

# Unraveling the Dividend Puzzle: A Field Experiment

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# Dividend payment in China

Year	No. of Listed Firms	No. of payers	Fraction of payers	Total dividend payments (100 million RMB)
1998	850	264	31.06%	153.243
1999	944	309	32.73%	208.428
2000	1,097	698	63.63%	346.295
2001	1,156	706	61.07%	441.844
2002	1,217	632	51.93%	476.396
2003	1,285	616	47.94%	595.130
2004	1,364	737	54.03%	790.368
2005	1,457	638	43.79%	849.083
2006	1,532	716	46.74%	1,306.014
2007	1,573	804	51.11%	2,773.325
2008	1,610	849	52.73%	3,330.937
2009	1,777	1,000	56.27%	3,879.947
2010	2,118	1,314	62.04%	4,979.039
2011	2,367	1,613	68.15%	6,043.897
2012	2,475	1,805	72.93%	6,807.341
2013	2,521	1,870	74.18%	7,614.018
2014	2,679	1,945	72.60%	7,966.077
2015	2,838	2,002	70.54%	8,291.637
2016	3,164	2,416	76.36%	9,644.282
2017	3,512	2,767	78.79%	11,226.979
2018	3,505	2,506	71.50%	12,332.340

# 1. Motivation

“Dividends have long been an **enigma.**”

— Fama and French (2001)

- Why do firms pay dividends? It is one of the thorniest puzzles in corporate finance.
  - Scholars have developed and empirically tested various models to explain why firms pay dividends (**Agency, Bird-in-hand, Signaling, Tax clientele**, etc.). The evidence is mixed.
- Challenge: **endogeneity**
  - Dividend policy and its determinants are simultaneously determined
  - Overlaps between theories
  - Reverse causality

# 1. Motivation

- To date, there is **no consensus** on the determinants of a firm's dividend policy. This **old puzzle** may need a **new method of solving**.
- In this paper, we conduct a **field experiment** to test the four primary dividend theories and shed light on the dividend puzzle.
  - *Express concerns or queries on frictions of a particular dividend theory*
  - *Examine whether firms receiving the treatment of the theory increase their propensity to pay dividends in the following period, compared with the control firms.*

# 1. Motivation: primary dividend theories

## **Agency theory:**

- Frictions: conflict of interest between managers and shareholders
- Paying dividend reduces free cash under management's control (Easterbrook, 1984; Jensen, 1986; Zwiebel, 1996).

## **Bird-in-hand theory:**

- Frictions: investors are risk averse and dislike uncertainty
- Dividends represent a sure thing and hence low risk (Gordon, 1963; Lintner, 1964).

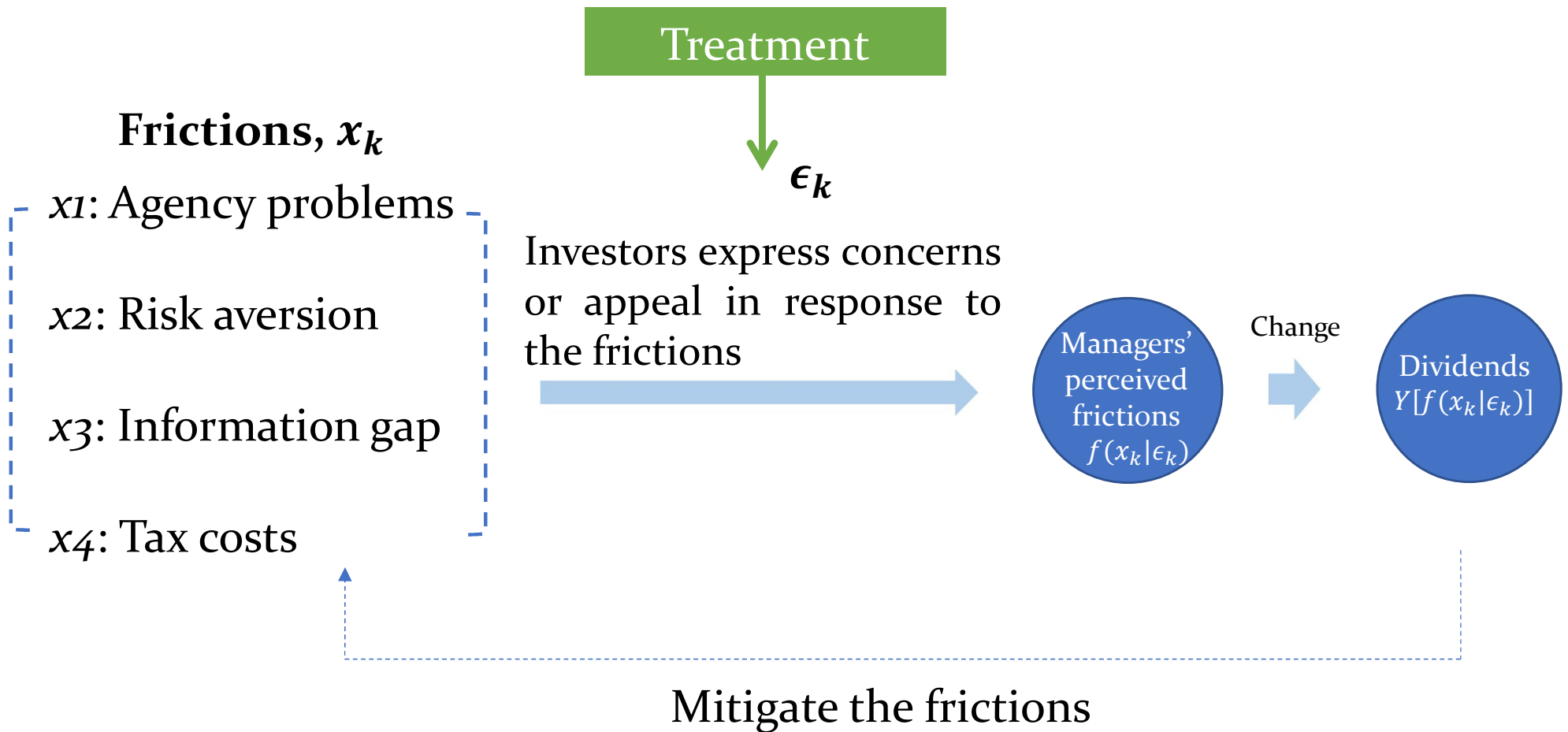
## **Signaling theory:**

- Frictions: information gap between insiders and outside investors
- Dividends convey insiders' private information about the firms' future prospects (Miller and Modigliani, 1961; Bhattacharya, 1979; Miller and Rock, 1985)

## **Tax clientele theory:**

- Frictions: tax costs
- Investors, who pay a lower tax rate on capital gain than dividend income, prefer stocks with none or low dividend pay-out (Elton and Gruber, 1970; Graham and Kumar, 2006; Desai and Jin, 2011).

## 2. Theoretical foundation



## 2. Theoretical foundation

- Change managers' perception and knowledge
- The premise of the four theories:
  - Agency: managers have to **perceive the threats from shareholders** because they have no incentive to pay out cash to lower their expropriation if the expropriation is not costly.
  - Bird-in-hand: managers have to **understand investors' risk attitude and have perceived investors' preference** for dividends over capital gains otherwise managers cannot know to change dividends to respond to investors' preference.
  - Signaling theory: managers have to **perceive the information gap between them and outside investors** otherwise there is no trigger for managers to send the signal even if the information gap exists.
  - Tax-clientele: managers have to **understand investors' tax status and perceive the firms' tax clientele** otherwise managers cannot know to adjust their dividend policy to cater to investors.

### 3. Main findings

- Past payers **receiving the treatment of agency concerns** increase dividends relative to control firms, supporting the agency theory of dividend payment.
- Firms **receiving the other treatments** (Bird-in-hand, signaling , Tax clientele) do not change dividend policy regardless of whether they are past payers or non-payers.
- Treatment effect of agency theory is **more pronounced** when
  - Firms face severer agency problems
  - The role of Secretary of the Board in a firm is more important
  - Telephone communication is effective



## 4. Research design

### Dividend policies

- Managers have considerable discretionary power in deciding firm's dividend policy in China.
- Chinese listed firms are required to review the implementation of their dividend policy and disclose the results in their periodic reports.
- Secretary of the Board (SOB) drafts the dividend proposal.

SOB propose the dividend plan



Board of directors meeting



General shareholder meeting



Announcement of dividend plan

## 4. Research design

We conduct a field experiment by contacting publicly listed firms during the period when the SOB proposes the firm's dividend payment plan.

### ○Investor relations platforms

- Shenzhen stock exchange——“EasyIR ”



- Shanghai stock exchange——“sseinfo.com ”



- Firms must provide telephone and email contact information on their IR web page and respond to queries and concerns raised by investors and other market participants.

# 4. Research design

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# 4. Research design



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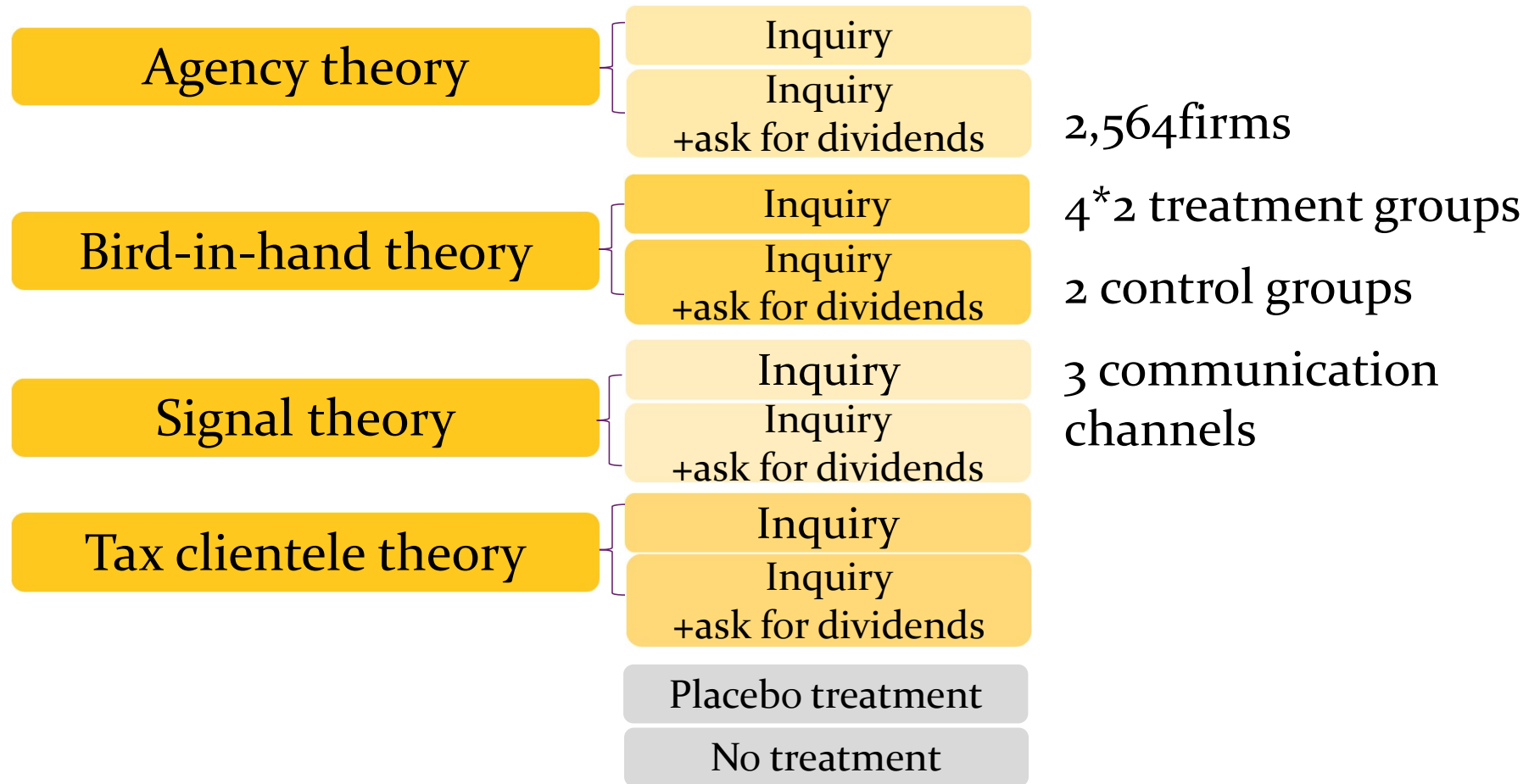
## 4. Research design

Step	Sample	Number of unique firms
1	Publicly listed firms by March 27, 2021	4,277
2	Excl. firms with missing ROA in 2020	3,861
3	Excl. B-shares	3,769
4	Excl. ST firms	3,569
5	Excl. firms with 2021 dividend proposals submitted before March 27, 2021	3,019
6	Excl. firms that did not issue a dividend proposal in April 2020	2,566
7	Excl. firms with missing financial information	2,564
8	The final sample	2,564
	--firms that paid dividends in 2020 (past payers)	1,859
	--firms that did not pay dividends in 2020 (non-payers)	705

## 4. Research design

- We randomize the full sample (2,564 firms) and equally divided them into ten groups.
- We hired undergraduates RAs in the capacity of potential investors to contact and deliver the respective treatment to each firm in the designated group by the channels of **IR online platforms, email, and telephone.**
- Execution time: March 29<sup>th</sup> to May 7<sup>th</sup> 2021.
- Execution frequency: each firm receives *one treatment* in all three communication ways each week. Each treatment is from a different investor.

# 4. Research design



## 4. Research design

Firm characteristics before the experiment (measured in 2020):

Sample	Control	Agency theory		
	mean [a]	mean [b]	diff. [b-a]	t-value
	(1)	(2)	(3)	(4)
<i>DivYield<sub>t</sub></i>	0.01	0.01	0.00	1.07
<i>DPS</i>	0.19	0.20	0.02	0.85
<i>Log(TA)</i>	22.51	22.60	0.08	0.78
<i>ROA</i>	0.04	0.04	0.00	-0.29
<i>AssetGrowth</i>	0.16	0.14	-0.02	-1.30
<i>M/B</i>	2.51	2.26	-0.25	-1.76
<i>Cash/TA</i>	0.25	0.24	-0.01	-0.66
<i>Leverage/TA</i>	0.42	0.42	0.00	0.00
<i>Return</i>	0.19	0.19	0.00	-0.08
<i>Volatility</i>	0.13	0.12	-0.01	-1.72
<i>CEODuality</i>	0.30	0.33	0.03	0.85
<i>IndDirectors</i>	0.38	0.38	0.00	0.18
<i>Log(ExePay)</i>	14.85	14.83	-0.01	-0.30
<i>ExeOwnership</i>	0.09	0.09	0.00	0.32
<i>FirmAge</i>	20.42	20.10	-0.33	-0.78

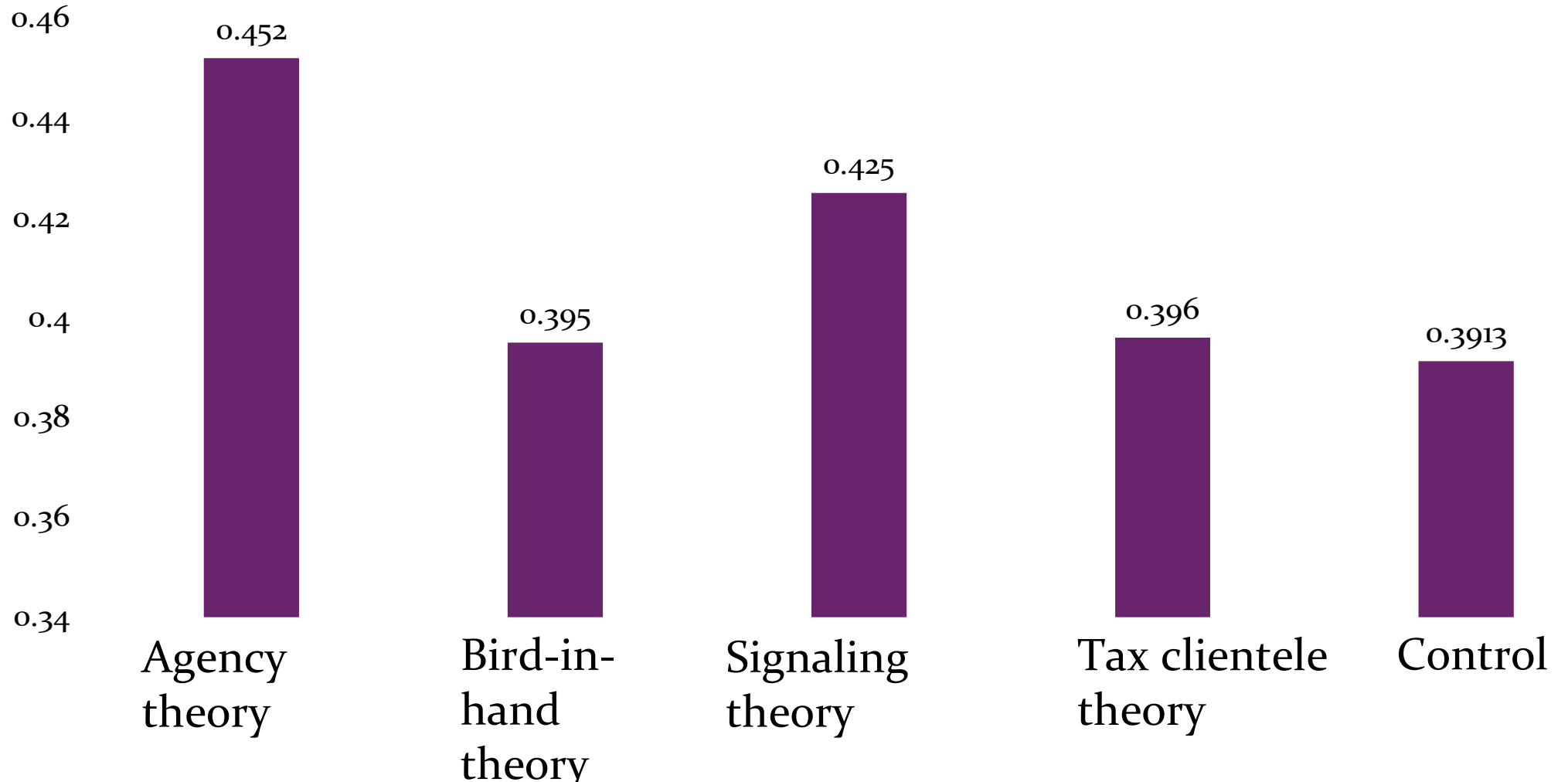


## 4. Research design

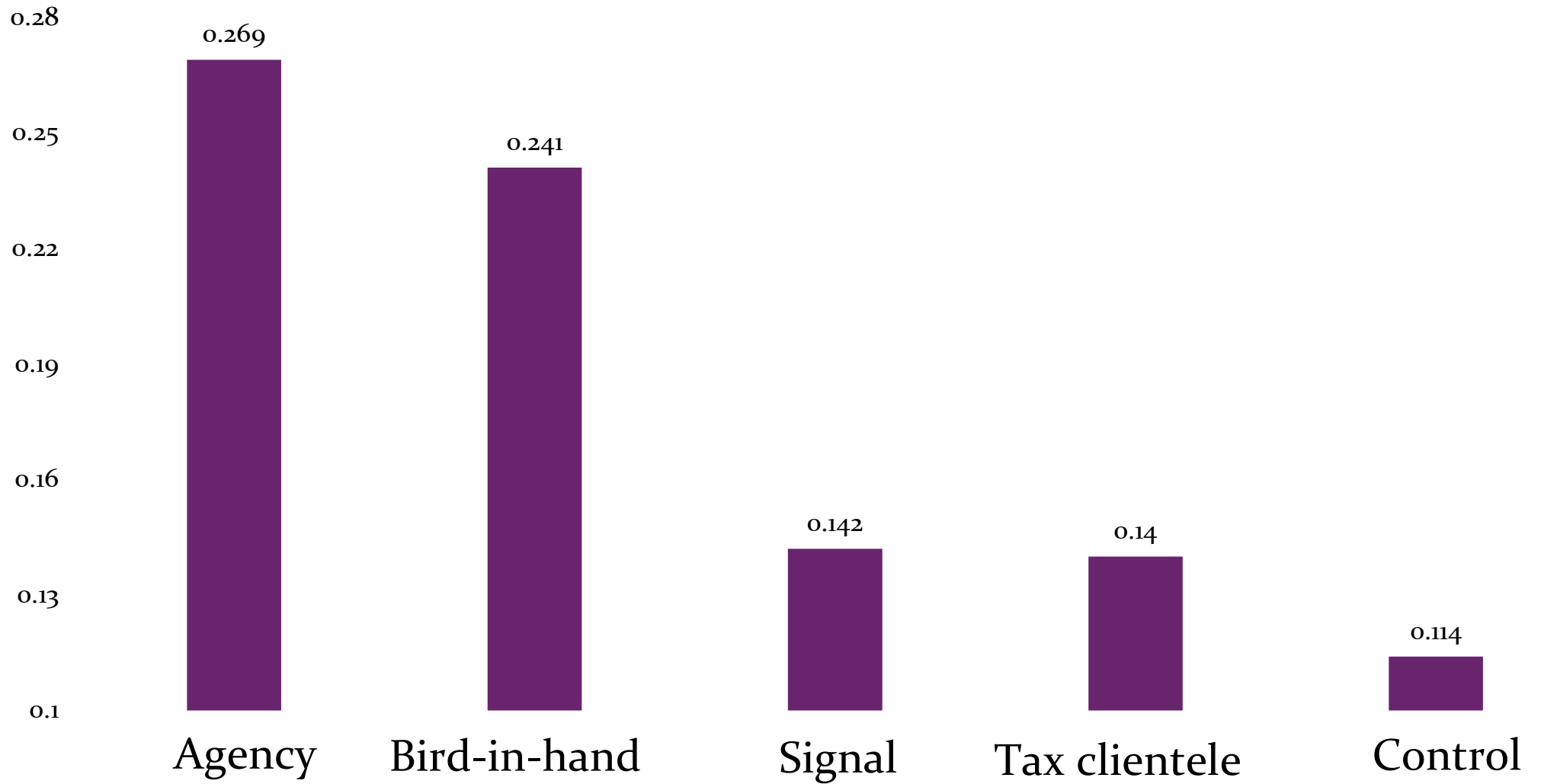
- Contact each firm during a period shortly before the SOB's proposal filling.
- Send information to firms to introduce exogenous changes in managers' perception and knowledge on investors' concerns about frictions that are pertinent to the four dividend theories.
  - **Theory treatment:** raise concerns or queries related to the friction of each theory
  - **Call treatment:** request the firms to increase/initiate dividends payments
  - **Control:** raise synthetic concerns or queries that are not related to a firm's dividend policy
    - E.g., “What is the firm's main business?”; “What changes has the COVID-19 pandemic brought to the day-to-day operation of the firm?”; and “Does the firm plan to expand into overseas markets?”

Theory	Inquiry	Inquiry+ask for more dividends	Inquiry+ask for dividends
Agency theory	<p>现金持有太多了会带来很多问题！比如过度扩张和投资，大肆消费。用合适的方式减少现金持有，有助提升股东价值。</p>	<p>现金持有太多了会带来很多问题！比如过度扩张和投资，大肆消费。用合适的方式减少现金持有，有助提升股东价值。 <b>贵公司要不增加现金分红？</b></p>	<p>现金持有太多了会带来很多问题！比如过度扩张和投资，大肆消费。用合适的方式减少现金持有，有助提升股东价值。 <b>贵公司要不考虑进行现金分红？</b></p>
Birds-in-hand theory	<p>我喜欢确定的东西，股价变动带来的收益来的快去的也快，还不如现在分红来的稳当。</p>	<p>我喜欢确定的东西，股价变动带来的收益来的快去的也快，还不如现在分红来的稳当。 <b>贵公司要不增加现金分红？</b></p>	<p>我喜欢确定的东西，股价变动带来的收益来的快去的也快，还不如现在分红来的稳当。 <b>贵公司要不考虑进行现金分红？</b></p>
Signaling theory	<p>公司有没有什么信号给到我们，让我们对公司的运营和盈利更有信心呀？</p>	<p>公司有没有什么信号给到我们，让我们对公司的运营和盈利更有信心呀？ <b>贵公司要不增加现金分红？</b></p>	<p>公司有没有什么信号给到我们，让我们对公司的运营和盈利更有信心呀？ <b>贵公司要不考虑进行现金分红？</b></p>
Tax Clientele theory	<p>持有公司的股票超过一年，根据规定是不是就不用交股息红利税了？</p>	<p>持有公司的股票超过一年，根据规定是不是就不用交股息红利税了？ <b>贵公司要不增加现金分红？</b></p>	<p>持有公司的股票超过一年，根据规定是不是就不用交股息红利税了？ <b>贵公司要不考虑进行现金分红？</b></p>

# The fraction of firms' DPS in 2021 greater than theirs in 2020



# The mean of $\Delta\text{DPS} / \text{DPS}$



# 5. Baseline results

## Regression analysis

$$y_i = \beta_1 + \beta_2 Treatment_i + X_i + I + \varepsilon_i, \quad (1)$$

- $y_i$  is firm  $i$ 's actual dividend payout that was announced post experiment.
  - *Dummy*( $\Delta DivYield_i > 0$ ), which equals 1 if a firm's dividend yield in 2021,  $DivYield_i$  (*DPS* scaled by the average stock price in the previous 12 months), is greater than its  $DivYield_i$  in 2020, and 0 otherwise (lower or no change).
- $Treatment_i$  takes a value of 1 if a firm is in a treatment group and 0 if it is in a control group.
- $X$  is a set of control variables.
  - firm size ( $Log(TA)$ ), profitability ( $ROA$ ), investment opportunities ( $AssetGrowth$  and  $M/B$ ), cash holding ( $Cash/TA$ ), financial leverage ( $Leverage/TA$ ), stock returns ( $Return$ ), stock volatility ( $Volatility$ ), CEO duality ( $CEODuality$ ), the number of independent directors ( $IndDirectors$ ), managerial compensation ( $Log(ExePay)$ ), managerial ownership ( $ExeOwnership$ ), and firm age ( $FirmAge$ ).
- $I$  is industry fixed effects.

## 5. Baseline results

Theory	Agency theory		Bird-in-hand theory		Signaling theory		Tax clientele theory	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Treatment</i>	<b>0.388***</b>	<b>0.402**</b>	0.134	0.068	0.168	0.171	0.215	0.162
	(2.59)	(2.46)	(0.88)	(0.40)	(1.11)	(1.02)	(1.43)	(0.96)
Control	N	Y	N	Y	N	Y	N	Y
Industry FE	N	Y	N	Y	N	Y	N	Y
Observations	746	738	741	732	746	728	748	734

- Firms receiving the **agency theory** treatment increase dividends relative to control firms.
- No significant treatment effects for the other three theories (Signalling, Bird-in-hand, and Tax clientele).

# 6. Additional analysis

## 1. Heterogeneous effects of the theory treatment (payers)

Panel A: Internal corporate governance				
Sample	<i>Log(ExePay)</i> > median (1)	<i>Log(ExePay)</i> < median (2)	<i>IndDirectors</i> < median (3)	<i>IndDirectors</i> > median (4)
<i>Treatment</i>	<b>0.507**</b> (2.28)	0.175 (0.70)	<b>0.457*</b> (1.95)	0.390 (1.63)
Control, Industry FE	Y	Y	Y	Y
Observations	397	335	367	371
Panel B: External corporate governance				
Sample	<i>Analyst</i> < median (1)	<i>Analyst</i> > median (2)	<i>IO</i> < median (3)	<i>IO</i> > median (4)
<i>Treatment</i>	<b>0.873***</b> (3.19)	0.129 (0.61)	<b>0.685***</b> (2.71)	0.224 (0.96)
Control, Industry FE	Y	Y	Y	Y
Observations	302	436	331	374

The treatment effect of agency theory is stronger when firms' ex-ante governance is poor.

# 6. Additional analysis

## 2. Distinguish between theory and call effects

Sample	Theory treatment vs. control		Theory + call treatments vs. control		Theory treatment vs. theory + call treatments	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Treatment</i>	<b>0.334*</b> (1.82)	<b>0.402**</b> (1.96)	<b>0.442**</b> (2.43)	<b>0.412**</b> (2.08)		
<i>Treatment (theory only)</i>					<b>-0.108</b> (-0.52)	<b>-0.011</b> (-0.05)
Industry FE	N	Y	N	Y	N	Y
Observations	560	552	560	554	372	370

The treatment effect of agency theory is not driven by the call effect

- The theory effect is significant for firms' propensity to increase dividends.
- Adding the call treatment does not have a significant incremental effect on firms' propensity to increase dividends.



# Additional analysis

## 3. The role of the SOB (payers)

<i>Moderator</i>	<i>Num. SOBs</i>	<i>Log(SOB Compensation)</i>	<i>Dummy (Alt. Communication)</i>
	(1)	(2)	(3)
<i>Treatment × Moderator</i>	<b>1.157<sup>**</sup></b> (2.52)	<b>0.609<sup>***</sup></b> (2.81)	<b>-0.767<sup>**</sup></b> (-2.20)
<i>Moderator</i>	-0.486 (-1.41)	-0.584 <sup>***</sup> (-2.76)	0.381 (1.51)
<i>Treatment</i>	-0.917 <sup>*</sup> (-1.67)	-7.717 <sup>***</sup> (-2.67)	0.707 <sup>***</sup> (3.29)
Industry FE	Y	Y	Y
Observations	719	719	702

The treatment effect of agency theory is more pronounced when

- A firm has more SOBs
- These SOBs are paid higher
- Investors cannot use alternative communication channels such as WeChat and Weibo to contact the firms.

# Additional analysis

## 4. Comparing different communication channels

We focus on a sample of firms **only receiving** the agency theory treatment

	(1)	(2)
Dummy(Telephone)	<b>1.037***</b> (2.85)	
Dummy(OnlineIR)	-0.177 (-0.74)	
Dummy(Email)	-0.141 (-0.55)	
Log(Telephone)		<b>0.170**</b> (2.32)
Log(OnlineIR)		-0.052 (-1.13)
Log(Email)		-0.024 (-0.47)
Control & Industry FE	Yes	Yes
Observations	370	370

**Telephone communication** services as an important channel through which our treatment effect of agency theory occurs.

# Conclusion

- We conduct a **field experiment** to test four main dividend theories in literature.
- We find that past payers receiving the treatment of agency theory **experience an increase** in dividend payment.
- Firms receiving the treatment of other three theories do not experience significant change in dividend policy
- Overall, our evidence suggest that **agency cost motive** is mostly likely to be the determinant of a firm's dividend policy.