Credit Allocation under Economic Stimulus: Evidence from China

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January 2018

Motivation

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  $\rightarrow$ Scarce direct empirical evidence

Credit Growth During Stimulus

Figure: Capital Flows from Financial System to Real Economy
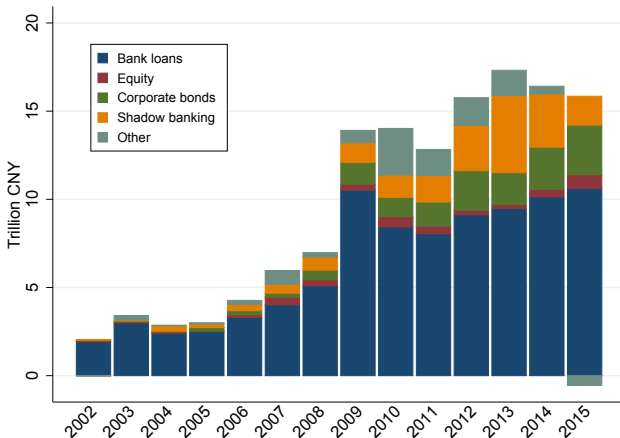
Source: People's Bank of China - Total Social Financing Dataset

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Study effect of credit supply increase on firm-level outcomes and allocation of credit across firms

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3 Discussion

- Discuss/test potential channels driving credit allocation dynamics

Preview of Results

- Average effects
  - Firms with larger increase in credit supply during stimulus
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- Channels
    1. State-ownership connection (banks-firms)
    2. Implicit bail-out of SOEs

Literature

1. Macroeconomics
   - Business cycles and resource allocation: Caballero et al (1994); Cooper et al (1993); Mortensen and Pissarides (1994)
   - Financial frictions: Kiyotaki and Moore (1997); Ramey and Watson (1997); Barlevy (2003).

2. Misallocation and Growth
   - Dynamic: Song et al. (2011); Buera and Shin (2013); Gopinath et al (2016)

3. China Economy and Credit Boom
   - Local government debt: Huang, Pagano, and Panizza (2016); Bai, Hsieh, and Song (2016); Ambrose, Deng, and Wu (2015); Chen, He, and Liu (2016)
   - Unintended Consequences of Stimulus: Brunnermeier, Sockin, and Xiong (2017), Deng, Morck, and Yeung (2015); Ouyang and Peng (2015).
   - Shadow banking: Hachem and Song (2015); Chen, He, and Liu (2016), Chen, Ren and Zha (2016)

4. State-Owned Enterprises
   - Social view Stiglitz and Weiss (1981), Greenwald and Stiglitz (1986), Stiglitz (1993)
   - Agency view Tirole, (1994); Banerjee, (1997)
   - Political view: Stigler (); Shleifer and Vishny (1998); Sapienza (2002)

Structure of the Talk

- **Background and Stylized Facts**

- Identification
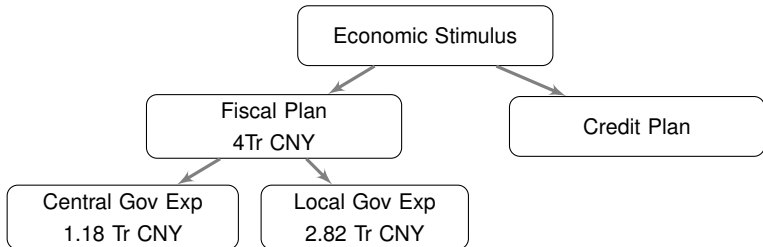
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- Discussion
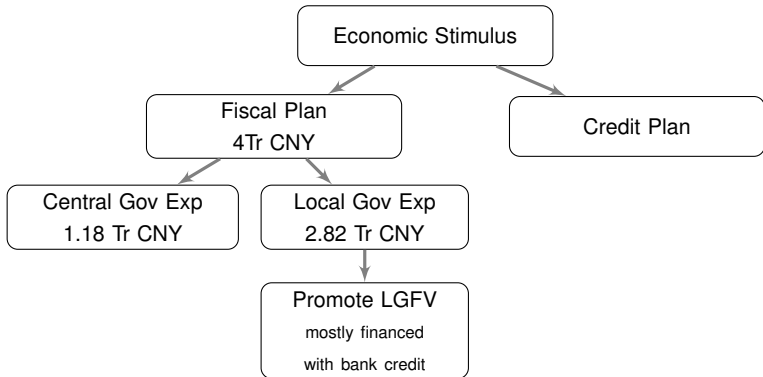
Background

Structure of the Economic Stimulus Plan
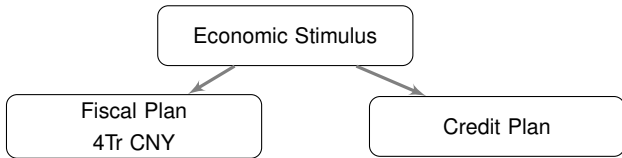
Background

Structure of the Economic Stimulus Plan

```
                    ┌─────────────────────┐
                    │ Economic Stimulus   │
                    └─────────────────────┘
                       ↓              ↓
          ┌──────────────────┐   ┌──────────────┐
          │ Fiscal Plan      │   │ Credit Plan  │
          │ 4Tr CNY          │   └──────────────┘
          └──────────────────┘
            ↓           ↓
 ┌──────────────────┐ ┌──────────────────┐
 │ Central Gov Exp  │ │ Local Gov Exp    │
 │ 1.18 Tr CNY      │ │ 2.82 Tr CNY      │
 └──────────────────┘ └──────────────────┘
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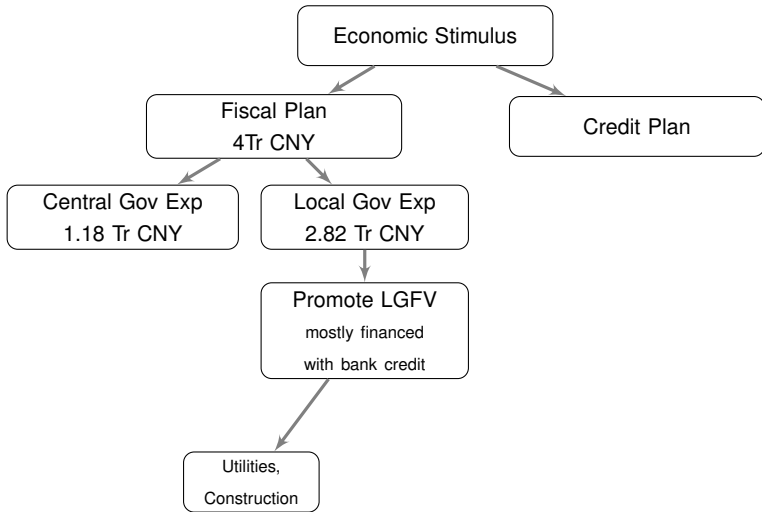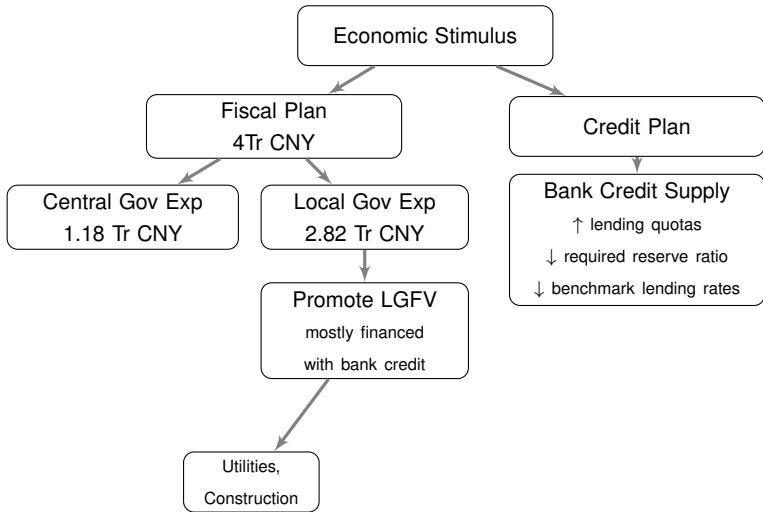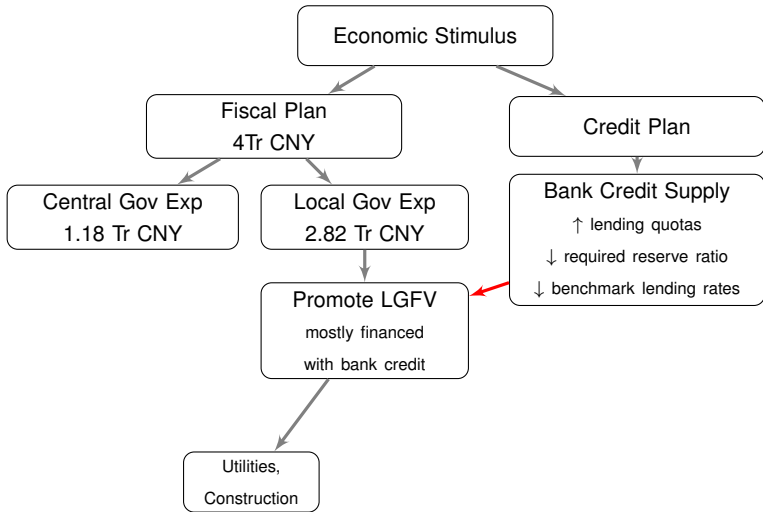
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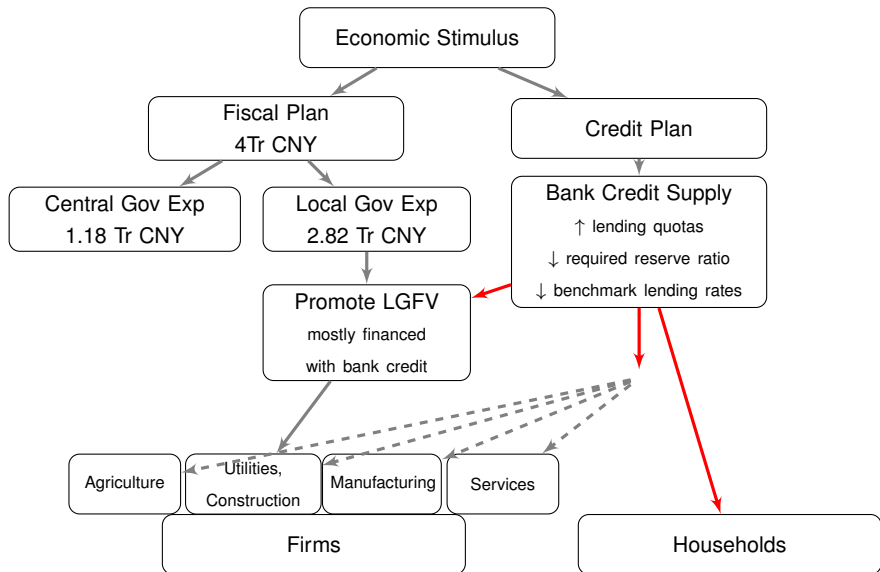
Changes in Banking Regulation

- Reduction in Required Reserve Ratios (RRR = reserves/deposits)

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↓ RRR Large Banks: 17.5→15.5%   ↓ RRR Small Banks: 17.5→13.5%
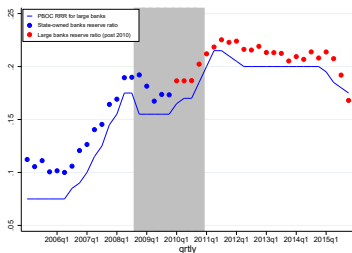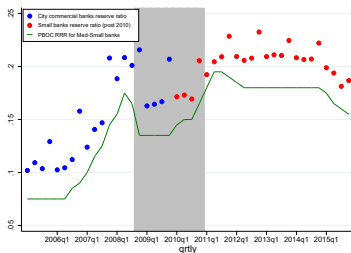
Notes: Shaded areas indicate stimulus years (2008:Q4 to 2010:Q4). Data on actual reserve ratios is from WIND and comes aggregated by bank category.

Change in Reserves and Credit Growth
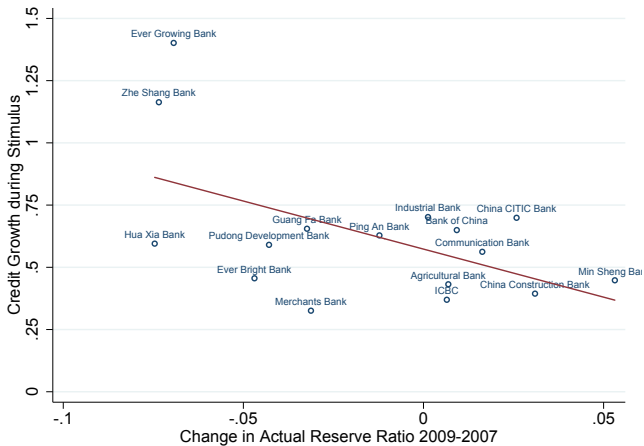
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   - Universe of loans to firms with annual outstanding balance $\geq$ 50m CNY

   - Variables: loan balance, maturity, repayment, bank and firm identifiers

Banks in the CBRC Loan-level Dataset

| Bank Name	Bank Type	Lending Share in 2008
ICBC	State-Owned Commercial Bank	18.19%
China Development Bank	Policy Bank	16.38%
China Construction Bank	State-Owned Commercial Bank	15.82%
Agricultural Bank	State-Owned Commercial Bank	13.03%
Bank of China	State-Owned Commercial Bank	10.44%
Communication Bank	State-Owned Commercial Bank	5.52%
Min Sheng Bank	National Joint-Equity Commercial Bank	2.95%
Merchants Bank	National Joint-Equity Commercial Bank	2.95%
China CITIC Bank	National Joint-Equity Commercial Bank	2.72%
Pudong Development Bank	National Joint-Equity Commercial Bank	2.62%
Export Import Bank	Policy Bank	2.08%
Ever Bright Bank	National Joint-Equity Commercial Bank	2.05%
Industrial Bank	National Joint-Equity Commercial Bank	1.68%
Hua Xia Bank	National Joint-Equity Commercial Bank	1.45%
Guang Fa Bank	National Joint-Equity Commercial Bank	0.81%
Ping An Bank	National Joint-Equity Commercial Bank	0.81%
Bo Hai Bank	National Joint-Equity Commercial Bank	0.18%
Ever Growing Bank	National Joint-Equity Commercial Bank	0.16%
Zhe Shang Bank	National Joint-Equity Commercial Bank	0.15%

Source: CBRC, Bankscope. All banks are currently publicly traded except: Guang fa Bank, Ever Growing Bank, Bohai Bank and the two policy banks.

Credit Growth across Sectors

Figure: Change in Bank Lending to Firms - by Sector, Quarterly Data
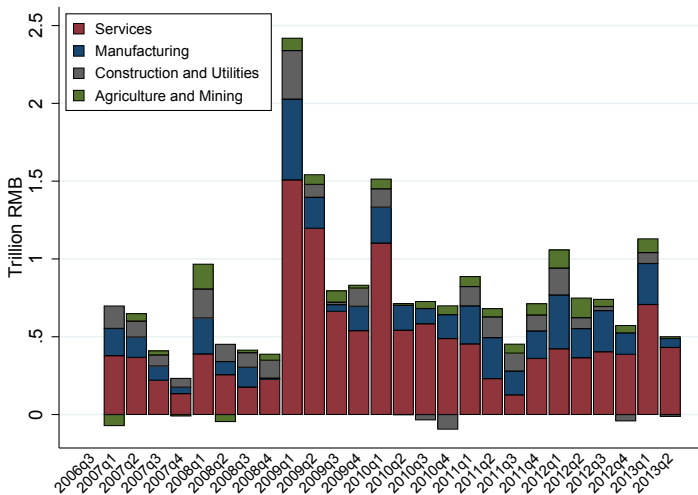
Credit Growth across Regions

Figure: Change in Bank Lending to Firms during Stimulus - by City/Prefecture-city

Credit Growth Quartiles
- (0.85,2.98]
- (0.63,0.85]
- (0.44,0.63]
- [-0.19,0.44]
- no data
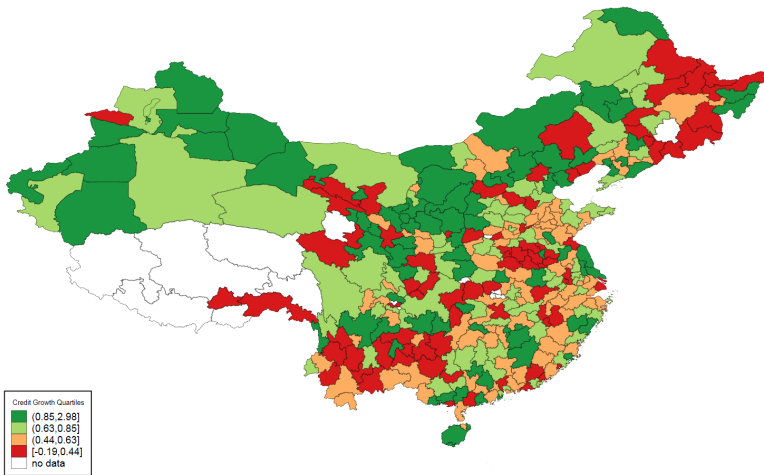
Notes: For each city c, we plot $\Delta L_c = (\frac{1}{2}\sum_{t=09}^{T=10} L_{ct} - \frac{1}{2}\sum_{t=07}^{T=08} L_{ct})/\frac{1}{2}\sum_{t=07}^{T=08} L_{ct}$.

Data Description

2. Annual Industrial Survey (1998-2013)

- Source: China's National Bureau of Statistics

- Manufacturing firms with revenues: $\geq$ 5m CNY (20m after 2010)

- Variables: employment, investment, assets, value added, book value of K

- Share of government ownership (following Hsieh and Song, 2015)

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1. + 2. Matched sample:

- 67% of Manufacturing Firms with credit relationship with top-19 bank

- Lending to manufacturing represents 22% total bank lending (2006-2013)

Summary Statistics

Variable Name	Mean	Median	St.Dev.	N
Panel A: CBRC loan-level data:				
$loan_{ibt}$ (million RMB)	163	63	452	177,087
stimulus years	179	68	474	39,005
stimulus years, firm-level	554	156	1791	11,067
$\Delta \log loan_{ibt}$	0.039	0.000	0.433	177,087
stimulus years	0.033	0.000	0.461	39,005
stimulus years, firm-level ($\Delta \log loan_{it}$)	0.094	0.048	0.442	11,067
Panel B: Annual Survey of Industrial firms:				
number of employees	2,144	702	7,405	11,067
fixed assets (million RMB)	731	121	3,699	11,067
sales (million RMB)	1,621	421	6,255	11,067
$StateShare$	0.113	0.000	0.290	11,067
age (year)	15	11	14	11,067
exporter dummy	0.449	0.000	0.497	11,067
public	0.052	0.000	0.222	11,067
$\Delta \log$ employment	0.027	0.045	0.598	11,067
$\Delta \log$ fixed assets	-0.272	-0.073	0.669	11,067
Panel C: independent variables:				
$\Delta \log L_{b-cj,t}$	0.131	0.118	0.113	177,087
stimulus years	0.231	0.187	0.127	39,005
$\widetilde{\Delta L_{icjt}}$	0.219	0.198	0.115	11,067

Structure of the Talk

- Background and Stylized Facts

- **Identification**

- Empirical Results

- Discussion

Identification

- Empirical questions:

  $\rightarrow$ Effect of bank credit supply on firm borrowing, investment and size

  $\rightarrow$ Allocation across firms with different ownership, initial productivity

- Main challenge:

  $\rightarrow$ Isolate changes in firm borrowing that are solely driven by **credit supply forces** and not by changes in demand/investment opportunities

- Measure of **firm exposure** to credit supply changes exploits:
  - Heterogeneous increases in lending across banks
  - Pre-existing bank-firm relationships

Empirics
Identification Strategy

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- Firm i exposure [as in Chodorow-Reich (QJE, 2014)]

$$\widetilde{\Delta L_{icjt}} = \sum_{b \in O_i} \omega_{bi,t=0} \times \Delta Loans_{b-cj,t} \tag{1}$$

  - $\omega_{bi,t=0}$ = initial share of borrowing of firm i from bank b
  - $\Delta Loans_{b-cj,t}$ = change in total loan balance of bank b
    - $\rightarrow$ excluding any lending to sector j and city c where firm i operates

Discussion

Identification Assumptions:

A1) Bank-firm relationships persistent over time

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    - but $\perp$ $unobservable$ firm characteristics affecting their credit demand

Diagnostics of Identification Assumptions

1. (A1) Estimate probability of new loan from pre-existing lender

2. (A2) Estimate loan-level equation with firm $\times$ year FE (Khwaja and Mian 2009)

$$\Delta \log loan_{ibcjt} = \alpha + \alpha_{\mathbf{it}} + \beta \Delta \log L_{b-cj,t} + \varepsilon_{ibcjt} \tag{2}$$

where: i firm, b bank, c city, j sector, t year

(A1) Persistence of Bank-Firm Relationship

outcome:	I(New loan of firm i from bank b)$_t$
I(Lending relationship firm i-bank b)$_{t-1}$	0.949
	[0.001]***
Year, Bank, Industry, City fe	y
R-squared	0.807
Observations	882,580

Notes: The outcome variable is a dummy equal to 1 if firm i takes a new loan from bank b at time t. Each observation in the dataset is a potential bank-firm relationship, i.e. for each firm and year, there is an observation for each potential lender. The independent variable is a dummy equal to 1 if firm i had a pre-existing credit relationship with bank b at time $t - 1$. Standard errors clustered by firm. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

- 95% probability new loan from bank with pre-existing relationship

(A2) Bank Lending and Borrowers' Characteristics

$$\Delta \log loan_{ibt} = \alpha + \alpha_{it} + \beta \Delta \log L_{b-i,t} + \varepsilon_{ibt}$$

	$\Delta \log loan_{ibt}$			
	all firms		multi-lender	
	(1)	(2)	(3)	(4)
$\Delta \log Loans_{b-i,t}$	0.173 [0.045]***	0.174 [0.045]***	0.161 [0.048]***	0.189 [0.058]***
Year fe	y	y	y	y
Industry fe	y	y	y	
City fe	y	y	y	
Firm characteristics		y	y	
Firm $\times$ Year fe				y
R-squared	0.012	0.012	0.012	0.341
Observations	177,087	177,087	143,525	143,525

Notes: The unit of observation is a loan. Standard errors clustered at the main lender level. Significance levels: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

- Similar point estimates when using $within$-firm variation

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Effect of Credit Supply on Firm Borrowing
Average effects

$$\Delta \log y_{icjt} = \alpha_c + \alpha_j + \alpha_t + \beta \Delta \widetilde{L_{icjt}} + \gamma X_{i,t-1} + \varepsilon_{icjt}$$

- i firm, j sector, c city, t year.
- $\Delta \widetilde{L_{it}}$: firm-level exposure to credit supply increases

$$\Delta \widetilde{L_{icjt}} = \sum_{b \in O_i} \omega_{bi,t=0} \times \Delta \log Loans_{b-cj,t}$$

- $X_{i,t-1}$: firm characteristics: size, export status, age, publicly traded status

Average Effects

outcome:	$\Delta \log loan_{it}$ (1)	$\Delta \log K_{it}$ (2)	$\Delta \log L_{it}$ (3)
$\Delta \widetilde{L_{icjt}}$	1.005 [0.088]***	0.218 [0.107]**	0.318 [0.100]***
Year FE	y	y	y
Industry FE	y	y	y
City FE	y	y	y
Firm characteristics	y	y	y
R-squared	0.094	0.438	0.232
Observations	11,067	11,067	11,067

Notes: Standard errors clustered at city level. *** p<0.01, ** p<0.05, * p<0.1.

- 1 percent increase in credit supply from pre-existing lenders:
  - $\approx$ 1 percent increase in firm borrowing
  - 0.22 percent increase in fixed capital
  - 0.32 percent increase in employment

Effect of Credit Supply on Firm Borrowing
Heterogeneous effects

$$\Delta \log y_{icjt} = \alpha_c + \alpha_j + \alpha_t + \beta_1 \widetilde{\Delta L_{icjt}} \times C_{i,t=0} + \beta_2 \widetilde{\Delta L_{icjt}} + \beta_3 C_{i,t=0}$$
$$+ \gamma X_{i,t-1} + \varepsilon_{ijct}$$

- i firms, j sector, c city, t year.

- $\widetilde{\Delta L_{icjt}}$: firm-level exposure to credit supply increases

- $C_{i,t=0}$:

  - $StateShare$ share of government ownership

  - $\log APK = \log \frac{VA}{K}$

State Ownership and Average Product of Capital

- unconditional (left) and conditional on city and industry (right)

2007 (pre-stimulus) — 2007 (pre-stimulus)

outcome:	$\Delta \log loan_{it}$		
sample:	all firms	$\log APK_{i,t=0}$	
		$= low$	$= high$
$\Delta \widetilde{L_{icjt}} \times StateShare_{i,t=0}$	0.367 [0.119]***		
$\Delta \widetilde{L_{icjt}}$	0.972 [0.086]***		
$StateShare_{i,t=0}$	-0.080 [0.027]***		
R-squared	0.095		
Observations	11,067		

sample:	all firms	$StateShare_{i,t=0}$	
		$= 0$	> 0
$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0}$			
$\Delta \widetilde{L_{icjt}}$			
$\log APK_{i,t=0}$			
R-squared			
Observations			

All columns include Year, Industry and City fixed effects as well as firm characteristics. Standard errors clustered at city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

outcome:	$\Delta \log loan_{it}$		
sample:	all firms	$\log APK_{i,t=0}$	
		$= low$	$= high$
$\Delta \widetilde{L_{icjt}} \times StateShare_{i,t=0}$	0.367	0.354	0.252
	[0.119]***	[0.132]***	[0.247]
$\Delta \widetilde{L_{icjt}}$	0.972	0.872	1.043
	[0.086]***	[0.106]***	[0.123]***
$StateShare_{i,t=0}$	-0.080	-0.051	-0.097
	[0.027]***	[0.033]	[0.056]*
R-squared	0.095	0.139	0.107
Observations	11,067	5,531	5,510
sample:	all firms	$StateShare_{i,t=0}$	
		$= 0$	> 0

$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0}$

$\Delta \widetilde{L_{icjt}}$

$\log APK_{i,t=0}$

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	[0.086]***	[0.106]***	[0.123]***
$StateShare_{i,t=0}$	-0.080	-0.051	-0.097
	[0.027]***	[0.033]	[0.056]*
R-squared	0.095	0.139	0.107
Observations	11,067	5,531	5,510

sample:	all firms	$StateShare_{i,t=0}$	
		$= 0$	> 0
$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0}$	-0.060		
	[0.027]**		
$\Delta \widetilde{L_{icjt}}$	0.984		
	[0.090]***		
$\log APK_{i,t=0}$	0.047		
	[0.008]***		
R-squared	0.099		
Observations	11,067		

All columns include Year, Industry and City fixed effects as well as firm characteristics. Standard errors clustered at city level. *** p<0.01, ** p<0.05, * p<0.1.

outcome:	$\Delta \log loan_{it}$		
sample:	all firms	$\log APK_{i,t=0}$	
		$= low$	$= high$
$\Delta \widetilde{L_{icjt}} \times StateShare_{i,t=0}$	0.367	0.354	0.252
	[0.119]***	[0.132]***	[0.247]
$\Delta \widetilde{L_{icjt}}$	0.972	0.872	1.043
	[0.086]***	[0.106]***	[0.123]***
$StateShare_{i,t=0}$	-0.080	-0.051	-0.097
	[0.027]***	[0.033]	[0.056]*
R-squared	0.095	0.139	0.107
Observations	11,067	5,531	5,510
sample:	all firms	$StateShare_{i,t=0}$	
		$= 0$	> 0
$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0}$	-0.060	-0.058	0.040
	[0.027]**	[0.029]**	[0.079]
$\Delta \widetilde{L_{icjt}}$	0.984	0.960	1.204
	[0.090]***	[0.094]***	[0.251]***
$\log APK_{i,t=0}$	0.047	0.052	0.002
	[0.008]***	[0.008]***	[0.021]
R-squared	0.099	0.101	0.223
Observations	11,067	9,251	1,789

All columns include Year, Industry and City fixed effects as well as firm characteristics. Standard errors clustered at city level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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Discussion

- Effect of credit supply increase on firm borrowing during stimulus

    - 38% larger for fully state-owned than for fully private firms
        - $\rightarrow$ Result holds both within low and $high$ capital productivity firms
    - 8% larger for firms with 1 st.dev. lower initial APK
        - $\rightarrow$ $between$ (private to SOEs) and $within$ effect (among private firms)

- Robustness
    - Exclude input-suppliers to construction and utilities

Allocation Dynamics: All Years

outcome:	$\Delta \log loan_{it}$		
sample:	all firms	$\log APK_{i,t=0}$	
		$= low$	$= high$
$\Delta \widetilde{L_{icjt}} \times StateShare_{i,t=0} \times I(stimulus)$	0.874 [0.240]***		
$\Delta \widetilde{L_{icjt}} \times StateShare_{i,t=0} \times I(post-stimulus)$	0.664 [0.291]**		
$\Delta \widetilde{L_{icjt}} \times StateShare_{i,t=0}$	-0.493 [0.209]**		
R-squared	0.065		
Observations	46,568		

Notes: All regressions include main effects of the triple interaction; year, industry and city fixed effects; firm characteristics. Standard errors clustered at city level. *** p<0.01, ** p<0.05, * p<0.1.

- Effect of credit supply increase on firm borrowing:
  - pre-stimulus: 49% larger for private firms than SOEs
  - Reversal starting from 2009, extends in post-stimulus period

Allocation Dynamics: All Years

outcome:	$\Delta \log loan_{it}$		
sample:	all firms	$\log APK_{i,t=0}$	
		$= low$	$= high$
$\widetilde{\Delta L_{icjt}} \times StateShare_{i,t=0} \times I(stimulus)$	0.874	0.650	1.152
	[0.240]***	[0.273]**	[0.503]**
$\widetilde{\Delta L_{icjt}} \times StateShare_{i,t=0} \times I(post-stimulus)$	0.664	0.438	1.244
	[0.291]**	[0.348]	[0.687]*
$\widetilde{\Delta L_{icjt}} \times StateShare_{i,t=0}$	-0.493	-0.246	-0.859
	[0.209]**	[0.244]	[0.430]**
R-squared	0.065	0.076	0.062
Observations	46,568	23,280	23,279

Notes: All regressions include main effects of the triple interaction; year, industry and city fixed effects; firm characteristics. Standard errors clustered at city level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

- Effect of credit supply increase on firm borrowing:
    - pre-stimulus: 49% larger for private firms than SOEs
    - Reversal starting from 2009, extends in post-stimulus period
    - effect holds when conditioning on capital productivity

Allocation Dynamics: All Years

outcome:	$\Delta \log loan_{it}$		
sample:	all firms	$StateShare_{i,t=0}$	
		$= 0$	> 0
$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0} \times I(stimulus)$	-0.149 [0.048]***		
$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0} \times I(post-stimulus)$	-0.054 [0.061]		
$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0}$	0.093 [0.044]**		
R-squared	0.069		
Observations	46,568		

Notes: All regressions include main effects of the triple interaction; year, industry and city fixed effects; firm characteristics. Standard errors clustered at city level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

- Effect of credit supply increase on firm borrowing:
  - pre-stimulus: larger for $high$ capital productivity firms
  - Reversal starting from 2009

Allocation Dynamics: All Years

outcome:		$\Delta \log loan_{it}$		
sample:		all firms	$StateShare_{i,t=0}$
			$= 0$	> 0
$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0} \times I(stimulus)$		-0.149	-0.162	0.031
		[0.048]***	[0.057]***	[0.143]
$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0} \times I(post-stimulus)$		-0.054	-0.055	0.203
		[0.061]	[0.069]	[0.177]
$\Delta \widetilde{L_{icjt}} \times \log APK_{i,t=0}$		0.093	0.107	-0.013
		[0.044]**	[0.053]**	[0.119]
R-squared		0.069	0.070	0.120
Observations		46,568	39,131	7,428

Notes: All regressions include main effects of the triple interaction; year, industry and city fixed effects; firm characteristics. Standard errors clustered at city level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

- Effect of credit supply increase on firm borrowing:
  - pre-stimulus: larger for $high$ capital productivity firms
  - Reversal starting from 2009
  - capital productivity not a driver of credit allocation within SOEs

Structure of the Talk

- Background and Stylized Facts

- Identification

- Empirical Results

- **Discussion**

Discussion of Allocation Dynamics

- Pre-stimulus years:
  - Results consistent with capital reallocation from low to high-productivity firms in China during the 2000s (e.g. Song et al. AER 2011)

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- Stimulus years:

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    1. State-ownership connection between banks and firms

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- Stimulus years:
  what can explain reversal of previous reallocation process?

  1. State-ownership connection between banks and firms
  2. Implicit government bail-out of SOEs becoming more important during "recession"

State-ownership connection

Relies on two empirically testable arguments:

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   - Career incentives of top-management

   $\rightarrow$ "Mechanically" more of new credit directed to SOEs

State-ownership connection, cont.

- First, re-construct ownership structure of 19 largest Chinese banks

Bank Name	Bank Type	Gov. Ownership in 2008
ICBC	State-Owned Commercial Bank	75.10%
China Construction Bank	State-Owned Commercial Bank	58.56%
Agricultural Bank	State-Owned Commercial Bank	100.00%
Bank of China	State-Owned Commercial Bank	70.82%
China Development Bank	Policy Bank	100.00%
Communication Bank	State-Owned Commercial Bank	32.54%
Merchants Bank	National Joint-Equity Commercial Bank	32.63%
Pudong Development Bank	National Joint-Equity Commercial Bank	39.74%
China CITIC Bank	National Joint-Equity Commercial Bank	63.28%
Min Sheng Bank	National Joint-Equity Commercial Bank	12.38%
Industrial Bank	National Joint-Equity Commercial Bank	29.92%
Ever Bright Bank	National Joint-Equity Commercial Bank	88.30%
Hua Xia Bank	National Joint-Equity Commercial Bank	34.41%
Export Import Bank	Policy Bank	100.00%
Guang Fa Bank	National Joint-Equity Commercial Bank	65.78%
Ping An Bank	National Joint-Equity Commercial Bank	0.00%
Ever Growing Bank	National Joint-Equity Commercial Bank	19.23%
Zhe Shang Bank	National Joint-Equity Commercial Bank	14.92%
Bo Hai Bank	National Joint-Equity Commercial Bank	62.01%

Source: CBRC, Author's calculations from Banks' Annual Reports.

State-ownership connection, cont.

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State-ownership connection, cont.

Table: Top-10 Shareholders of China Everbright Bank Co., Ltd in 2008

| Rank	Shareholder	Shareholder type	Ownership
1	Central Huijin Investment Ltd.	Gov fund	70.88%
2	China Everbright Group	Gov fund	7.59%
3	China Everbright Limited	Gov fund	6.23%
4	Hongta Tobacco Group Company Limited	SOE	1.35%
5	Zhejiang Southeast Electric Power Company Limited	SOE	0.62%
6	Haixin Iron & Steel Group Co., Ltd.	Private Corp.	0.59%
7	China Export & Credit Insurance Corporation	SOE	0.53%
8	Qingdao Guoxin Industry Corporation	Local Gov Fund	0.39%
9	Shanxi International Electricity Group Company Limited	SOE	0.37%
10	Hongyun honghe Tobacco Group Company Limited	SOE	0.34%

Source: Annual Reports.

- State-Ownership: Central Gov Funds + Local Gov Funds + SOEs

Do SOBs lend relatively more to SOEs than private firms?
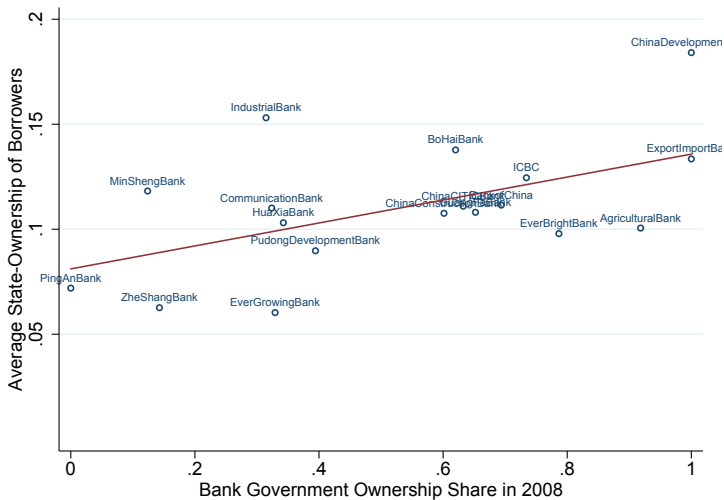
Do SOBs respond more than private banks to credit stimulus?
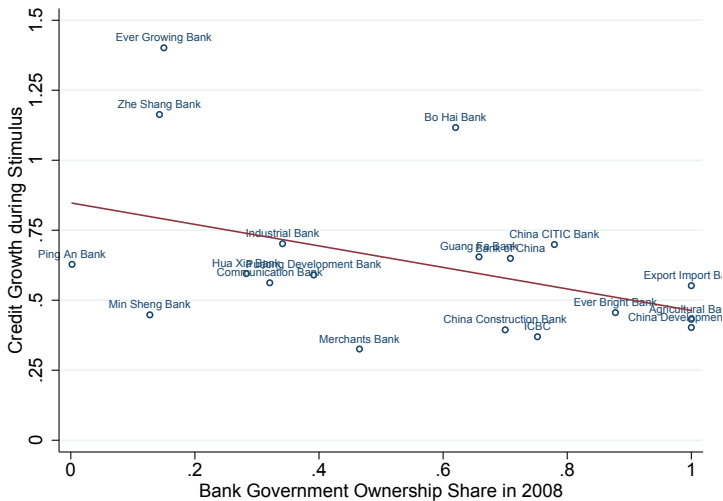
Implicit bail-out of SOEs

- Government might bail out SOEs if close to financial distress

- Lenders favor SOEs *more* when probability of financial distress is higher

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Anecdotal evidence:

東方航空   東星航空

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- Government injected 7 billion CNY into China Eastern through SASAC
- East Star Airline liquidated in August 2009

Ex-post Loan Performance

Panel A outcomes:	$\Delta \log K_{it}$	$\Delta \log L_{it}$	NPL_{it}
$\Delta \widetilde{L_{icjt}} \times StateShare_{i,t=0} \times I(stimulus)$	-0.282 [0.256]	0.760 [0.310]**	-0.110 [0.037]***
$\Delta \widetilde{L_{icjt}} \times StateShare_{i,t=0} \times I(post-stimulus)$	-0.264 [0.267]	-0.130 [0.379]	-0.067 [0.034]*
$\Delta \widetilde{L_{icjt}} \times StateShare_{i,t=0}$	0.156 [0.182]	-0.031 [0.151]	0.086 [0.031]***
R-squared	0.383	0.044	0.070
Observations	46,568	46,568	42,974

Notes: NPL_{it}: value-weighted share of loans originated in year t to firm i which are eventually non-performing (90 days or more delinquent). Standard errors are clustered at city level. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

- Effect of credit supply increase on ex-post non-performing loans:
  - pre-stimulus: loans to SOEs had larger probability of default
  - Gap closes from 2009
  - consistent with government intervention to prevent SOE financial distress

Conclusions

- This paper uses loan-level and firm-level data from China to document:

  - SOEs experienced larger bank credit growth than private firms

  - Reversal of trend of reallocation observed during pre-stimulus years

  - Within private firms, less productive (more $connected$?) ones experience larger credit growth

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- Informs debate on consequences of China stimulus plan.

    - broader impact on the economy besides facilitating off-balance-sheet borrowing by local governments

Thank you!

APPENDIX SLIDES

Appendix. SOEs and Private Firms: within industry and city

2007 (pre-stimulus)