

State Ownership and Corporate Leverage Around the World

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Motivation (1/2)

- Political economy is an important source of distortions in financial markets (Lambert, Perotti, and Rola-Janicka, 2021)
- Politically connected firms are more likely to be bailed out than similar non-connected firms (Faccio et al., 2006): should **decrease** the cost of debt for state-owned enterprises (SOEs)
- However, governments also use SOEs for political purposes, which is against creditors' interests and can therefore **increase** the cost of debt

Motivation (2/2)

- Existing literature mostly supports the argument that state ownership is associated with higher leverage:
 - ① Dewenter and Malatesta (2001) consider the **500 largest non-US firms** and show that state-owned enterprises are leveraged more, while leverage falls after privatization
 - ② Boubakri and Cosset (1998; **79 large companies**); D'Souza and Megginson (1999; **85 large companies**) and Megginson, Nash, and Van Randenborgh (1994; **61 large companies**) find that, after privatization, companies reduce their debt ratios
 - ③ Boubakri and Saffar (2019; **453 large companies**) also find a positive correlation between state ownership and leverage

Our contribution

- Quantify the link between state ownership and firm leverage...
 - ... across the firm-size distribution
 - ... in a wide range of developed and emerging economies
 - ... resulting in a panel of 4 million firms across 89 countries
- Study heterogeneity by firm size and by quality of institutions
- Consider changes in ownership (privatizations) *within the same* firms

Main results

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- 4 Relationship depends critically on the structure of the banking system: presence of foreign and state banks

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- 4 Relationship depends critically on the structure of the banking system: presence of foreign and state banks
- 5 Analysis of within-firm privatization yields very similar results as cross-firm analysis, both qualitatively and quantitatively

Main sample

Our data come from splicing various historical versions of Bureau Van Dijk's Orbis database:

- Almost 4 million firms in 89 countries between 2000 and 2019
- About 20 million firm-year observations overall
- 46,039 firms (~1%) have at least 20% government stake

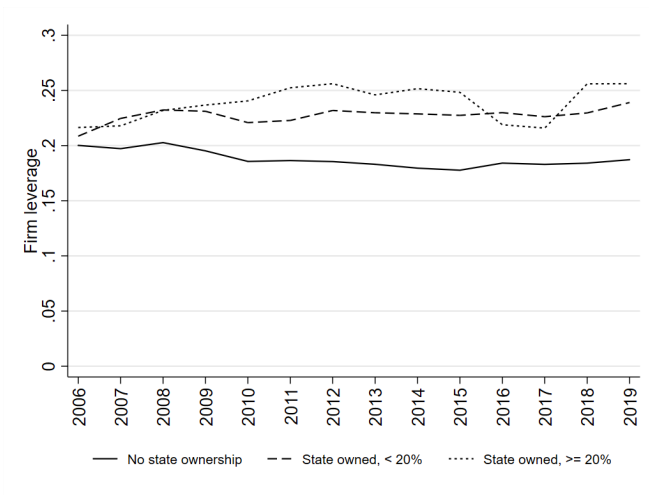
Corporate leverage and covariates

- **Leverage** = Total formal debt / Total assets
- **Firm size** = $\log(\text{Total assets})$
- **Profitability** = EBITDA / Total assets
- **Tangibility** = Tangible fixed assets / Total assets
- **Non-debt tax shield** = Depreciation & Amortization / Total assets

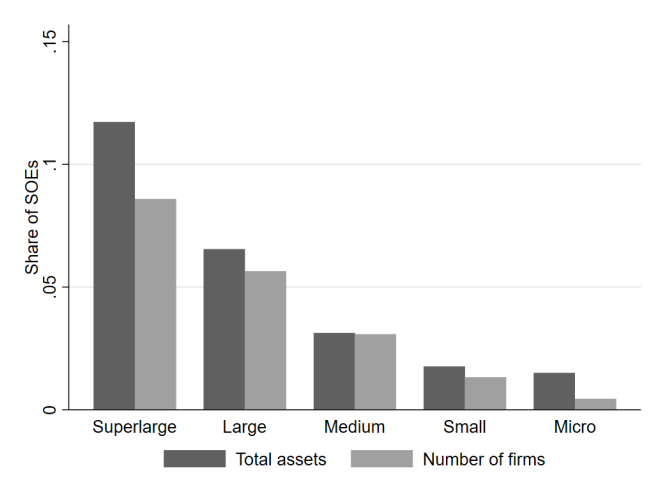
Second outcome variable:

- **Cost of debt** = Total interest expenses / Total formal debt

State ownership and firm leverage over time



Share of SOEs among all enterprises, by firm size



Industry-level data

- **External finance dependence:** industry-level share of capex not financed with cash flow from operations (Rajan and Zingales, 1998 and Duygan-Bump et al., 2015)
- **Liquidity needs:** industry-level median ratio of inventories over annual sales (Raddatz, 2006)
- **Tangibility:** industry-level median value of tangible fixed assets over total assets

Country-level data

- **Ownership of banking assets**
 - Share of domestic government-owned banks (WB BRSSs)
 - Share of foreign banks (WB GFDD)
- **National income:** log GDP per capita, PPP in constant 2017 dollars
- **Quality of governance:** Rule of law and Control of corruption (WGI)
- **Investor protection:** Resolving insolvency and Protecting minority investors (Doing Business)

Privatization sample

- Extract all privatizations in Zephyr that are acquisitions
- Privatization: “government, council or other state-owned entity disposes of a (stake in a) company that it owns”
- Acquisition: “acquirer ends up with 50 percent or more of the equity of the target”
- Our dataset includes 2,714 firms privatized during 2000–2019, incl. Russia (1,098 cases), Serbia (267), Poland (192), Ukraine (140) and Bulgaria (118)
- Focus on 946 firms with at least three years of data before and after privatization

Cross-sectional analysis

Explain leverage L or cost of debt I

$$L_{isct} = \beta_0 + \beta_1 S_{it} + \gamma' Z_{it} + \phi_{sct} + \epsilon_i$$

or

$$I_{isct} = \beta_0 + \beta_1 S_{it} + \gamma' Z_{it} + \phi_{sct} + \epsilon_i$$

i	Firm	S	State ownership measure
s	Sector	Z	Firm-level characteristics matrix
c	Country	ϕ	Country \times Industry \times Year FEs
t	Year		

Cross-country or cross-industry heterogeneity

Explain leverage L

$$L_{isct} = \beta_0 + \beta_1 S_{it} + \beta_2 S_{it} \times M_{ct} + \gamma' Z_{it} + \phi_{sct} + \epsilon_i$$

or

$$L_{isct} = \beta_0 + \beta_1 S_{it} + \beta_2 S_{it} \times M_{st} + \gamma' Z_{it} + \phi_{sct} + \epsilon_i$$

i	Firm	S	State ownership measure
s	Sector	Z	Firm-level characteristics matrix
c	Country	ϕ	Country×Industry×Year FE
t	Year	M	Country- or Industry-level measure

Panel-data analysis of privatized firms

Explain leverage L

$$L_{isct} = \beta_0 + \beta_1 PP_{it} + \gamma' Z_{it} + \psi_i + \theta_{ct} + \mu_{st} + \epsilon_i$$

i	Firm	PP	Pre-privatization dummy
s	Sector	Z	Firm-level characteristics matrix
c	Country	ϕ	Firm FE
t	Year	θ	Country \times Year FE
		μ	Industry \times Year FE

Matching estimator of ATT on privatized firms

- **Treated firm** is a firm privatized in year T
- **Control firm** is a firm that stayed state-owned throughout the observed period
- **Matching** on firm size, tangibility, operating revenue / total assets, leverage and total informal debt / total assets
- **Reference period** is mean of years $T-3$, $T-4$, and $T-5$
- **Exact matching** on country, 2-digit industry and year
- **Genetic search algorithm** by Diamond and Sekhon (2005) used to find the optimal covariate balance
- **One-to-one matching with replacement**

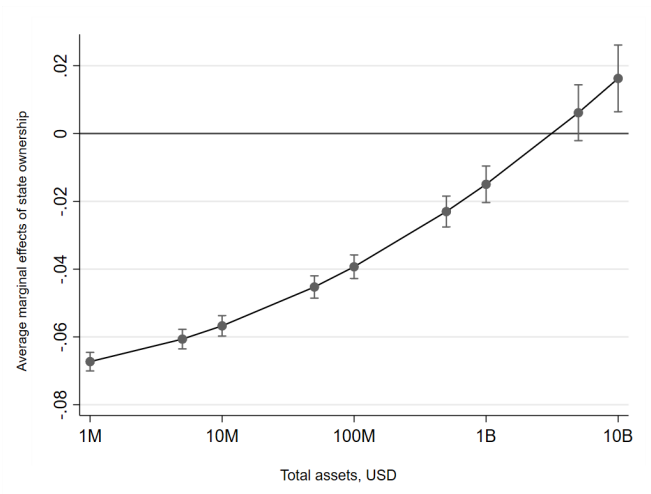
State ownership and firm leverage

	Firm leverage				
	(1)	(2)	(3)	(4)	(5)
State-owned $\geq 1\%$	-0.048*** (0.001)				
State-owned $\geq 20\%$		-0.055*** (0.001)			
State-owned $\geq 50\%$			-0.060*** (0.001)		
State-owned $\geq 99\%$				-0.064*** (0.002)	
State-owned [1%; 20%)					-0.030*** (0.001)
State-owned [20%; 50%)					-0.031*** (0.002)
State-owned [50%; 99%)					-0.047*** (0.002)
State-owned [99%; 100%]					-0.067*** (0.002)
Firm characteristics	Yes	Yes	Yes	Yes	Yes
Country \times Sector \times Year FE	Yes	Yes	Yes	Yes	Yes
R-squared	0.214	0.214	0.214	0.214	0.214
N observations	19,651,734	19,651,734	19,651,734	19,651,734	19,651,734
N firms	3,976,881	3,976,881	3,976,881	3,976,881	3,976,881
N countries	89	89	89	89	89

Firm-size heterogeneity

	Firm leverage					
	Micro (1)	Small (2)	Medium (3)	MSMEs (4)	Large (5)	Super-large (6)
State-owned \geq 20%	-0.063*** (0.002)	-0.062*** (0.003)	-0.040*** (0.003)	-0.062*** (0.001)	-0.018*** (0.003)	-0.005 (0.009)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Country \times Sector \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.220	0.201	0.227	0.213	0.286	0.380
N observations	14.0M	3.5M	1.3M	18.8M	737,270	75,625
N firms	3.1M	582,095	198,609	3.9M	96,179	8,433
N countries	61	76	85	87	89	68

Marginal effects of state ownership, by firm size



Institutional quality

	Firm leverage				
	(1)	(2)	(3)	(4)	(5)
State-owned \geq 20%	-0.521*** (0.021)	-0.074*** (0.001)	-0.071*** (0.001)	-0.139*** (0.004)	-0.113*** (0.006)
State-owned \geq 20% \times GDP per capita	0.045*** (0.002)				
State-owned \geq 20% \times Rule of law		0.023*** (0.001)			
State-owned \geq 20% \times Control of corruption			0.022*** (0.001)		
State-owned \geq 20% \times Resolving insolvency				0.120*** (0.006)	
State-owned \geq 20% \times Protecting investors					0.097*** (0.010)
Firm characteristics	Yes	Yes	Yes	Yes	Yes
Country \times Sector \times Year FE	Yes	Yes	Yes	Yes	Yes
R-squared	0.214	0.214	0.214	0.213	0.212
N observations	19.6M	19.5M	19.5M	19.2M	18.5M
N firms	4.0M	3.9M	3.9M	3.8M	3.7M
N countries	87	86	86	84	84

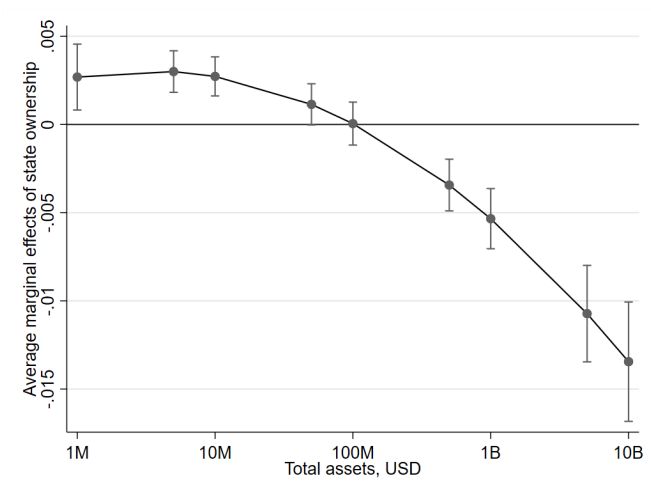
Banking sector ownership

	Firm leverage			
	All firms (1)	MSMEs (2)	Large (3)	Super-large (4)
State-owned $\geq 20\%$	-0.030*** (0.003)	-0.032*** (0.003)	-0.029*** (0.008)	0.010 (0.018)
State-owned $\geq 20\%$ \times State banks	-0.022*** (0.008)	-0.088*** (0.011)	0.049*** (0.018)	-0.030 (0.042)
State-owned $\geq 20\%$ \times Foreign banks	-0.087*** (0.004)	-0.084*** (0.005)	0.000 (0.016)	-0.015 (0.047)
Firm characteristics	Yes	Yes	Yes	Yes
Country \times Sector \times Year FE	Yes	Yes	Yes	Yes
R-squared	0.208	0.207	0.288	0.373
N observations	13.1M	12.6M	517,548	47,825
N firms	3.7M	3.6M	90,533	7,798
N countries	85	84	85	66

Cost of debt

	Cost of debt			
	All firms (1)	MSMEs (2)	Large (3)	Super-large (4)
State-owned $\geq 20\%$	0.003*** (0.000)	0.004*** (0.001)	-0.008*** (0.001)	-0.007** (0.003)
Firm characteristics	Yes	Yes	Yes	Yes
Country \times Sector \times Year FE	Yes	Yes	Yes	Yes
R-squared	0.089	0.091	0.149	0.31
N observations	9.8M	9.3M	507,440	57,541
N firms	2.4M	2.4M	79,680	7,040
N countries	89	85	89	63

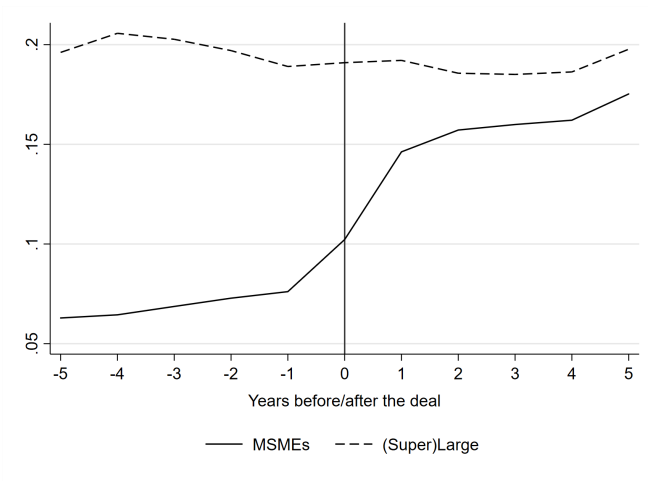
Marginal effects of state ownership on cost of debt, by firm size



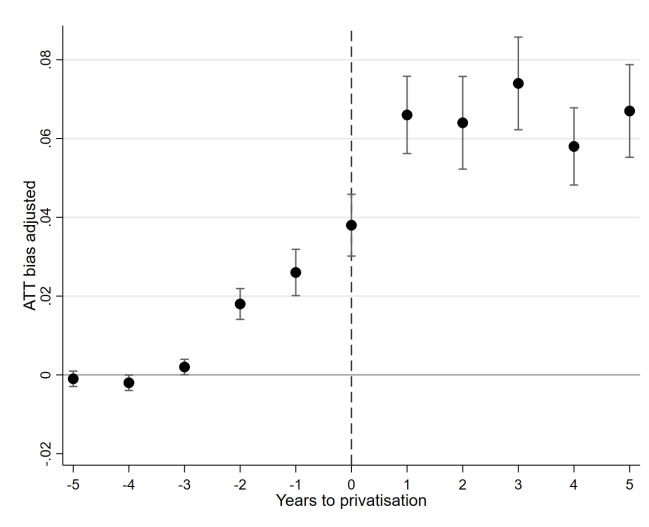
Privatization and firm leverage

	Firm leverage		
	All firms (1)	MSMEs (2)	(Super)Large (3)
Pre-privatization	-0.050*** (0.010)	-0.061*** (0.011)	-0.006 (0.025)
Firm characteristics	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes
Sector × Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Within R-squared	0.042	0.043	0.010
N observations	7,911	6,129	1,286
N firms	920	727	164
N countries	29	22	21

Firm leverage before and after privatization



Privatization and firm leverage: Event study



Conclusions (1/3)

- *Heterogeneous* relationship between state ownership and leverage across firm size
- No robust impact of state ownership on leverage for large firms, but strong *negative* effect on MSMEs
- Overall, state-owned firms have 5pp *lower* debt to assets ratio than private peers (while average leverage is 18.6%)
- State ownership *increases* costs of debt for smaller state firms, *reduces* it for large and super-large SOEs
- Privatization allows firms to *increase* leverage by 5pp and level up with private peers. The effect is driven by MSMEs

Conclusions (2/3)

- Strong negative relationship between state ownership and corporate leverage likely reflects corporate governance risks of state ownership
- Creditors may fear the state's intervention in firms' operations, and they may therefore be less willing to lend to such firms
- Negative effects of state ownership on leverage are much stronger in countries with weaker political and legal institutions

Conclusions (3/3)

- Recent literature underlines substantial misallocation of capital and labor across firms (cf. Hopenhayn, 2014)
- Our results highlight one mechanism through which state ownership can introduce distortions and resource misallocation: it interferes with the ability of all but the largest firms to access credit