

Discussion of  
“Incentives and firm investment:  
Evidence from China’s reform”

by He, Liao, and Wang

March 17, 2022

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# Motivation

- Paper studies EVA reform in China where management of SOE firms is evaluated (by SASAC) applying common cost of capital, 5.5%
- Paper provides causal evidence by exploiting staggered implementation of reform
  - Identifying assumption: implementation of reform is independent of firm performance
- Assume that ...
  - debt is the only source of external finance (reasonable)
  - firms can freely choose debt level (questionable)

# Motivation (cont)

- Before EVA: assume that firms maximize

$$\max\{(1 - \tau_{Yi})F(D + E) - (E + D) * r_D\}$$

*Foc:*

$$F'(D + E) = \frac{1}{1 - \tau_{Yi}} r_D$$

- After EVA: assume that firms maximize

$$\max\{(1 - \tau_{Yi}) F(D + E) - (E + D) * 5.5\%\}$$

- FOC:

$$F'(D + E) = \frac{5.5\%}{1 - \tau_{Yi}}$$

# Motivation (cont)

- Suppose capital and output wedges are purely pecuniary
- Then: maximizing return on equity (ROE) implies

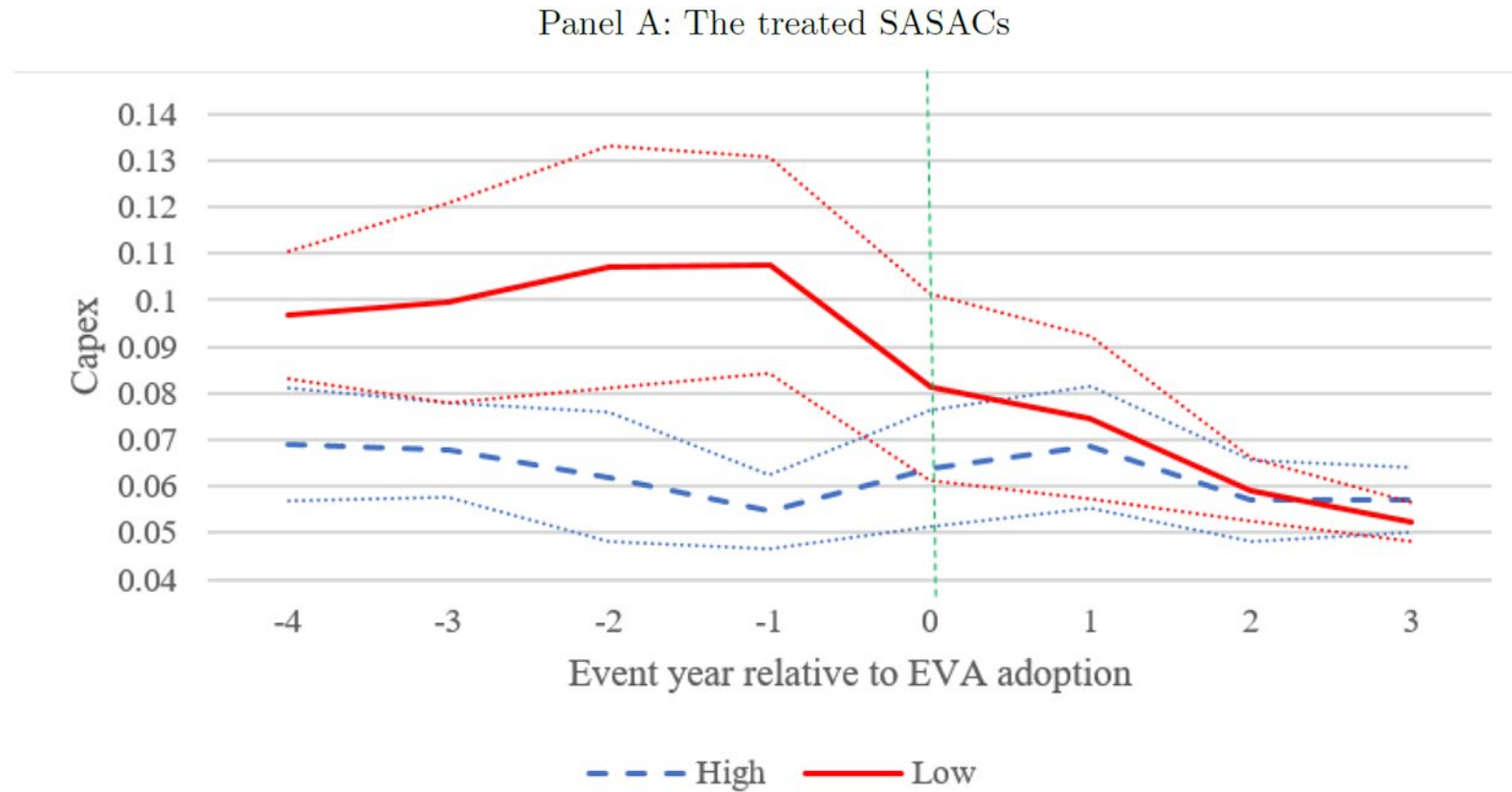
$$F'(D + E) = \frac{r_D}{1 - \tau_{Yi}}$$

- Implies that EVA will LOWER ROE for firms with  $r_D \neq \frac{5.5\%}{1-0.25} = 7.3\%$

# Implications of EVA

- Let  $r_D$  be marginal cost of debt.
  - Measure  $r_D$  as average interest on interest-bearing debt
  - EVA induce SOEs with high  $r_D$  to invest less than firms with low  $r_D$
  - EVA will affect allocative efficiency of capital
- 
- Main questions of paper:
    1. Did EVA increase investments for SOEs with high  $r_D$ ? **ANSWER: yes**
    2. Did EVA lower ROE for SOEs with  $r_D \neq 7.3\%$ ? **ANSWER: yes**
    3. How did EVA affect efficiency? **ANSWER: unclear**

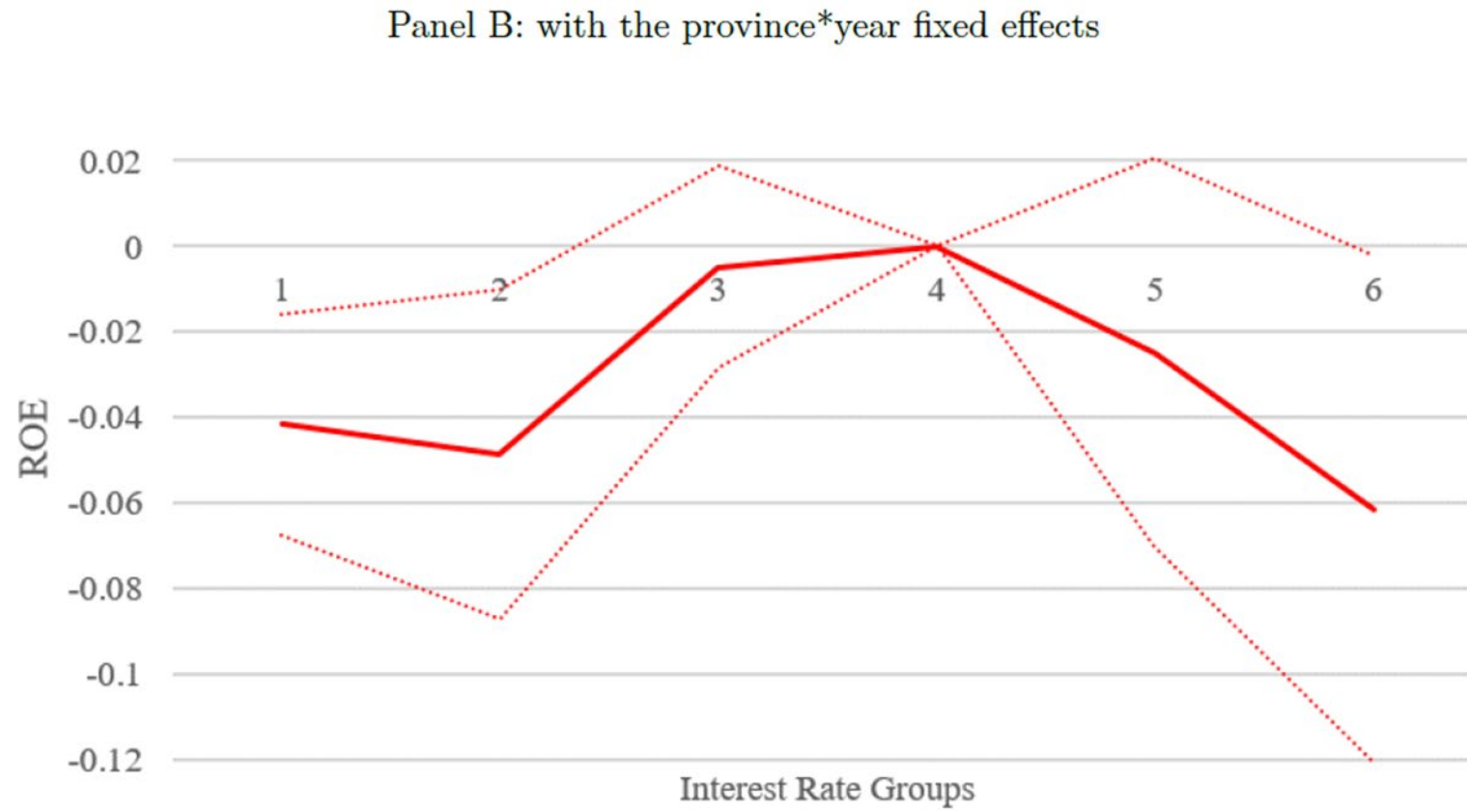
# Convergence in investment rates in raw data



# Main result: dependent var.=capex/assets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Post × InterestRate</i>	0.256*** (2.71)	0.233*** (2.68)	0.240*** (2.62)	0.186*** (4.13)	0.175*** (4.31)	0.179*** (3.37)	0.190*** (3.17)
<i>Post</i>	-0.032*** (-3.13)	-0.026*** (-2.76)	-0.030** (-2.54)	-0.005 (-0.99)			
<i>InterestRate</i>	-0.368*** (-4.16)	-0.357*** (-4.20)	-0.321*** (-4.60)	-0.196*** (-4.46)	-0.156*** (-2.92)	-0.183** (-2.90)	-0.170** (-2.88)
<i>Tobin's Q</i>		0.003*** (3.22)	0.004*** (4.27)	0.007*** (4.21)	0.006*** (3.77)	0.005** (2.93)	0.004** (2.24)
<i>CashFlow</i>		0.232*** (10.26)	0.215*** (7.63)	0.106*** (5.57)	0.101*** (5.32)	0.087*** (7.29)	0.078*** (6.77)
<i>Log(Assets)</i>			0.005* (1.84)	-0.016*** (-2.82)	-0.017** (-2.76)	-0.021* (-2.02)	-0.027** (-2.83)
<i>Leverage</i>			-0.036** (-2.46)	-0.058*** (-3.13)	-0.048** (-2.53)	-0.039* (-2.14)	-0.028 (-1.73)
Observations	4,716	4,716	4,716	4,682	4,648	4,628	4,616
R-squared	0.025	0.107	0.118	0.471	0.514	0.549	0.591
Firm FE	NO	NO	NO	YES	YES	YES	YES
Year FE	NO	NO	NO	YES	NO	NO	NO
SASAC*Year FE	NO	NO	NO	NO	YES	YES	YES
Industry*Year FE	NO	NO	NO	NO	NO	YES	YES
Province*Year FE	NO	NO	NO	NO	NO	NO	YES

# Result 2: lower ROE for firms with $r_D \neq 7.3\%$





# Potential problem

- Measure  $r_D$  as realized interest rate payments on debt
- Paper assumes that  $r_D$  equals expected interest rate
- What about default risk?
- Empirical fact: almost zero default in data set
- Possible reason: SASAC bails out failing firms
- Implication: management cares only about return if success
  - Overinvestment
  - Too much leverage and risk
- Two problems for paper:
  1. SASAC/bank's response: borrowing constraints for risky firms
  2. Realized  $r_D$  could have survivor bias, might ignore SASAC bailout and presence of borrowing constraints

# Potential problem (cont.)

- No perfect solution to potential mismeasurement of  $r_D$   
... although paper does control for leverage
- Did banks/SASAC change borrowing limits for firms after EVA?  
...possibly
  - Paper should look into this

# EVA and allocative efficiency of capital (cont.)

- Paper pursues a Hsieh and Klenow (2009) exercise
  - No data on industrial value-added.
  - Follow Chen and Song (2013) and measure MRPK as
$$\text{MRPK} = \log(\text{before tax operating profit} / \text{lagged fixed assets})$$
- Result: no evidence of reduction in dispersion in MRPK after EVA
- Why?
  - measurement error (difficult to measure MRPK)
  - Differences across industries in risk-adjusted cost of capital (beta)
  - Could also be due to correlation between capital and output wedges

# EVA and allocative efficiency of capital

- Allocative efficiency: equate marginal product of capital across firms
- Hsieh and Klenow (2009): distortion is increasing in  $var(\log(MRPK_i))$

- Before EVA

$$MRPK^{ROE}_i = \frac{1 + \tau_{Ki}}{1 - \tau_{Yi}} \times r_i$$

- After EVA

$$MRPK^{EVA}_i = \frac{(1 + \tau_{Ki})(0.25 - \pi)r_i + 5.5\%}{1 - \tau_{Yi}}$$

- Suppose the efficient  $r_i$  is constant ( $r_i = r$ ) and ( $\pi = 0.25$ )

# EVA and allocative efficiency of capital (cont.)

$$\begin{aligned} \text{var}(\ln(MRPK^{ROE}_i)) &= \text{var}(\ln(1 + \tau_{Ki})) + \text{var}(\ln(1 - \tau_{Yi})) \\ &\quad - 2\text{cov}(\ln(1 + \tau_{Ki}), \ln(1 - \tau_{Yi})) \\ &\approx \text{var}(\tau_{Ki}) + \text{var}(\tau_{Yi}) + 2\text{cov}(\tau_{Yi}, \tau_{Ki}) \end{aligned}$$

$$\text{var}(\ln(MRPK^{EVA}_i)) = \text{var}(\ln(1 - \tau_{Yi})) \approx \text{var}(\tau_{Yi})$$

- Whether distortion is larger or smaller under EVA depends on covariance b/w capital wedge & output wedge
  - Worse distortion if firms with high  $r_D$  also have large output taxes  $\tau_{Yi} > 0$
  - Smaller distortion if firms with high  $r_D$  have output subsidies,  $\tau_{Yi} < 0$

# EVA and allocative efficiency of capital (cont.)

- Empirical evidence on  $cov(\tau_{Yi}, \tau_{Ki})$ :
  - $\text{corr}(r_D, \text{political connection}) = -0.038$
  - $\text{corr}(r_D, \text{direct subsidies}) = +0.101^{**}$
  - $\text{corr}(r_D, \text{effective tax rates}) = -0.069$
- ... cross-sectional correlations based on averages across all years

SOEs w/large  $r_D$  tend to have ...

- Large subsidies (low  $\tau_{Yi}$ ) [significant]
- ... and low effective tax rates (low  $\tau_{Yi}$ )
  - suggests  $cov(\tau_{Yi}, \tau_{Ki}) < 0$
- Less political connections (high  $\tau_{Yi}$ )
  - suggests  $cov(\tau_{Yi}, \tau_{Ki}) < 0$