey measure})_i + \beta_2 \mathbb{1}(\text{Unant. remind})_i + \beta_3 \mathbb{1}(\text{Survey measure})_i \times \mathbb{1}(\text{Unant. remind})_i + \varepsilon_i$$

- Comparing unanticipated reminder to no reminder

Survey measure	Firm accepted offer by deadline					
	Trust (1)	Reciprocity (2)	Procrastination (3)	Memory (4)	Overconfidence (5)	Attention (6)
Intercept	0.406***	0.600***	0.586***	0.278***	0.370***	0.273**
	(0.088)	(0.221)	(0.092)	(0.107)	(0.094)	(0.135)
Survey measure	0.344*	-0.143	-0.404***	0.359**	0.322**	0.279*
	(0.178)	(0.237)	(0.149)	(0.148)	(0.160)	(0.164)
Unanticipated reminder	0.038	-0.074	-0.048	0.254*	0.135	0.114
	(0.100)	(0.249)	(0.102)	(0.129)	(0.106)	(0.162)
Survey measure	-0.138	0.149	0.384**	-0.359**	-0.264	-0.106
× Unanticipated reminder	(0.192)	(0.266)	(0.170)	(0.171)	(0.176)	(0.191)
Number of firms	228	228	228	228	228	228
Prop. survey measure = 1	0.366	0.895	0.315	0.683	0.420	0.841
Prop. firms took up treatment	0.611	0.611	0.611	0.611	0.611	0.611

▸ Graph ▸ Weighted ▸ Survey balance ▸ Survey response balance ▸ Logins

Anticipated Reminder (Weighted)

$$\mathbb{1}(\text{Adopt})_i = \beta_0 + \beta_1 \mathbb{1}(\text{Survey measure})_i + \beta_2 \mathbb{1}(\text{Ant. remind})_i + \beta_3 \mathbb{1}(\text{Survey measure})_i \times \mathbb{1}(\text{Ant. remind})_i + \varepsilon_i$$

- Comparing anticipated to unanticipated reminder

Survey measure	Firm accepted offer by deadline					
	Trust	Reciprocity	Procrastination	Memory	Overconfidence	Attention
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.243***	0.305***	0.316***	0.311***	0.289***	0.202***
	(0.036)	(0.098)	(0.038)	(0.063)	(0.041)	(0.060)
Survey measure	0.177***	0.006	-0.019	-0.001	0.046	0.133*
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Anticipated reminder	0.123**	0.031	0.052	0.028	0.088	0.111
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Survey measure	-0.269***	-0.012	-0.080	-0.012	-0.152	-0.114
× Anticipated reminder	(0.096)	(0.154)	(0.096)	(0.103)	(0.093)	(0.121)
Number of firms	389	389	389	389	389	389
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▸ Graph ▸ Unweighted ▸ Survey balance ▸ Survey response balance ▸ Logins

Unanticipated Reminder (Weighted)

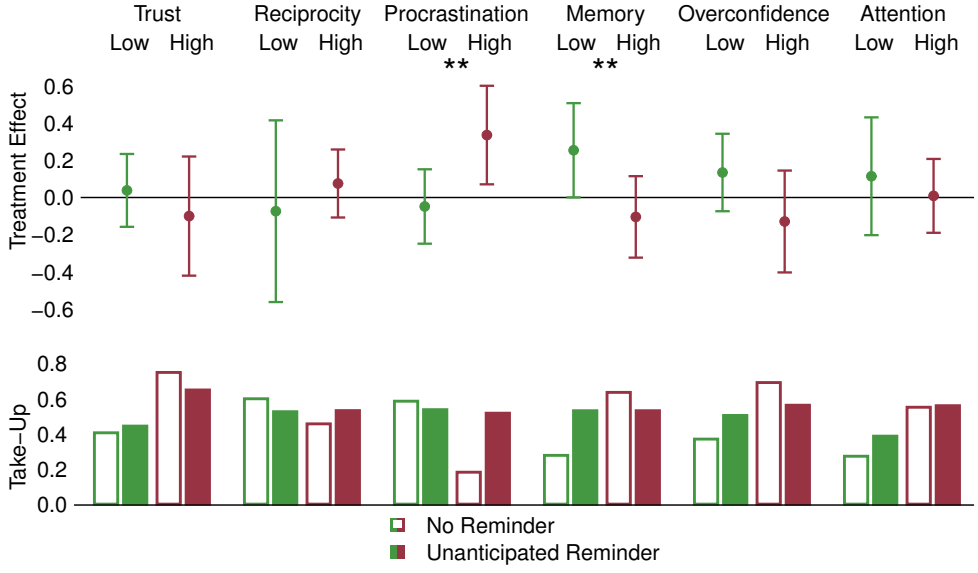
$$\mathbb{1}(\text{Adopt})_i = \beta_0 + \beta_1 \mathbb{1}(\text{Survey measure})_i + \beta_2 \mathbb{1}(\text{Unant. remind})_i + \beta_3 \mathbb{1}(\text{Survey measure})_i \times \mathbb{1}(\text{Unant. remind})_i + \varepsilon_i$$

- Comparing unanticipated reminder to no reminder

Survey measure	Firm accepted offer by deadline					
	Trust (1)	Reciprocity (2)	Procrastination (3)	Memory (4)	Overconfidence (5)	Attention (6)
Intercept	0.214***	0.437*	0.377***	0.135**	0.200***	0.135*
	(0.062)	(0.228)	(0.091)	(0.063)	(0.065)	(0.081)
Survey measure	0.333	-0.190	-0.299***	0.273**	0.240	0.189
	(0.216)	(0.237)	(0.107)	(0.126)	(0.165)	(0.116)
Unanticipated reminder	0.029	-0.132	-0.061	0.176**	0.090	0.068
	(0.072)	(0.248)	(0.098)	(0.089)	(0.077)	(0.101)
Survey measure	-0.157	0.196	0.281**	-0.273*	-0.194	-0.056
× Unanticipated reminder	(0.227)	(0.258)	(0.127)	(0.146)	(0.177)	(0.136)
Number of firms	228	228	228	228	228	228
Prop. survey measure = 1	0.301	0.897	0.348	0.626	0.386	0.787
Prop. firms took up treatment	0.300	0.300	0.300	0.300	0.300	0.300

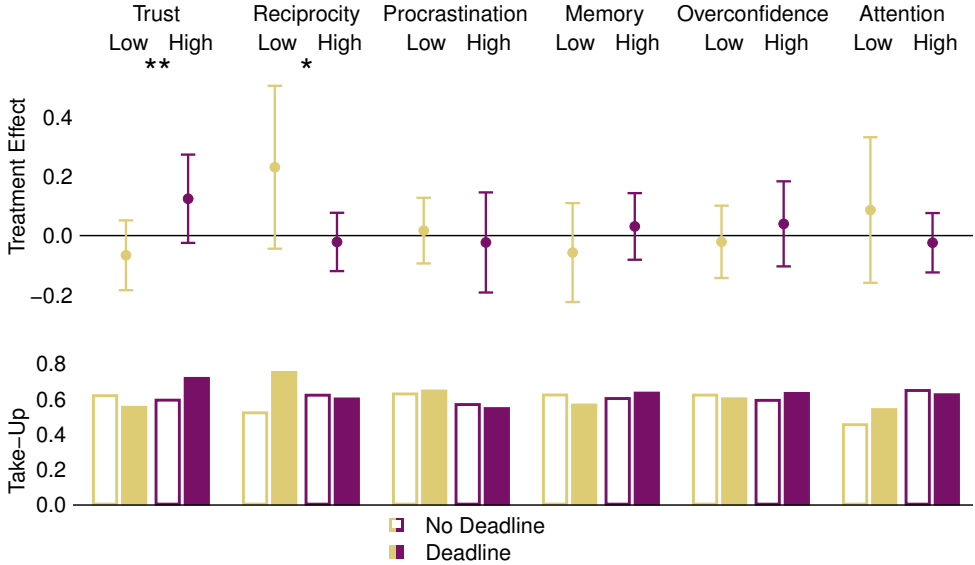
▸ Graph ▸ Unweighted ▸ Survey balance ▸ Survey response balance ▸ Logins

Unanticipated Reminder Effect Concentrated Among Low-Memory



▸ Table ▸ Weighted ▸ Survey balance ▸ Survey response balance ▸ Logins ▸ Anticipated ▸ Deadline ▸ Take-Up

Deadline Effect



Deadline Effect

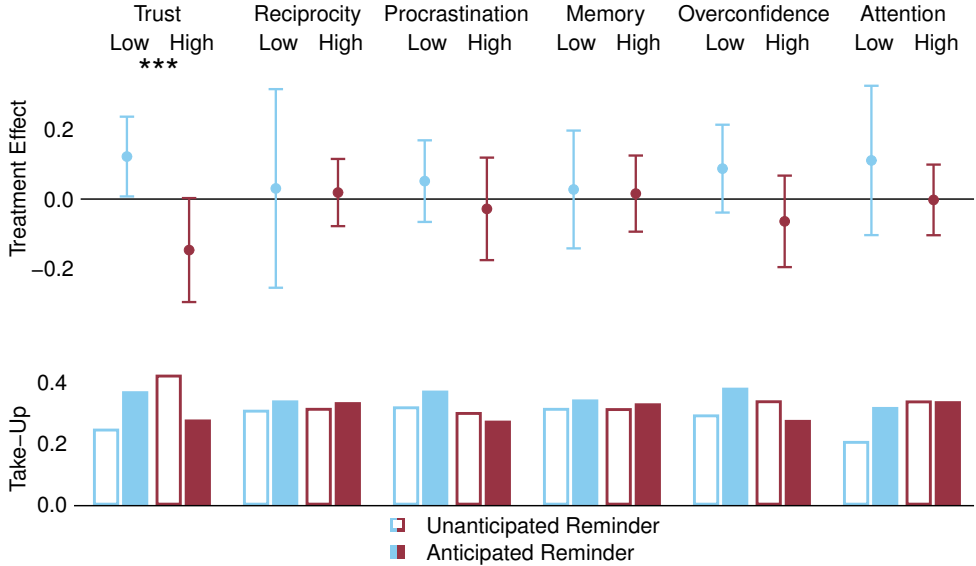
$$\mathbb{1}(\text{Adopt})_i = \beta_0 + \beta_1 \mathbb{1}(\text{Survey measure})_i + \beta_2 \mathbb{1}(\text{Deadline})_i + \beta_3 \mathbb{1}(\text{Survey measure})_i \times \mathbb{1}(\text{Deadline})_i + \varepsilon_i$$

- Comparing deadline to no deadline

Survey measure	Firm accepted offer by deadline					
	Trust (1)	Reciprocity (2)	Procrastination (3)	Memory (4)	Overconfidence (5)	Attention (6)
Intercept	0.618***	0.520***	0.628***	0.622***	0.621***	0.452***
	(0.042)	(0.100)	(0.040)	(0.057)	(0.044)	(0.077)
Survey measure	-0.026	0.100	-0.060	-0.020	-0.030	0.195**
	(0.070)	(0.107)	(0.073)	(0.070)	(0.068)	(0.085)
Deadline	-0.066	0.230	0.017	-0.057	-0.021	0.086
	(0.060)	(0.140)	(0.056)	(0.085)	(0.062)	(0.125)
Survey measure	0.190**	-0.251*	-0.040	0.088	0.060	-0.110
× Deadline	(0.097)	(0.148)	(0.103)	(0.102)	(0.096)	(0.135)
Number of firms	429	429	429	429	429	429
Prop. survey measure = 1	0.366	0.895	0.315	0.683	0.420	0.841
Prop. firms took up treatment	0.611	0.611	0.611	0.611	0.611	0.611

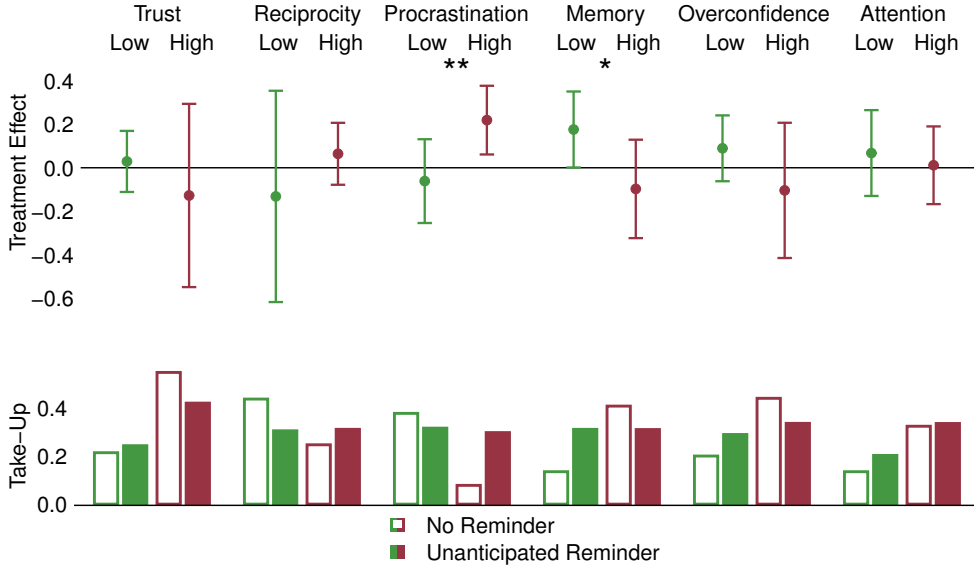
▸ Graph ▸ Weighted ▸ Survey balance ▸ Survey response balance ▸ Logins ▸ Unanticipated reminder

Anticipated Reminder (Weighted)



▸ Table ▸ Unweighted ▸ Survey balance ▸ Survey response balance ▸ Logins

Unanticipated Reminder (Weighted)



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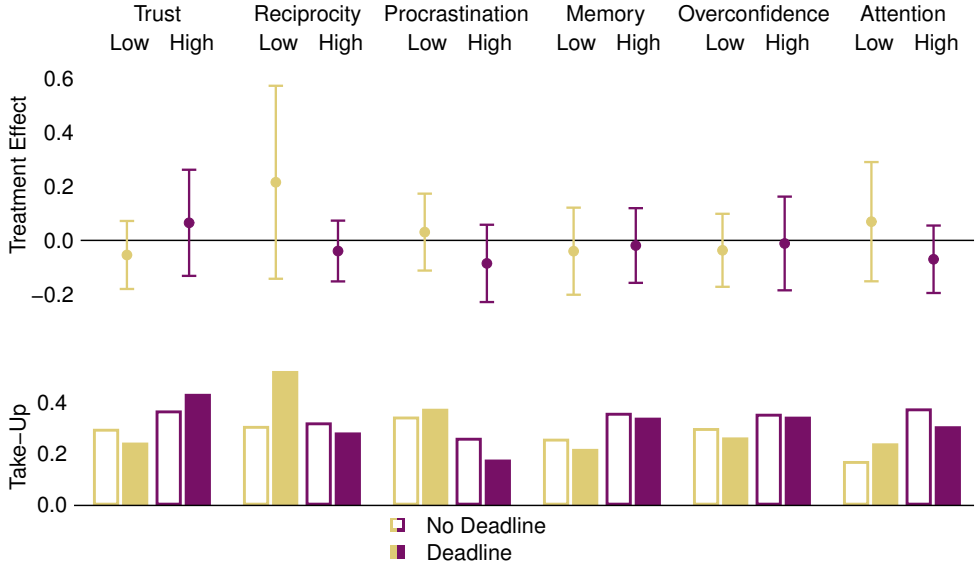
Deadline (Weighted)



▸ Table ▸ Unweighted ▸ Survey balance ▸ Survey response balance ▸ Logins

Deadline Effect (Weighted)

$$\mathbb{1}(\text{Adopt})_i = \beta_0 + \beta_1 \mathbb{1}(\text{Survey measure})_i + \beta_2 \mathbb{1}(\text{Deadline})_i + \beta_3 \mathbb{1}(\text{Survey measure})_i \times \mathbb{1}(\text{Deadline})_i + \varepsilon_i$$

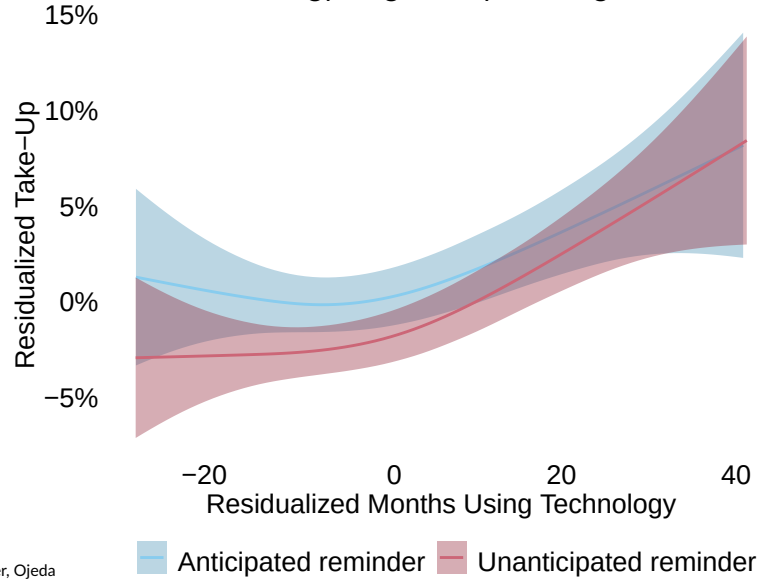
- Comparing deadline to no deadline

Survey measure	Firm accepted offer by deadline					
	Trust (1)	Reciprocity (2)	Procrastination (3)	Memory (4)	Overconfidence (5)	Attention (6)
Intercept	0.289***	0.300***	0.337***	0.250***	0.292***	0.163***
	(0.048)	(0.114)	(0.051)	(0.059)	(0.050)	(0.056)
Survey measure	0.072	0.014	-0.083	0.101	0.056	0.206***
	(0.082)	(0.121)	(0.077)	(0.078)	(0.079)	(0.074)
Deadline	-0.054	0.215	0.031	-0.040	-0.037	0.069
	(0.064)	(0.182)	(0.072)	(0.082)	(0.069)	(0.112)
Survey measure	0.119	-0.254	-0.116	0.021	0.025	-0.139
× Deadline	(0.119)	(0.191)	(0.103)	(0.108)	(0.112)	(0.129)
Number of firms	429	429	429	429	429	429
Prop. survey measure = 1	0.301	0.897	0.348	0.626	0.386	0.787
Prop. firms took up treatment	0.300	0.300	0.300	0.300	0.300	0.300

▸ Graph ▸ Unweighted ▸ Survey balance ▸ Survey response balance ▸ Logins ▸ Unanticipated reminder

Anticipated Reminder Effect Concentrated Among Less-Trusting ▸ Survey

- Firms that have used the technology longer likely have higher trust in FinTech company



Elasticity of Usage of E-Payments

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- Treatment-on-the-treated estimate: taking up offer $\nearrow$ sales by $\sim 40\%$
- Sales Elasticity = $\frac{\%\Delta \text{Sales}}{\%\Delta \text{Fee}} \approx \frac{40\%}{-20\%} = -2$
- $\Rightarrow$ profitable for FinTech partner to lower merchant fee

▸ More details ▸ Mechanisms ▸ Conclusion

E-payment Usage Elasticity

How does e-payment usage respond to lower merchant fees?

$$Y_{it} = \beta Post_t \times Treated_i + \gamma_i + \delta_t + \epsilon_{it} \quad (1)$$

- y_{it}: $log(sales + 1)_{it}$, $log(transactions + 1)$ or indicator make sale
- β main coefficient of interest
- γ_i merchant FE
- δ_t month FE
- To calculate TOT: $Post_t \times Treated_i$ instrument for $Post_t \times Adopt_i$
- Standard errors clustered at firm-level

▸ Elasticity summary ▸ Conclusion

Lower Merchant Fee Leads to Increased Usage ITT

- Being treated ↗ sales by $\sim$ 10%
- ↗ number of payments by $\sim$ 3%
- ↗ probability of using technology by 1 pp

	Log(sales + 1)	Log(payments + 1)	Made at least 1 sale
Post * Treated	0.103**	0.028*	0.010**
	(0.047)	(0.016)	(0.005)
Num.Obs.	662162	662162	662162
Num. Firms	33998	33998	33998
Cluster Std. Errors	Firm	Firm	Firm
Fixed Effects	Firm & month	Firm & month	Firm & month
Control Mean (levels)	21946.04	18.08	0.81
Control Mean (levels, winsorized)	11286.71	18.08	0.81

▸ Elasticity summary ▸ Conclusion

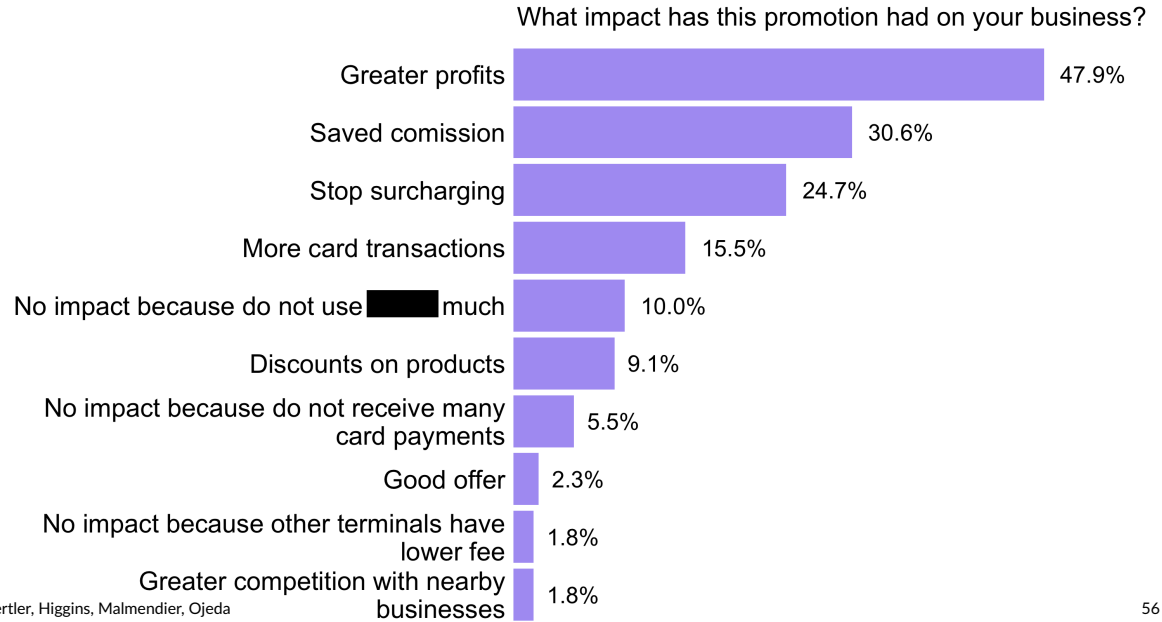
Lower Merchant Fee Leads to Increased Usage TOT

- Taking up offer $\nearrow$ increases sales by $\sim 40\%$
- Sales Elasticity = $\frac{\%\Delta \text{Sales}}{\%\Delta \text{Fee}} \approx \frac{40\%}{-20\%} = -2$
- $\nearrow$ increases number of payments by $\sim 10\%$
- $\nearrow$ increases probability of using technology by ~ 4 pp

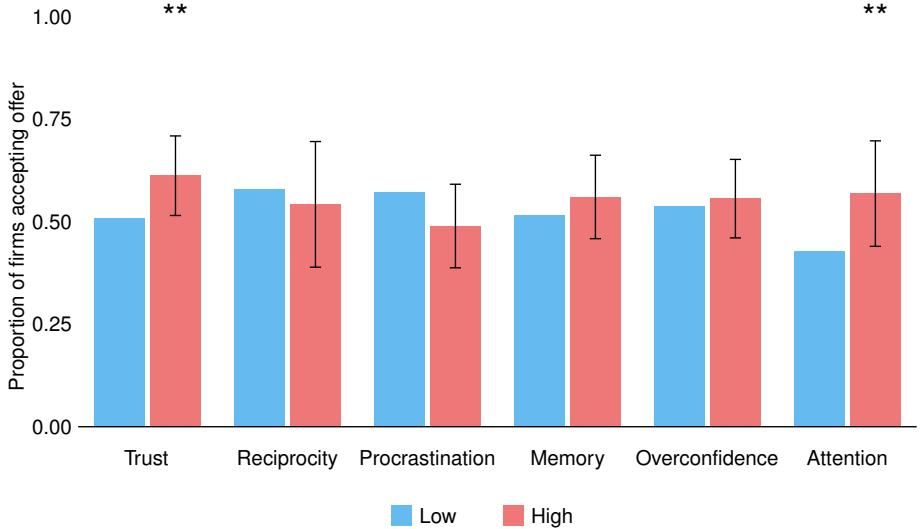
	Log(sales + 1)	Log(payments + 1)	Made at least 1 sale
Post * Adopted	0.355**	0.098*	0.036**
	(0.162)	(0.057)	(0.017)
Num.Obs.	662162	662162	662162
Num. Firms	33998	33998	33998
Cluster Std. Errors	Firm	Firm	Firm
Fixed Effects	Firm & month	Firm & month	Firm & month
Control Mean (levels)	21946.04	18.08	0.81
Control Mean (levels, winsorized)	11286.71	18.08	0.81

▸ Elasticity summary ▸ Conclusion

What impact has this offer had on your business? ▸ Elasticity

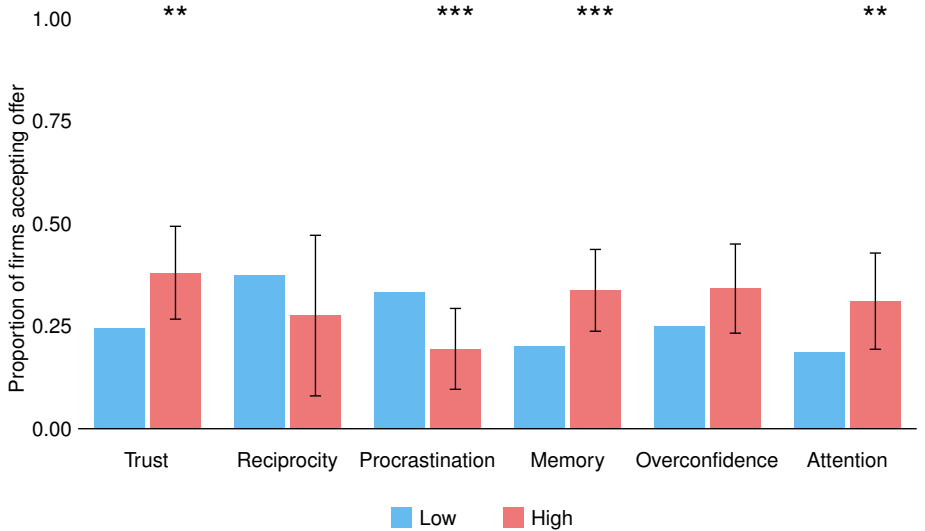


Survey Measures and Take-Up



- Anticipated reminder compliers
- Unanticipated reminder compliers
- Deadline compliers

Survey Measures and Take-Up (Weighted)



- Anticipated reminder compliers
- Unanticipated reminder compliers
- Deadline compliers

Self-Reported Reasons for Not Adopting