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

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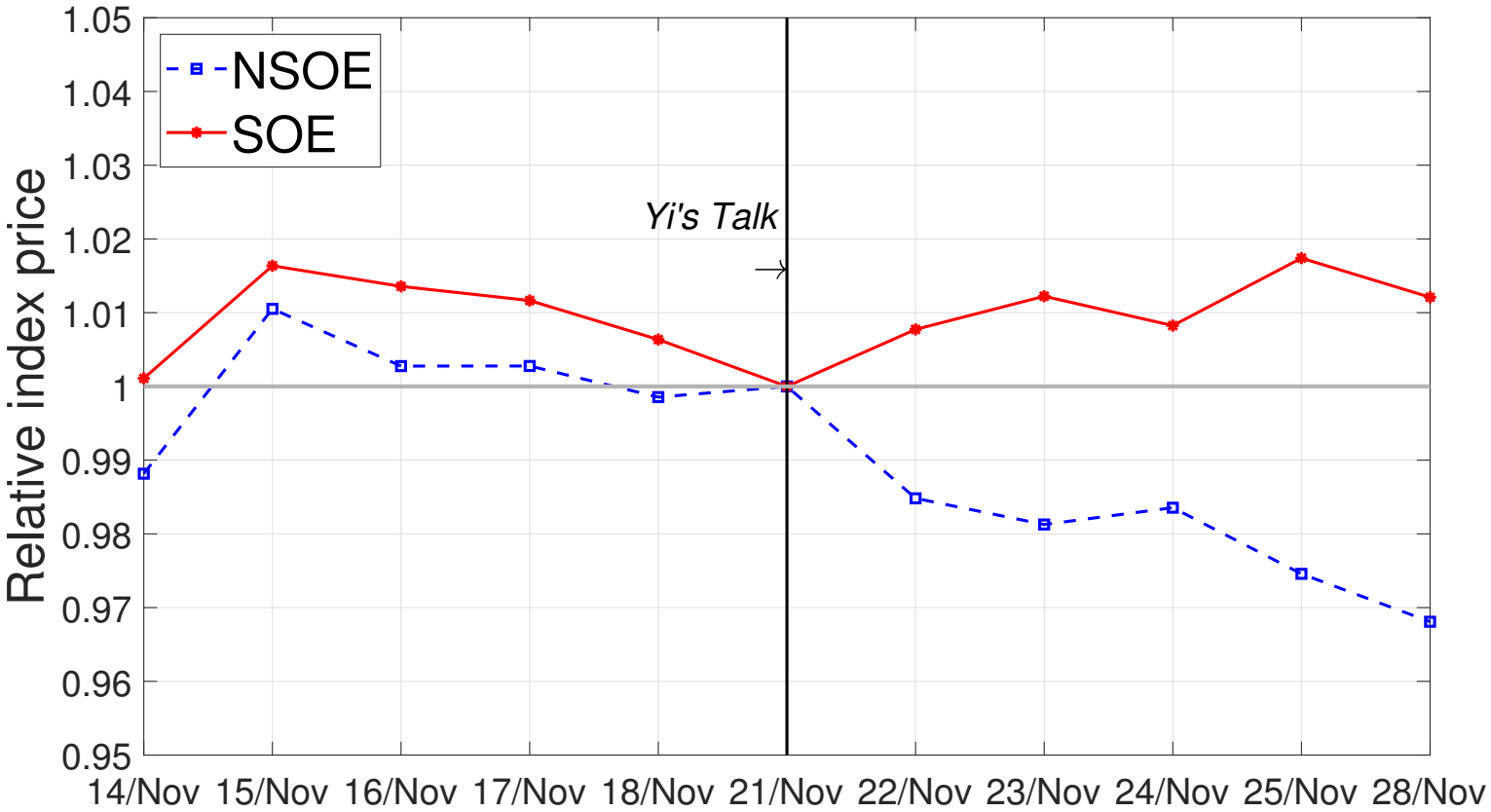
Motivation: "Chinese-style valuation system?"

*... build a **valuation system with Chinese characteristics** so that the market plays a better role in resource allocation.*

Huiman Yi, Chairman of the CSRC (2019.1—2024.2)
Financial Street Forum Annual Conference, Nov 21, 2022

Motivation: Market response to Yi's talk



Are SOEs undervalued compared to NSOEs?

Motivation: "How are SOEs valued?"

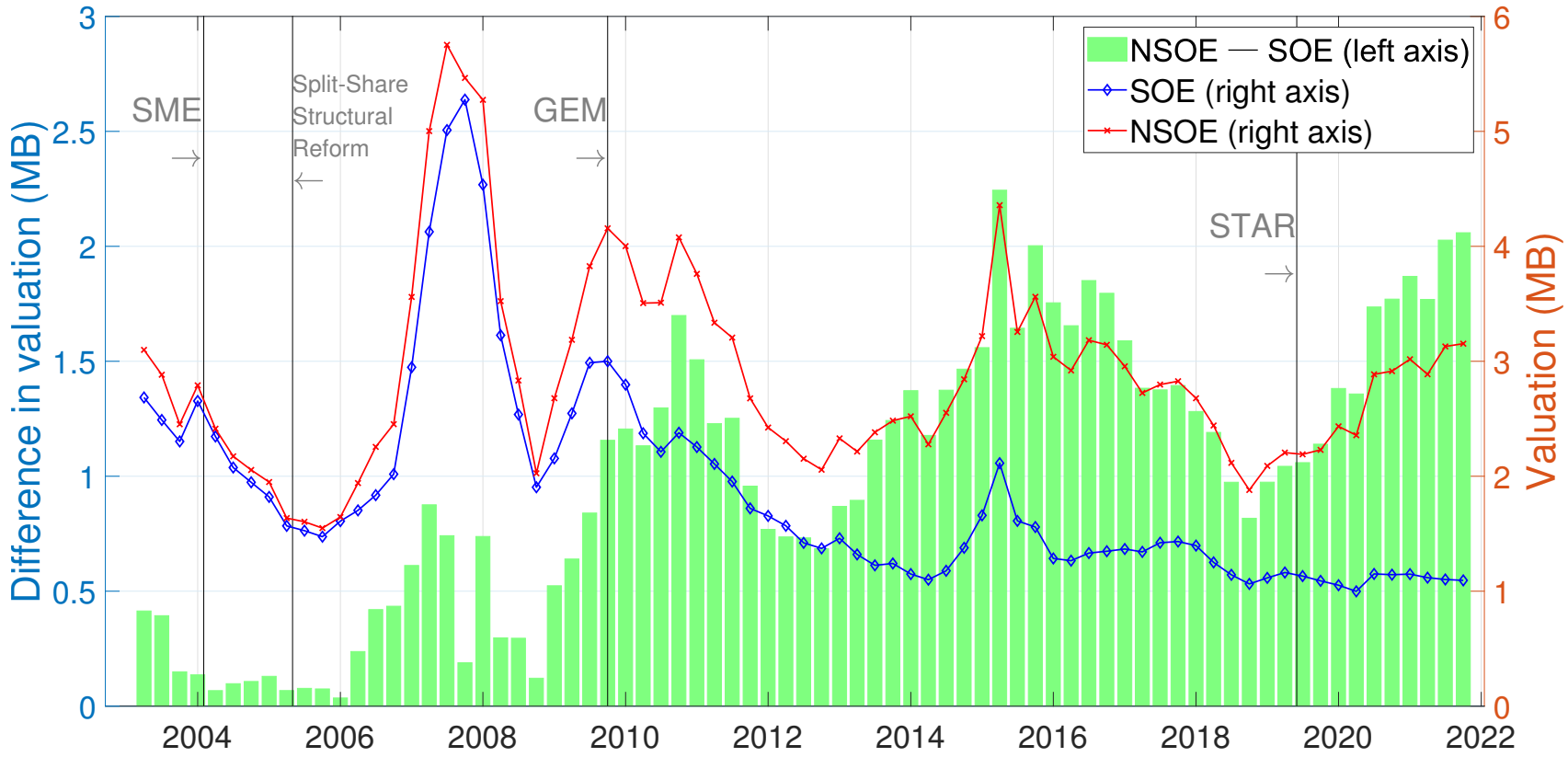
- In countries other than the U.S., it is not uncommon for the state to have majority ownerships in a significant fraction of publicly traded firms.

Questions:

(1) Are state-owned enterprises (SOEs) valued similarly to NSOEs?

(2) If not, what is the source of the discrepancies in valuations?

Motivation: Valuation difference in China



SME: Small and Medium Enterprises Board
GEM: Growth Enterprise Market
STAR: Science and Technology Innovation Board

Motivation: Why do SOEs receive lower valuation?

- SOEs are often criticized for pursuing non-economic objectives and lacking efficiency.
- But these should translate to **determinants of valuation** such as risk, profitability, growth in profits, etc.

Question:

(1) To what extent can valuation differences be explained by **traditional influences**, as opposed to simply a difference in ownership structure per sé?

(2) More generally, what are the determinants of the SOE-NSOE value divergence?

Our Goal: Perform a thorough empirical investigation of these questions, using the Chinese A-share market as the backdrop.

One related paper

- Allen at al. (2024) examine the long-term underperformance of China stock market and attribute it to
  - deficiencies in the listing and delisting systems
  - investor sentiment
  - poor corporate governance

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- Allen at al. (2024) examine the long-term underperformance of China stock market and attribute it to
  - deficiencies in the listing and delisting systems
  - investor sentiment
  - poor corporate governance

- Our focus: Whether traditional determinants can explain valuation disparities between SOEs and NSOEs
  - fundamentals (risk, profitability, growth, uncertainty)
  - trading attributes (liquidity, turnover)
  - We show that classical determinants of valuation DO play a significant role in explaining valuation differences

Contents

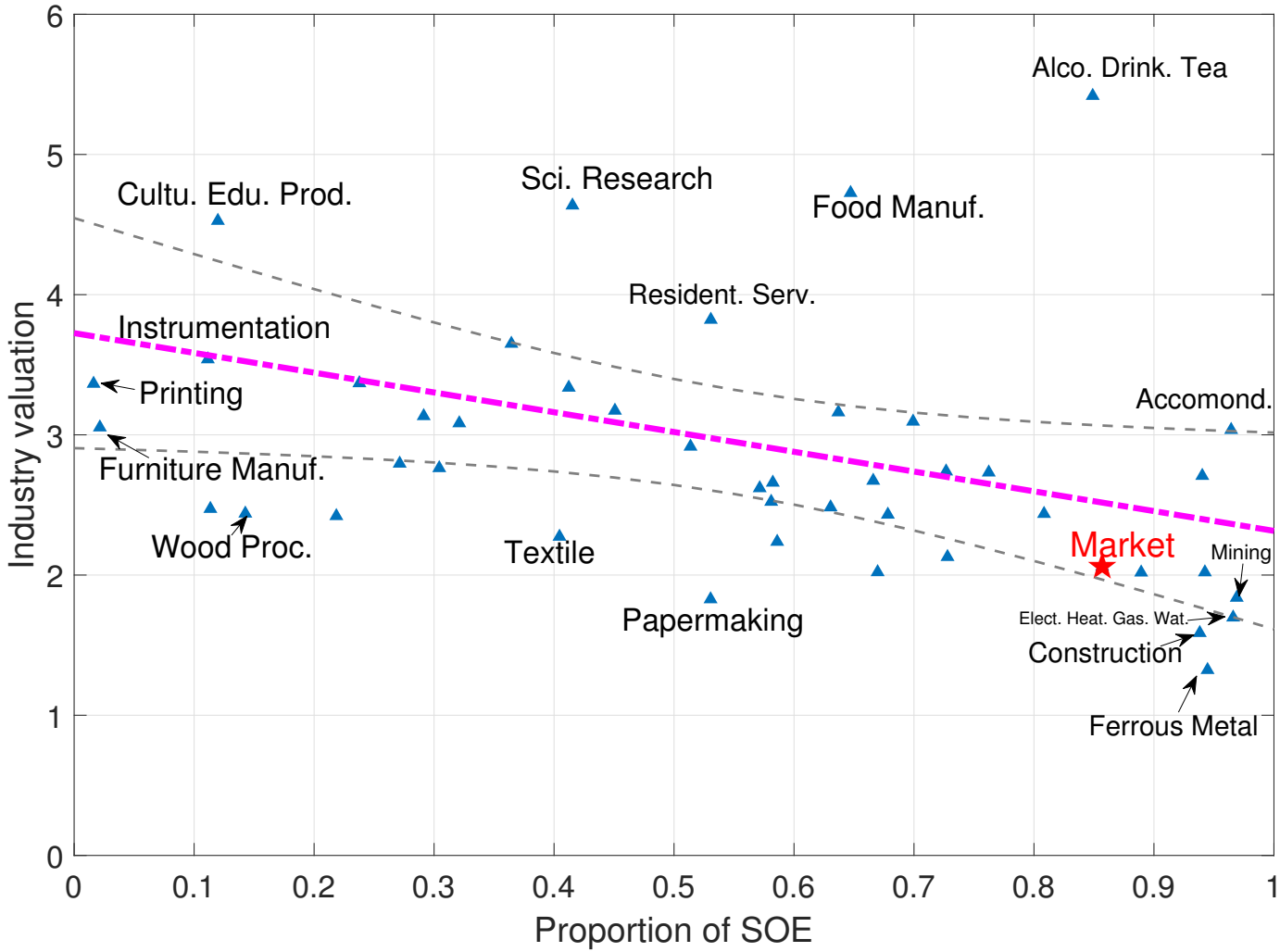
Data

- Sample: All A-share listed firms in China
- Period: January 1, 2003 — December 31, 2021
- Main data source: CSMAR
  - Basic information: listing date, ownership, capital structure, shareholder, industry classification, etc
  - Trading data: daily trading prices, turnover, etc
  - Financial data: balance sheet, income statement, cash-flow statement
  - Analyst forecast file
- Other data: China factors by Liu et al. (2019), firms' patent applications, CPI data, ESG Score, etc

Data

- Identification of SOEs and NSOEs
  - CSMAR determines the controlling shareholders of listed firms based on their annual reports, and categorizes them as follows:
    1100 - state-owned enterprises
    2000 - government agencies and institutions
    2100 - central government and departments
    2120 - local government and departments
    Others
- Data processing (filter)
  - Trading - Companies listed for less than one year; less than 45 (120) trading days in the most recent quarter (year)
  - Financial - Negative total assets/net assets/revenue in the most recent report period
  - Other - Observations with missing ownership nature or industry classification
  - Portfolio - Observations with less than 5 companies

Industry and valuation



Industry structure explanation

Diff. in Industry Structure ⇒ Diff. in Valuation

- In a policy document issued by the Chinese government in 1999, explicit objectives were set regarding the industry layout of SOEs:
  - "*... The industries and sectors that the SOEs should focus on include those related to national security, natural monopolies, providing important public goods and services, as well as pillar industries and high-tech industries.*"

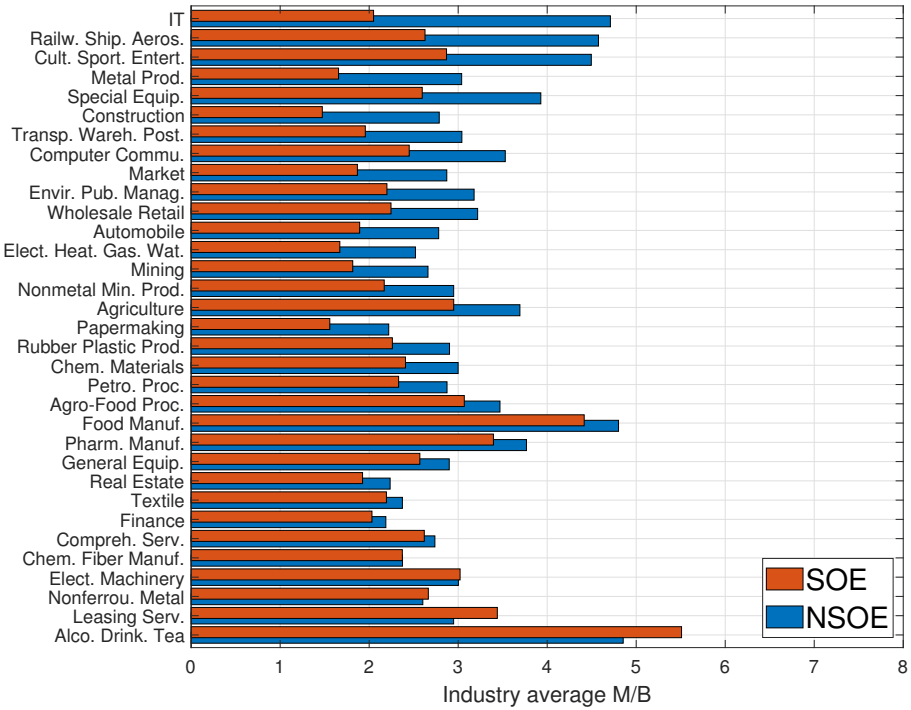
H0: **SOEs are more concentrated in undervalued (low M/B) industries**, resulting in a lower overall valuation of SOEs.

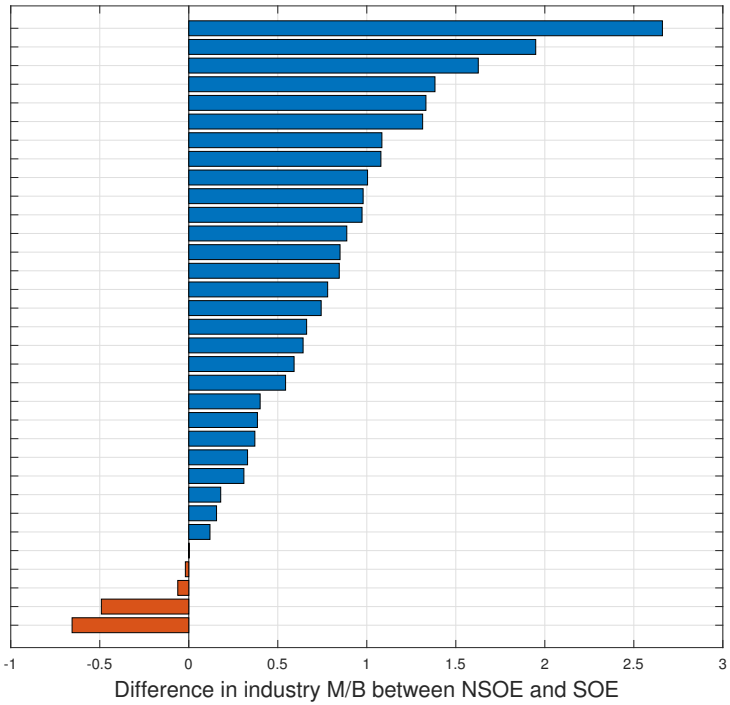
Differences within and across industries

$$
\begin{aligned}
DV &= V^{NSOE} - V^{SOE} = \sum_{j=1}^{N} w_{jt}^{NSOE} V_{jt}^{NSOE} - \sum_{j=1}^{N} w_{jt}^{SOE} V_{jt}^{SOE} \\
&= \sum_{j=1}^{N} w_{jt}^{NSOE} \left(V_{jt}^{NSOE} - V_{jt}^{SOE} \right) + \sum_{j=1}^{N} \left(w_{jt}^{NSOE} - w_{jt}^{SOE} \right) V_{jt}^{SOE} \\
&= DI \text{ (Diff. within Industry)} + DS \text{ (Structural Diff.)}
\end{aligned}
$$

Mean(DV)	Mean(DI)	Mean(DI)/Mean(DV)
1.002	0.631	63.0%
Var(DV)	**Cov(DI, DV)**	**Cov(DI, DV)/Var(DV)**
0.349	0.181	51.8%

Differences within each industry





In 29 (out of 33) industries,
NSOEs have higher valuations than SOEs.

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Gordon model for valuation

- Gordon growth model:

$$\text{Stock price } P = \frac{E}{r-g}$$

E: Net income

r: Discount rate

g: Expected rate of growth of earning

- Dividing both sides by the book value of equity (B) yields:

$$PB = \frac{E/B}{r-g} = \frac{ROE}{r-g}$$

PB: Market-to-Book, valuation

ROE: Return on equity

Gordon model: Profitability and discount rate

$$MB = \frac{\boldsymbol{ROE}}{r - g}$$

ROE: profitability

H1: Higher profitability of NSOEs compared to SOEs leads to their higher valuation.

Gordon model: Profitability and discount rate

$$MB = \frac{ROE}{r - g}$$

ROE: profitability

H1: Higher profitability of NSOEs compared to SOEs leads to their higher valuation.

r: related to risk

H2a: Differences in systematic risk exposure between SOEs and NSOEs contribute to their valuation disparities.

H2b: Differences in overall risk levels between SOEs and NSOEs lead to differences in their valuations.

H2c: Differences in leverage levels between SOEs and NSOEs translate into differences in their valuations.

Gordon model: Discount rate

$$MB = \frac{ROE}{\boldsymbol{r} - g}$$

$\boldsymbol{r}$: related to information environment & liquidity

H2d: The greater the openness of SOEs relative to NSOEs, the lower the valuation.

- Valuations differ for stocks with varying levels of accessibility to foreign investment.

H2e: The lower the liquidity of SOEs relative to NSOEs, the lower the valuation.

- Valuations differ for stocks with varying liquidity.

Gordon model: Growth in earnings

$$MB = \frac{ROE}{r - \boldsymbol{g}}$$

$\boldsymbol{g}$: measures of growth rate

- Business or asset growth rate (backward)
- Analyst earnings forecast (mixed)
- Innovation activities (forward)

H3a: The lower the asset or revenue growth rate of SOEs relative to NSOEs, the lower the valuation.

H3b: The lower the expected future growth rate of SOEs relative to NSOEs, the lower the valuation.

H3c: The lower the level of innovation of SOEs relative to NSOEs, the lower the valuation.

Speculative component (resale option)

- Speculative trading: Scheinkman and Xiong (2003); Mei, Scheinkman and Xiong (2009); DeFusco, Nathanson, and Zwick (2022)

$$P = \frac{E}{r - g} + \boldsymbol{S}$$

H4a: The valuation difference between SOEs and NSOEs is positively correlated with the difference in their turnover.

H4b: The valuation difference is positively correlated with investors' fundamental belief divergence (proxied by idio. vol.).

H4c: The correlation between turnover difference and valuation difference weakens after controlling for the difference in fundamental belief divergence.

Average profitability and Uncertainty

- Pastor and Veronesi (JF, 2003) :

$$\frac{M}{B} = \exp\left[\left(\bar{g} + \sigma^2/2 - r\right)T\right]$$

  - Valuation is "convex" w.r.t. profitability $g \sim N(\bar{g}, \sigma^2)$
  - Uncertainty about profit (σ) increases the firm's valuation
  - The "unknown" average profitability $\bar{g}$ has positive impact on valuation
  - Newly listed companies have less observable information, thus their future profit uncertainty is greater

H5a: Compare to NSOEs, SOEs with lower average profitability have lower valuations

H5b: Compare to NSOEs, SOEs with a longer listing history have lower valuations.

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Empirical setting

- Construct stock portfolios for SOEs and NSOEs based on industry, characteristics and boards (61 portfolios in total for each of SOE and NSOE).
  - Industry portfolios: 48
  - Technology/Non-technology portfolios: 2
  - Size, liquidity, turnover rate, ownership concentration:

    Characteristic-High/Low (30%, 70%) portfolios: (4×2)
  - Listing boards portfolios: 3
- Why take portfolios as empirical observations?
  - Industry/Characteristic differences;
  - Reduce errors;
  - Bekeart et al. (2022)

Empirical model

- For each portfolio, compute the "book value of equity"-weighted average of each variable.
- Dependent variable: the valuation differential between NSOEs and SOEs.
- Independent variables: the differences in proposed explanatory variables.

$$DV = \beta DX + \gamma DCtrl + \mu + \epsilon,$$

where (The prefix D denotes the "Difference"):

$$DV = V^{NSOE} - V^{SOE}$$

$$DX = X^{NSOE} - X^{SOE}$$

$$DCtrl = Ctrl^{NSOE} - Ctrl^{SOE} \quad \text{(Size)}$$

$$\mu = Portfolio\ Fixed\ Effect$$

Explanatory power for valuation differentials

Run the following time series regressions for each industry, then analyze the distribution of their intercepts and the corresponding t-values.

$$DV_{t+1} \sim \mathbf{1}, \tag{1a}$$
$$DV_{t+1} \sim \mathbf{1} + DControl_t, \tag{1b}$$
$$DV_{t+1} \sim \mathbf{1} + DControl_t + DX_t. \tag{1c}$$

Intercepts of 1a: Mean valuation difference within each portfolio.

Intercepts of 1b: Residual difference after controlling for size.

Intercepts of 1c: Residual difference after controlling for all determinants.

Dominance analysis: Variables' importance

To examine the relative importance of each explanatory variable, we conduct a dominance analysis following Budescu (1993).

- Consider a linear regression model:

$$y = a + \sum_{i=1}^{p} b_i x_i + \epsilon.$$

- A measure of $x_i's$ importance, marginal increment, is

$$R^2_{\{x_S, x_i\}} - R^2_{x_S}.$$

  - $R^2_{x_A}$ is the ratio of RSS (regression sum of squares) to TSS (total sum of squares) when predictors in set x_A is included
  - x_S is any subset of k predictors, x_i excluded

Dominance analysis: Variables' importance

- Since there are $\binom{p-1}{k}$ combinations of x_S, the contribution of x_i to the model with k variables can be measured by the its average, that is,

$$C_{(i)}^k = \sum_{l=1}^{\binom{p-1}{k}} \frac{R^2_{\{x_{S_l}, x_i\}} - R^2_{x_{S_l}}}{\binom{p-1}{k}}.$$

- By averaging $C_{(i)}^k$ across all orders ($k = 0, 1, 2, ..., p-1$), we obtain the variable's average importance:

$$C_{x_i} = \sum_{k=0}^{p-1} \frac{C_{(i)}^k}{p}.$$

- C_{x_i} provides the decomposition of total R^2 (Budescu, 1993).

$$R^2_{x_{1,2,...p}} = \sum_{i=1}^{p} C_{x_i}.$$

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Multivariate regression analysis

- Select variables based on: significance and align with the expectations of the hypothesis.

Variable	Ln(MB)	Ln(MB)
ROE		0.213
Lev		-0.294
Zero		-2.334***
Amihud		-5.361***
AGR Asset		0.020
AGR Rev		0.102*
AEEG		0.094***
AESG		0.084*
IdioVol		1.015***
AvgROE		1.850***
ListAge		-0.021**
Size	-0.267***	-0.129***

Explanatory power for valuation differentials

Run the following time series regressions for each industry:

$$(1a)\ DV_{t+1} \sim \mathbf{1},$$
$$(1b)\ DV_{t+1} \sim \mathbf{1} + DSize_t,$$
$$(1c)\ DV_{t+1} \sim \mathbf{1} + DSize_t + DZero_t + DAmihud_t + DAGRRev_t + DAEEG_t + DAESG_t + DIdioVol_t + DAvgROE_t + DListAge_t$$

Summary	$(1a)$	$(1b)$	$(1c)$	Diff.	$(1c)-(1a)$	$(1c)-(1b)$
Avg interc.	0.315	0.208	0.123	Interc.	-0.191	-0.084
Avg t-values	10.391	3.460	0.720		(-2.671)	(-1.692)
No industries	34	34	34	t	-9.671	-2.740
No sig. interc.	25	21	7		(-6.495)	(-3.284)
Avg Adj-R^2	0.000	0.186	0.585	Adj-R^2	0.585	0.399
					(15.715)	(10.936)

Dominance analysis

	Zero	Amihud	AGR Rev	AEEG	AESG	IdioVol	AvgROE	ListAge	Size
Agriculture	0.024	0.123	0.012	0.047	0.008	0.028	0.014	0.048	0.019
Mining	0.058	0.124	0.010	0.023	0.087	0.002	0.035	0.107	0.020
Agro-Food Proc.	0.020	0.215	0.003	0.003	0.015	0.047	0.042	0.094	0.008
Food Manuf.	0.071	0.264	0.028	0.085	0.058	0.033	0.072	0.066	0.073
Alco. Drink. Tea	0.016	0.018	0.002	0.012	0.020	0.031	0.109	0.664	0.021
Textile	0.020	0.044	0.067	0.176	0.024	0.029	0.034	0.082	0.045
Papermaking	0.012	0.131	0.015	0.006	0.003	0.039	0.027	0.068	0.018
Petro. Proc.	0.013	0.284	0.072	0.008	0.057	0.097	0.010	0.021	0.227
Chem. Materials	0.013	0.013	0.020	0.078	0.081	0.033	0.119	0.172	0.056
Pharm. Manuf.	0.001	0.006	0.007	0.003	0.040	0.046	0.061	0.248	0.129
Chem. Fiber Manuf.	0.032	0.019	0.123	0.024	0.064	0.008	0.026	0.170	0.139
Rubber Plastic Prod.	0.142	0.064	0.006	0.007	0.051	0.115	0.081	0.255	0.111
Nonmetal Min. Prod.	0.078	0.017	0.004	0.039	0.047	0.180	0.068	0.187	0.222
Ferrous Metal	0.007	0.047	0.047	0.013	0.057	0.105	0.122	0.241	0.044
Nonferrou. Metal	0.021	0.049	0.004	0.041	0.011	0.029	0.037	0.663	0.010
Metal Prod.	0.024	0.070	0.032	0.020	0.016	0.036	0.245	0.146	0.041
General Equip.	0.017	0.035	0.004	0.132	0.025	0.094	0.063	0.358	0.128
Special Equip.	0.095	0.024	0.100	0.010	0.028	0.035	0.114	0.196	0.249
Automobile	0.059	0.063	0.020	0.133	0.043	0.111	0.018	0.166	0.072
Railw. Ship. Aeros.	0.058	0.017	0.003	0.018	0.037	0.031	0.025	0.023	0.048
Elect. Machinery	0.045	0.046	0.024	0.054	0.078	0.168	0.142	0.170	0.073
Computer Commu.	0.017	0.016	0.001	0.004	0.006	0.093	0.053	0.028	0.095
Other Manuf.	0.058	0.039	0.015	0.082	0.048	0.119	0.191	0.194	0.141
Elect. Heat. Gas. Wat.	0.003	0.070	0.013	0.088	0.051	0.142	0.056	0.119	0.010
Construction	0.144	0.039	0.069	0.045	0.081	0.114	0.060	0.016	0.279
Wholesale Retail	0.022	0.033	0.036	0.026	0.039	0.017	0.151	0.040	0.375
Transp. Wareh. Post.	0.099	0.053	0.017	0.013	0.030	0.045	0.256	0.350	0.006
IT	0.016	0.053	0.019	0.045	0.033	0.161	0.058	0.092	0.128
Finance	0.008	0.099	0.014	0.013	0.033	0.028	0.157	0.160	0.137
Real Estate	0.055	0.233	0.013	0.030	0.015	0.040	0.218	0.010	0.017
Leasing Serv.	0.005	0.018	0.094	0.022	0.050	0.118	0.137	0.266	0.058
Envir. Pub. Manag.	0.071	0.062	0.046	0.089	0.096	0.003	0.228	0.133	0.016
Cult. Sport. Entert.	0.066	0.022	0.011	0.007	0.064	0.181	0.012	0.226	0.117
Compreh. Serv.	0.134	0.052	0.016	0.049	0.113	0.008	0.048	0.139	0.071
Average	0.045	0.072	0.028	0.043	0.044	0.070	0.091	0.174	0.094

Dominance analysis

	Liquidity	Growth	Speculation	Prof.&Unc.	Size
Agriculture	0.147	0.067	0.028	0.061	0.019
Mining	0.182	0.120	0.002	0.143	0.020
Agro-Food Proc.	0.235	0.021	0.047	0.137	0.008
Food Manuf.	0.336	0.170	0.033	0.138	0.073
Alco. Drink. Tea	0.034	0.035	0.031	0.773	0.021
Textile	0.064	0.267	0.029	0.115	0.045
Papermaking	0.143	0.024	0.039	0.095	0.018
Petro. Proc.	0.297	0.137	0.097	0.031	0.227
Chem. Materials	0.026	0.179	0.033	0.291	0.056
Pharm. Manuf.	0.007	0.050	0.046	0.309	0.129
Chem. Fiber Manuf.	0.051	0.210	0.008	0.195	0.139
Rubber Plastic Prod.	0.206	0.064	0.115	0.335	0.111
Nonmetal Min. Prod.	0.095	0.090	0.180	0.255	0.222
Ferrous Metal	0.054	0.118	0.105	0.363	0.044
Nonferrou. Metal	0.069	0.056	0.029	0.700	0.010
Metal Prod.	0.094	0.069	0.036	0.391	0.041
General Equip.	0.052	0.161	0.094	0.421	0.128
Special Equip.	0.119	0.138	0.035	0.311	0.249
Automobile	0.121	0.196	0.111	0.184	0.072
Railw. Ship. Aeros.	0.075	0.058	0.031	0.049	0.048
Elect. Machinery	0.090	0.156	0.168	0.313	0.073
Computer Commu.	0.034	0.010	0.093	0.081	0.095
Other Manuf.	0.097	0.145	0.119	0.385	0.141
Elect. Heat. Gas. Wat.	0.073	0.152	0.142	0.175	0.010
Construction	0.184	0.194	0.114	0.075	0.279
Wholesale Retail	0.054	0.101	0.017	0.191	0.375
Transp. Wareh. Post.	0.152	0.060	0.045	0.606	0.006
IT	0.069	0.097	0.161	0.150	0.128
Finance	0.107	0.060	0.028	0.317	0.137
Real Estate	0.288	0.059	0.040	0.228	0.017
Leasing Serv.	0.022	0.167	0.118	0.403	0.058
Envir. Pub. Manag.	0.133	0.230	0.003	0.361	0.016
Cult. Sport. Entert.	0.088	0.083	0.181	0.237	0.117
Compreh. Serv.	0.186	0.178	0.008	0.188	0.071
Average	0.117	0.115	0.070	0.265	0.094

Liquidity, Growth, Speculation, Prof.&Unc., Size

Contents

Does shell value matter?

- Due to strict IPO policies, companies may go public through reverse mergers: Listed companies possess shell value, which can be sold to companies in need of listing.
- Liu et al. (JFE, 2019) and Lee et al. (RF, 2023) demonstrate the existence of shell value in the Chinese stock market.
  - The shell value increases during periods of IPO suspension.

Variable	Ln(MB)	Ln(MB)
IPOSusp	-0.108*	-0.028
	(-1.94)	(-1.18)
Size		-0.127***
		(-3.28)
⋮		⋮

Excluding stocks with high shell premium (small size)

- Liu et al. (2019) show that stocks with smaller market cap contain a higher shell premium as a proportion of total value.

Variable	Ln(MB)	Ln(MB)
ROE	0.213	0.401**
Lev	-0.294	-0.338
Zero	-2.334***	-2.123***
Amihud	-5.361***	-4.572***
AGR Asset	0.020	-0.045
AGR Rev	0.102*	0.050
AEEG	0.094***	0.113***
AESG	0.084*	0.057
IdioVol	1.015***	1.054***
AvgROE	1.850***	1.822***
ListAge	-0.021**	-0.019**
Size	-0.129***	-0.184***
Sample	All	**Exclude 30%**

Does social responsibility matter?

- One distinctive feature of SOEs compared to NSOEs is that SOEs undertake more social responsibilities.
- May have a positive or negative impact on firms' value.
  - Preferential bank loans; government subsidies; sustainability; investor preferences, etc. Increased costs.
  - ESG ratings provided by Chindices; scores for E (Environmental), S (Social), and G (Governance) dimensions.

Variable	Ln(MB)	Ln(MB)	Ln(MB)	Ln(MB)
ESG	-0.015**			
	(-2.54)			
E		0.000		
		(0.10)		
S			-0.009***	
			(-3.33)	
G				-0.007
				(-1.25)
Control & Expl. Var	YES	YES	YES	YES

Does social responsibility matter?

Dominance analysis after including social responsibility

	Zero	Amihud	AGR Rev	AEEG	AESG	IdioVol	AvgROE	ListAge	Size	S
Agriculture	0.025	0.130	0.012	0.047	0.008	0.025	0.012	0.046	0.019	0.030
Mining	0.068	0.118	0.009	0.023	0.102	0.003	0.032	0.108	0.018	0.022
Agro-Food Proc.	0.025	0.223	0.002	0.003	0.016	0.046	0.025	0.078	0.013	0.022
Food Manuf.	0.065	0.255	0.026	0.074	0.050	0.034	0.071	0.075	0.071	0.044
Alco. Drink. Tea	0.015	0.017	0.003	0.012	0.019	0.029	0.116	0.641	0.019	0.024
Textile	0.027	0.034	0.044	0.145	0.020	0.029	0.030	0.058	0.027	0.144
Papermaking	0.010	0.130	0.014	0.008	0.004	0.041	0.023	0.067	0.019	0.007
Petro. Proc.	0.014	0.264	0.077	0.008	0.049	0.082	0.010	0.020	0.206	0.076
Chem. Materials	0.014	0.015	0.019	0.077	0.081	0.035	0.105	0.170	0.053	0.025
Pharm. Manuf.	0.001	0.006	0.009	0.005	0.039	0.039	0.064	0.203	0.104	0.081
Chem. Fiber Manuf.	0.030	0.018	0.113	0.032	0.061	0.007	0.023	0.153	0.140	0.029
Rubber Plastic Prod.	0.138	0.058	0.007	0.007	0.053	0.113	0.083	0.256	0.110	0.018
Nonmetal Min. Prod.	0.079	0.016	0.004	0.038	0.045	0.178	0.066	0.183	0.212	0.021
Ferrous Metal	0.009	0.035	0.034	0.012	0.052	0.099	0.117	0.274	0.034	0.047
Nonferrou. Metal	0.030	0.043	0.004	0.038	0.008	0.025	0.026	0.604	0.007	0.091
Metal Prod.	0.022	0.070	0.031	0.021	0.017	0.031	0.252	0.147	0.042	0.014
General Equip.	0.014	0.040	0.006	0.108	0.021	0.087	0.065	0.326	0.102	0.091
Special Equip.	0.095	0.021	0.104	0.011	0.029	0.034	0.115	0.189	0.256	0.012
Automobile	0.054	0.058	0.019	0.122	0.041	0.107	0.020	0.169	0.073	0.028
Railw. Ship. Aeros.	0.051	0.024	0.004	0.018	0.040	0.029	0.033	0.022	0.050	0.029
Elect. Machinery	0.044	0.045	0.024	0.053	0.077	0.168	0.143	0.171	0.073	0.011
Computer Commu.	0.009	0.023	0.004	0.003	0.007	0.083	0.103	0.030	0.086	0.132
Other Manuf.	0.051	0.040	0.013	0.080	0.050	0.102	0.187	0.181	0.167	0.056
Elect. Heat. Gas. Wat.	0.002	0.062	0.012	0.090	0.067	0.132	0.034	0.100	0.010	0.078
Construction	0.145	0.039	0.067	0.044	0.081	0.111	0.060	0.015	0.276	0.007
Wholesale Retail	0.019	0.042	0.028	0.020	0.046	0.017	0.167	0.036	0.331	0.049
Transp. Wareh. Post.	0.097	0.052	0.017	0.012	0.030	0.045	0.255	0.347	0.006	0.008
IT	0.014	0.054	0.018	0.037	0.028	0.147	0.060	0.104	0.157	0.050
Finance	0.007	0.091	0.013	0.013	0.028	0.027	0.146	0.152	0.130	0.044
Real Estate	0.058	0.236	0.013	0.030	0.015	0.042	0.214	0.009	0.015	0.009
Leasing Serv.	0.004	0.017	0.102	0.024	0.055	0.119	0.127	0.248	0.056	0.026
Envir. Pub. Manag.	0.068	0.052	0.048	0.080	0.089	0.003	0.176	0.145	0.013	0.073
Cult. Sport. Entert.	0.064	0.023	0.010	0.008	0.064	0.181	0.012	0.225	0.118	0.005
Compreh. Serv.	0.132	0.052	0.015	0.047	0.110	0.009	0.045	0.128	0.070	0.025
Average	0.044	0.071	0.027	0.040	0.044	0.066	0.089	0.167	0.091	0.042

Investment Efficiency: SOEs vs NSOEs

- SOEs exhibit **lower investment efficiency** than NSOEs.

Dep. Var	Investment	Investment	Investment
TobinQ	0.005	0.011***	0.016***
	(0.28)	(4.52)	(8.47)
TobinQ×SOE	-0.009***	-0.009***	-0.007***
	(-4.69)	(-4.66)	(-3.36)
SOE	0.011**	0.011**	0.003
	(2.04)	(2.02)	(0.54)
Controls	CtrlSet01	CtrlSet02	CtrlSet03
Firm FE	Y	Y	Y
Year FE	Y	Y	Y

Contents

Mixed-Ownership Reform

- SOE reform has always been an important issue in China. In recent years, the focus has been the mixed-ownership reform (MOR) of SOEs.
  - Introducing non-state capital to SOEs.
    - The 4th (1999), 3rd (2003), and 3rd (2013) Plenary Sessions of the 15th, 16th, and 18th Central Committee of the CPC
    - The 19th National Congress of the CPC in 2017
- Our previous findings indicate that the valuation difference ($V_{NSOEs} - V_{SOEs}$) stems from some classical characteristics.
- Controlling for these characterstics, the MOR should NOT have a significant impact on valuation, particularly in the long term.
- Otherwise, the valuation difference ($V_{NSOEs} - V_{SOEs}$) may not be adequately captured by our proposed characteristics.

Identification of MOR

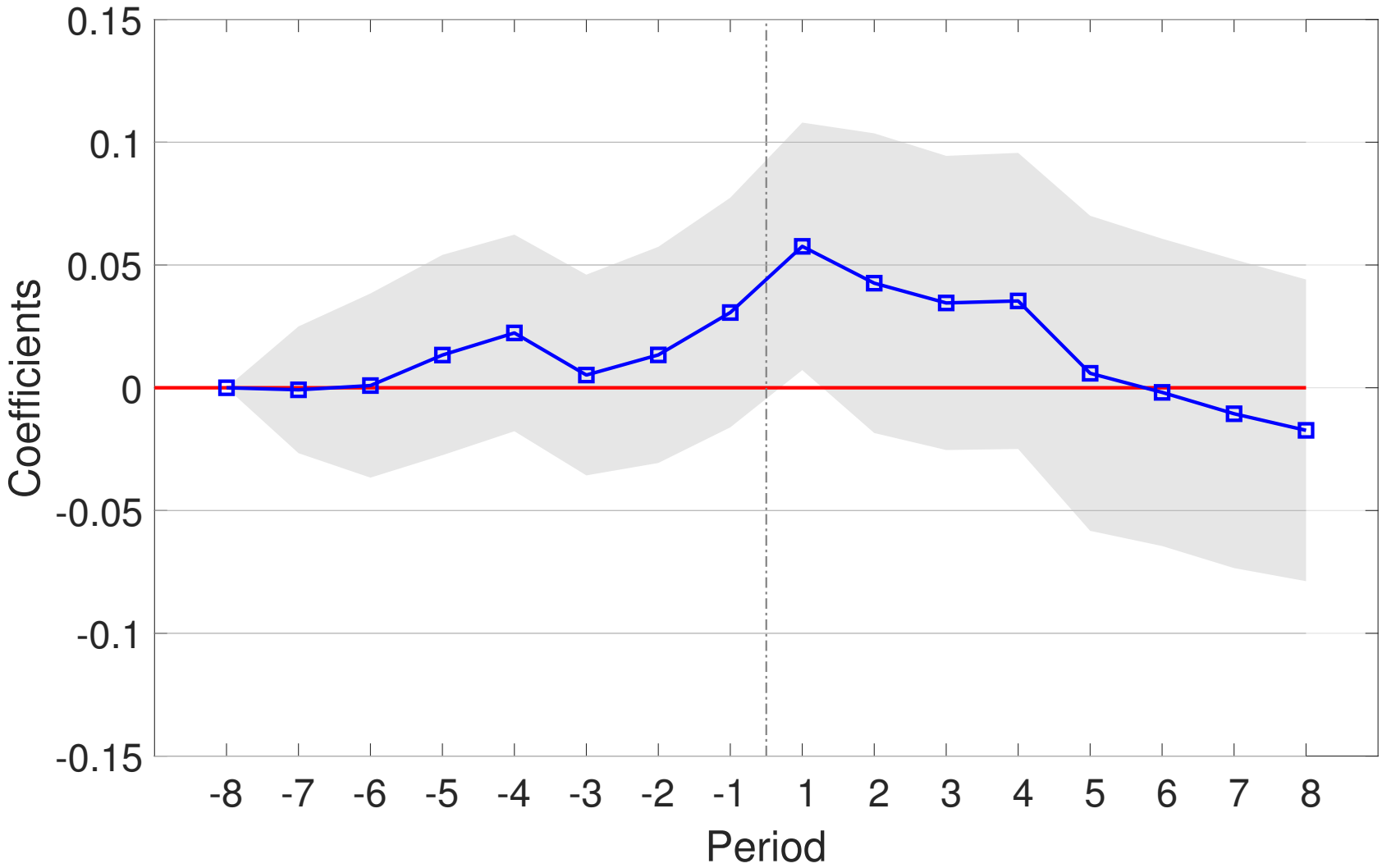
- Data: information about the top ten shareholders disclosed in the periodic reports of listed companies.
- CSMAR classifies shareholders into six categories:
  1. **State-owned shareholders**
  2. **Private enterprise shareholders**
  3. **Individual and family shareholders**
  4. **Institutional investors**
  5. **Foreign shareholders**
  6. **Other shareholders**
- Aggregating the shareholding percentages of the last five categories yields the proportion of non-state-owned shares in that company.

Identification of MOR (Continued)

- For SOEs, we consider an **MOR to have occurred** when the percentage of non-state-owned shares exceeds 10%.
  - *China Company Law* explicitly states that "*shareholders holding 10% or more of the company's shares have the right to request the convening of an extraordinary general meeting.*"
- In our sample, 1601 companies that were (or had been) controlled by state-owned shareholders. Among them, 844 companies underwent mixed-ownership reform.
- PSM + stacked DID:
  - Construct a cohort of treated firms using firm-quarter observations for the 8 quarters before and the 8 quarters after.
  - Firms are required to have a minimum of 9 observations.
  - Use PSM to select controls (Size, Lev, ROE, Amihud, AGR Rev, List Age, and SttShr (state ownership ratio).

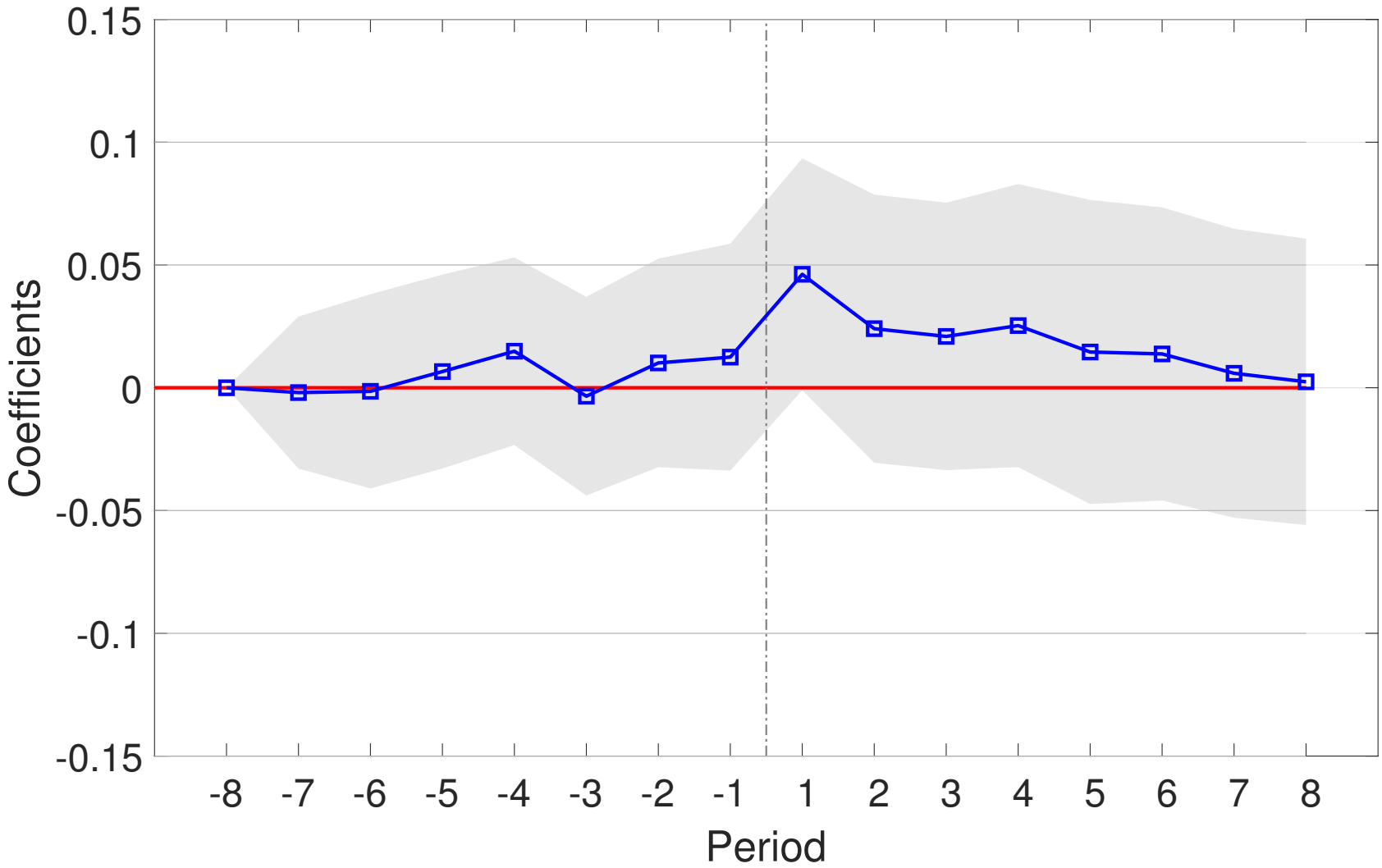
DID: Trend analysis on Ln(MB)

Estimates **without** explanatory variables



DID: Trend analysis on Ln(MB)

Estimates **with** explanatory variables



Event study: DID estimates on Ln(MB)

$$\text{LnMB}_{Ei,Et} = \beta\, Treat \times After_{Ei,Et} + \sum_k \gamma_k X_{k,Ei,Et} + \mu_{Ei} + \lambda_{Et} + \varepsilon_{Ei,Et}.$$

Periods	$[-8,+8]$		$[-8,+4]$		$[-8,+8]\backslash[+1,+4]$	
Variable	Ln(MB)	Ln(MB)	Ln(MB)	Ln(MB)	Ln(MB)	Ln(MB)
Treat×After	0.008	-0.015	0.033	0.030*	-0.014	0.005
	(0.40)	(0.79)	(1.60)	(1.67)	(-0.56)	(0.23)
Expl. Var	No	Yes	No	Yes	No	Yes
Obs.	15,762	15,706	11,844	11,809	11,770	11,732
Adj. R^2	0.850	0.874	0.875	0.895	0.843	0.866

Contents

Conclusion

- SOEs have lower valuations than NSOEs within most industries in China (2003-2021).
- Differences in **industry membership account for 37%** of the overall average valuation difference
- After accounting for proposed factors (**size, liquidity, growth, speculation, and profitability**), valuation gaps are **no longer significant in 27 out of the 34** industries
- **Fundamentals account for 38%** of within industry gap
  - Profit & Uncertainty (26.5%), Growth (11.5%)
- **Market factors account for 28%** of within industry gap
  - Liquidity (11.7%), Size (9.4%), Speculation (7.0%)
- Our work provides evidence in favor of the applicability of classical valuation theories in the Chinese stock market

Acknowledgement

Thank you very much!

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