

# The Financial Premium and Real Cost of Bureaucrats in Businesses

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## Motivation

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  - Increasing and large State footprint in local and global markets (WB, 2023, Agarwal et al., 2019)
  - EMDE's limited fiscal space and debt distress. Need reforms to rebuild fiscal buffers (WB and IMF, 2023)
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- Contentious but (mis)informed debate ▶ Quotes
  - Evidence is, mainly, China-centric (Dollar and Wei, 2007; Hsieh and Klenow, 2009; Whited and Zhao, 2021)
  - Lack of broader characterization to shed light on differences across countries, sectors, and overtime for evidence-based policymaking
  - Measurement concerns: (i) evidence focuses on factor markets, (ii) intentional misreporting due to rent-seeking behavior and/or political patronage (OECD 2020), (iii) indivisibilities in the use of public capital and free-riding problems across State firms/agencies (Lefebvre et al., 2018)

## What do we do?

- Explore the distortionary effect of State-ownership on (mis)allocation and TFP using a mirror approach.
  - Theory: build on the Whited and Zhao (2021) model, that is the financial mirror of Hsieh and Klenow (2009) framework
  - Data: create a new firm-level dynamic database that provides a full characterization of the ownership structure of a firm, based on Orbis, Vintage Ownership Disks, for 24 European countries during the period 2010-2016 (Cusolito and Vranic, 2020)
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  - Empirics: estimate the effect of State-ownership distortions on the average cost of production through the financial channel
- Policy counterfactual analysis to quantify the productivity (output) gains from SOE-related structural reforms: (i) shut down SOEs, (ii) targeted approach, (iii) targeted approach coupled with fixing markets before reallocating resources.

## Main findings

- On average, SOEs get subsidized access to financial resources. A 1 p.p increase in government direct shareholding reduces the average cost of production through the financial channel (e.g., debt and equity) by 0.02 percent, with no differences between publicly listed (PL) and non-PL SOEs. [▶ Table](#)

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- Largest State-ownership subsidy in sectors that are the greatest facilitators of the economy like financial services (0.37%), agriculture (0.09%), electricity (0.07%), water (0.06%), transport (0.05%). [▶ Figure](#)



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- Policy counterfactuals
  - Scenario #1: elimination of SOEs coupled with reallocation of finance towards the private sector subject to financial frictions lead to moderate gains in some economies and moderate losses in many others (-22.2%, 11%) [▶ TFP gains #1](#)
  - Scenario #2: a targeted approach that eliminates underperforming SOEs lead to a moderate increase in aggregate productivity for all countries, except Norway (0%, 7.4%) [▶ TFP gains #2](#)
  - Scenario #3: complementary structural reforms (target SOEs and eliminate heterogeneity of distortions) maximize aggregate productivity gains (19.1%, 83.7%) [▶ TFP gains #3](#)

- Financial distortions as drivers of real misallocation
  - Cusolito et.al. (2022), Whited and Zhao (2021), Gopinath et al., (2017), Buera and Moll (2015), Midrigan and Xu (2014), Moll (2014), Buera et al., (2011), Mendoza (2010), Banerjee and Duflo (2005)
- State-ownership as drivers of financial distortions
  - Fang et. al., (2022), Brandt et al., (2021), Jurzyk and Ruane (2021), Bai et. al., (2018), Wei et. al., (2016), Song et. al. (2011), Hsieh and Klenow (2009)
- Our work: SOEs as drivers of real misallocation through the financial channel for a large sample of EMDEs in Europe, while most of the literature is China-centric

- Hsieh and Klenow (2009): real (mis)allocation from factors to output

$$Y_i = A_i K_i^\alpha L_i^\theta$$

- Whited-Zhao (2021): real (mis)allocation from finance to factors to output

*Finance (D, E) → Factors (L, K) → Output*

$$Y_i = A_i \left[ \alpha D_i^{\frac{\gamma-1}{\gamma}} + (1-\alpha) E_i^{\frac{\gamma-1}{\gamma}} \right]^{\frac{\gamma}{\gamma-1}}$$

- $\gamma$ : deviation from Modigliani-Miller

- Given prices of debt and equity, cost minimization requires:

$$\min_{D_i, E_i} \{ (1 + \tau_{D_i}) r D_i + (1 + \tau_{E_i}) \lambda E_i \}$$

s. t.

$$A_i \left[ \alpha D_i^{\frac{\gamma-1}{\gamma}} + (1 - \alpha) E_i^{\frac{\gamma-1}{\gamma}} \right]^{\frac{\gamma}{\gamma-1}} = \bar{Y}_i$$

- Equalization of debt/equity ratios unless there are distortions

$$\frac{D_i}{E_i} = \left[ \frac{\alpha (1 + \tau_{E_i}) \lambda}{1 - \alpha (1 + \tau_{D_i}) r} \right]^{\gamma}$$

- KEY: data on debt and equity holding to back out distortions

► FOCS-finance

- We work with Orbis firm-level financial and ownership files to construct an unbalanced panel with information for 24 European countries during the period 2010-2016. [▶ Countries](#)

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- Orbis ownership module: we build on to clean vintage/links files and create ownership trees (Cusolito and Vranic, 2020). Appendix A of the paper has a detailed routine.
- SOE: percentage of direct shares owned by all the public authorities that govern the country in which the firm operates.
  - Method: (i) identify PAs in Entity files using S category, (ii) merge Links and Entity files using shareholder BvD ID, (iii) differentiate domestic and foreign PAs by comparing country code of PAs with that of firm, (iv) add all the direct shares belonging to the same PA. We eliminate branches and institutional investors as shareholders (e.g., IMF, EBRD, etc.). [▶ Ownership tree](#)

## Summary statistics

### Summary statistics - ownership variables

Variables	2010	2011	2012	2013	2014	2015	2016	Average
Proportion of SOE Firms	1.9%	1.9%	0.9%	1.0%	1.1%	1.9%	2.0%	1.5%
Average Govt. Shareholdings	72.5%	71.7%	72.8%	75.0%	76.9%	78.4%	80.3%	75.4%
Total Number of Firms	611,289	799,699	807,411	898,277	920,795	973,742	887,367	824,654
Total Number of SOEs	4,907	5,625	3,519	4,718	4,871	6,852	6,249	5,249

► Variation in State Ownership

### Summary statistics - financial variables: SOEs vs. POEs

Variable	State-Owned Enterprise	Private-Owned Enterprise	p-value (t-test)
Debt	14.141	12.877	0.00000
Cost of Debt	0.653	0.644	0.00003
Equity	14.215	12.232	0.00000
Cost of Equity	0.513	0.585	0.00000
Number of Observations	36,741	5,861,839	5,898,580



## Empirical strategy: identification concerns

- Main concern: identifying state-ownership distortions.

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- Main concern: identifying state-ownership distortions.
- WHY? Restrictive theoretical underpinnings of the HK (WZ) framework left researchers uncertain as to what distortions capture.
  - Elasticity of prices to technological improvements is  $-1$  and constant markups.
    - Firm-level evidence for the U.S suggests that industry-level elasticities are generally substantially less than 1, and overall, closer to 0.5 or 0.6 (Haltiwanger, Kulick, and Syverson 2018).
    - Evidence for Argentina (Chen and Juvenal 2016), Chile (Cusolito, García-Marín, and Maloney 2017), Colombia (Eslava and Haltiwanger 2017), India (De Loecker et al. 2016), and Slovenia (De Loecker and Warzynski 2012) show imperfect pass-through.
  - Relaxation of restrictive assumptions implies that distortions may confound differences (across firms) in
    - technology (Kasahara, Nishida, and Suzuki, 2017)
    - markups (David and Venkateswaran, 2019)
    - quality (Krishna, Levchenko, and Maloney, 2018)
    - adjustment costs (Asker, Collard-Wexler, and De Loecker, 2014)
    - risk and uncertainty (Doraszelski and Jaumandreu, 2013)
    - alternatively, mismeasurement (Bils, Klenow, Ruane 2021)

## Empirical strategy: core specification

$$\begin{aligned} \ln(\text{Cost of Cap}_{isct}) = & \alpha + \beta \text{State Ownership}_{isct-1} + \gamma \text{Publicly Listed}_{isct-1} \times \text{State Ownership}_{isct-1} \\ & + \kappa X[\text{Size}_{t-1}, \text{Age}_t, \text{TFPQ}_{t-1}]_{isct,t-1} + \lambda_c + \lambda_{st} + \lambda_i + u_{isct}. \end{aligned} \quad (1)$$

Table 3: main result

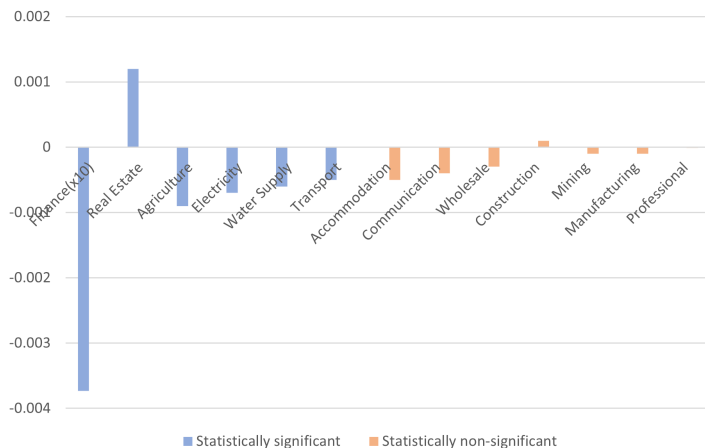
## Financial Premium (Tax) of Bureaucrats in Business

	(1)	(2)	(3)	(4)	(5)	(6)
	(OLS)	(OLS)	(OLS)	(OLS)	(OLS)	(IV)
State Ownership	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.0002*** (0.0001)	-0.0008*** (0.0000)	-0.0002*** (0.0001)
Publicly Listed=1 X State Ownership		-0.0006 (0.0006)	-0.0006 (0.0006)	-0.0004 (0.0006)	-0.0009** (0.0004)	0.0002 (0.0007)
Age			-0.0345*** (0.0090)	-0.0559*** (0.0099)	0.0134*** (0.0034)	-0.0181* (0.0094)
Log(Total Assets)				-0.3301*** (0.0009)	-0.5425*** (0.0003)	-0.1623*** (0.0011)
Log(TFPQ)					0.4055*** (0.0001)	0.0666*** (0.0004)
Observations	5898580	5898580	5898580	5898580	5898580	4090426
Country fixed effects	Y	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y	Y
Industry-time fixed effects	Y	Y	Y	Y	Y	Y

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

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## Heterogeneous effects across sectors



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## Policy counterfactuals

- We study counterfactual policy scenarios to measure the effects that state ownership and market distortions have on aggregate productivity.
- To measure these effects, we quantify TFP gains between a counterfactual policy scenario economy,  $\tilde{Y}$ , and the economy implied by the data (with distortions),  $Y$ :

$$\text{TFP Gains relative to } Y = \left( \frac{\tilde{Y}}{Y} - 1 \right) \times 100$$

$$\tilde{D}_{si} = \frac{A_{si}^{\sigma-1}}{\sum_{i \notin X_s} A_{sj}^{\sigma-1}} \times D_s, \quad (2)$$

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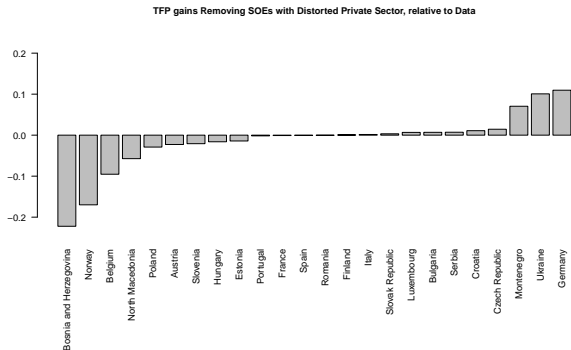
- We assume that the sectoral levels of  $D$  and  $E$  do not change.
- Intuitively, resources are reallocated towards the most productive firms.

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# TFP gains: no SOEs and distorted markets

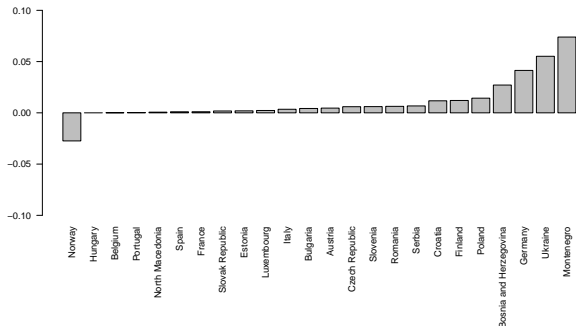


Note: *TFP* gains from removing SOEs from the economy, while preserving financial frictions in credit markets.

▶ TFPQ SOEs vs POEs

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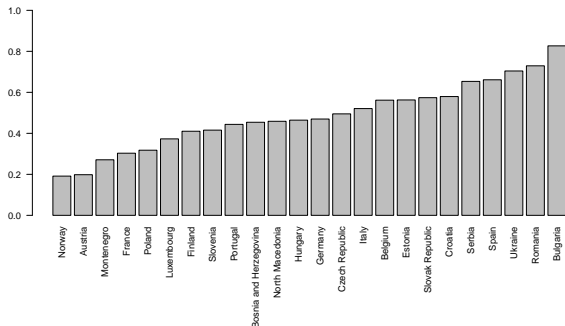
## TFP gains: targeted SOEs and distorted markets



Note: *TFP* gains from a targeted removal of the SOEs with debt and equity levels below the median level among private sector enterprises in the same industry and country. The *TFP* gains in the counterfactual economy are measured relative to the distorted allocation we observe in the data, with both SOEs and financial frictions. The numbers reported in the histogram correspond to the average for each country across all years in our sample.

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## TFP gains: targeted SOEs and undistorted markets



Note: *TFP* gains from a targeted removal of SOEs with debt and equity levels below the median among private sector enterprises in the same industry and country. The *TFP* gains in the counterfactual economy are measured relative to another hypothetical economy with all SOEs and no distortions in financial markets. The numbers reported in the histogram correspond to the average for each country across all years in our sample

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- *Policy#3*-hard vs. soft interventions. Small estimated coefficients may suggest the relevance of the extensive margin, but the changes in the intensive margin may be more prominent if SOEs are highly indebted



- *"This bossy business interventionism (BBI) is well intentioned. But, ultimately, it is a mistake."*—The Economist, 2022 edition.
- *"The Entrepreneurial State Must Lead on Climate Change"* M.Mazzucatto, Project Syndicate, 2022

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## Countries in Sample

Austria	France	Poland
Belgium	Germany	Portugal
Bosnia	Hungary	Romania
Bulgaria	Italy	Serbia
Croatia	Luxembourg	Slovakia
Czech Republic	Montenegro	Slovenia
Estonia	North Macedonia	Spain
Finland	Norway	Ukraine

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## Constructing Financial Liabilities in Orbis

- Debt:

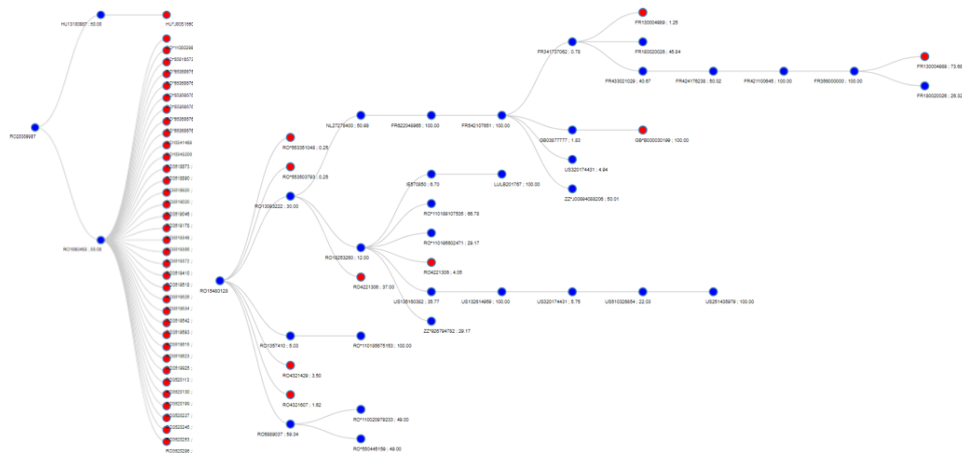
$$\text{Debt}_{isct} = \text{Creditors}_{isct} + \text{Loans}_{isct} + \text{Other Current Liabilities}_{isct} \\ + \text{Long Term Debt}_{isct} + \text{Other Non-current Liabilities}_{isct}$$

- Equity:

$$\text{Equity}_{isct} = \text{Shareholders' Capital}_{isct} + \text{Other Shareholders' Funds}_{isct}$$

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# Examples of Ownership Trees



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## Variation in State Ownership

### Summary Statistics - Variation in State Ownership

Period	Extensive Margin				Intensive Margin				
	POEs → SOEs	POEs → SOEs (as a % of total POEs)	SOEs → POEs	SOEs → POEs (as a % of total SOEs)	Share of SOEs with Change in State Ownership %	% of SOEs with Positive Change relative to all SOEs with change	Average Positive Change in State Ownership %	% of SOEs with Negative Change relative to all SOEs with change	Average Negative Change in State Ownership %
2010 - 2011	685	0.1%	924	18.5%	6.4%	59.2%	6.2%	40.8%	-12.5%
2011 - 2012	732	0.1%	877	14.8%	4.3%	62.7%	9.9%	37.3%	-14.2%
2012 - 2013	1,337	0.2%	505	13.4%	6.8%	54.8%	13.3%	45.2%	-10.4%
2013 - 2014	494	0.1%	446	9.0%	6.2%	41.8%	12.7%	58.2%	-11.2%
2014 - 2015	1,988	0.2%	442	8.8%	6.7%	33.8%	13.4%	66.2%	-7.8%
2015 - 2016	448	0.1%	791	11.2%	5.4%	65.8%	6.7%	34.2%	-18.5%

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## Tabla 3. Main Result

	State Ownership and Subsidized Access to L and K				
	1	2	3	4	5
State Ownership	-0.0002*** (0.0001)	-0.0002*** (0.0001)	-0.0002*** (0.0001)	-0.0002*** (0.0001)	-0.0005*** (0.0000)
Publicly Listed x State Ownership		-0.0003 (0.0006)	-0.0003 (0.0006)	-0.0003 (0.0006)	-0.0006 (0.0004)
Age			-0.0171 (0.0129)	-0.0189 (0.0129)	0.0417*** (0.0098)
Log(Total Assets)				-0.0194*** (0.0010)	-0.3402*** (0.0007)
Log(TFPQ)					0.3972*** (0.0003)
Observations	4716712	4716712	4716712	4716712	4716712
Country fixed effects	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y
Industry-time fixed effects	Y	Y	Y	Y	Y

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

► Finance paper: Main Results

# Tabla 4. Heterogeneous Effects across Sectors

## State Ownership and Subsidized Access to L and K: Sectoral Analysis

	Agriculture	Mining	Manufacturing	Electricity	Water Supply	Construction	Wholesale	Transport
State Ownership	-0.0029*** (0.0002)	-0.0016*** (0.0006)	-0.0029*** (0.0002)	-0.0014*** (0.0001)	-0.0024*** (0.0001)	-0.0049*** (0.0002)	0.0011*** (0.0002)	-0.0013*** (0.0001)
Publicly Listed x State Ownership	0.0083* (0.0044)	0.0038 (0.0043)	-0.0006 (0.0007)	-0.0010 (0.0013)	-0.0018** (0.0008)	-0.0011 (0.0013)	0.0027 (0.0026)	0.0011 (0.0021)
Age	-0.0090*** (0.0002)	-0.0110*** (0.0007)	-0.0059*** (0.0001)	-0.0036*** (0.0009)	-0.0074*** (0.0004)	-0.0063*** (0.0001)	-0.0096*** (0.0001)	-0.0069*** (0.0002)
Log(Total Assets)	-0.4018*** (0.0014)	-0.3034*** (0.0053)	-0.2886*** (0.0006)	-0.3955*** (0.0055)	-0.3329*** (0.0026)	-0.2858*** (0.0009)	-0.3233*** (0.0005)	-0.3903*** (0.0013)
Log(TFPQ)	0.3788*** (0.0009)	0.3078*** (0.0036)	0.2835*** (0.0005)	0.3449*** (0.0042)	0.3164*** (0.0020)	0.3277*** (0.0006)	0.3365*** (0.0004)	0.3722*** (0.0008)
Observations	147411	12759	973721	15152	41554	641422	1416160	255589
Country fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Industry-time fixed effects	Y	Y	Y	Y	Y	Y	Y	Y

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

# Tabla 4. Heterogeneous Effects across Sectors (Con't)

## State Ownership and Subsidized Access to L and K: Sectoral Analysis (Con't)

	Accommodation	Communication	Finance	Real Estate	Professional
State Ownership	-0.0027*** (0.0002)	-0.0027*** (0.0002)	-0.0057*** (0.0014)	-0.0012*** (0.0002)	-0.0018*** (0.0001)
Publicly Listed x State Ownership	0.0006 (0.0020)	0.0092*** (0.0027)	0.0000 (.)	-0.0039 (0.0028)	-0.0014 (0.0010)
Age	-0.0045*** (0.0001)	-0.0088*** (0.0002)	-0.0056 (0.0044)	-0.0049*** (0.0003)	-0.0084*** (0.0002)
Log(Total Assets)	-0.3350*** (0.0008)	-0.2974*** (0.0017)	-0.3301*** (0.0230)	-0.4310*** (0.0013)	-0.3113*** (0.0010)
Log(TFPQ)	0.3092*** (0.0007)	0.2837*** (0.0013)	0.4028*** (0.0091)	0.3906*** (0.0010)	0.3336*** (0.0007)
Observations	282043	180477	1010	93380	361981
Country fixed effects	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y
Industry-time fixed effects	Y	Y	Y	Y	Y

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

► Finance paper: Heterog Effects



## Tabla 5 paper. Heterogeneous Effects across Countries and Development Path

### Real Distortions and Development

	State-ownership subsidy
GDP per Capita	-0.323*** (0.082)
Constant	3.612*** (0.843)
Observations	24
$R^2$	0.416
Av. State-ownership effect	-0.281

► Finance paper: Development Path

▶ DEratio

$$\{D_{si}\} : \frac{\sigma - 1}{\sigma} \alpha_s \cdot \frac{P_{si} Y_{si}}{\left( \alpha_s D_{si}^{\frac{\gamma_s - 1}{\gamma_s}} + (1 - \alpha_s) E_{si}^{\frac{\gamma_s - 1}{\gamma_s}} \right) D_{si}^{\frac{1}{\gamma_s}}} = (1 + \tau_{Dsi}) R, \quad (4)$$

$$\{E_{si}\} : \frac{\sigma - 1}{\sigma} (1 - \alpha_s) \cdot \frac{P_{si} Y_{si}}{\left( \alpha_s D_{si}^{\frac{\gamma_s - 1}{\gamma_s}} + (1 - \alpha_s) E_{si}^{\frac{\gamma_s - 1}{\gamma_s}} \right) E_{si}^{\frac{1}{\gamma_s}}} = (1 + \tau_{Esi}) \lambda. \quad (5)$$

# Optimal Allocation of Financial Resources: Distortions vs. No Distortions

- Firms' optimal debt,  $D_i$  and equity,  $E_i$ , under financial distortions (economy implied by the data):

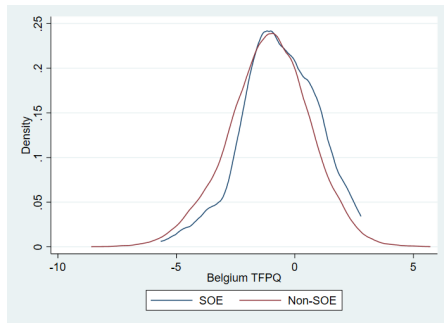
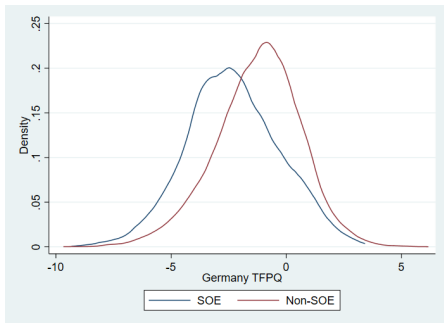
$$D_i = \frac{\frac{P_i(A_i, \tau D_i, \tau E_i)^{1-\sigma}}{\left[ \alpha_s + (1-\alpha_s) Z_i^{-\frac{\gamma_s-1}{\gamma_s}} \right] (1+\tau D_i)}}{\sum_{j=1}^{M_s} \frac{\rho_j^{1-\sigma}}{\left[ \alpha_s + (1-\alpha_s) Z_j^{-\frac{\gamma_s-1}{\gamma_s}} \right] (1+\tau D_j)}} \times \bar{D}_s, \quad E_i = \frac{\frac{P_i(A_i, \tau D_i, \tau E_i)^{1-\sigma}}{\left[ \alpha_s Z_i^{\frac{\gamma_s-1}{\gamma_s}} + (1-\alpha_s) \right] (1+\tau E_i)}}{\sum_{j=1}^{M_s} \frac{\rho_j^{1-\sigma}}{\left[ \alpha_s Z_j^{\frac{\gamma_s-1}{\gamma_s}} + (1-\alpha_s) \right] (1+\tau E_j)}} \bar{E}_s$$

- Firms' optimal debt,  $\hat{D}_i$ , and equity,  $\hat{E}_i$  under no financial distortions (efficient economy):

$$\hat{D}_i = \frac{A_i^{\sigma-1}}{\sum_{j=1}^{M_s} A_j^{\sigma-1}} \times \bar{D}_s, \quad \hat{E}_i = \frac{A_i^{\sigma-1}}{\sum_{j=1}^{M_s} A_j^{\sigma-1}} \times \bar{E}_s.$$

▶ Back

## Distribution of *TFPQ*: SOE vs POEs



▶ Back

## Aggregation and TFP Gains

- Firm, sector, and aggregate output under financial distortions:

$$Y_i = A_i \left( \alpha_s D_i^{\frac{\gamma_s-1}{\gamma_s}} + (1 - \alpha_s) E_i^{\frac{\gamma_s-1}{\gamma_s}} \right)^{\frac{\gamma_s}{\gamma_s-1}}$$

$$Y_s = \left( \sum_{i=1}^{M_s} Y_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$$

$$Y = \prod_{s=1}^S Y_s^\theta$$

- Analogous expressions for firm,  $\hat{Y}_i$ , sector,  $\hat{Y}_s$ , and aggregate output,  $\hat{Y}$ , under no financial distortions.
- TFP gains between economy without distortions,  $\hat{Y}$ , and economy with distortions,  $Y$ :

$$\text{TFP Gains} = \left( \frac{\hat{Y}}{Y} - 1 \right) \times 100$$

## Key Takeaways - Counterfactual Interventions

- Eliminating SOEs and reallocating resources towards POEs subject to market frictions lead to moderate gains in some economies and moderate losses in many others.
- Two confounding forces at play drive losses: 1) severity of market distortions and 2) productive SOEs are eliminated from the market. [▶ Back](#)

## Key Takeaways - Counterfactual Interventions

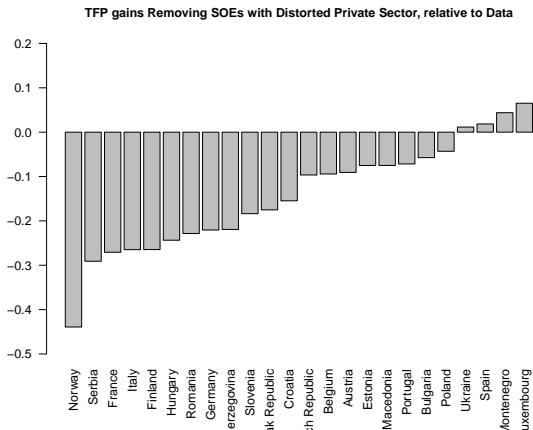
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  - However, if distortions of surviving firms are severe enough, productivity may decline after the targeted intervention as reallocation occurs in a distorted fashion. [▶ Back](#)

## Key Takeaways - Counterfactual Interventions

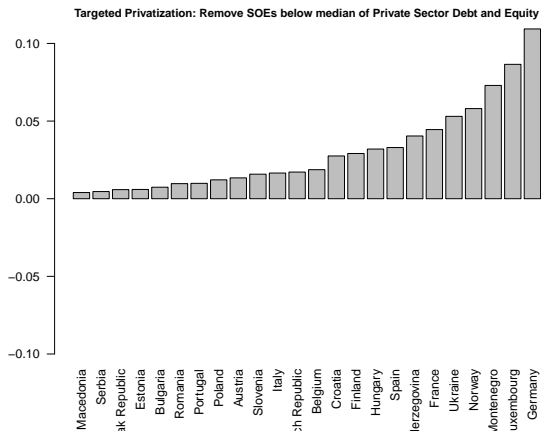
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- A targeted intervention at under-performing SOEs results in positive TFP gains for more countries, even under the presence of market frictions.
  - However, if distortions of surviving firms are severe enough, productivity may decline after the targeted intervention as reallocation occurs in a distorted fashion.
- A targeted intervention at under-performing SOEs, preceded by a reform that eliminates market distortions, leads to TFP gains in every country.
  - TFP gains from reducing misallocation in financial and real markets range from 19-81 and 14-100 percent, respectively.



# TFP gains: No SOEs, Distorted Input Factor Markets



# TFP gains: Targeted SOE Intervention in Distorted Input Factor Markets



# TFP gains: Targeted SOE Intervention in Undistorted Input Factor Markets

Targeted Privatization: Remove SOEs below median of Private Sector Debt and Equity

