Discussion of

Understanding the Valuation Gap between State-Owned and Non-State-Owned Enterprises

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Overview

- Economic question: What drives the differences in valuations between SOEs and NSOEs in China?

- Empirical findings:
  1. SOEs exhibit significantly lower valuations than NSOEs.
  2. Industry composition accounts for only a small portion of the valuation gap.
  3. Differences in profitability, the volatility of profitability, listing age, and stock liquidity account for a substantial part of the variation.

- Interpretation:
  The valuation difference between SOEs and NSOEs is consistent with standard valuation theory.

Summary

- Very interesting paper
- Contributes to the broad debate on state ownership and efficiency
  1. SOEs may correct market failures; social benefits can outweigh inefficiencies (Atkinson and Stiglitz 1980; Vernon and Aharoni 2014).
  2. SOEs may be inefficient due to non-shareholder objectives (Shleifer and Vishny 1994; Alok & Ayyagari, 2020)
- Findings may be surprising given evidence that SOEs have preferential treatment in financing, regulation, entry access, etc.

Roadmap

1. Conduct firm-level empirical analysis
2. Develop a model of firm valuation
3. Interpret the results through the lens of the model

Comments on empirics

Empirical check of the main findings

- The paper uses portfolio-level analysis
- I will try to replicate the findings using firm-level panel regressions

$$
\begin{aligned}
Y_{i,j,t+1} \text{ or } Y_{i,j,t} \quad = \quad & \beta_0 + \beta_1 \text{NSOE} + \beta_2 X_{i,j,t} + \beta_3 X_{i,j,t} * \text{NSOE} \\
& + \theta * Controls + \underbrace{\alpha_i}_{\text{Firm}} + \underbrace{\gamma_j}_{\text{Industry}} + \underbrace{\delta_t}_{\text{Year}} + \epsilon_{i,j,t}
\end{aligned}
$$

Finding 1: Evidence of predictive regressions

	(1) leadmb	(2) leadmb	(3) leadmb	(4) leadmb	(5) leadmb	(6) leadmb	(7) leadmb	(8) leadmb
nsoe	0.4795**	0.3967**	0.5444***	-0.0086	-0.2730	0.2125	0.5125***	-0.6839**
	(3.222)	(2.583)	(3.737)	(-0.037)	(-1.466)	(1.358)	(3.475)	(-2.726)
size		0.1098					1.3199***	1.0848*
		(0.266)					(4.324)	(2.569)
nsoe*size		1.1990*						0.3624
		(2.157)						(0.607)
roe			-2.3251***				-2.0106***	-2.2980***
			(-8.396)				(-9.078)	(-8.001)
nsoe*roe			0.2491					0.4949
			(0.635)					(1.197)
leverage				1.6941***			1.6207***	1.0262**
				(5.035)			(6.208)	(3.067)
nsoe*leverage				1.0652*				0.9238*
				(2.277)				(1.980)
age_list					0.5298***		0.4620***	0.5183***
					(3.876)		(3.595)	(3.802)
nsoe*age_list					0.0579***			0.0366**
					(5.441)			(3.162)
idiovol						7.6333***	8.2182***	6.9804***
						(15.578)	(26.963)	(15.119)
nsoe*idiovol						1.7949**		1.9846***
						(3.024)		(3.443)
N	49579	49522	49579	49579	49579	48292	48244	48244
adj. R^2	0.102	0.103	0.129	0.115	0.105	0.131	0.163	0.165

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Finding 2: Evidence of contemporaneous regressions

	(1) mb	(2) mb	(3) mb	(4) mb	(5) mb	(6) mb	(7) mb	(8) mb
nsoe	0.3901**	0.1649	0.4313**	0.1489	-0.2440	0.1985	0.3932**	-0.3860
	(2.747)	(1.106)	(3.051)	(0.641)	(-1.386)	(1.347)	(2.740)	(-1.628)
size		1.5676***					3.6227***	2.2704***
		(3.766)					(11.652)	(5.279)
nsoe*size		3.0825***						2.4961***
		(5.536)						(4.149)
roe			-1.5761***				-1.2068***	-1.4609***
			(-6.448)				(-7.048)	(-5.834)
nsoe*roe			0.3902					0.4082
			(1.176)					(1.211)
leverage				1.8324***			1.8492***	1.5363***
				(5.474)			(6.699)	(4.534)
nsoe*leverage				0.5990				0.4123
				(1.295)				(0.879)
age_list					0.6283***		0.6716***	0.6736***
					(4.862)		(5.398)	(5.250)
nsoe*age_list					0.0483***			0.0199
					(4.977)			(1.833)
idiovol						4.9403***	5.1271***	4.2829***
						(11.654)	(17.861)	(10.429)
nsoe*idiovol						1.1754*		1.3178*
						(2.161)		(2.467)
N	53313	53313	53313	53313	53313	52024	52024	52024
adj. R^2	0.113	0.126	0.123	0.124	0.116	0.128	0.159	0.162

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Quick takeaways

1. SOEs exhibit significantly lower valuations than NSOEs on average
2. Listing age and idiosyncratic volatility are more significant variables
3. The NSOE dummy becomes insignificant in multivariate regressions

Ownership structure in detail

1. State-owned enterprises
2. Private-owned enterprises
3. Others
   - Foreign ownership
   - Collective ownership
   - Etc

Question: Is the valuation difference between SOEs and NSOEs driven by POEs?

Finding 3: Predictive panel regressions based on POEs

	(1) leadmb	(2) leadmb	(3) leadmb	(4) leadmb	(5) leadmb	(6) leadmb	(7) leadmb	(8) leadmb
poe	0.5985***	0.5287**	0.6551***	0.0493	-0.1263	0.3231	0.6237***	-0.5880*
	(3.615)	(3.119)	(4.043)	(0.200)	(-0.636)	(1.848)	(3.729)	(-2.249)
size		0.1631					1.2613***	1.0646*
		(0.393)					(4.162)	(2.497)
poe*size		1.0746						0.3197
		(1.891)						(0.528)
roe			-2.3204***				-2.0595***	-2.3100***
			(-8.369)				(-9.420)	(-8.044)
poe*roe			0.1973					0.4553
			(0.497)					(1.089)
leverage				1.6391***			1.5603***	0.9354**
				(4.832)			(5.958)	(2.786)
poe*leverage				1.1891*				1.0175*
				(2.413)				(2.082)
age_list					0.5393***		0.4784***	0.5370***
					(3.979)		(3.786)	(3.943)
poe*age_list					0.0557***			0.0345**
					(4.824)			(2.736)
idiovol						7.5486***	8.1335***	6.9240***
						(15.522)	(26.287)	(14.997)
poe*idiovol						1.8229**		2.0109***
						(3.020)		(3.413)
N	47031	46979	47031	47031	47031	45904	45861	45861
adj. R^2	0.107	0.107	0.134	0.120	0.110	0.135	0.168	0.171

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Finding 4: Contemporaneous panel regressions based on POEs

	(1) mb	(2) mb	(3) mb	(4) mb	(5) mb	(6) mb	(7) mb	(8) mb
poe	0.4358**	0.2187	0.4747**	0.1189	-0.1805	0.2785	0.4439**	-0.3417
	(2.762)	(1.329)	(3.027)	(0.484)	(-0.951)	(1.696)	(2.725)	(-1.379)
size		1.6474***					3.5713***	2.2907***
		(3.945)					(11.665)	(5.302)
poe*size		3.0045***						2.5247***
		(5.280)						(4.120)
roe			-1.5618***				-1.2635***	-1.4762***
			(-6.374)				(-7.362)	(-5.874)
poe*roe			0.3112					0.3567
			(0.924)					(1.040)
leverage				1.7514***			1.8202***	1.4312***
				(5.187)			(6.526)	(4.175)
poe*leverage				0.7467				0.5650
				(1.549)				(1.151)
age_list					0.6807***		0.7228***	0.7290***
					(5.213)		(5.915)	(5.708)
poe*age_list					0.0471***			0.0173
					(4.505)			(1.476)
idiovol						4.9237***	4.9320***	4.3049***
						(11.685)	(16.734)	(10.511)
poe*idiovol						0.9257		1.0107
						(1.691)		(1.877)
N	50569	50569	50569	50569	50569	49440	49440	49440
adj. R^2	0.117	0.130	0.129	0.129	0.120	0.132	0.163	0.167

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Finding 5: Predictive panel regression based on Others

	(1) leadmb	(2) leadmb	(3) leadmb	(4) leadmb	(5) leadmb	(6) leadmb	(7) leadmb	(8) leadmb
other	0.2433	0.1140	0.2239	-0.4038	-0.2702	0.0302	0.2116	-0.9858
	(0.851)	(0.380)	(0.793)	(-0.595)	(-0.597)	(0.090)	(0.709)	(-1.267)
size		0.6588					1.2673**	1.2225**
		(1.635)					(3.170)	(2.968)
other_size		1.4192						0.3442
		(0.918)						(0.224)
roe			-2.2902***				-1.9233***	-2.1923***
			(-7.889)				(-6.080)	(-7.285)
other_roe			1.6354					1.9089
			(1.569)					(1.651)
leverage				1.9811***			1.4670***	1.3082***
				(5.952)			(4.260)	(3.944)
other_leverage				1.2564				1.0573
				(1.065)				(0.880)
age_list					0.2405		0.1389	0.1477
					(1.724)		(0.873)	(0.936)
other_age_list					0.0360			0.0260
					(1.485)			(1.008)
idiovol						7.4941***	7.1134***	6.9383***
						(15.471)	(16.444)	(15.238)
other_idiovol						1.4910		1.4689
						(1.195)		(1.232)
N	23406	23393	23406	23406	23406	22342	22332	22332
adj. R^2	0.105	0.106	0.134	0.117	0.106	0.134	0.166	0.169

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Finding 6: Contemporaneous panel regressions based on Others

	(1) mb	(2) mb	(3) mb	(4) mb	(5) mb	(6) mb	(7) mb	(8) mb
other	0.2835	-0.0306	0.2545	0.0443	-0.0817	-0.1905	0.2506	-0.5531
	(1.025)	(-0.097)	(0.932)	(0.061)	(-0.190)	(-0.603)	(0.871)	(-0.686)
size		2.1791***					2.9157***	2.6384***
		(5.233)					(6.766)	(6.196)
other_size		4.0586						3.1549
		(1.932)						(1.483)
roe			-1.5397***				-1.1289***	-1.3997***
			(-6.200)				(-4.573)	(-5.479)
other_roe			1.8602*					1.9012*
			(2.492)					(2.450)
leverage				1.9074***			1.6908***	1.6279***
				(5.501)			(4.556)	(4.661)
other_leverage				0.5012				0.0371
				(0.375)				(0.026)
age_list					0.2137		0.2322	0.2288
					(1.871)		(1.874)	(1.805)
other_age_list					0.0251			0.0032
					(1.142)			(0.133)
idiovol						4.5328***	4.4636***	3.9783***
						(10.930)	(11.695)	(9.880)
other_idiovol						3.7151**		3.9435**
						(2.821)		(2.960)
N	24817	24817	24817	24817	24817	23753	23753	23753
adj. R^2	0.112	0.124	0.126	0.122	0.112	0.130	0.158	0.163

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Takeaway: The valuation difference is not driven by other ownership types.

A model of firm valuation

Overview

Sources of heterogeneity between SOEs and NSOEs

1. Efficiency
2. Real frictions
3. Financial constraints
4. Market power

Choices of firms in the model

1. Real (investment and hiring) & financial (debt and equity) choices

Three types of shocks:

1. Standard TFP shocks
2. Industry-level shocks
3. Firm-level productivity shocks

Based on Belo, Hao, Lin, Qiu and Tong (2024) who explores the relationship between state ownership, asset prices, and monetary policy transmission mechanism

Technology

Let $\mathcal{O}$ denote ownership type

- Demand

$$P_t(\mathcal{O}) = \underbrace{X}_{\text{Demand shifter}} Y_t^{-\eta(\mathcal{O})}$$

- Output

$$Y_t = \underbrace{A_t}_{\text{Agg}} \underbrace{S_t}_{\text{Industry}} \underbrace{Z_t(\mathcal{O})}_{\text{Idio}} K_t^{\alpha(\mathcal{O})} L_t^{1-\alpha(\mathcal{O})}$$

- Standard capital and labor accumulation

$$\begin{aligned} K_{t+1} &= (1-\delta_k)K_t + I_t \\ L_{t+1} &= (1-\delta_l)L_t + H_t \end{aligned}$$

- Convex capital and labor adjustment costs

$$G_t(\mathcal{O}) = \underbrace{\frac{c_k(\mathcal{O})}{2}\left(\frac{I_t}{K_t}\right)^2 K_t}_{\text{Capital adj costs}} + \underbrace{\frac{c_l(\mathcal{O})}{2}\left(\frac{H_t}{L_t}\right)^2 L_t}_{\text{Labor adj costs}}$$

Debt financing

- Debt collateral constraint

$$B_{t+1} \leq \underbrace{\varphi(\mathcal{O})}_{\text{Tightness}} K_{t+1}$$

- Debt adjustment cost

$$\Phi_t^B(\mathcal{O}) = \phi_B(\mathcal{O})\Big(\frac{\Delta B_{t+1}}{B_t}\Big)^2 B_t\Big]$$

Equity financing

- Firms' budget constraint (E_t firm's net payout before issuance cost)

$$E_t(\mathcal{O}) = \underbrace{P_t(\mathcal{O}) * Y_t(\mathcal{O}) - W_t\mathcal{O})L_t}_{\text{Gross profit}} - \underbrace{[I_t + G_t(\mathcal{O})]}_{\text{Inv+adj costs}}$$
$$+\underbrace{B_{t+1} - [1 + r_f(\mathcal{O})]\, B_t - \Phi_t^B(\mathcal{O})}_{\text{Net debt issuance}}$$

- External equity issuance H_t

$$H_t = \begin{cases} -E_t, & \text{if } E_t < 0 \\ 0, & \text{otherwise} \end{cases}$$

- Equity issuance cost

$$\Psi_t(\mathcal{O}) = \underbrace{\psi(\mathcal{O})H_t}_{\text{Equity issuance cost}} \mathbf{1}_{\{H_t>0\}}$$

Firms' maximization problem

- Net payout of equity after issuance cost

$$\underbrace{D_t(\mathcal{O})}_{\text{Payout after iss. cost}} = \underbrace{E_t(\mathcal{O})}_{\text{Payout before iss. cost}} - \underbrace{\Psi_t(\mathcal{O})}_{\text{Iss. cost}}$$

- SDF $M_{t,t+1}$: aggregate TFP shocks
- Value maximization

$$V_t(\mathcal{O}) = \max_{I_t, K_{t+1}, B_{t+1}} D_t(\mathcal{O}) + \mathbb{E}_t[M_{t,t+1} V_{t+1}(\mathcal{O})]$$

Interpretation

Heterogeneity and valuation: Efficiency channel

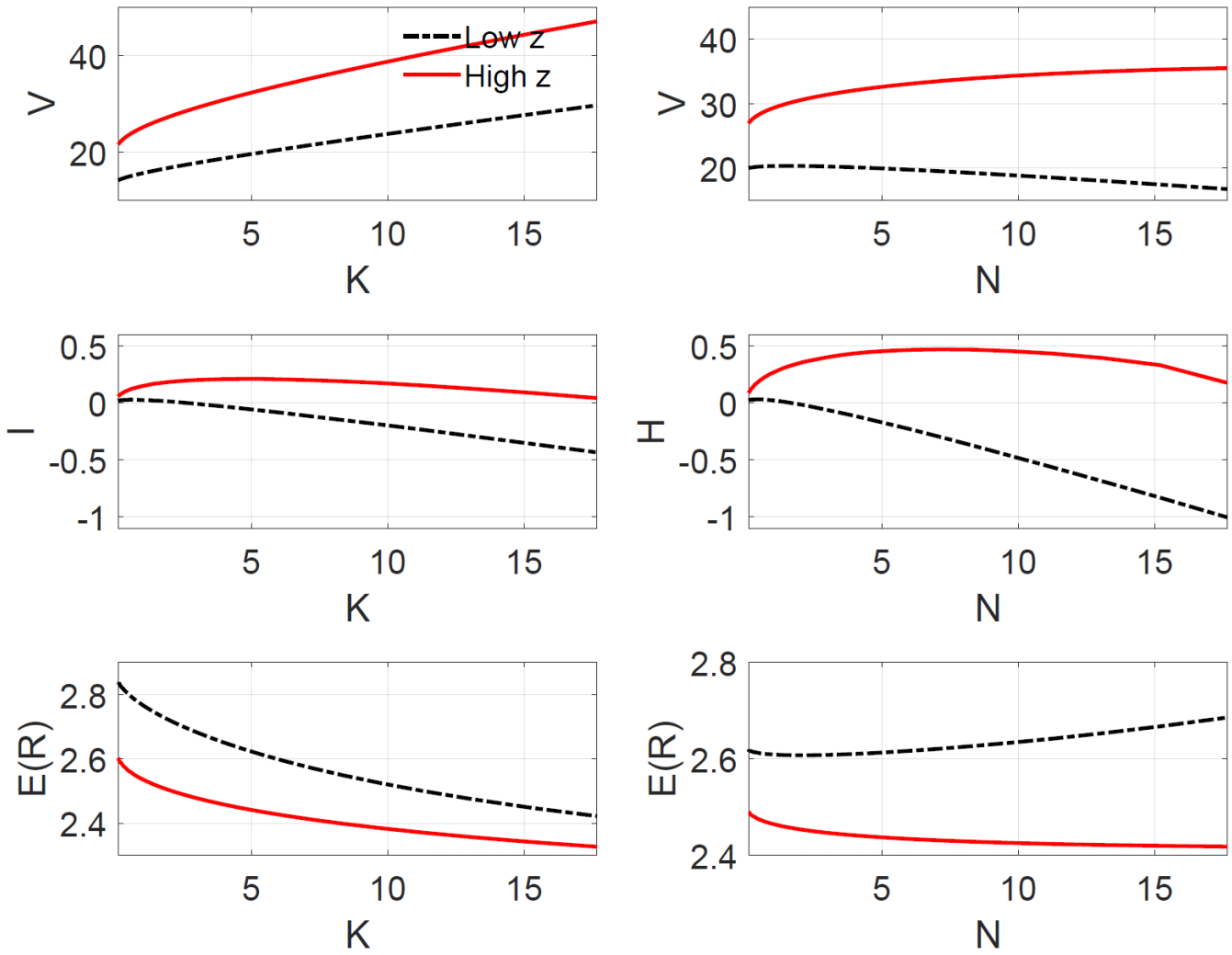
SOEs

- Subject to agency frictions
- May pursue non-commercial objectives, including overstaffing
- Tend to be more bureaucratic and risk-averse
- Potential for capital misallocation

POEs

- Emphasize cost control and leaner operations
- Rely on performance-based incentives and streamlined hiring
- More responsive to market changes and competitive pressures

Heterogeneity and valuation: Efficiency channel



SOEs are less efficient, exhibit lower valuations, and face higher risk premia

Heterogeneity and valuation: Financial frictions channel

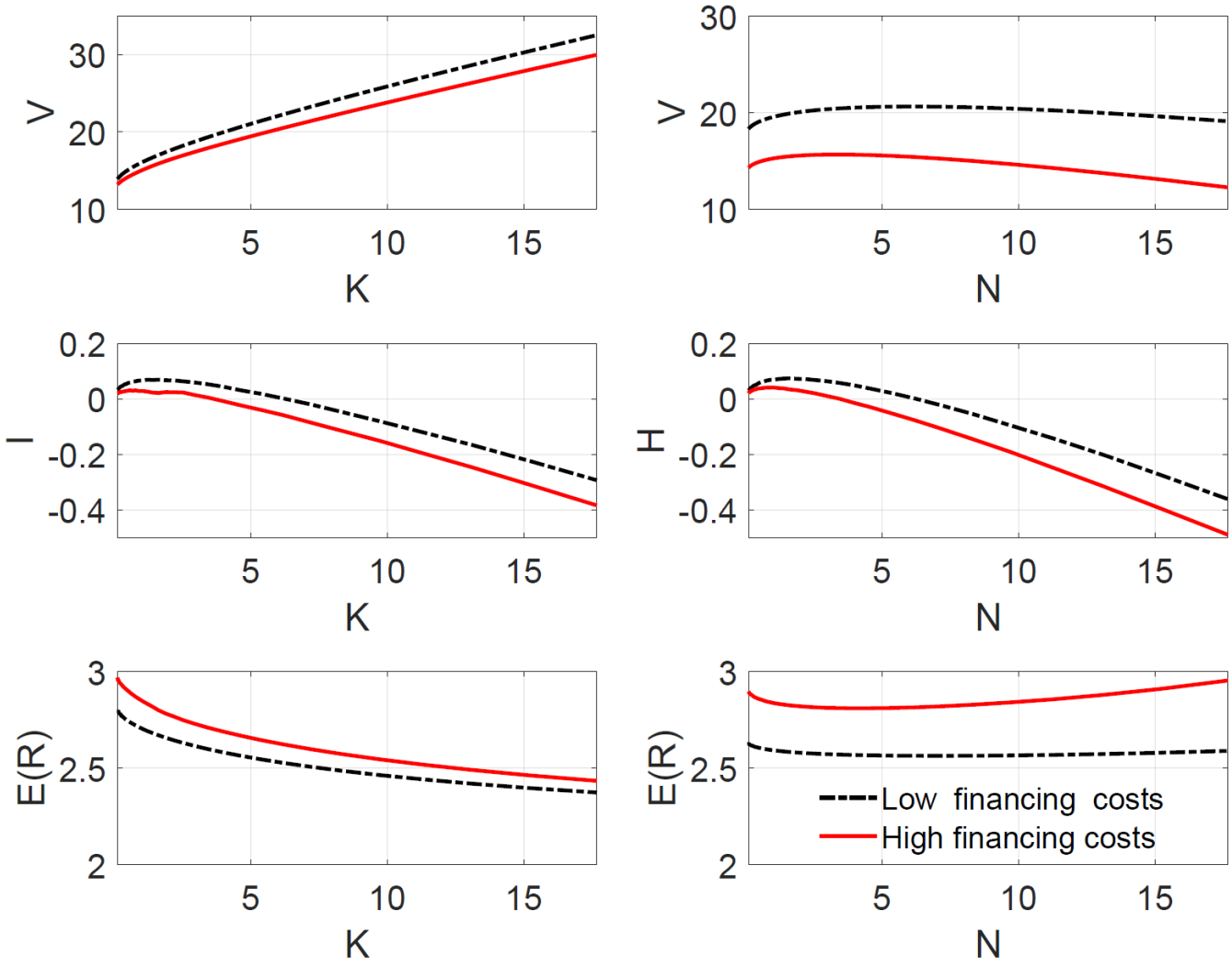
SOEs

- Access to bank loans due to implicit state guarantees and political ties
- Lower interest rates and more favorable terms
- More likely to receive regulatory approval for IPOs and bond issuance
- Often benefit from policy-driven credit allocation and bailouts

POEs

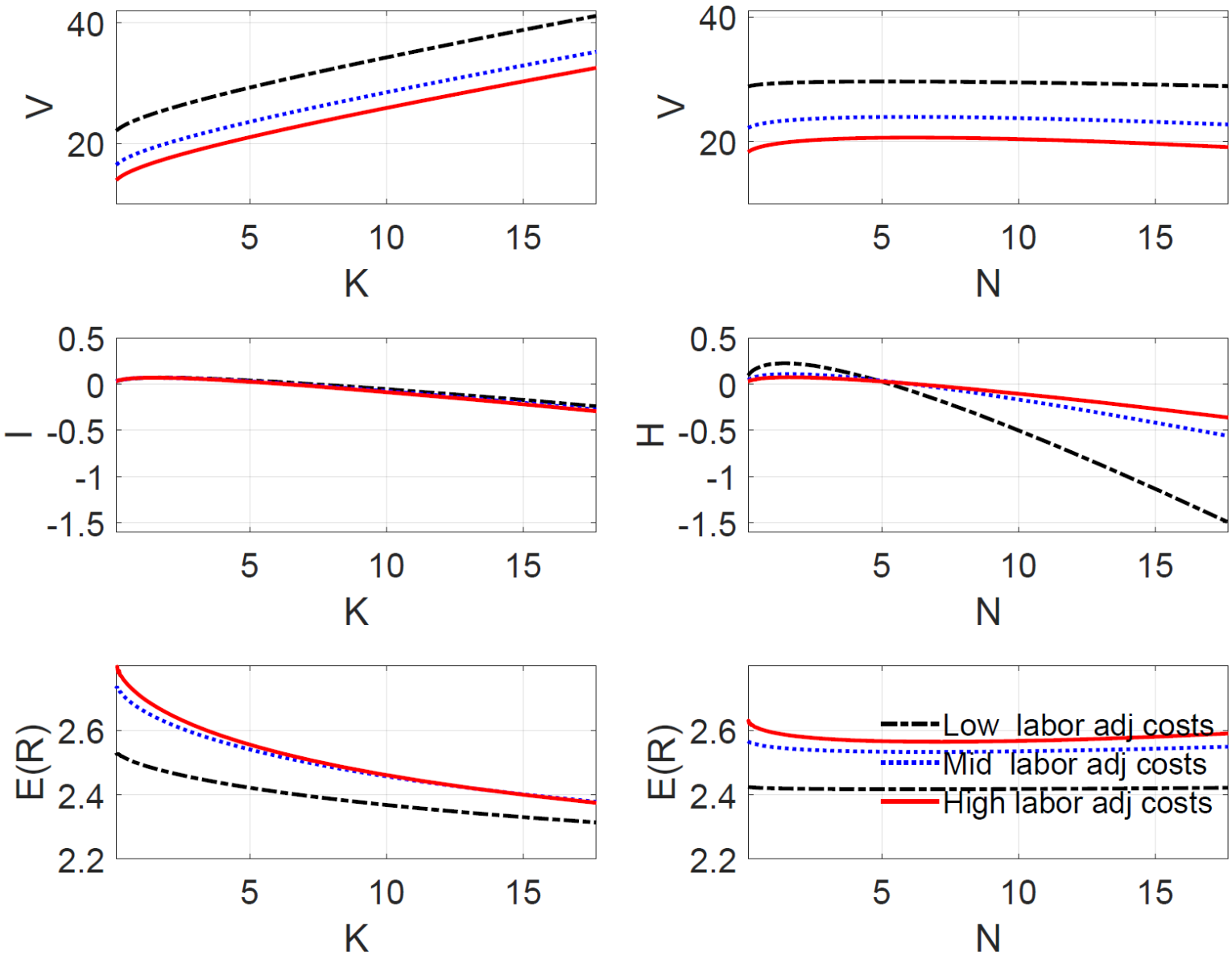
- Face discrimination and require more collateral in access loans
- Higher borrowing costs and stricter terms
- Encounter more regulatory hurdles for IPOs and bond issuance
- Less likely to receive direct or indirect government support

Heterogeneity and valuation: Financial frictions channel



SOEs have preferential access to external financing, and exhibit higher valuations and lower risk premia

Heterogeneity and valuation: Adjustment cost channel



Heterogeneity and valuation: Adjustment cost channel

- The empirical impact of adjustment costs on firm valuation is not clear-cut.
- SOEs typically face low capital adjustment costs due to state support and soft budget constraints, but high labor adjustment costs driven by political and social considerations.
- POEs, in contrast, often encounter high capital adjustment costs due to market-based constraints, but benefit from low labor adjustment costs due to greater operational flexibility.
- The net effect of these opposing forces on valuations remains ambiguous.

- Other sources of heterogeneity including entry barriers often favor SOEs, granting them preferential access to markets and limiting competition from POEs.

Major takeaways

- Heterogeneity contribute to the valuation difference between SOE and NSOE differently

	SOEs	POEs
Efficiency	−	+
Financing	+	−
Real frictions	Unclear	Unclear

- These different effects are not additive due to the model's nonlinearity.
- Heterogeneity drives both cash flow and discount rate differences between SOEs and POEs.
- Earnings, age, and idioVol relate to all heterogeneities, worth probing underlying mechanisms.

Heterogeneity and valuation: Differences in Objective Functions

SOEs often pursue non-commercial goals, while POEs focus on value maximization, leading to valuation differences.

$$V_t(\mathcal{O}) = \max_{I_t, K_{t+1}, B_{t+1}} \underbrace{w_t(\mathcal{O})}_{\text{weight on the objective}} \left[D_t(\mathcal{O}) + \mathbb{E}_t M_{t,t+1} V_{t+1}(\mathcal{O})\right] + \left(1 - w_t\left(\mathcal{O}\right)\right) [\text{Employment stability}]$$

1. SOEs' objectives can be viewed as a weighted average of shareholder value and broader goals (e.g., employment stability).
2. These objectives may empirically affect profitability.
3. As a result, interpreting valuation differences purely through the lens of traditional valuation theory may be problematic.

Conclusions

- Nice and interesting paper!
- The valuation gap between SOEs and NSOEs is an important finding
- It would be helpful to further explore the mechanisms driving this empirical result