How Much Does Your Boss Make?

The Effects of Salary Comparisons

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Introduction

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  - Does it affect the employees' behavior?
- Boss' salary may motivate employees.
  - Career concerns (Lazear & Rosen, 1981; Lazear, 1989; Gibbons & Murphy, 1992; Holmstrom, 1999).
- Boss' salary may demotivate employees.
  - Social preferences (e.g., Akerlof & Yellen, 1990; Breza, Kaur & Shamdasan, 2017).

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- Research Questions:
  - How do employees form beliefs about the salaries of their bosses and their peers?
  - Do these beliefs have a causal effect on the employee's own behavior?

Research Design

- Our research design combines incentivized surveys, administrative data and information-provision experiments.
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- Design in a nutshell:
  1. Measure salary perceptions using incentivized survey data.
  2. Use information-provision experiment to create exogenous variation in those perceptions.
  3. Measure how exogenous changes in perceptions affect subsequent behavior (e.g., effort).

Preview of Findings

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- Employees motivated by well-paid managers.
  - Elasticity of effort w.r.t. manager salary ≈ 0.15.
  - Consistent with career concerns.
- Employees demotivated by well-paid peers.
  - Elasticity of effort w.r.t. peer salary ≈ -0.7.
  - Consistent with social preferences.

Related Literature

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- **Theory:** Frank (1984), Romer (1984), Summers (1988), Lazear & Rosen (1981), Lazear (1989), Akerlof & Yellen (1990), Gibbons & Murphy (1992), Holmstrom (1999), Gneezy & List (2006), DellaVigna, List, Malmandier & Rao (2019).

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- **Effects of pay transparency:** Card, Mas, Moretti & Saez (2012), Perez-Truglia (2015), Cullen & Pakzad-Hurson (2016), Mas (2016), Mas (2017).

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- **Effects of pay transparency:** Card, Mas, Moretti & Saez (2012), Perez-Truglia (2015), Cullen & Pakzad-Hurson (2016), Mas (2016), Mas (2017).
- **Effects of pay inequity:** Valenzi & Andrews (1971), Pritchard, Dunnette & Jorgenson (1972), Huet-Vaughn (2017), Breza, Kaur & Shamdasan (2017).

Contribution

1. Study vertical comparisons.
   - Important: vast majority of within-firm inequality is vertical.
2. Methodology to study causal effect of beliefs.
   - Combines survey data, behavioral data and information-provision experiment.
3. Unique scope of the experiment.
   - High stakes, rich behavioral and survey data.

Outline of the Talk

Research Design

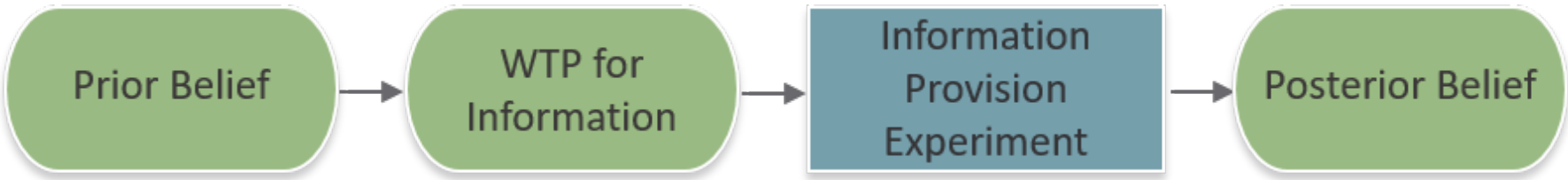
Survey Design

- Managers: same unit, higher position.
  - Example: Junior Researcher $\Rightarrow$ Senior Researcher.
  - Mean absolute difference between own salary and avg. manager salary: 315%.
  - Wide variation in the distance to the managerial position.

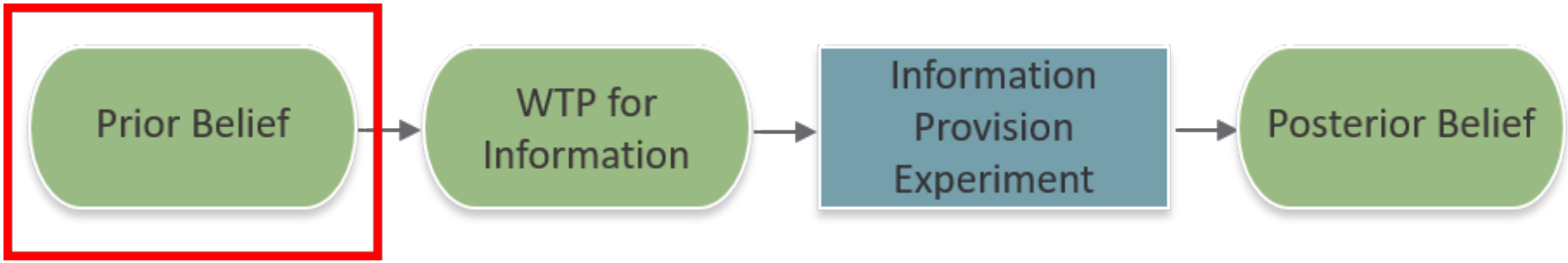
Survey Design

- Managers: same unit, higher position.
  - Example: Junior Researcher $\Rightarrow$ Senior Researcher.
  - Mean absolute difference between own salary and avg. manager salary: 315%.
  - Wide variation in the distance to the managerial position.
- Peers: same unit, same position.
  - Example: the other Junior Researchers in your team.
  - Mean absolute difference between own salary and avg. peer salary: 11.7%.

Manager Salary Module

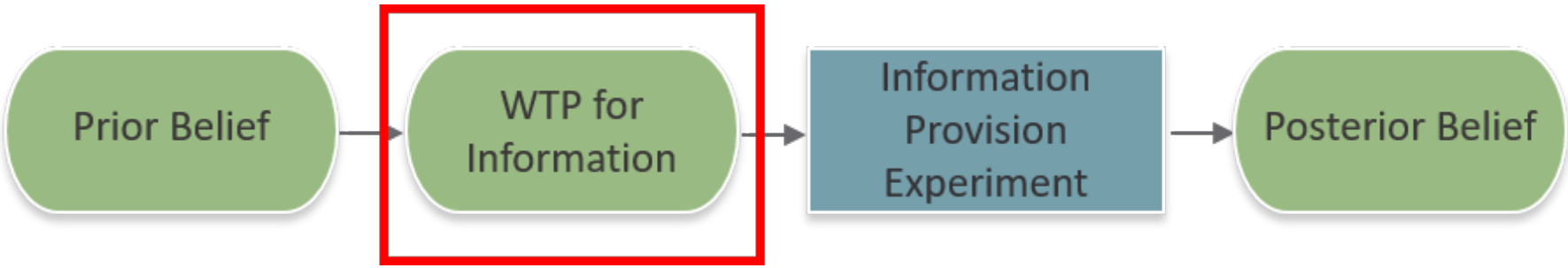


Manager Salary: Prior Belief



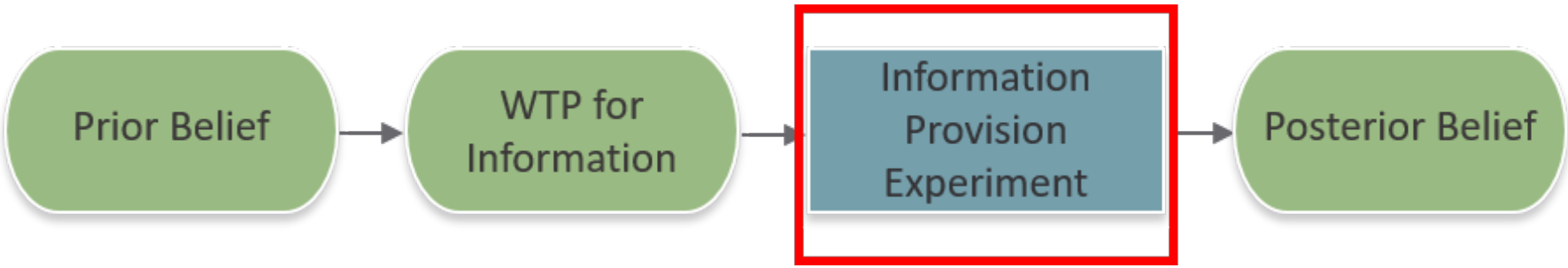
- As of March 2017, what is the average monthly base salary in [managerial position]?
- Incentivized: up to $2.61 for accuracy.

Manager Salary: Willingness to Pay



- Elicited WTP for salary information using incentive-compatible method.
  - Price-list method (Becker, DeGroot & Marschak, 1964).
  - Informative despite limitations (List et al. 2001)
- 1% of subjects finished the survey at this point, because they were chosen to have their bids "implemented."

Manager Salary: Info Experiment



- Some subjects were randomly allocated to information...

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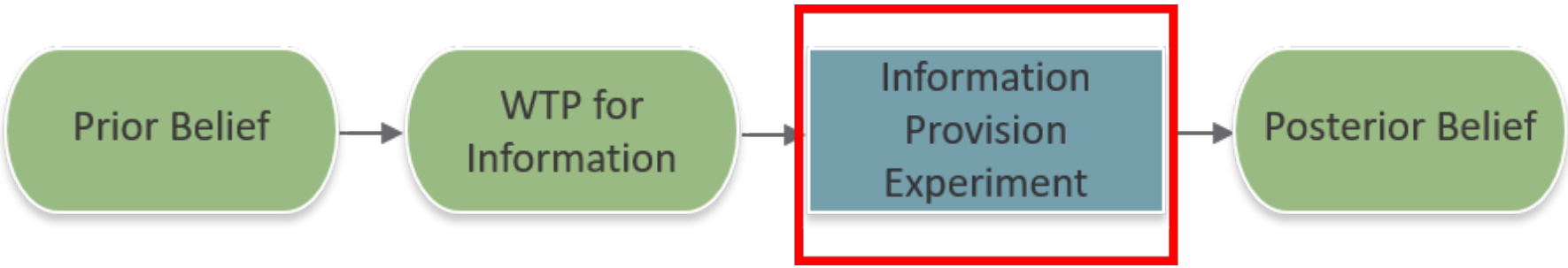

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  - Control (50%): No information.

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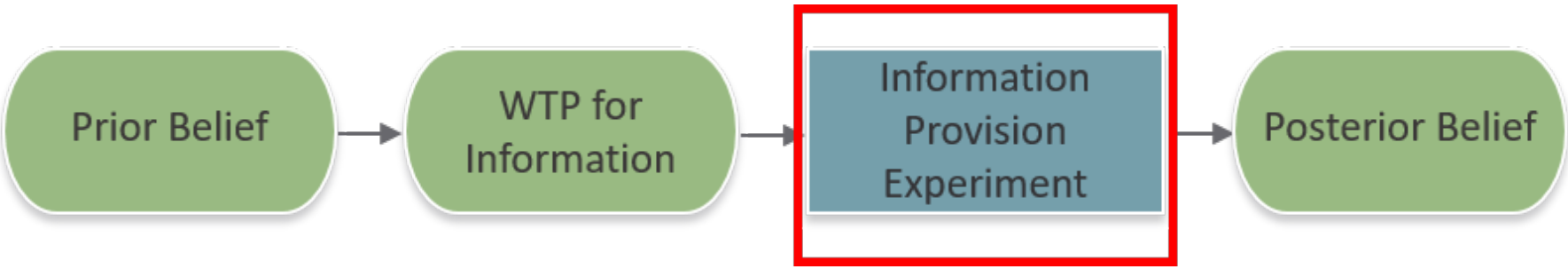
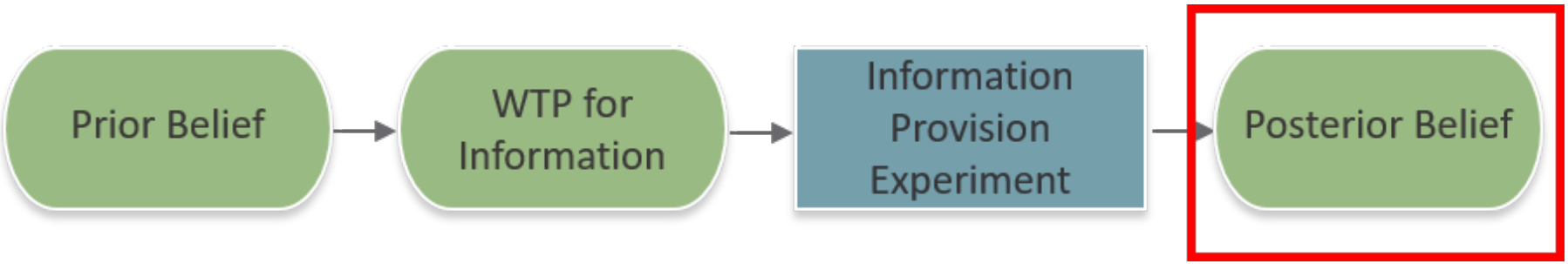


- Some subjects were randomly allocated to information...
  - Control (50%): No information.
  - Treatment (50%): Average salary from random sample of 5 in [managerial position].

Manager Salary: Posterior Belief



- We give all participants the opportunity to revise their guess...
- As of March 2017, what is the average monthly basic salary among those in [managerial position]?

Behavioral Outcomes

- Effort.
  - Hours in office: real time data on every swipe in and out of office (only for headquarters).
  - Emails: real time data on every email sent/received.
    - Elastic actions (DellaVigna, List, Malmandier & Rao, 2019)
- Output.
  - Sales: standardized sales score (only for salespeople).
- Career outcomes.
  - Firm exit, internal transfers, raises, promotions, etc.
  - See paper for details.

Survey Outcomes

- Survey outcome can help disentangle mechanisms.
- Career concerns:
  - Expected Future Salary (incentivized).
  - Perceived Productivity Rank (incentivized).
- Social preferences:
  - Demand for Salary-Redistribution.
  - Pay Satisfaction & Job Satisfaction.

Implementation

Institutional Context

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  - Thousands of employees, millions of customers, billions of dollars in assets.

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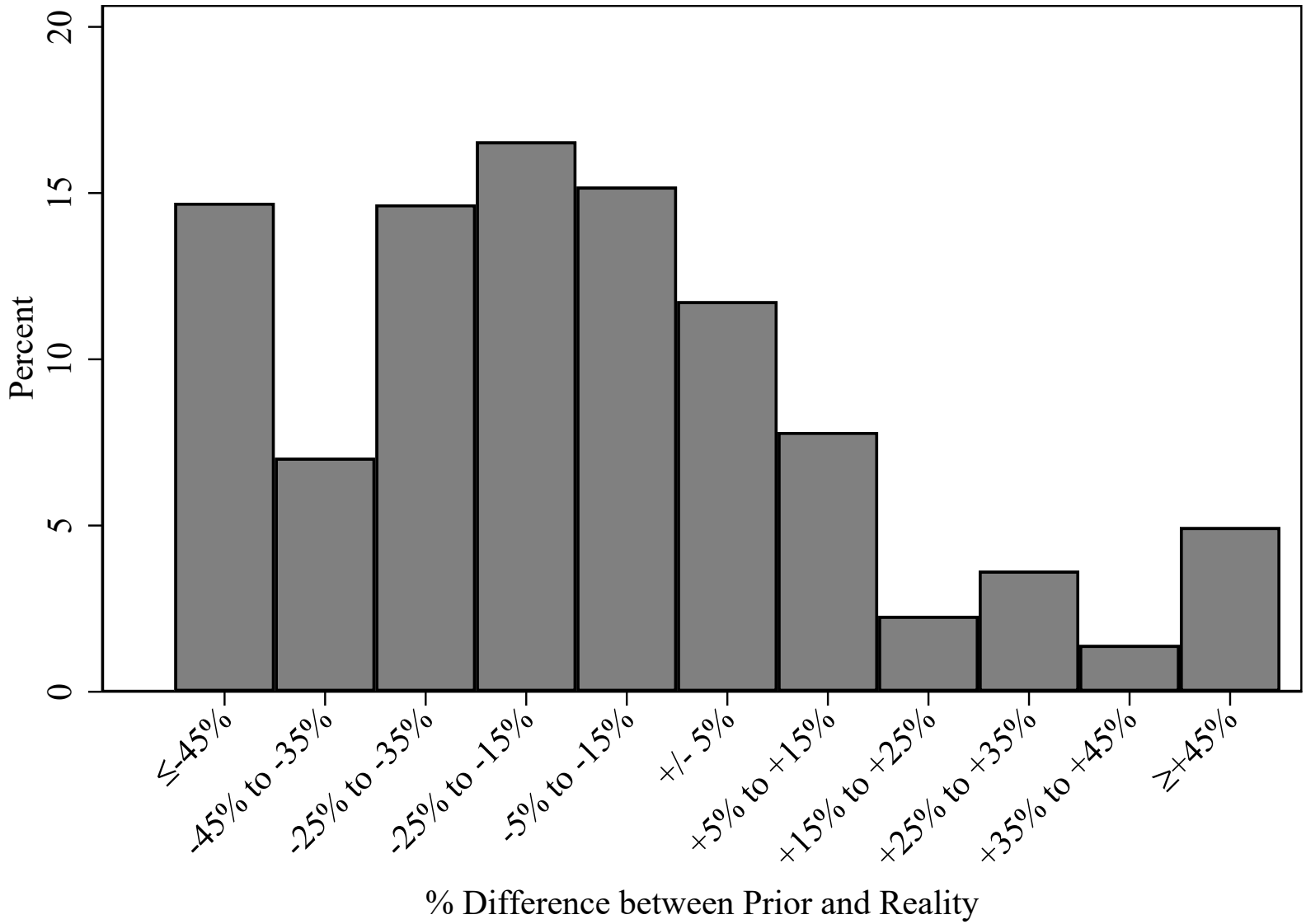
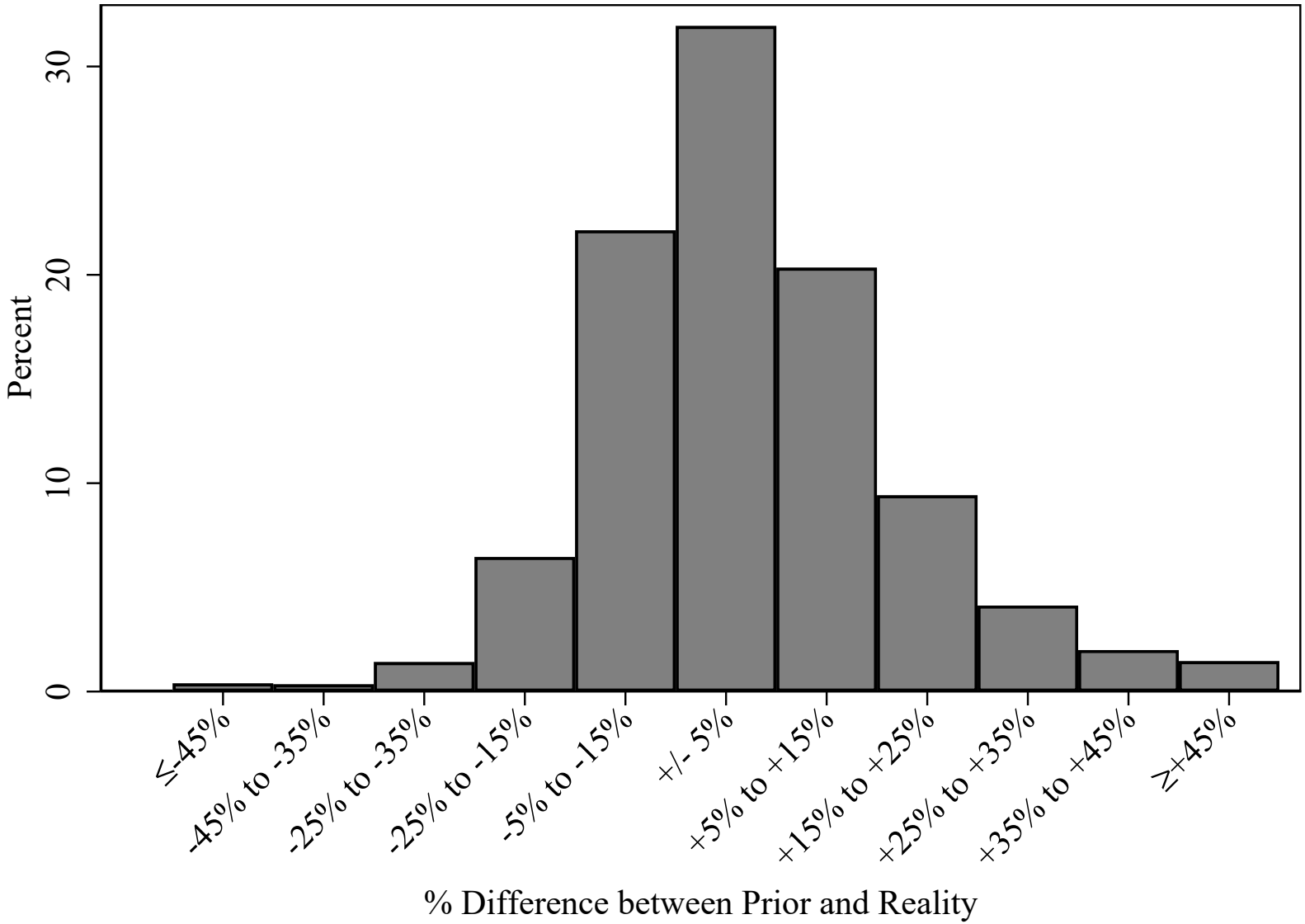
- Comparable to most corporations.
  - Within-firm inequality.
  - Degree of pay transparency.
- 2,060 employees participated.
  - 53.6% of invited employees.
  - Highly representative of whole bank.

Results: Beliefs

Manager-Salary Misperceptions



Peer-Salary Misperceptions



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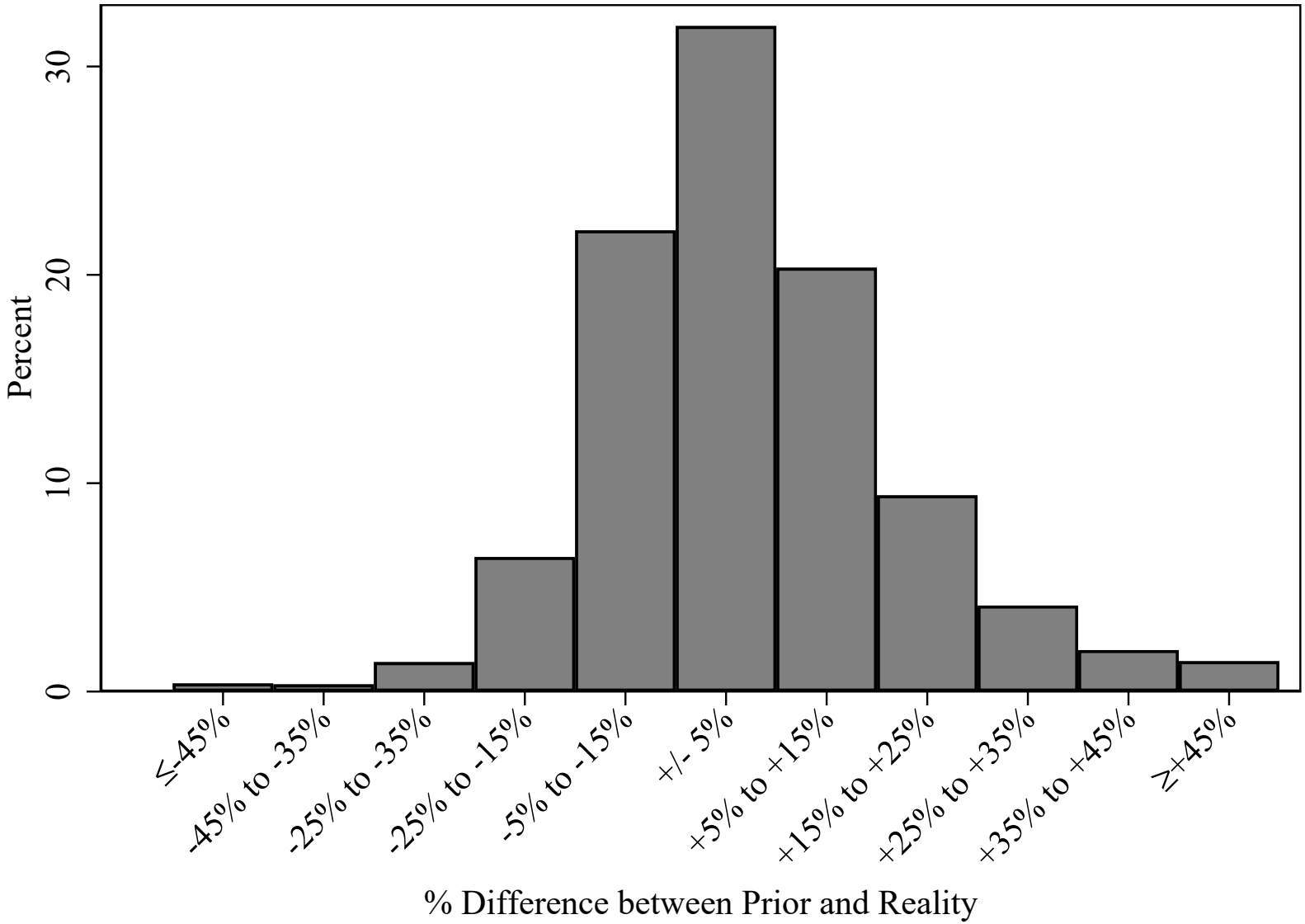
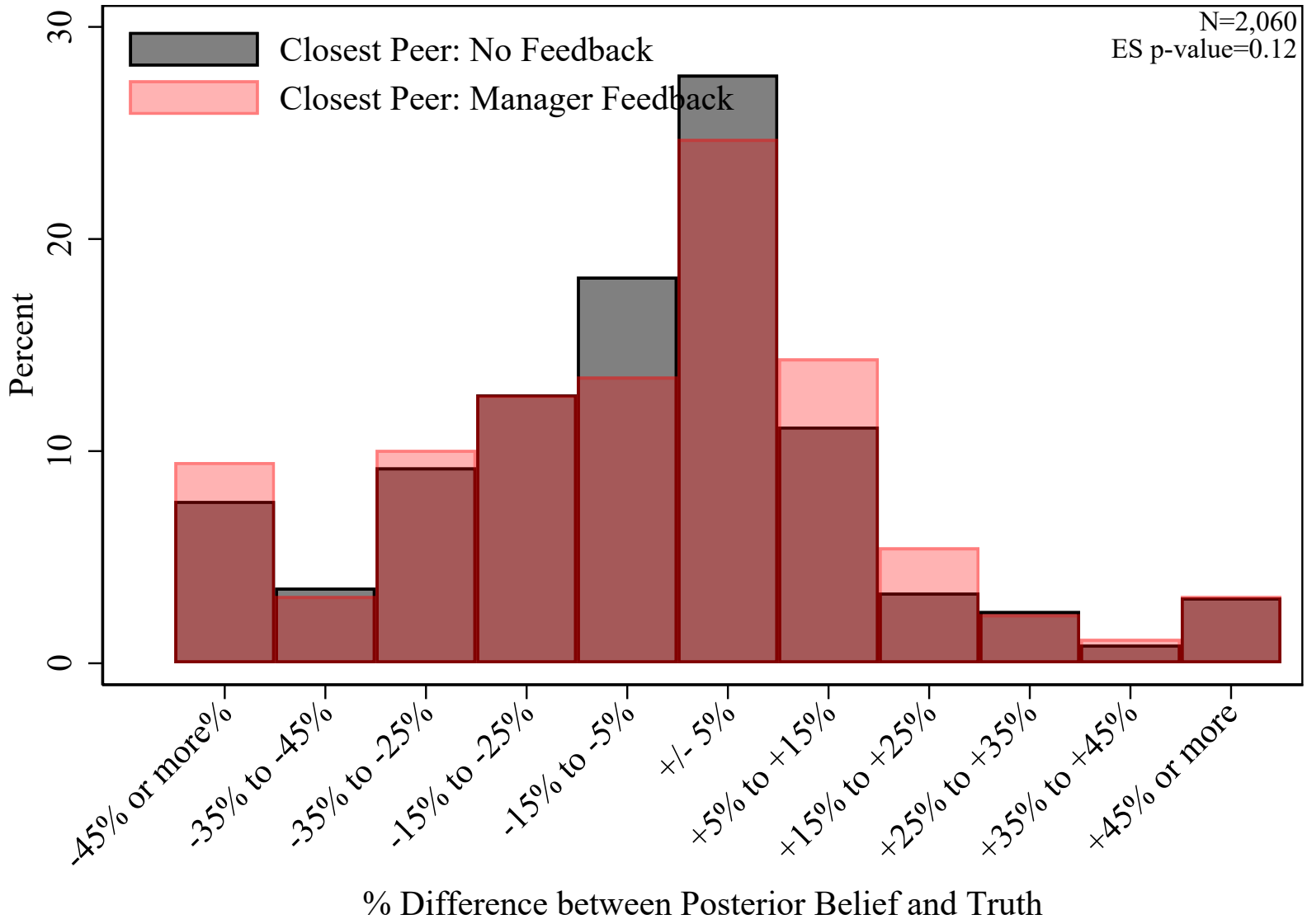


Results: Information Diffusion

Manager-Salary Learning Spillovers



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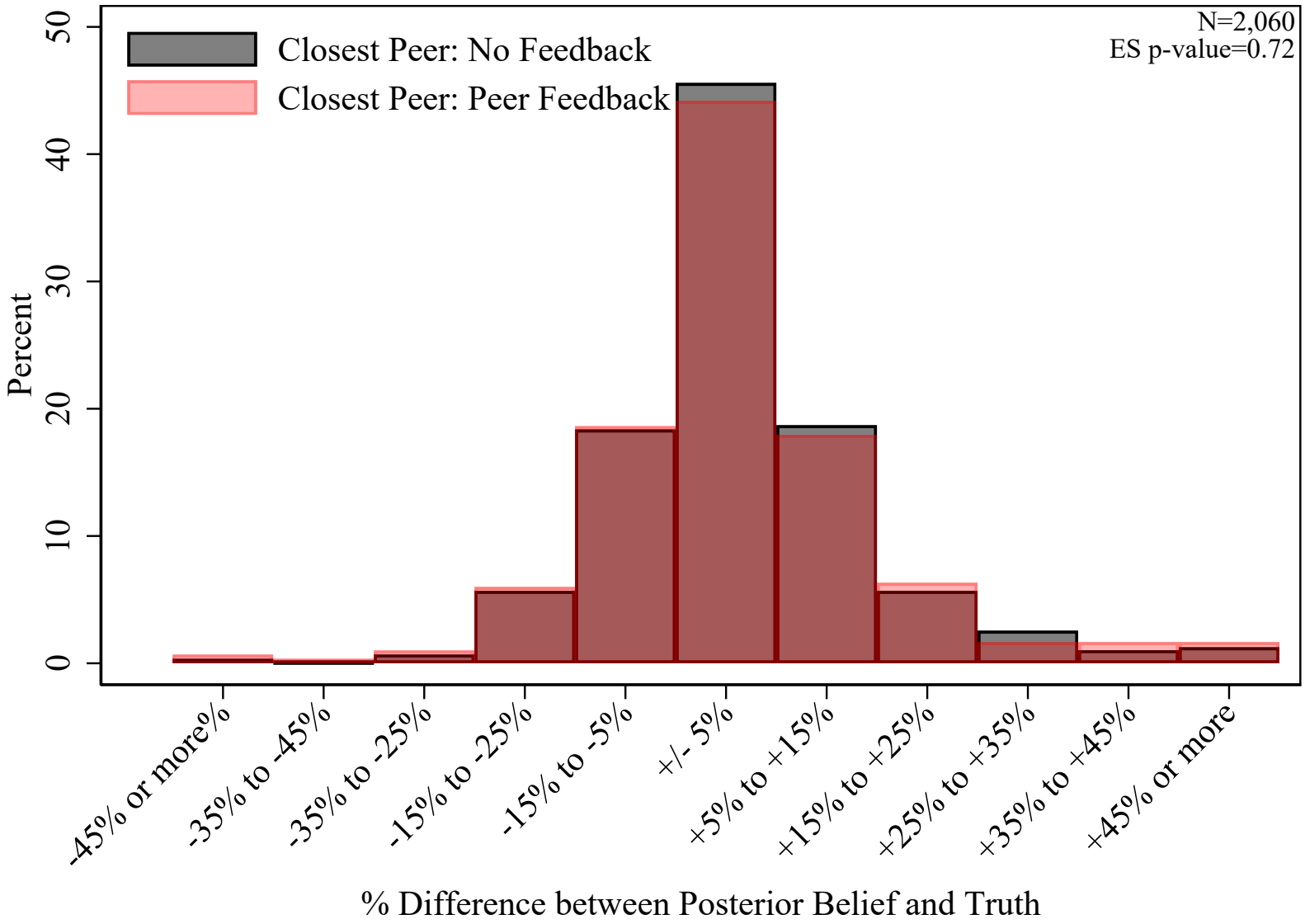
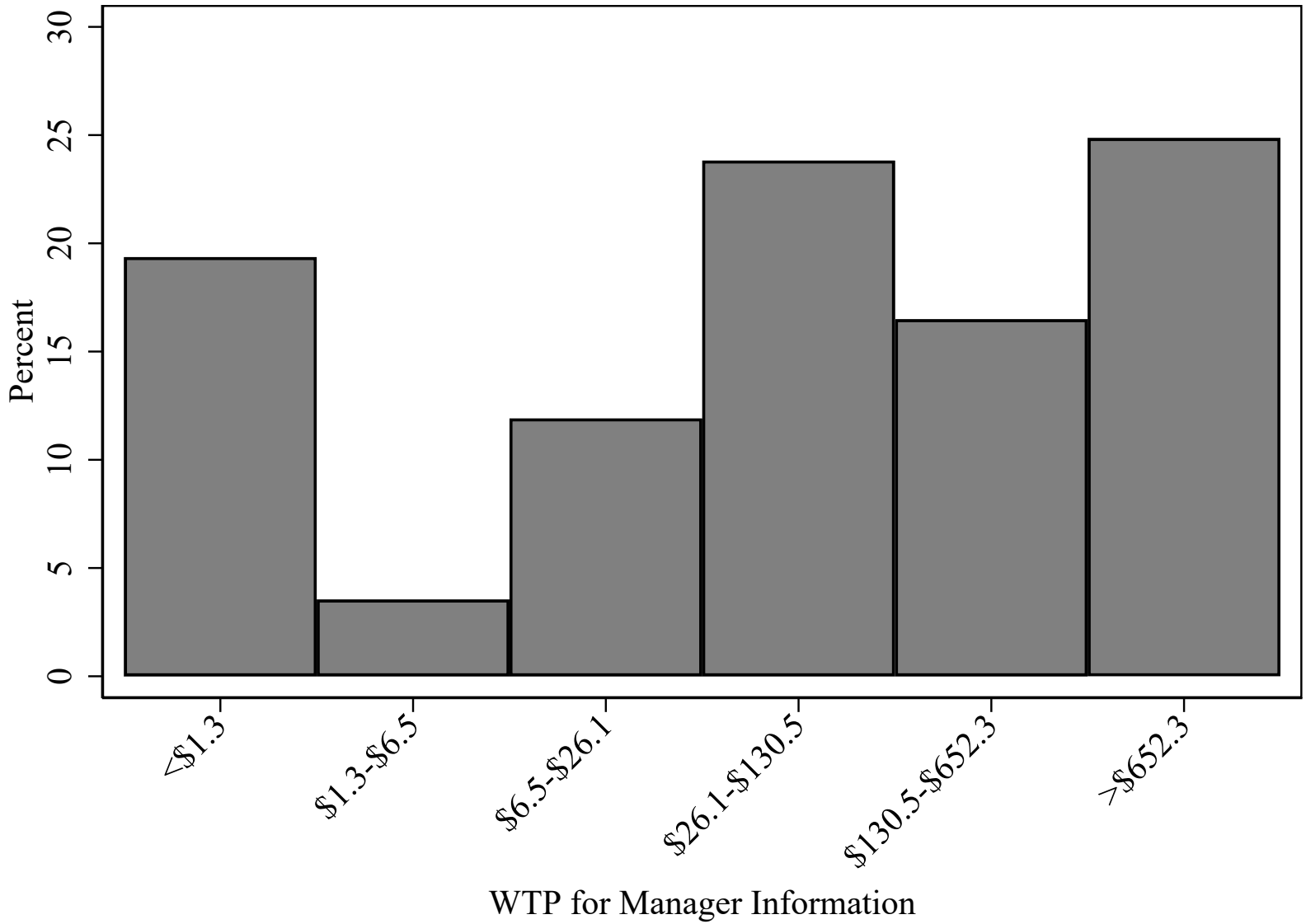


Results: Willingness to Pay

Manager-Salary WTP



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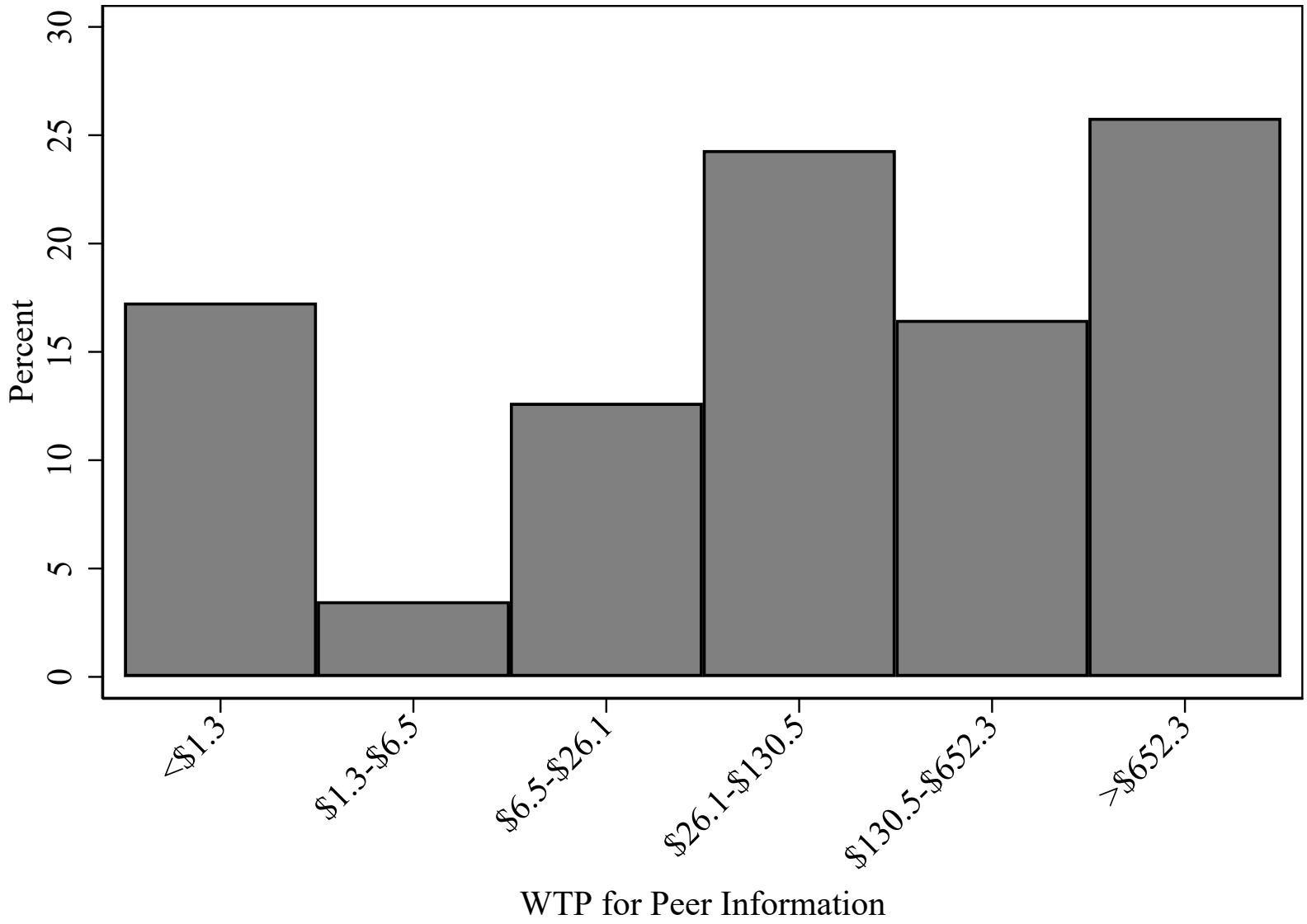
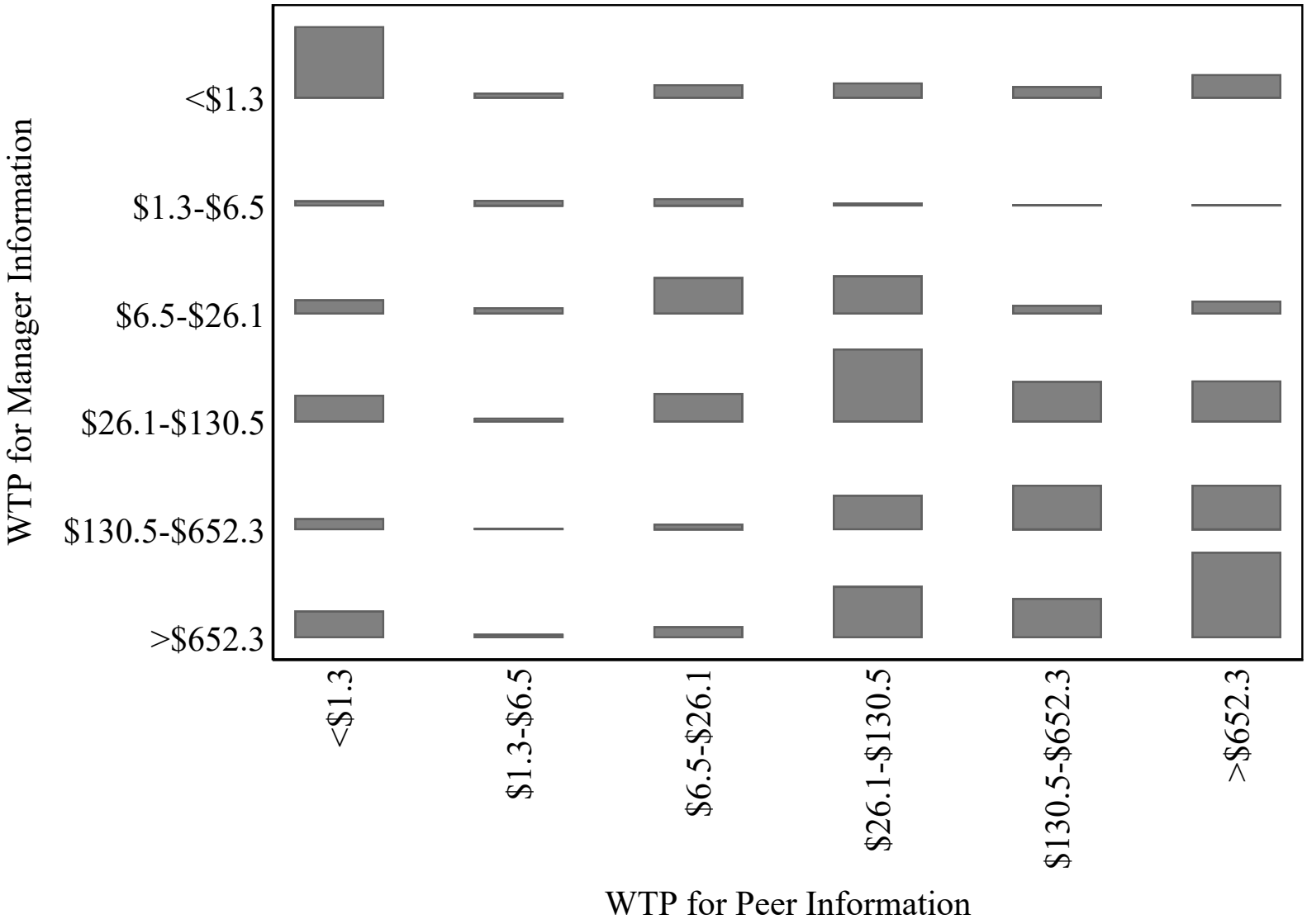


Peer and Manager Salary WTP



Results: Behavior

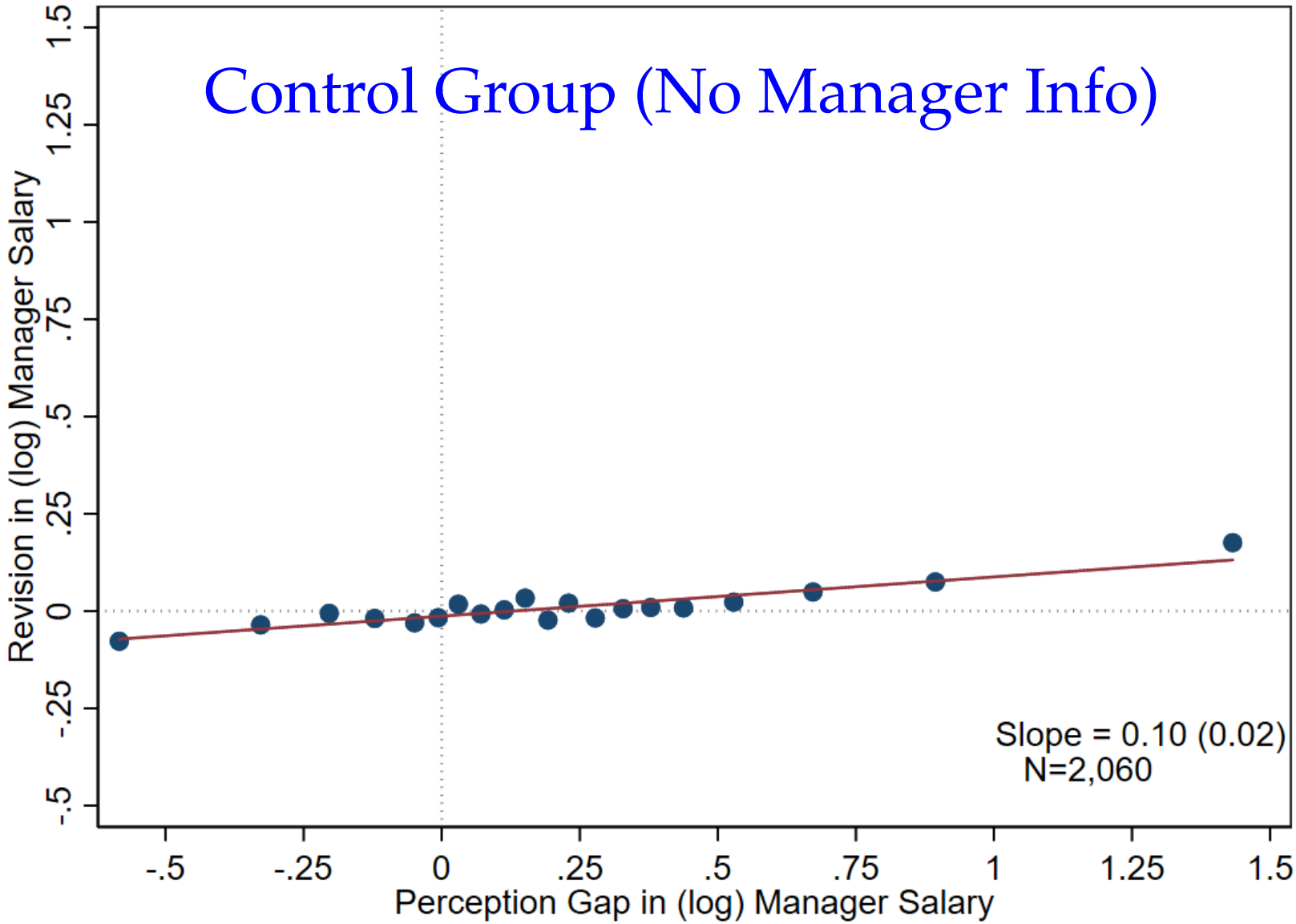
Identification

- M_i^{post} and P_i^{post}: perceived manager and peer salary at the end of the survey.
- Y_i^{post}: average behavior from survey completion until 3 months later.
- Regression Model:

$$\log\left(Y_i^{post}\right) = \eta_M \cdot \log\left(M_i^{post}\right) + \eta_P \cdot \log\left(P_i^{post}\right)$$

- Instrumental variables model: use only the exogenous variation in $\{M_i^{post}, P_i^{post}\}$ created by information-provision experiment.

First Stage: Manager Salary



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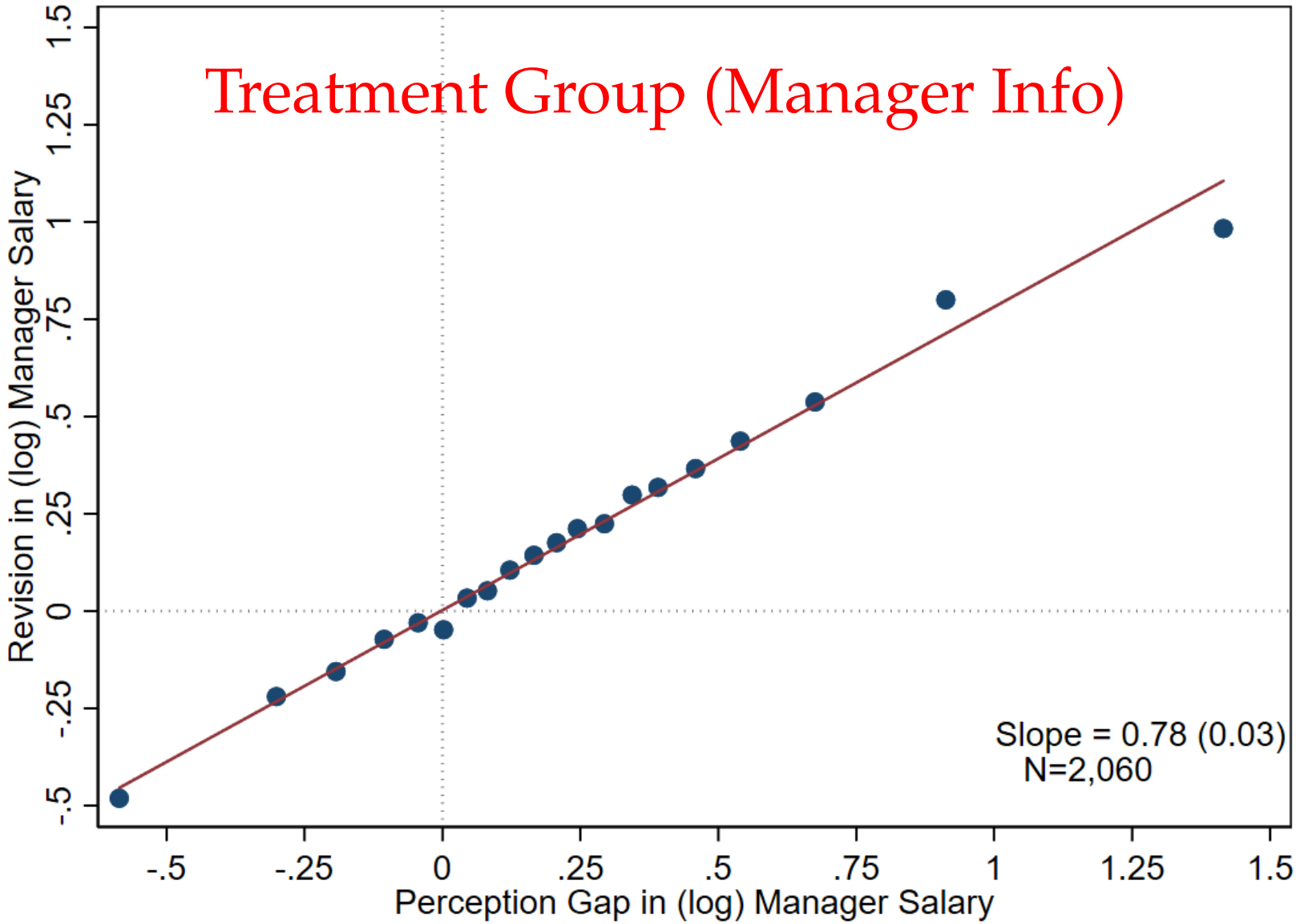

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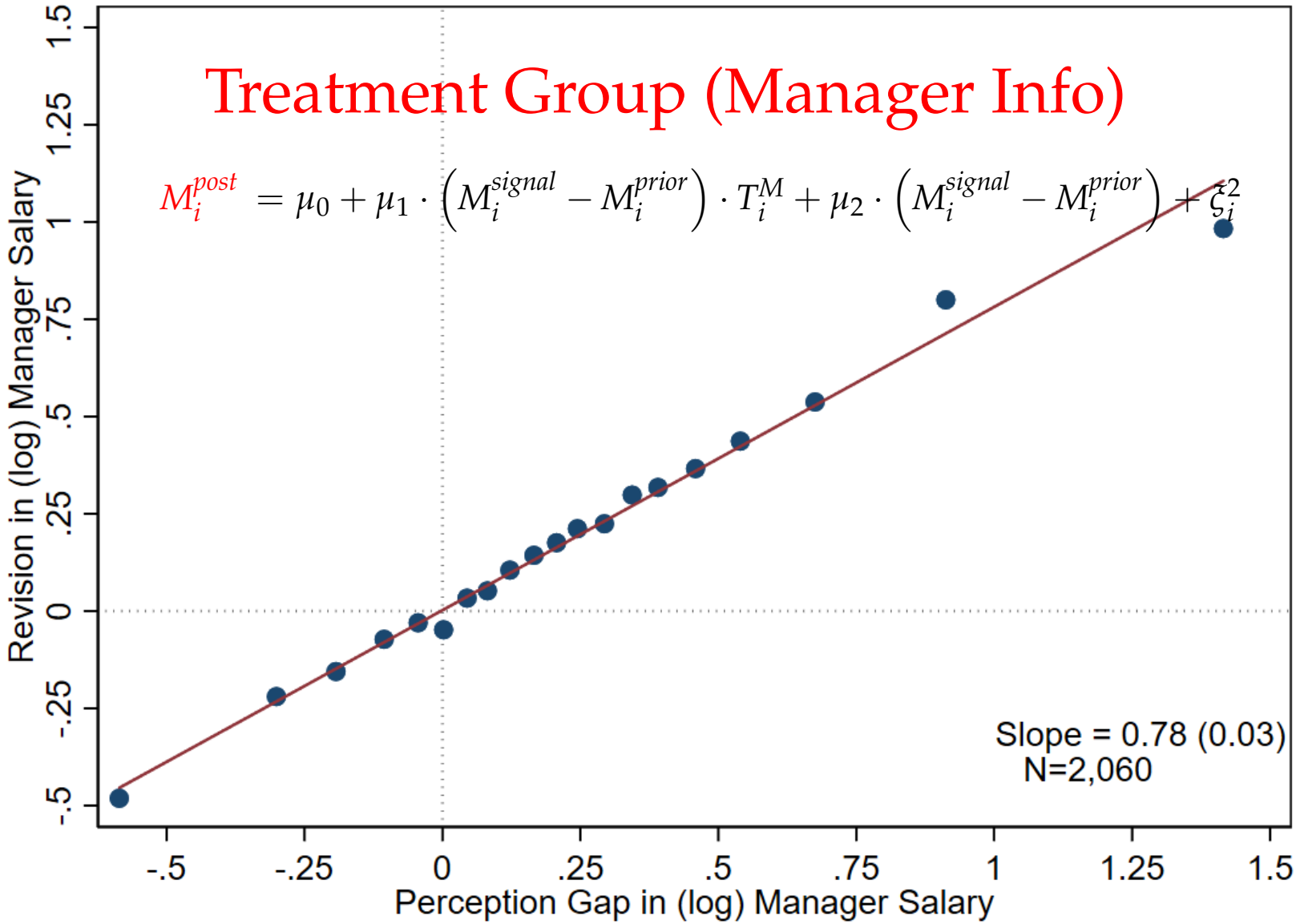

Effects on Behavior

	(1) log(*Hours*)	(2) log(*Emails*)	(3) log(*Sales*)
log (Manager-Salary)			
log (Peer-Salary)			
Mean Outcome	5.98	35.57	0.48
Std. Dev. Outcome	1.88	44.93	0.23
Observations	602	2,060	791

Effects on Behavior

	(1) log(*Hours*)	(2) log(*Emails*)	(3) log(*Sales*)
log (Manager-Salary)	0.150**	0.130***	0.106
	(0.074)	(0.041)	(0.122)
log (Peer-Salary)			
Cragg-Donald F-Stat.	29.8	204.0	98.2
Mean Outcome	5.98	35.57	0.48
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log (Peer-Salary)	-0.943**	-0.431**	-0.731**
	(0.472)	(0.210)	(0.297)
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log (Peer-Salary)	-0.943**	-0.431**	-0.731**
	(0.472)	(0.210)	(0.297)
P-value *H*0: (i)=(ii)	0.026	0.007	<0.001
Cragg-Donald F-Stat.	29.8	204.0	98.2
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- Robust to falsification test using pre-treatment outcomes.
- Results are persistent and stable over time.
- Cannot reject null hypothesis of symmetric effects (e.g., up/down, above/below mean).

Mechanisms: Survey Outcomes

	log(E[Future Salary])	
	+1 year	+5 years
	(1)	(2)
log (Manager-Salary)$^{(i)}$		
log (Peer-Salary)$^{(ii)}$		
P-Value (i)=(ii)		
Cragg-Donald F-Stat.		
Mean Dep. Var.		
Std. Dev. Dep. Var.		
Observations		

Mechanisms: Survey Outcomes

	log(E[Future Salary])	
	+1 year	+5 years
	(1)	(2)
log (Manager-Salary)$^{(i)}$	0.025	0.166***
	(0.025)	(0.055)
log (Peer-Salary)$^{(ii)}$		
P-Value (i)=(ii)		
Cragg-Donald F-Stat.	253.5	255.3
Mean Dep. Var.	2.58	3.22
Std. Dev. Dep. Var.	0.51	0.59
Observations	2,033	2,026

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	+1 year	+5 years
	(1)	(2)
log (Manager-Salary)$^{(i)}$	0.025	0.166***
	(0.025)	(0.055)
log (Peer-Salary)$^{(ii)}$	0.071	0.280
	(0.090)	(0.176)
P-Value (i)=(ii)	0.595	0.532
Cragg-Donald F-Stat.	253.5	255.3
Mean Dep. Var.	2.58	3.22
Std. Dev. Dep. Var.	0.51	0.59
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Mechanisms: Survey Outcomes

	Satisfaction		Redist. Pref.
	w/Pay	w/Job	
	(1)	(2)	(3)
log (Manager-Salary)$^{(i)}$			
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Cragg-Donald F-Stat.			
Mean Dep. Var.			
Std. Dev. Dep. Var.			
Observations			

Mechanisms: Survey Outcomes

	Satisfaction		Redist. Pref.
	w/Pay	w/Job	
	(1)	(2)	(3)
log (Manager-Salary)$^{(i)}$	-0.015	-0.086	0.008
	(0.125)	(0.102)	(0.075)
log (Peer-Salary)$^{(ii)}$			
P-Value (i)=(ii)			
Cragg-Donald F-Stat.	253.6	254.3	254.3
Mean Dep. Var.	2.79	3.60	2.20
Std. Dev. Dep. Var.	0.92	0.78	0.57
Observations	2,030	2,027	2,027

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log (Manager-Salary)$^{(i)}$	-0.015	-0.086	0.008
	(0.125)	(0.102)	(0.075)
log (Peer-Salary)$^{(ii)}$	-0.762*	-0.444	0.373*
	(0.433)	(0.491)	(0.216)
P-Value (i)=(ii)	0.084	0.433	0.135
Cragg-Donald F-Stat.	253.6	254.3	254.3
Mean Dep. Var.	2.79	3.60	2.20
Std. Dev. Dep. Var.	0.92	0.78	0.57
Observations	2,030	2,027	2,027

Mechanisms: Heterogeneity

	log(E[Future Salary])		Effort and Performance		
	+1 year	+5 years	log(*Hours*)	log(*Emails*)	log(*Sales*)
	(1)	(2)	(3)	(4)	(5)
log (Manager-Salary)					
Closer$^{(i)}$					
Farther$^{(ii)}$					
P-value (i)=(ii)					
Observations					

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log (Manager-Salary)					
Closer$^{(i)}$	0.041	0.204***	0.212**	0.170***	0.195
	(0.030)	(0.059)	(0.099)	(0.052)	(0.131)
Farther$^{(ii)}$					
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Observations	2,033	2,026	602	2,060	791

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	(0.030)	(0.059)	(0.099)	(0.052)	(0.131)
Farther$^{(ii)}$	-0.008	0.086			
	(0.033)	(0.092)			
P-value (i)=(ii)	0.216	0.229			
Observations	2,033	2,026	602	2,060	791

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log (Manager-Salary)					
Closer$^{(i)}$	0.041	0.204***	0.212**	0.170***	0.195
	(0.030)	(0.059)	(0.099)	(0.052)	(0.131)
Farther$^{(ii)}$	-0.008	0.086	-0.074	0.019	0.033
	(0.033)	(0.092)	(0.093)	(0.104)	(0.285)
P-value (i)=(ii)	0.216	0.229	0.040	0.243	0.657
Observations	2,033	2,026	602	2,060	791

Conclusions

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- Employees work harder when their managers are paid more.
  - Consistent with career concerns.
- In contrast, employees are demoralized when their peers get paid more.
  - Consistent with social preferences.

Implications

- **Setting optimal compensation:** changing the salary of one employee can have spillovers to subordinates/peers.
- **Understanding firm's compensation choices:** firms may be loading incentives vertically to avoid negative peer spillovers.
- **Pay transparency:** social concerns may compress salaries, but only in a narrow sense.