Discretion and Favoritism in Public Procurement

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Motivation

- Public procurement accounts for 12% of GDP in OECD (OECD 2018)
- There are two common ways of procuring goods and services
  1. Direct purchases
  2. Open auctions
- Lack of consensus about open auction vs discretion
  - Pros: more competition, more transparency
  - Cons: higher administrative costs, slower process, contracting difficulties

This paper

Does discretion

1. give rise to political favoritism?
2. transfer money from taxpayers to firms?
3. misallocate resources?

I analyze a large dataset on public procurement in Hungary to measure the causal effects of buyers discretion

- Combine a unique policy reform with a semi-parametric selection correction model
- Use the model to think about optimal procurement policy

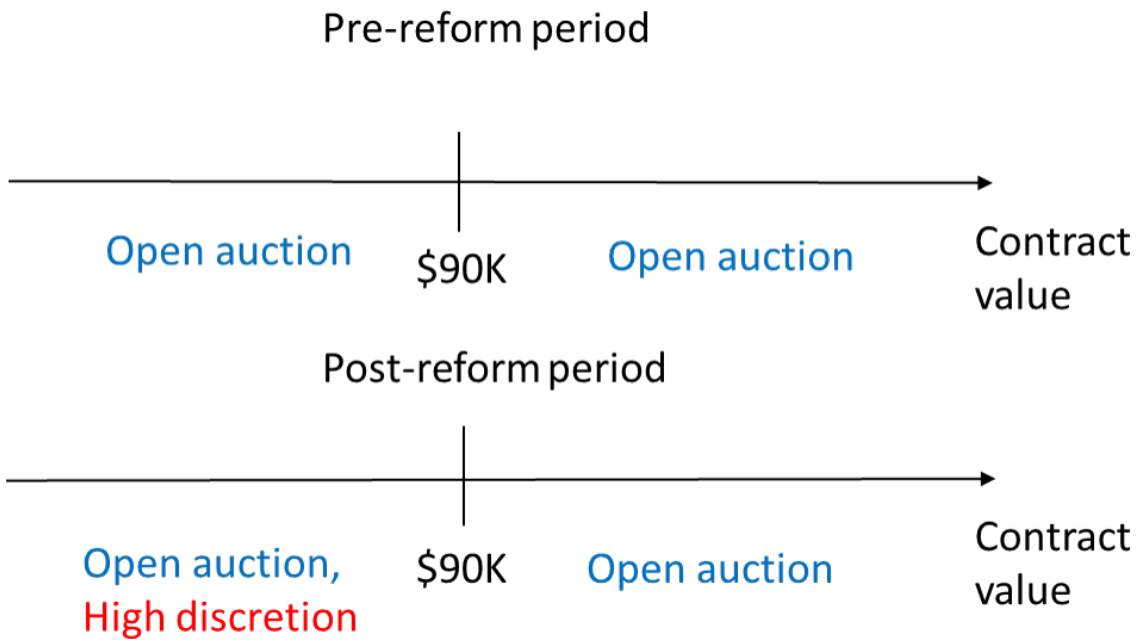
Contribution

- **Consequences of discretion:** Lalive and Schmutzler (2011); Coviello, Guglielmo, and Spagnolo (2017); Carril, Gonzalez-Lira and Walker (2020); Baltrunaite, Giorgiantonio, Mocetti, and Orlando (2021); Coviello, Guglielmo, Lotti and Spagnolo (2022)
- **Discretion and rent seeking:** Palguta and Pertold (2014); Gerardino, Litschig and Pomeranz (2017); Decarolis, Fisman, Pinotti and Vannutelli (2020)
- **Political favoritism in public procurement:** Bandiera, Prat and Valletti (2009); Goldman, Rocholl, and So (2013); Zhuravskaya (2014); Brogaard, Denes, and Duchin (2016); Schoenherr (2016)
- Contribution of this paper:
  - Data on firm level outcomes (e.g. productivity and political connections)
  - Identification of the effects of discretion (using the policy change and the selection correction)

Outline from here

1. Context and data
2. Reduced-form evidence
3. Selection correction model
4. Policy simulations
5. Conclusion

Procurement policy reform



- External validity
  - Hungary has similar Corruption Perceptions Index as other Eastern and Southern European Countries (Transparency International 2016)
  - Similar policies exist in many developed countries: EU, US, Israel

Data

1. Procurement, 2009-15
   - Cleaned public records of non-construction industries
2. Firm performance
   - Balance sheet data of bidding firms
3. Political connections
   - Created for the top 500 contractors
   - Identifies government politicians among firm representatives (board members and top management)

Main outcomes

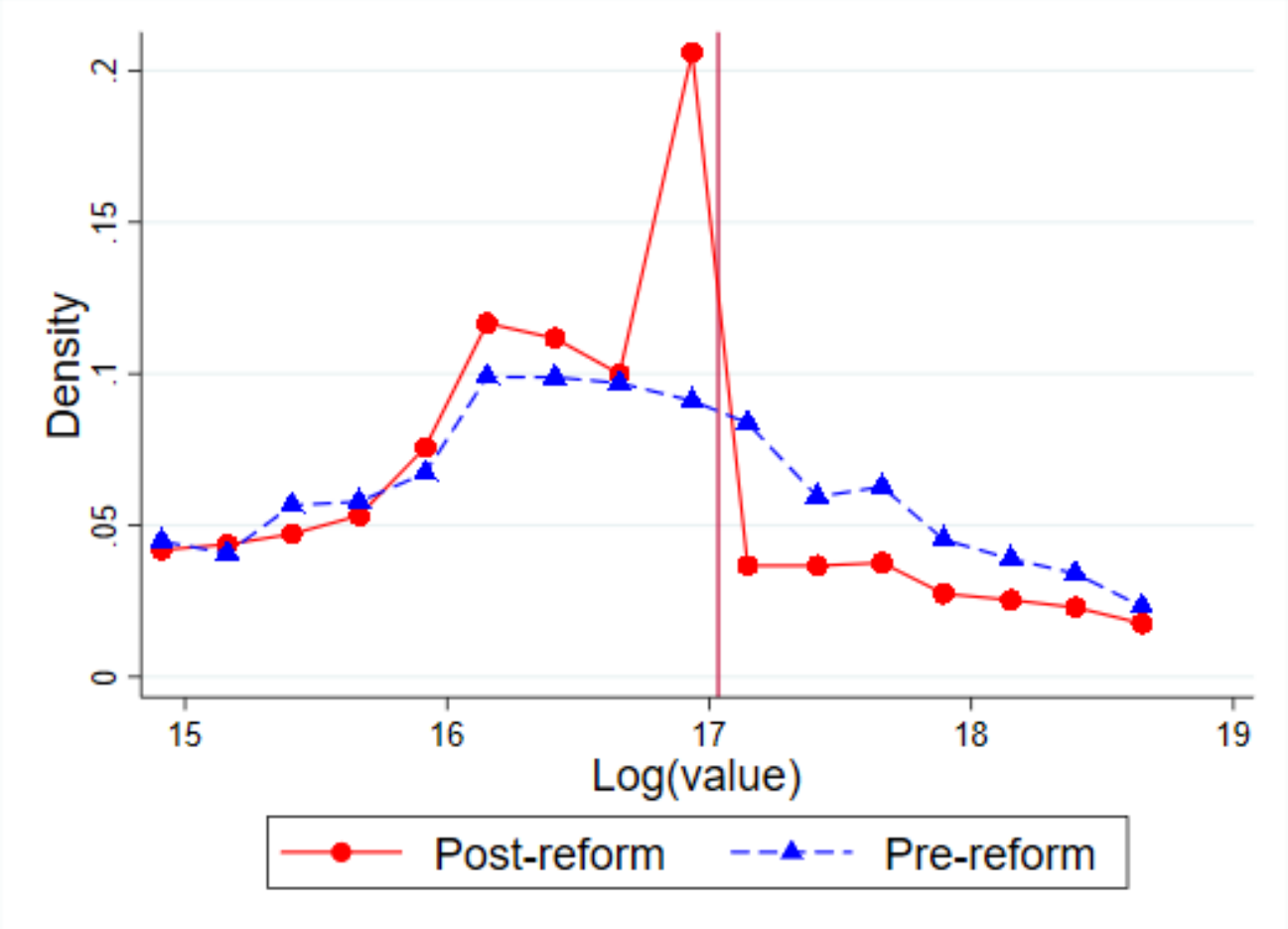
- Price of procurement (using procurment data):

$$Normalized\ price = \log \frac{winning\ bid}{anticipated\ value}$$

- Number of bidders
- Productivity (using balanced sheet data):
  - TFP following Wooldridge (2009), Hsieh and Klenow (2009)
- Connected firm wins the contract
  - Conditional on having at least one "checked" firm bidding

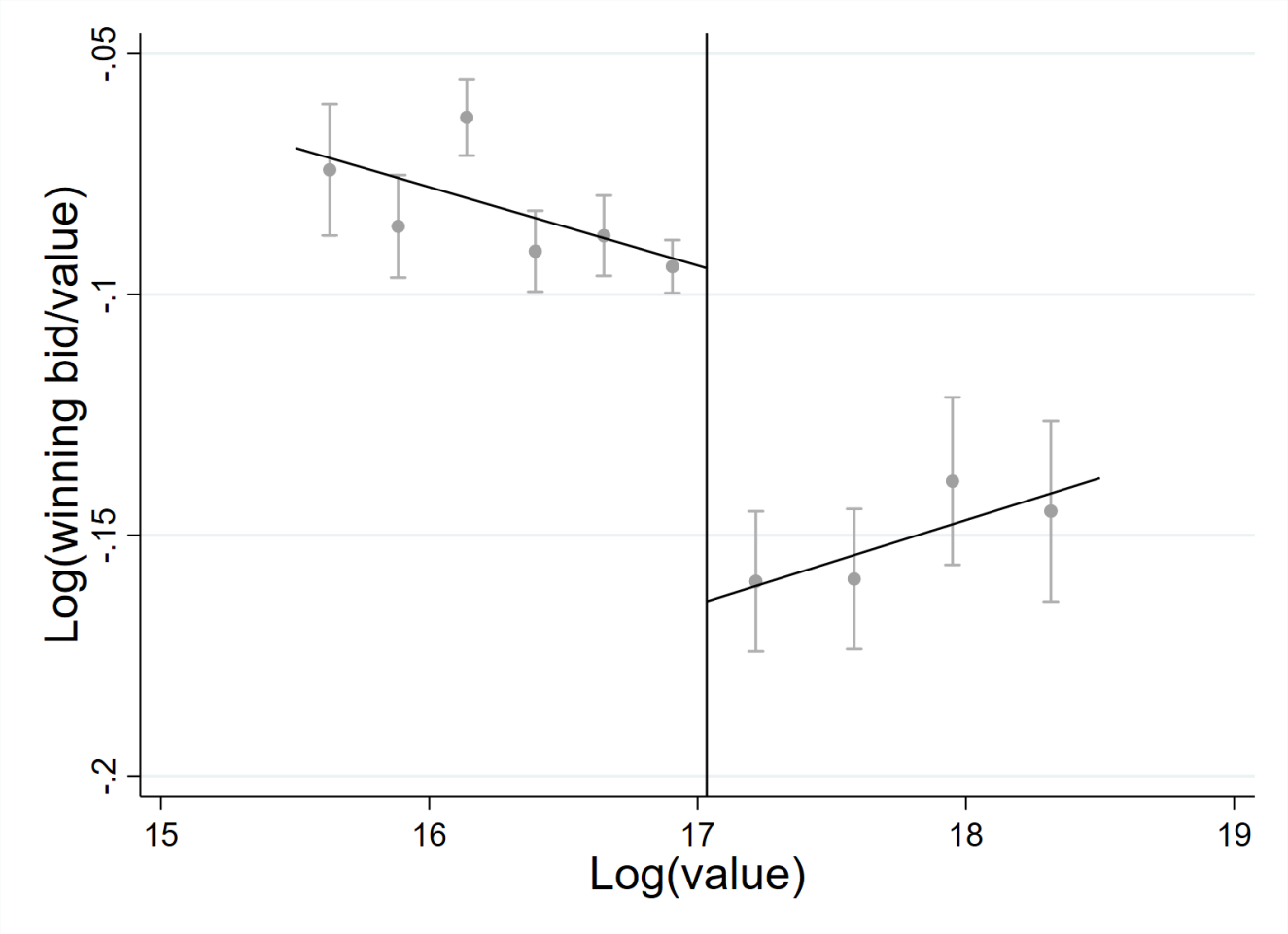
Outline

Manipulation of contract values



▸ Collapsed distribution

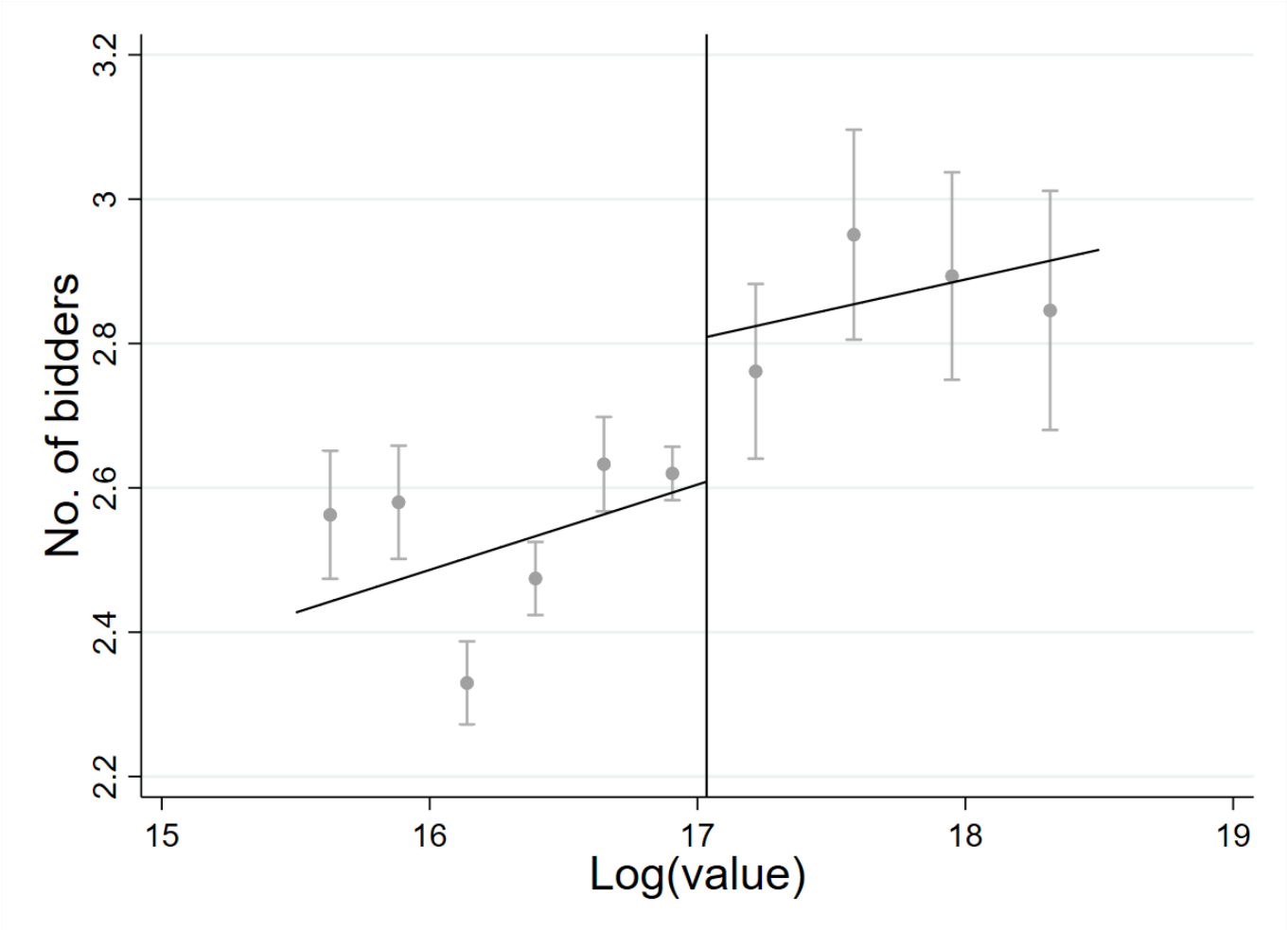
Discontinuity in procurement outcomes



Normalized price

▸ Placebo

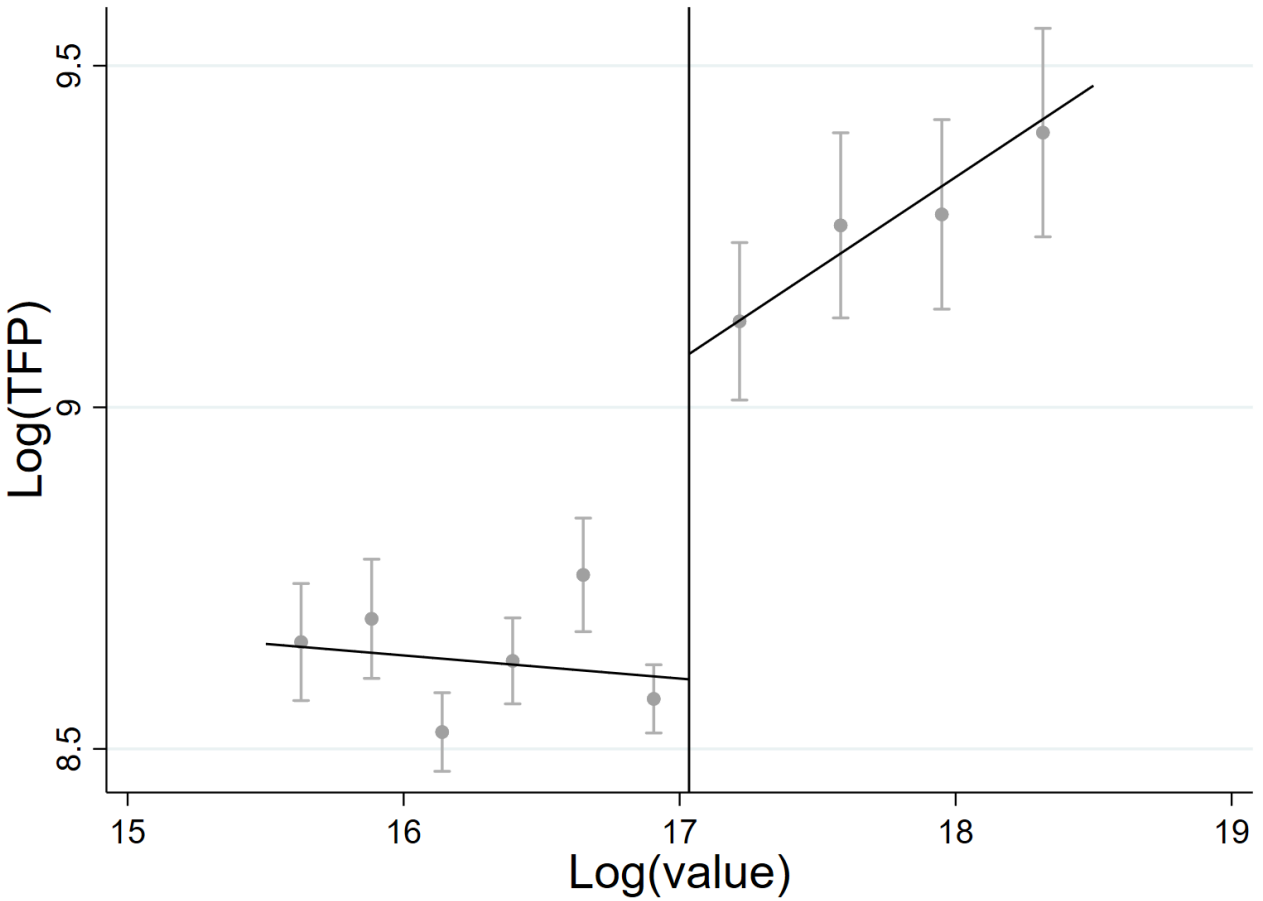
Discontinuity in procurement outcomes



No. of bidders

▸ Placebo

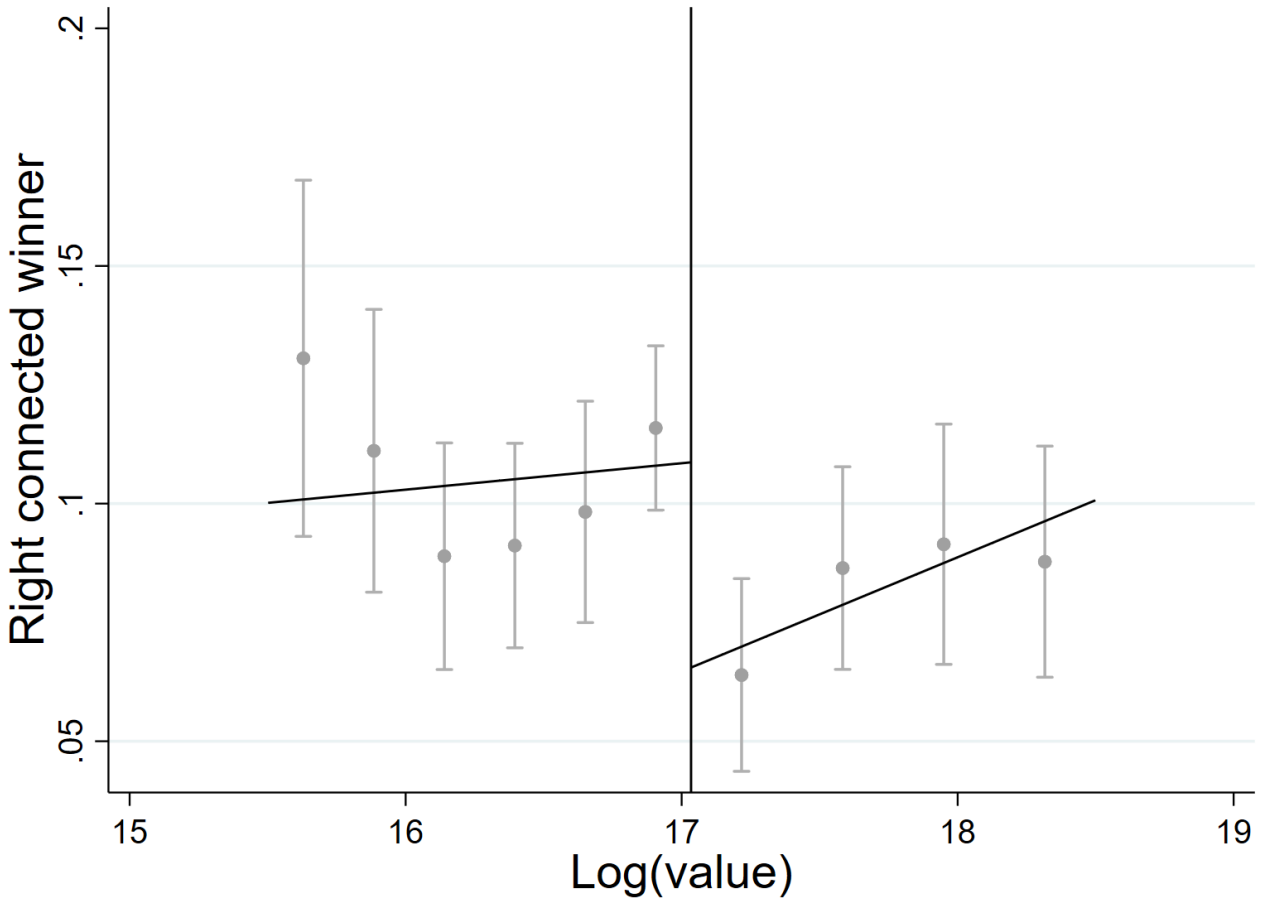
Discontinuity in procurement outcomes



Log-productivity

▸ Placebo

Discontinuity in procurement outcomes



Connected winner

▸ Other connections ▸ Placebo

Interpretation

- Ideal experiment would randomly assign procurement procedures to tenders
- We cannot use RDD to recover the causal effects of discretion
  - Manipulation in the running variable indicates selection around the cutoff
  - Different composition of agencies and tenders on the two sides of the threshold

Outline

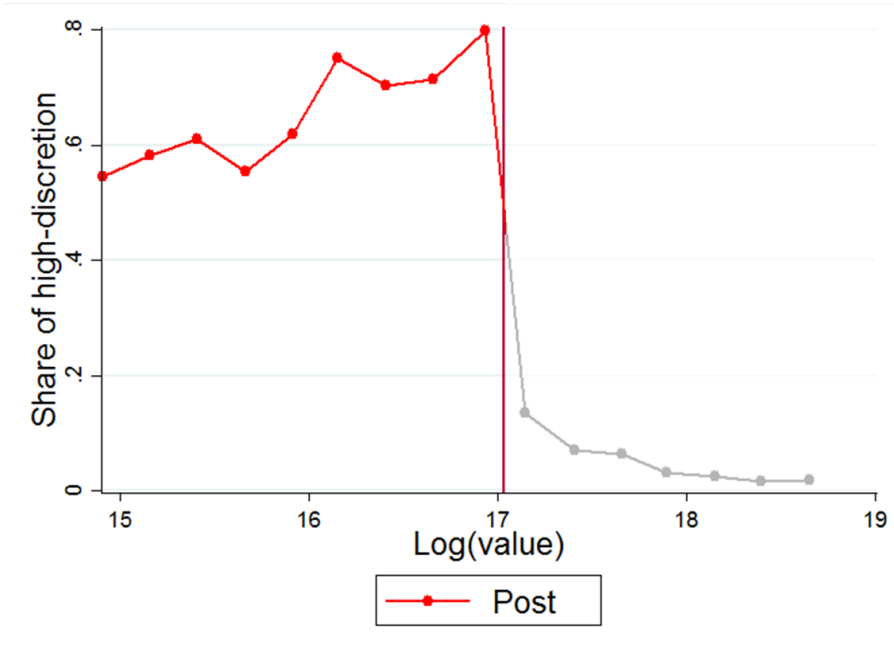
Selection correction

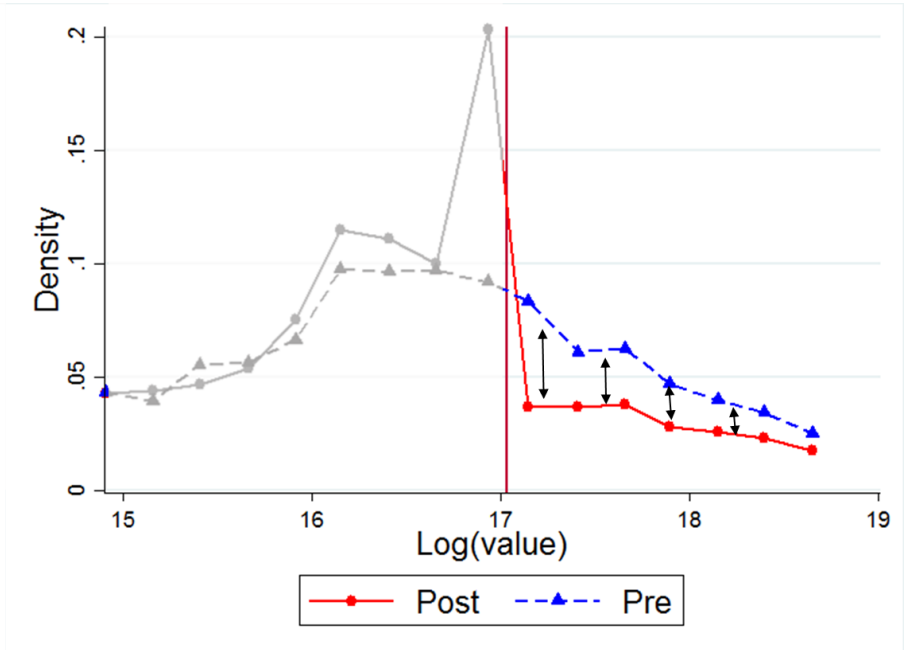
$$Y_i = \delta D_i + f(V_i) + \tau Post_i + u_i \tag{1}$$

$$D_i = 1[d_i \geq h(\nu_i)] Post_i \tag{2}$$

- Y_i is normalized price, log-productivity, or connected winner
- D_i is an indicator for high discretion
- V_i is the anticipated contract value
- $Post_i$ is an indicator for post-reform period
- ν_i is the exogenous project size
- $Cov(d_i, u_i) \neq 0$

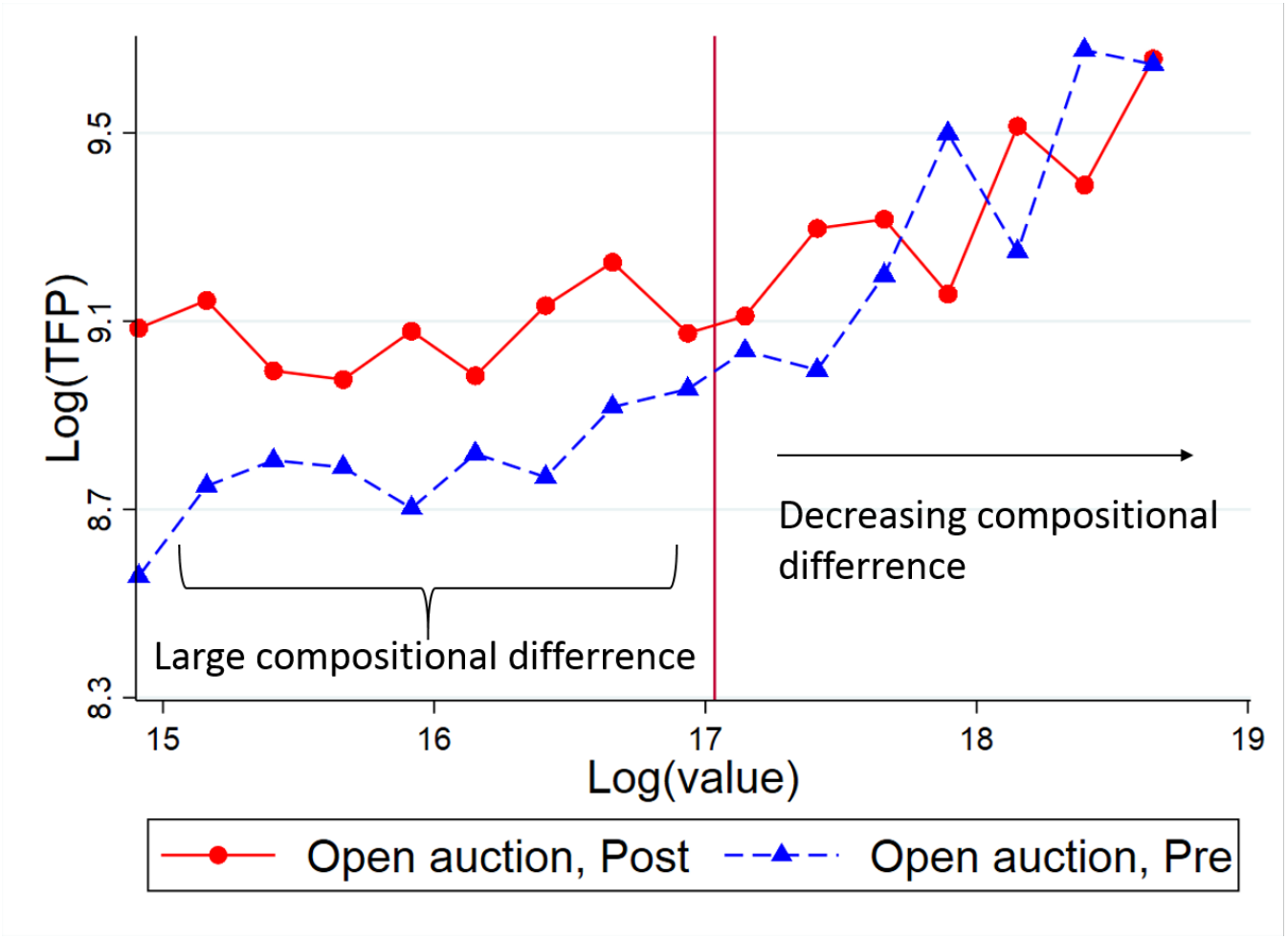
First stage



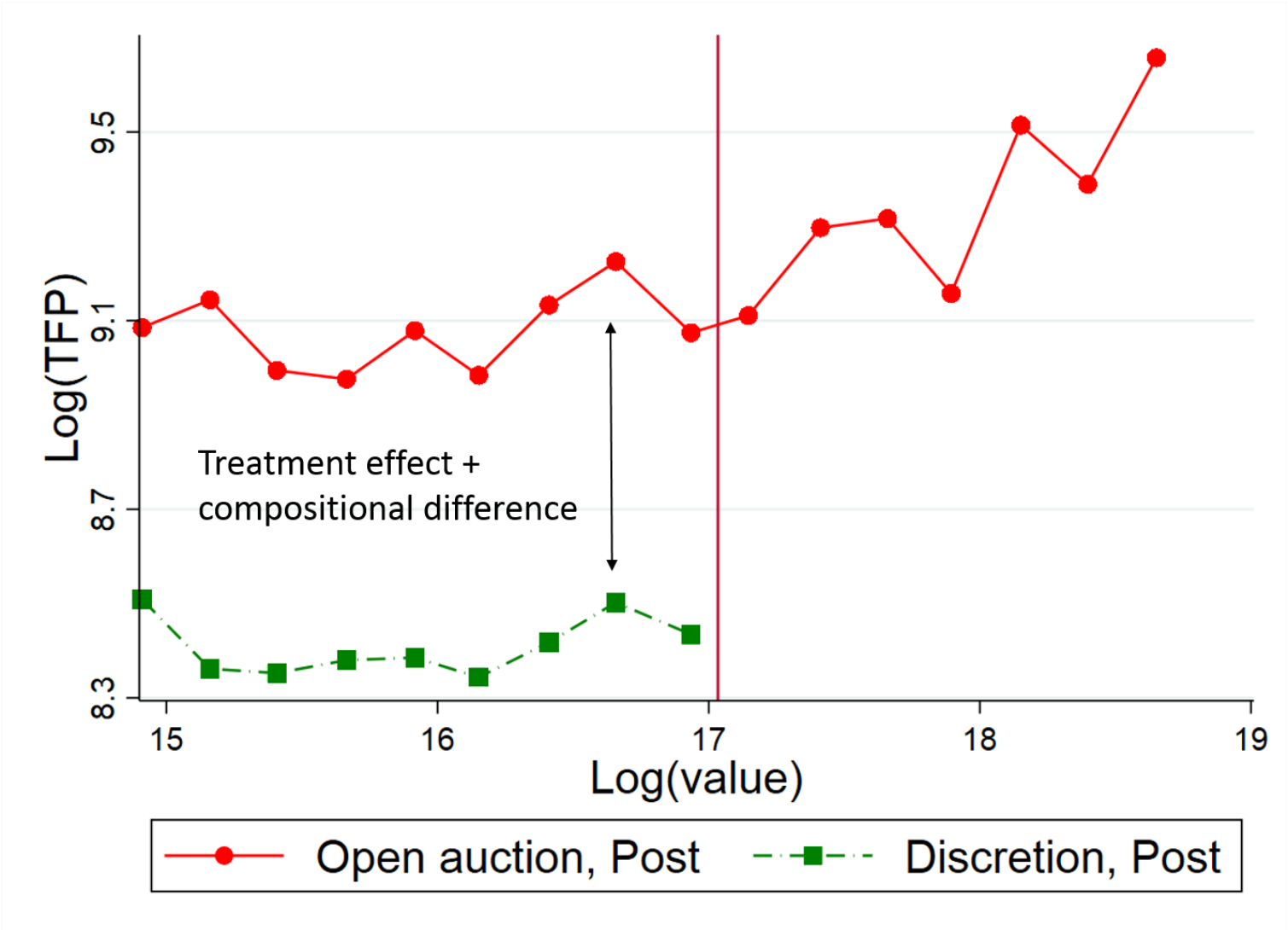


$$D_i = 1[d_i \geq h(\nu_i)]Post_i$$

Second stage



Second stage



Selection correction results

	Log(norm price)	No. of bidders	Log(TFP)	Connection of the winner firm		
				Right	Left	Unconnected
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: Naive OLS			
Discretion	0.055	-0.739	-0.636	0.091	0.014	-0.026
	(0.009)	(0.097)	(0.067)	(0.014)	(0.006)	(0.021)
			Panel B: Selection correction			
Discretion	0.064	-0.954	-0.282	0.108	0.027	0.031
	(0.019)	(0.190)	(0.135)	(0.039)	(0.016)	(0.051)
Control fn	-0.006	-0.138	-0.229	-0.012	-0.008	-0.039
	(0.011)	(0.126)	(0.086)	(0.024)	(0.011)	(0.036)
Mean of dep. var. for open auctions	-0.130	2.95	9.06	0.078	0.025	0.476
Observations	44,915	47,971	34,930	12,249	12,249	12,249

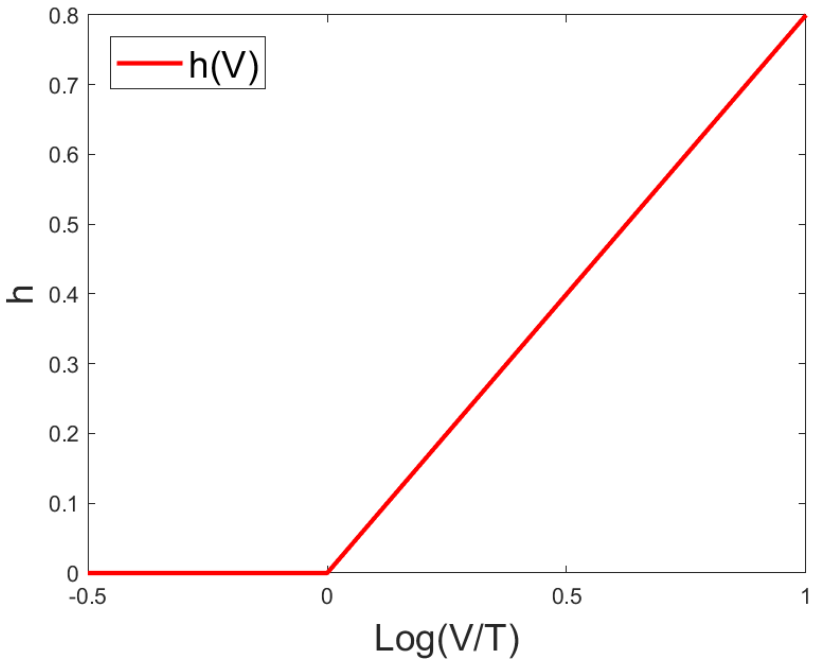
▸ Treatment effect heterogeneity ▸ Other outcomes

Outline

Parametric selection model

$$Y_i = \delta D_i + \gamma' X_i + f(V_i) + \tau Post_i + u_i$$

$$D_i = 1[d_i \geq \underbrace{\log \frac{\nu_i}{T} 1(\nu_i > T) + \eta' X_i}_{h(\nu_i)}] Post_i$$

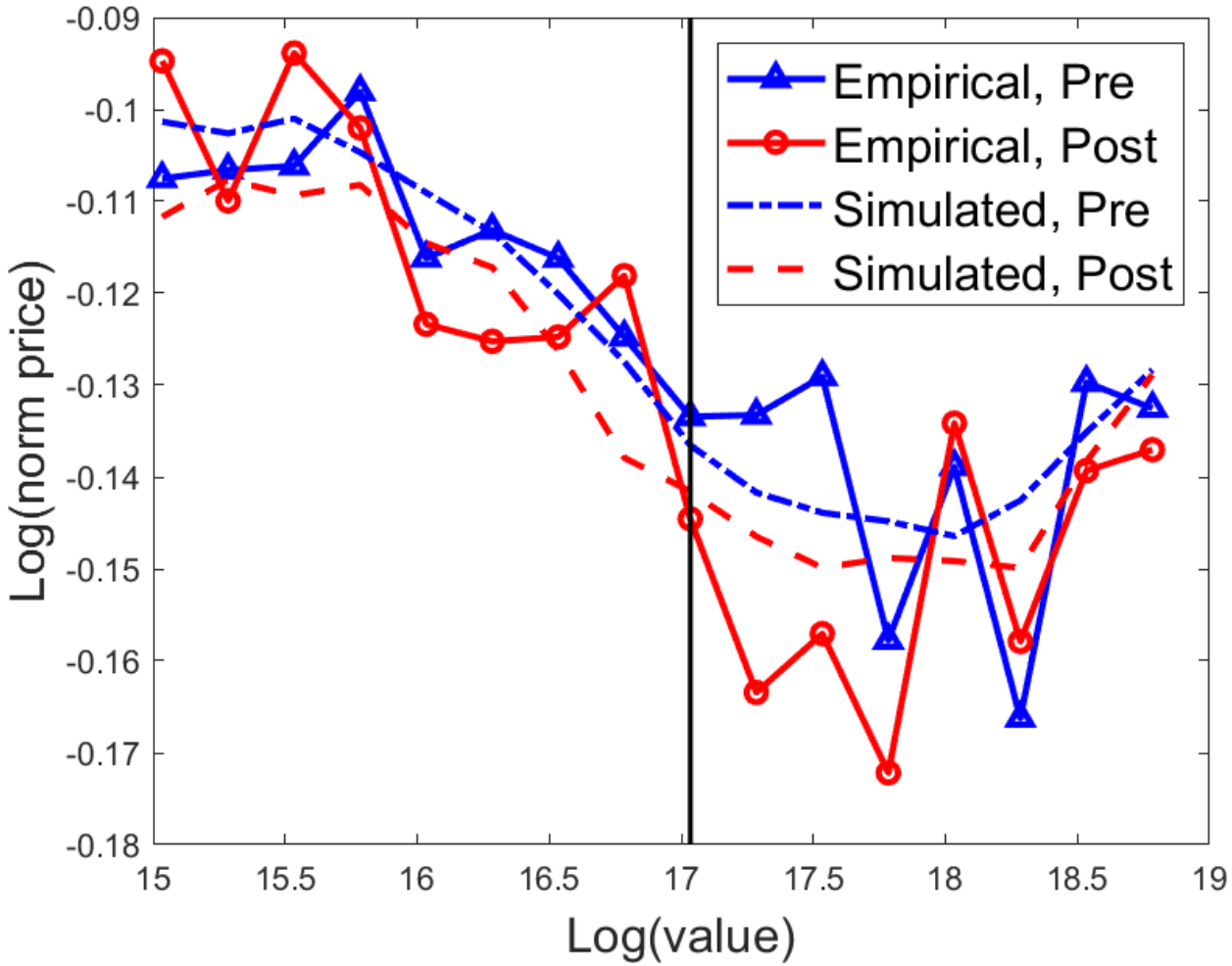


▸ Microfoundation

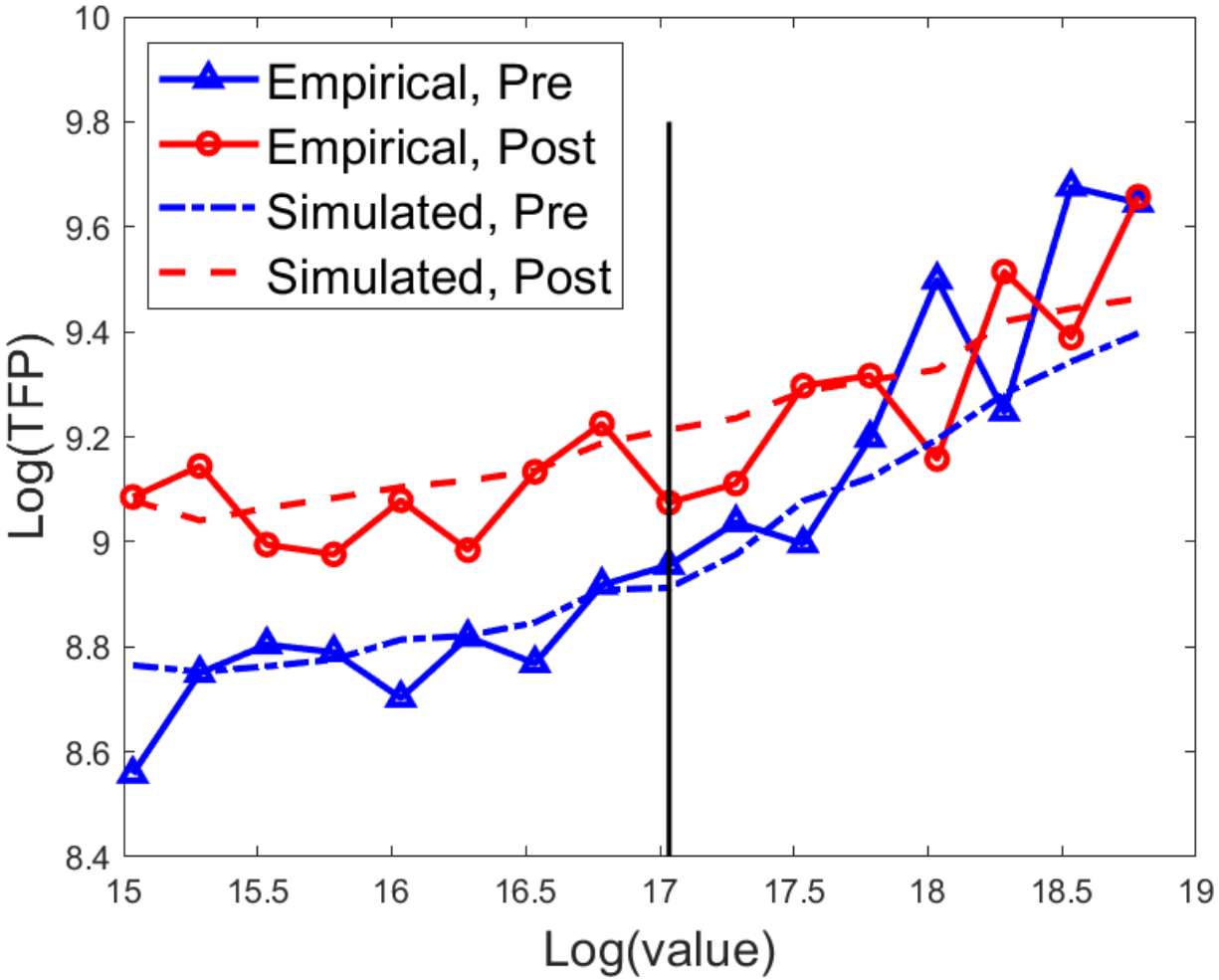
Parametric results

	Price		Productivity	
	Discretion	Log(norm price)	Discretion	Log(TFP)
	(1)	(2)	(3)	(4)
Discretion		0.056		-0.289
		(0.018)		(0.221)
Share of connected top 500 firms	0.873	0.034	0.577	8.90
	(0.154)	(0.018)	(0.179)	(0.119)
Share of unconnected top 500 firms	-0.349	-0.045	-0.428	1.39
	(0.062)	(0.008)	(0.077)	(0.054)
Share of domestic firms	0.300	-0.058	0.224	-2.33
	(0.060)	(0.008)	(0.069)	(0.052)
Central government agency	-0.640	-0.014	-0.566	0.098
	(0.031)	(0.004)	(0.033)	(0.031)
Services	0.707	-0.042	0.573	-0.669
	(0.031)	(0.004)	(0.032)	(0.031)
Correlation of d and μ		0.026		-0.111
		(0.046)		(0.098)
Observations		44,915		34,930

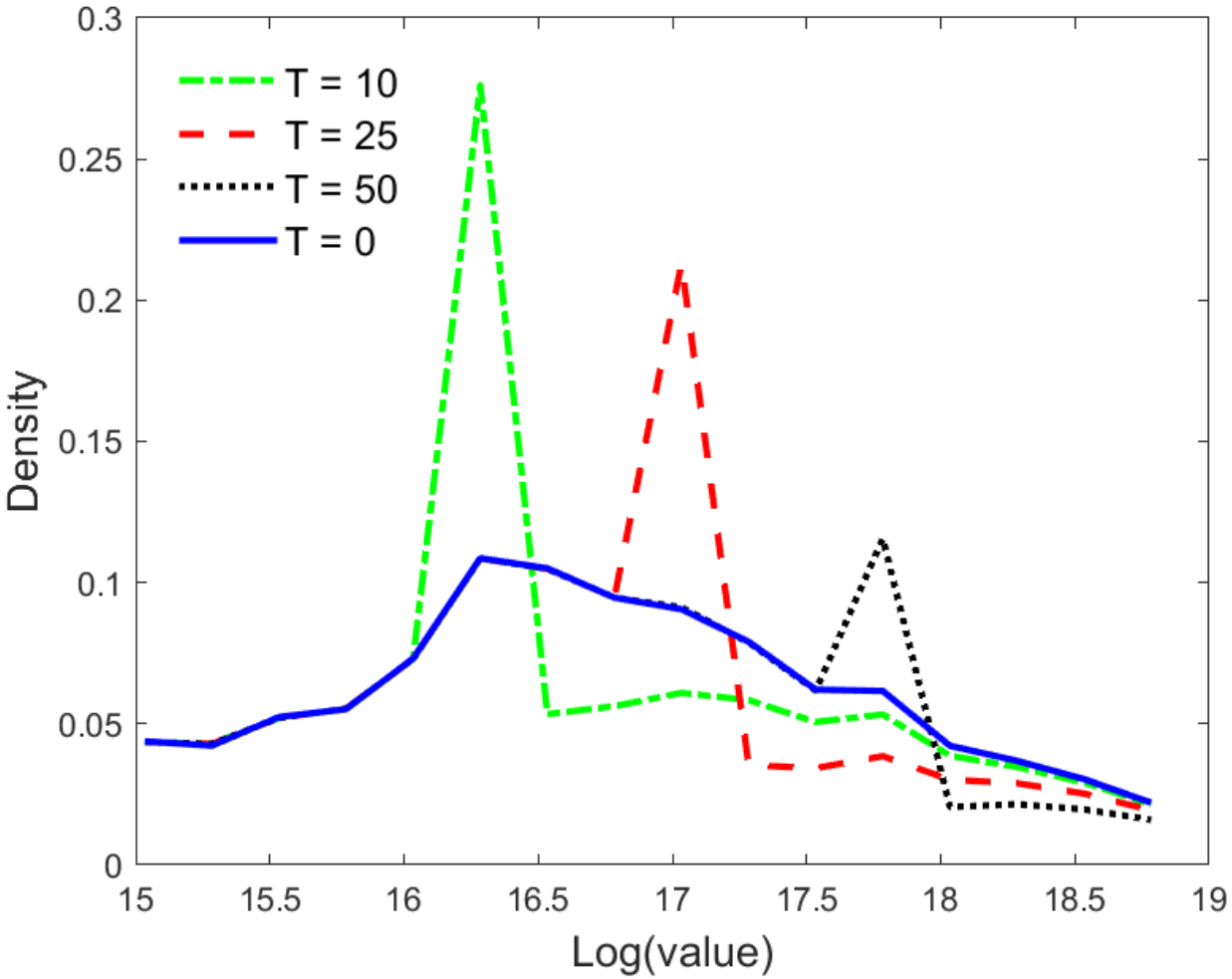
Predicted normalized price



Predicted log-productivity



Out-of-sample value distributions



Productivity effects of different thresholds

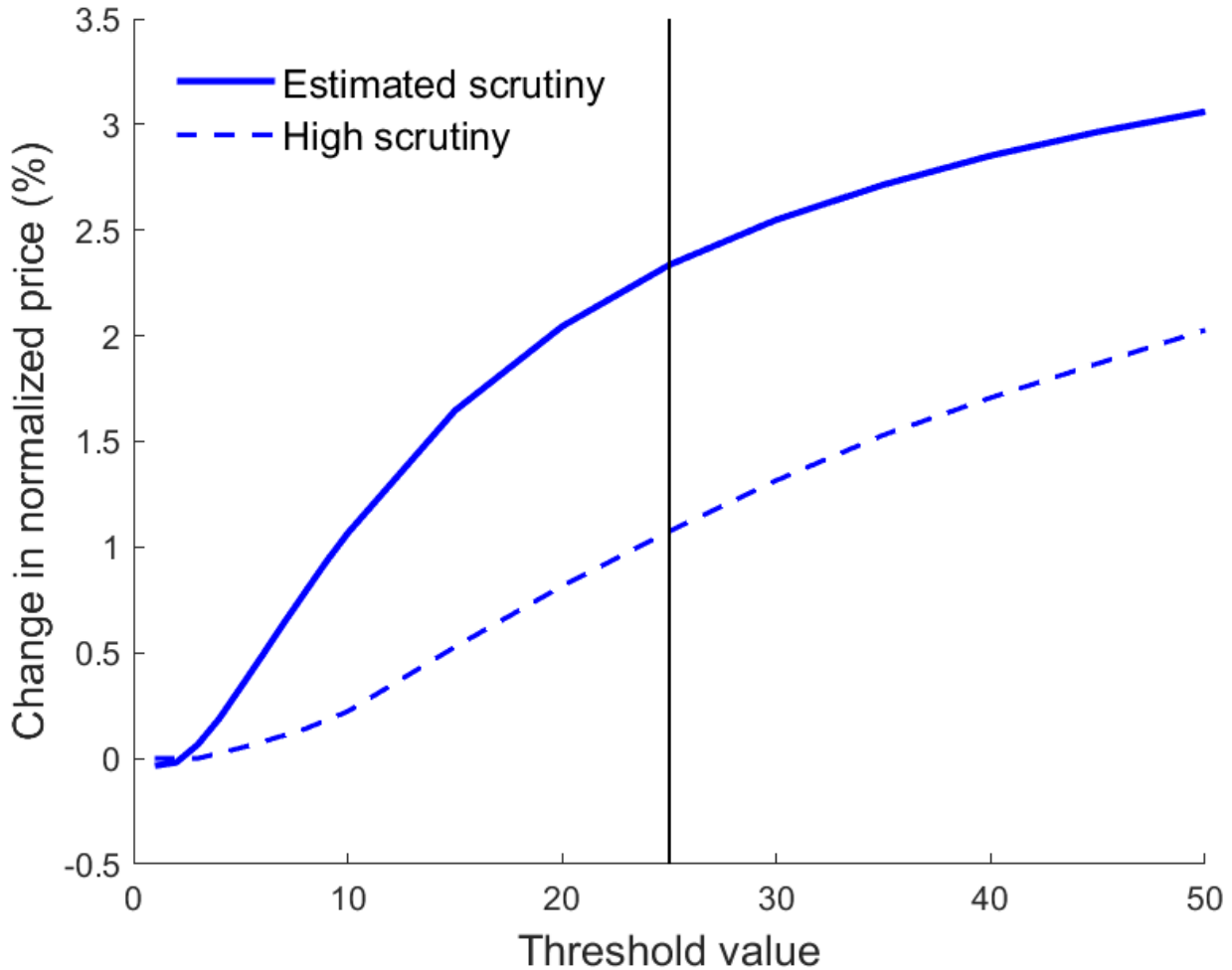
I simulate the the effects of different procurement thresholds on prices and productivity

$$\Delta \bar{Y}(T,s) = \frac{\sum_i Y_i(T,s)V_i(T,s)/\sum_i V_i(T,s)}{\sum_i Y_i(0,s)V_i(0,s)/\sum_i V_i(0,s)} - 1,$$

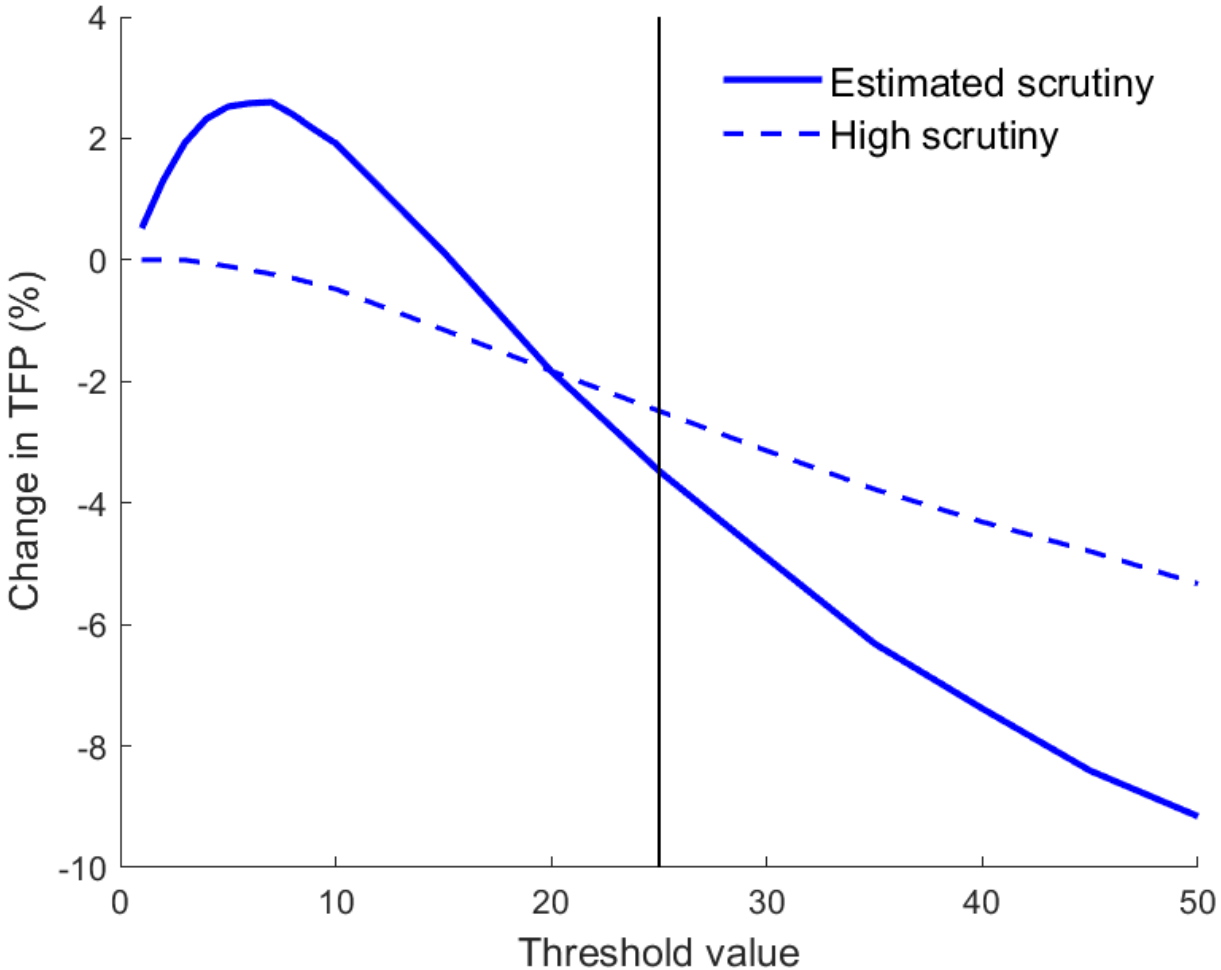
A larger threshold

- Always decrease normalized prices
- Affects productivity through two channels:
  1. Procedure channel: increases average productivity
  2. Contract value channel: decreases average productivity

Threshold's impact on prices under different levels of scrutiny



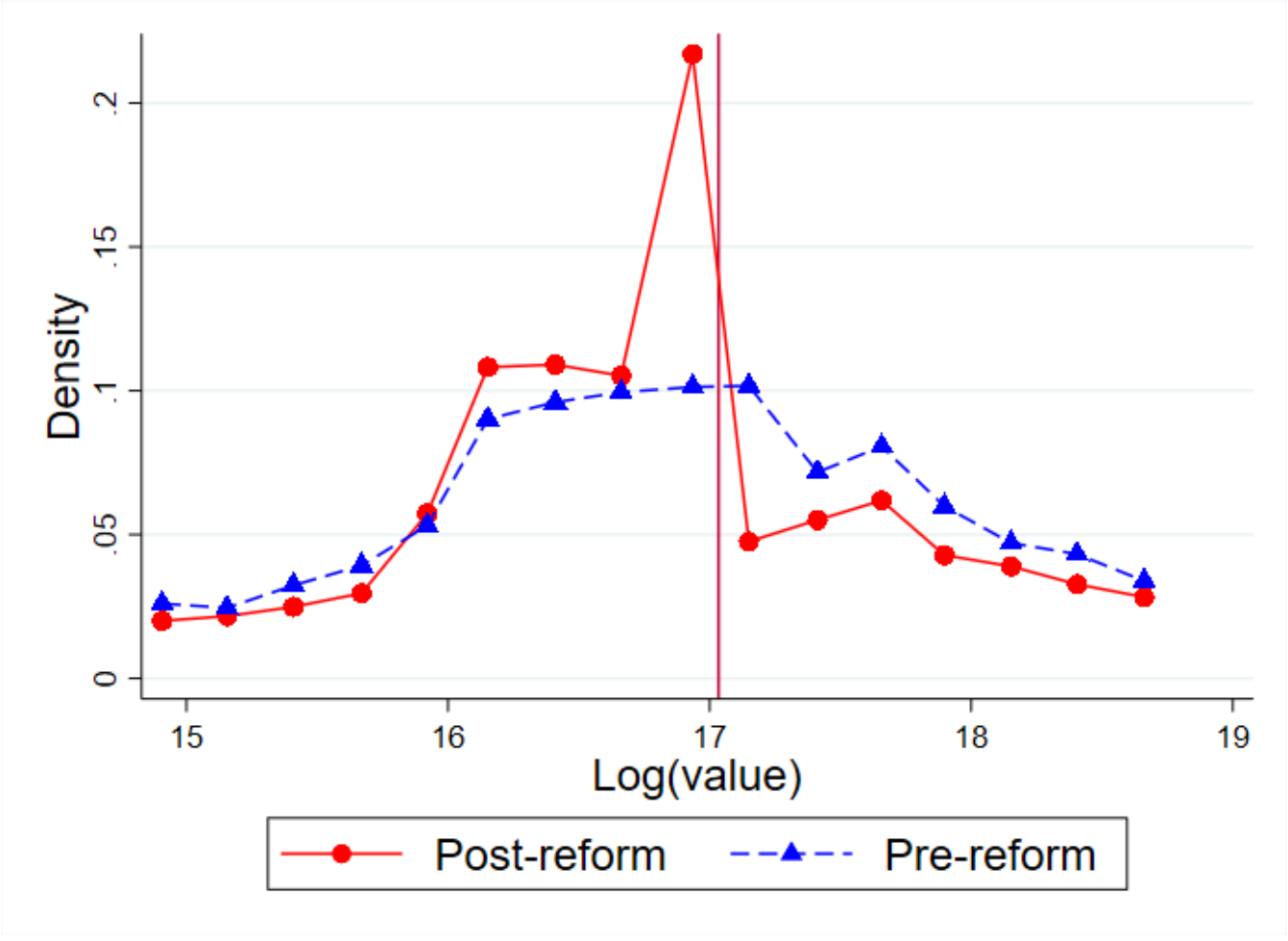
Threshold's impact on productivity under different levels of scrutiny



Conclusion

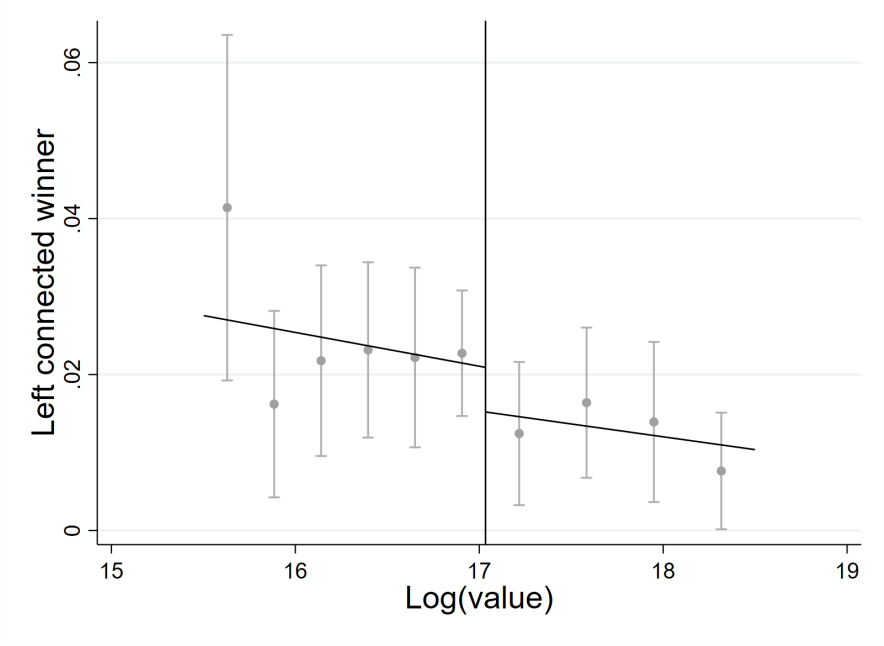
- Providing more discretion to public agencies results in
  - 6% higher prices
  - 28% less productive contractors
  - More politically connected winners
- There is a substantial sorting into high-discretion
  - Tenders with less productive winners
- Optimal threshold would be smaller than the actual and would yield 6% higher average productivity

Distribution of contract values

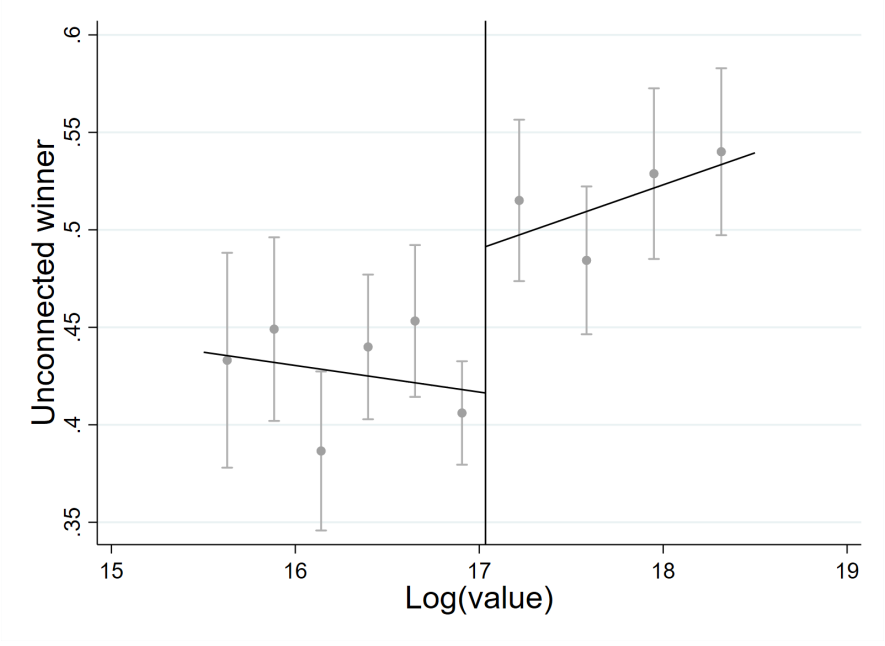


▸ Distribution

Discontinuity in other connections



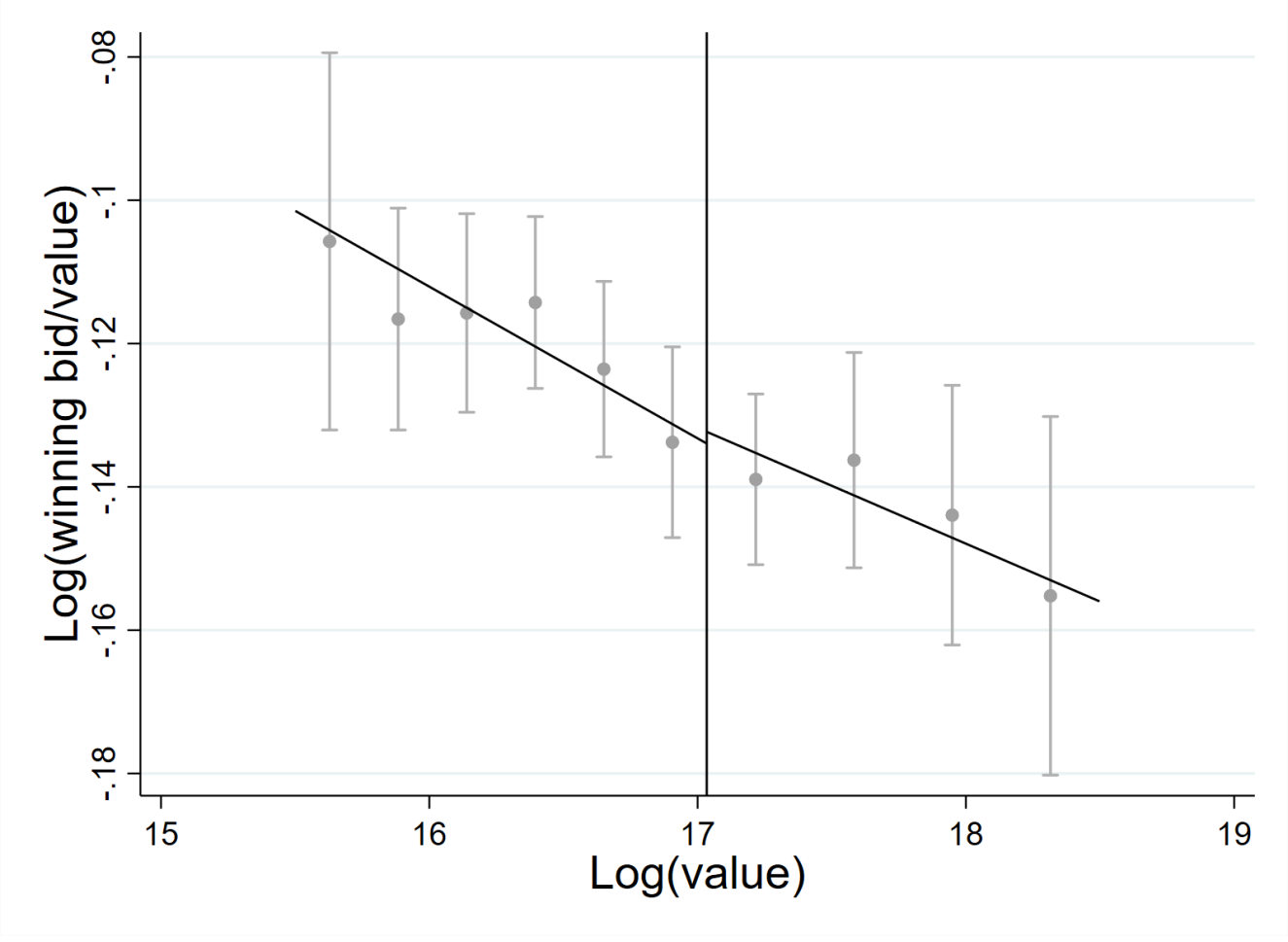
Left connected



Unconnected

▸ Right connected

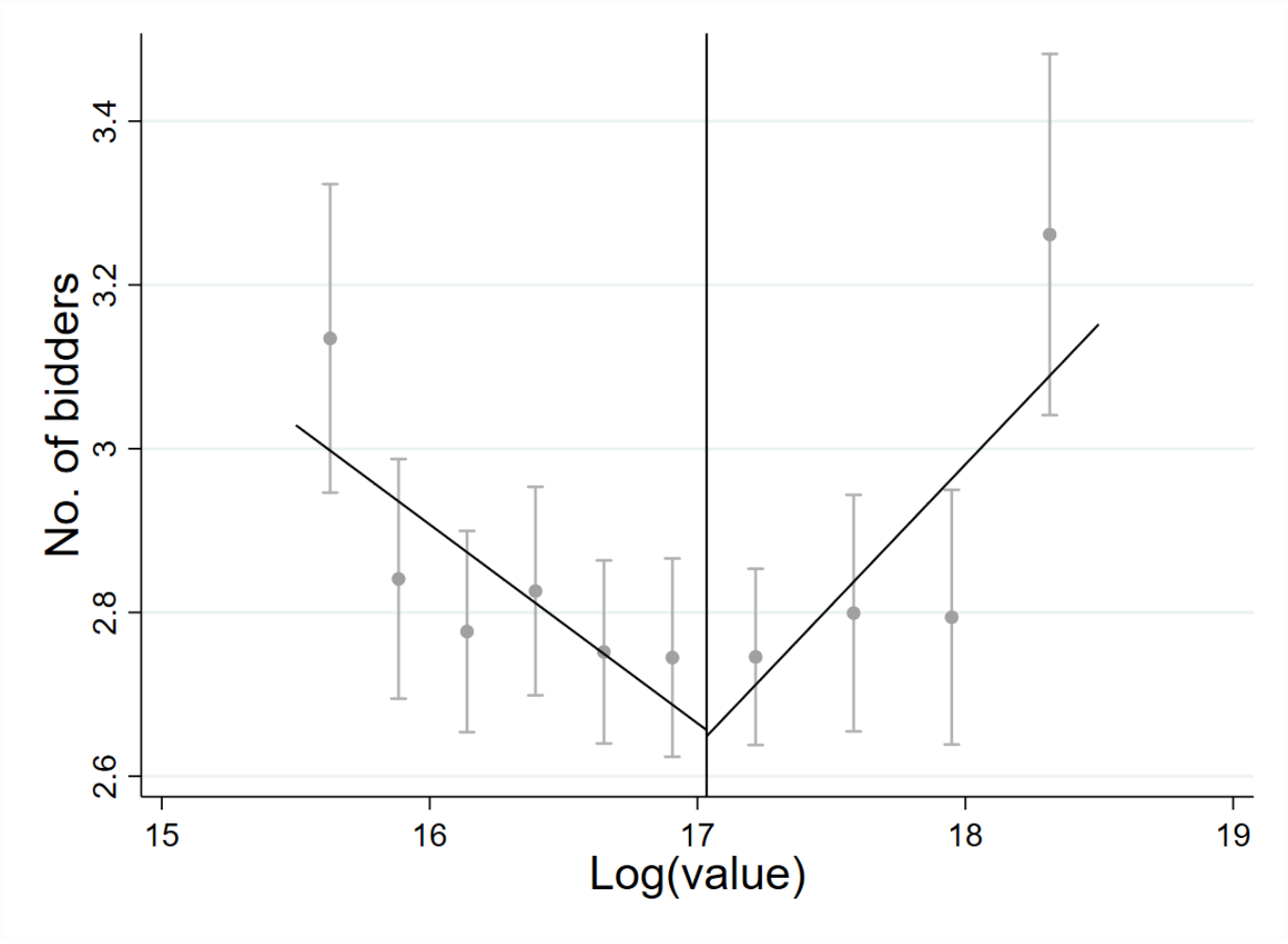
Placebo test



Normalized price

▸ Main outcomes

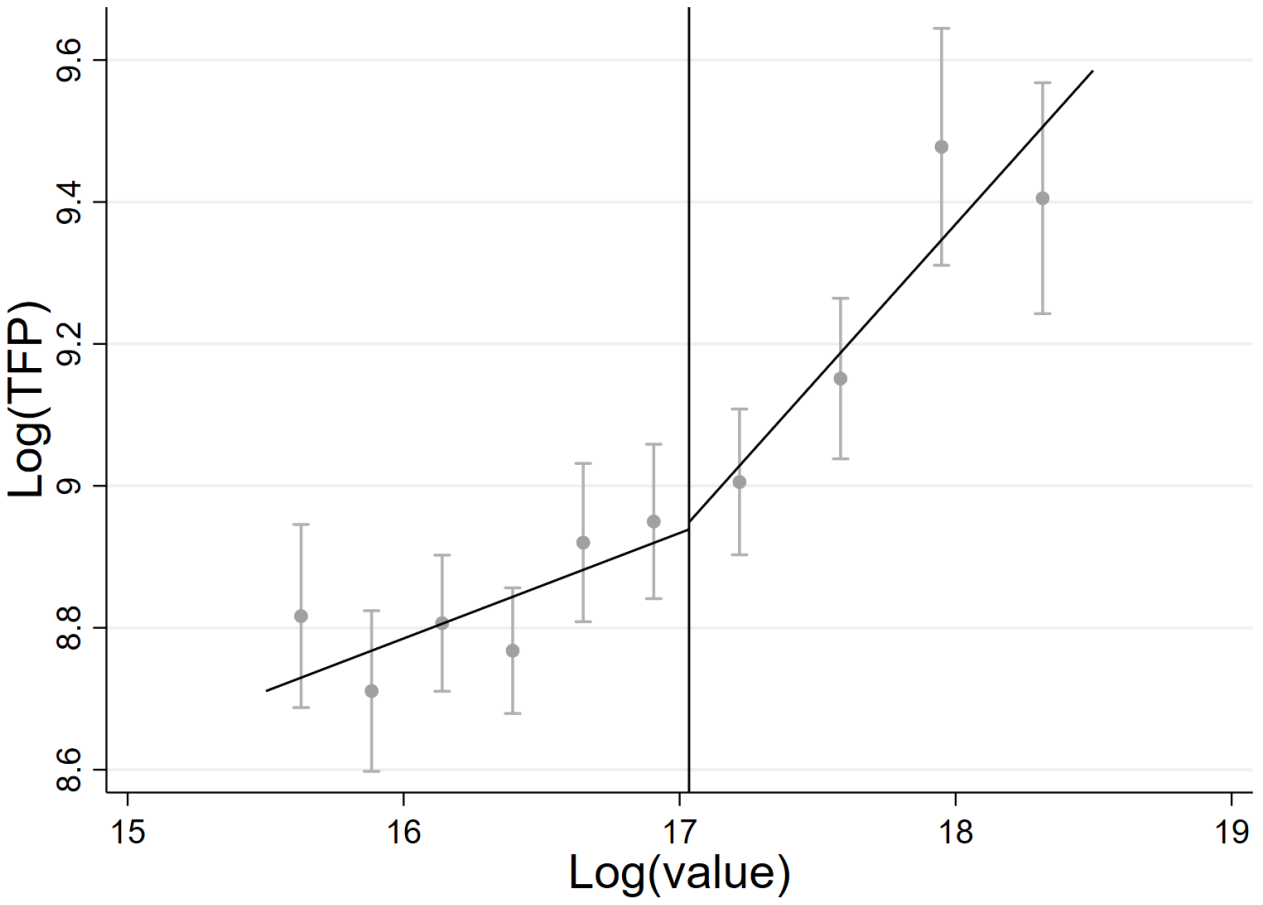
Placebo test



No. of bidders

▸ Main outcomes

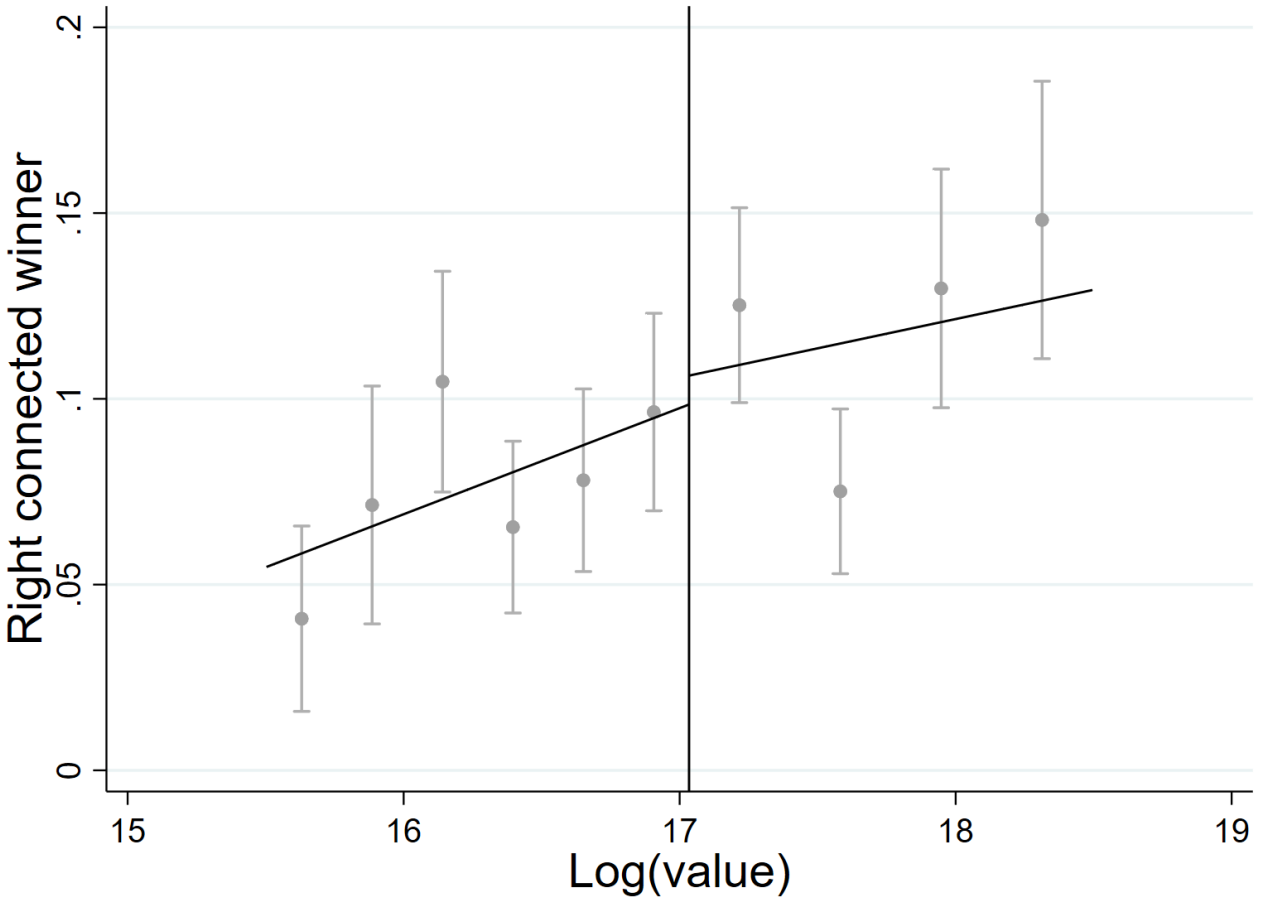
Placebo test



Log-productivity

▸ Main outcomes

Placebo outcomes



Connected winner

▸ Main outcomes

Treatment effect heterogeneity

	Log(norm price)	No. of bidders	Log(TFP)	Connection of the winner firm		
				Right	Left	Unconnected
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A - Product categories					
Goods	0.059	-1.02	-0.493	0.172	0.0426	-0.219
	(0.019)	(0.172)	(0.133)	(0.050)	(0.025)	(0.074)
Services	0.083	-1.07	-0.148	0.097	0.012	0.191
	(0.036)	(0.412)	(0.277)	(0.049)	(0.018)	(0.073)
	Panel B - Level of government					
Central	0.029	-0.919	-0.310	0.128	0.028	0.041
	(0.035)	(0.343)	(0.220)	(0.065)	(0.021)	(0.070)
Local	0.085	-1.20	-0.310	0.152	0.020	0.008
	(0.028)	(0.209)	(0.256)	(0.048)	(0.023)	(0.076)

▸ Main results

Other outcomes

	Domestic (1)	Log(emp) (2)	Distance (3)	Experienced (4)	Incumbent (5)	Firm age (6)	Exit (7)
				Panel A: Naive OLS			
Discretion	0.095	-0.836	-9.16	-0.128	-0.225	-3.14	0.015
	(0.013)	(0.048)	(4.02)	(0.010)	(0.019)	(0.210)	(0.008)
				Panel B: Selection correction			
Discretion	-0.015	-0.125	-6.48	-0.091	-0.203	-0.867	0.040
	(0.028)	(0.129)	(5.82)	(0.029)	(0.039)	(0.654)	(0.018)
Control fn	0.071	-0.456	-10.0	-0.024	-0.014	-1.45	-0.016
	(0.018)	(0.085)	(4.21)	(0.020)	(0.021)	(0.379)	(0.012)
Mean of dep. var. for open auctions	0.805	3.25	68.4	0.703	0.332	15.1	0.057
Observations	40,352	40,143	37,730	48,380	48,380	41,616	41,342

▸ Main results

Microfundations of parametric model

$$U(V_i, D_i, X_i, d_i) = \log(V_i) + (\eta' X_i + d_i) D_i$$

$$st. : V_i \leq \begin{cases} \nu_i & \text{if } D_i = 0, \\ \min\{\nu_i, T\} & \text{if } D_i = 1, \end{cases}$$

where ν_i is the budget of the procuring agency
Solution:

$$D_i = 1\left[d_i \geq \log \frac{\nu_i}{T} 1(\nu_i > T) + \eta' X_i\right]$$

▸ Parametric model