What We Learn from China's Rising Shadow Banking: Exploring the Nexus of Monetary Tightening and Banks' Role in Entrusted Lending[1]

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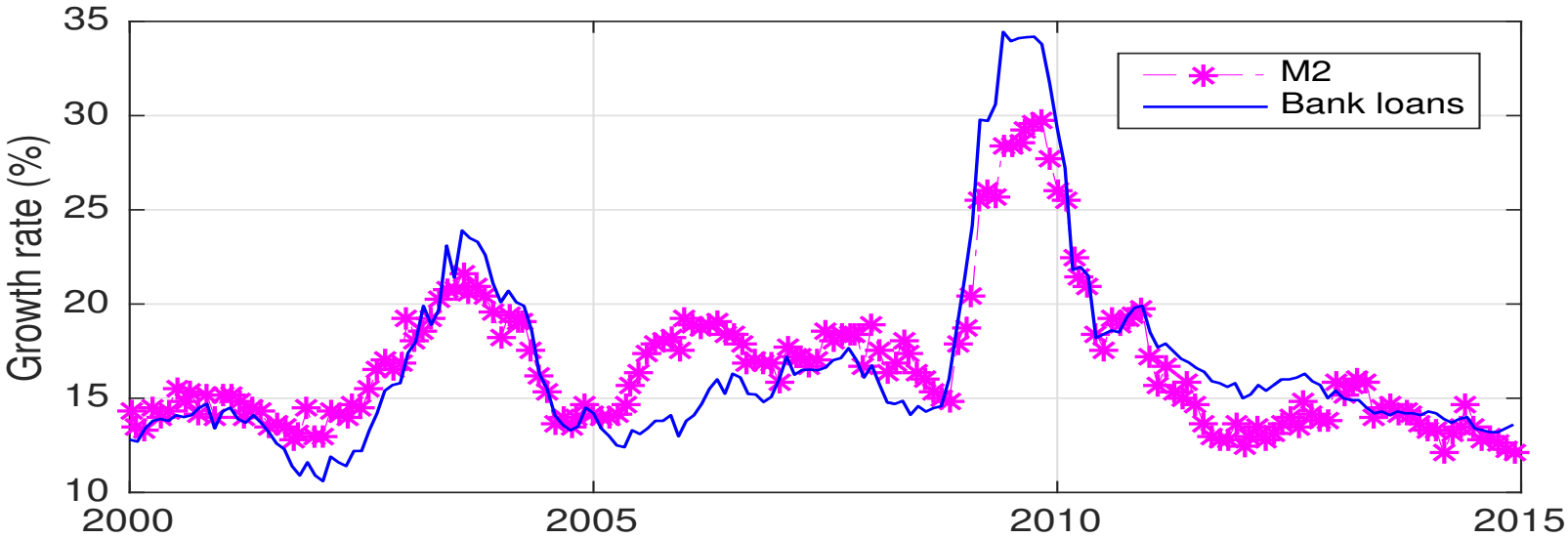
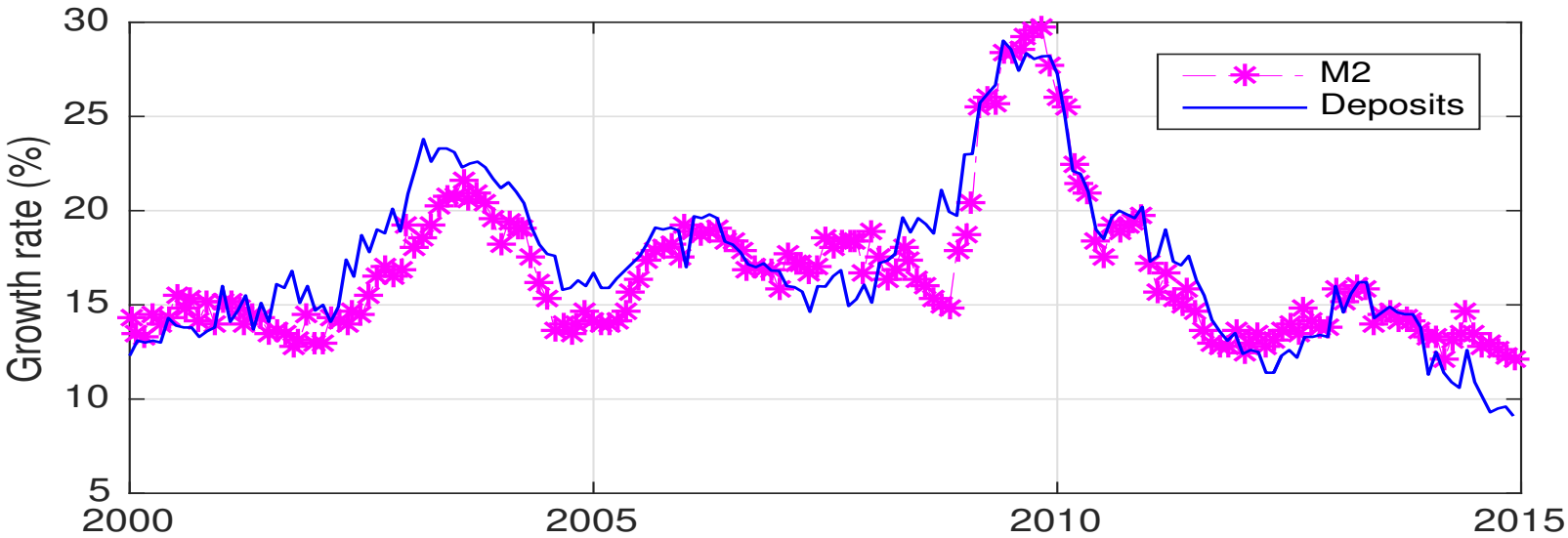
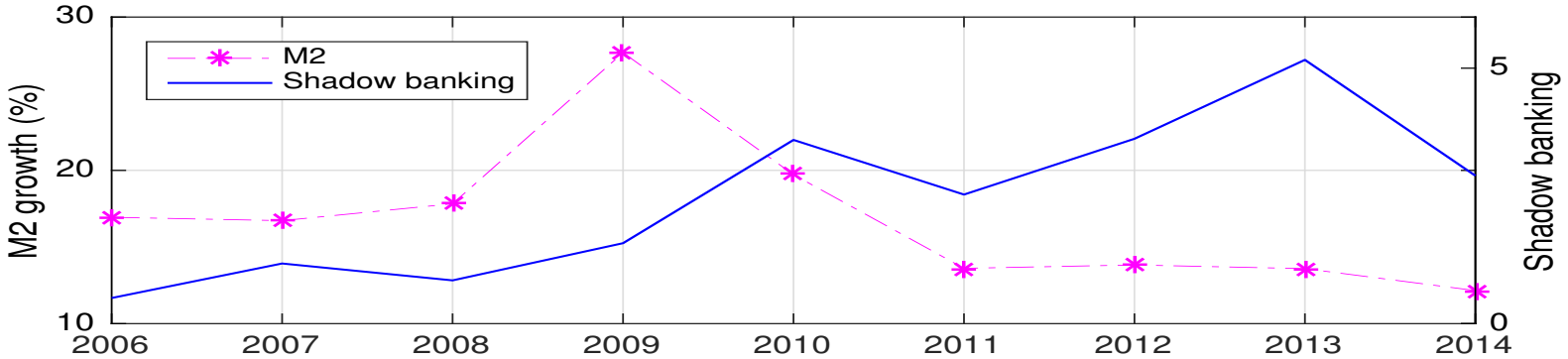
Monetary policy and the banking system

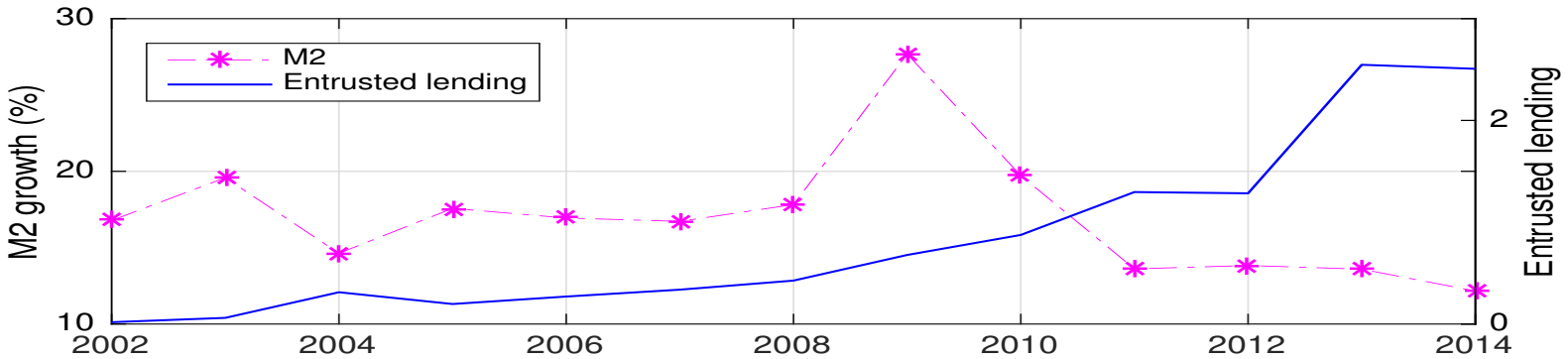


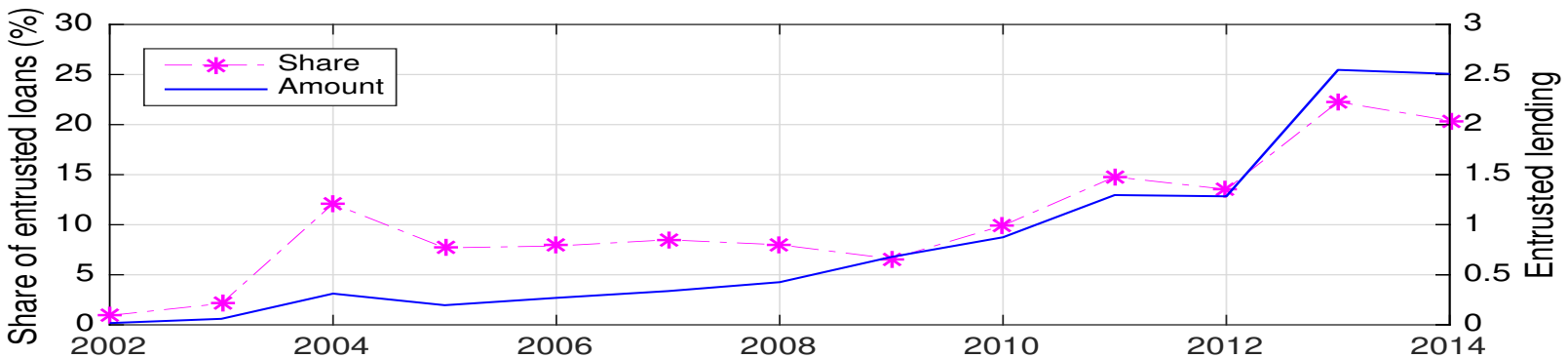


Monetary policy and entrusted lending

Right-hand scale: trillion RMB.







Entrusted lending

- Financing activities between *nonfinancial* companies.

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- A role of the banking system: banks or nonbank financial intermediaries act as trustees or middlemen to facilitate the financing activities.

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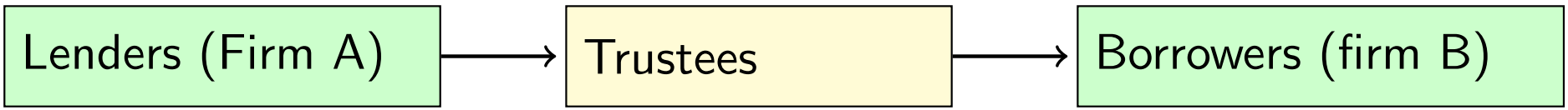
- Financing activities between *nonfinancial* companies.
- A role of the banking system: banks or nonbank financial intermediaries act as trustees or middlemen to facilitate the financing activities.
- A unique feature of China's shadow banking and thus is a focus of our analysis.

Entrusted lending by law



Two policy questions

- What was the role of commercial banks in the rising of entrusted loans?

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- What was the role of commercial banks in the rising of entrusted loans?
- How did the rising entrusted loans offset the effect of monetary policy?

What role did banks play in the rise of shadow loans?

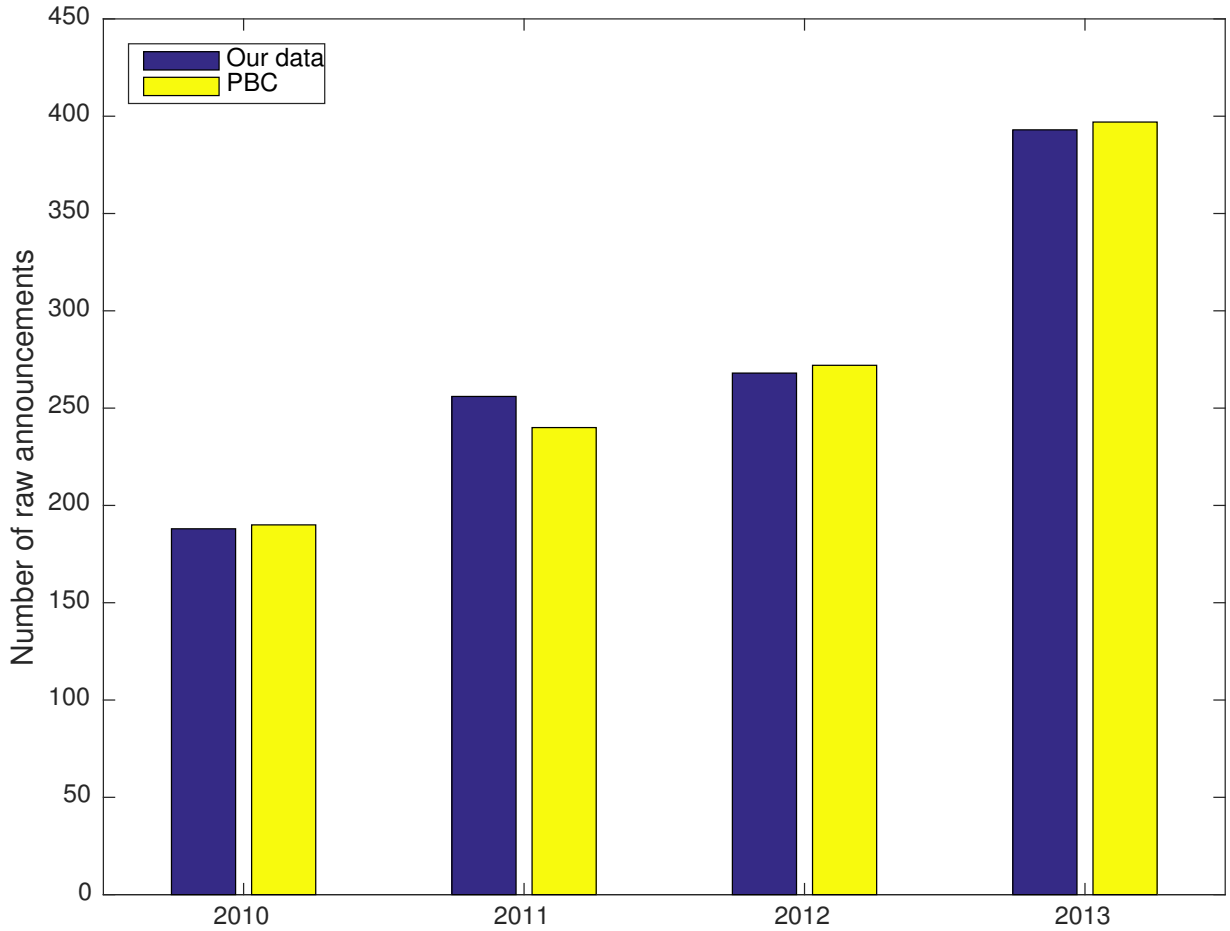
We argue that commercial banks, **especially nonstate banks**, played a prominent role in the rapid rise of entrusted lending during **the period of monetary tightening**.

Microdata

- Transactions of entrusted loans between Chinese firms, facilitated by trustees as middlemen.
- The sample is from 2007 to 2013.
- Read various data sources line by line and combine them to ensure the accuracy of our manually constructed dataset: announcements, PBC, Bankscope, WIND, annual reports of banks and nonfinancial firms.
- Data problems:
  - Duplications in reporting transactions.
  - Outstanding vs. newly originated loans.
  - Reporting how the transaction of an entrusted loan was conducted (planned vs executed).
  - Delays in announcing transactions.
  - Announcement date vs. transaction date.

Data verification

Number of raw announcements we collect versus number published by the PBC's Financial Stability Reports. Data source: WIND.



Data (2007-2013)

- Number of announcements made by lenders and borrowers:

Description	NLA	NBA	NLABA	Total
Number of observations	644	134	-3	775

- A breakdown of the total number of transactions by types of trustees and types of loans:

Description	NBTs	State banks	Nonstate banks	Total
Non-affiliated loans	3	87	135	225
Affiliated loans	122	188	240	550
Total	125	275	375	775

- Proportions (%) of loan transactions and loan volume according to different types of trustees:

Description	NBTs	State banks	Nonstate banks	Total
Number of transactions	16.13	35.48	48.39	100
Loan volume	24.33	34.85	40.82	100

Characterics of risky entrusted loans

- Each loan transaction is uniquely determined by a quadruple index $s = (t, i, b, j)$, a total of 775 transactions between 2007 and 2013.
- Focusing on the borrowers' risk characteristics:

$$\mathfrak{s}_s = \alpha + \alpha_t + \alpha_m \mathfrak{m}_s + \alpha_r \mathscr{I}\left(\text{Risky}_i\right) + \varepsilon_s. \tag{1}$$

- Estimated results of regression (1)

Explanatory variable	Coefficient	(Std. Err.)
$\mathfrak{m}_s$: α_m	$-.0384\%^{***}$	(.0077%)
$\mathscr{I}\left(\text{Risky}_i\right)$: α_r	$1.276\%^{***}$	(.300%)
Impact of a one-year longer maturity on the spread: $12 * \alpha_m$	$-0.461\%^{***}$	pv=0.00
The estimate spread between risky and non-risky loan rates: α_r	$1.276\%^{***}$	pv=0.00

Role of banks in entrusted lending

- Using the NBT dummy as an instrument:

$$\log \mathscr{S}_s = \alpha + \alpha_t + \alpha_g g_{t-1} + \beta_b g_{t-1} \mathscr{I}\left(\text{Bank}_b\right) + \text{Control}_b + \varepsilon_s. \quad (2)$$

- Estimated results of regression (2)

Explanatory variable	Coefficient	(Std. Err.)
g_{t-1} : α_g	1.85	(2.77)
$g_{t-1}\mathscr{I}\left(\text{Bank}_b\right)$: β_b	-6.05^{**}	(2.86)
Impact of money growth via NBTs: α_g	1.85	pv=0.51
Impact of money growth via banks: $\alpha_g + \beta_b$	-4.20^{***}	pv=0.00

Types of banks

- Identifying non-state banks and state banks:

$$\log \mathscr{S}_s = \alpha + \alpha_t + \alpha_g g_{t-1} + \beta_s g_{t-1} \mathscr{I}\left(\text{Nonstate}_b\right) + \beta_\ell g_{t-1} \mathscr{I}\left(\text{State}_b\right) + \text{Control}_b + \varepsilon_s. \quad (3)$$

- Estimated results of regression (3)

Explanatory variable	Coefficient	(Std. Err.)
g_{t-1} : α_g	1.92	(2.78)
$g_{t-1}\mathscr{I}\left(\text{State}_b\right)$: β_ℓ	-4.63	(3.10)
$g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)$: β_s	-7.15^{**}	(2.98)
Impact of money growth via NBTs: α_g	1.92	pv=0.48
Impact of money growth via state banks: $\alpha_g + \beta_\ell$	-2.71	pv=0.12
Impact of money growth via non-state banks: $\alpha_g + \beta_s$	-5.23^{***}	pv=0.00

Relevant effects to be controlled

Control variable	Regression						
	(2)	(3)	(4)	(14)	(15)	(16)	(17)
GDP_{t-1}: macroeconomic effect	X	X	X	X	X	X	X
Inf_{t-1}: macroeconomic effect	X	X	X	X	X	X	X
$\mathscr{I}(Bank_b)$: trustee type	X		X				
$\mathscr{I}(State_b)$: trustee type		X		X			X
$\mathscr{I}(Nonstate_b)$: trustee type		X		X		X	X
$\mathscr{I}(Risky_i)$: borrower type			X	X	X	X	X
α_{sec}: industry fixed effect			X	X	X	X	X
$\mathscr{I}(Risky_i)\,\mathscr{I}(Bank_b)$: double interactions			X				
$\mathscr{I}(Risky_i)\,\mathscr{I}(State_b)$: double interactions				X			X
$\mathscr{I}(Risky_i)\,\mathscr{I}(Nonstate_b)$: double interactions				X		X	X

- Regression (14) is the benchmark regression.

Types of loans

- Using the risky-loan dummy as an instrument:

$$\log \mathscr{S}_s = \alpha + \alpha_t + \alpha_{sec} + \alpha_g g_{t-1} + \beta_b g_{t-1} \mathscr{I}\left(\text{Bank}_b\right) + \gamma_n g_{t-1} \mathscr{I}\left(\text{Risky}_i\right) + \gamma_b g_{t-1} \mathscr{I}\left(\text{Bank}_b\right) \mathscr{I}\left(\text{Risky}_i\right) + \text{Control}_{ib} + \varepsilon_s. \quad (4)$$

- Estimated results of regression (4)

Explanatory variable	Coefficient	(Std. Err.)
g_{t-1} : α_g	-5.52^{*}	(2.88)
$g_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$: γ_n	5.66^{**}	(2.42)
$g_{t-1}\mathscr{I}\left(\text{Bank}_b\right)$: β_b	2.95	(2.68)
$g_{t-1}\mathscr{I}\left(\text{Bank}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_b	-4.01^{**}	(1.67)
Impact of money growth on *risky loans* via NBTs: $\alpha_g + \gamma_n$	0.14	pv=0.96
Impact of money growth on *risky loans* via banks: $\alpha_g + \beta_b + \gamma_b$	-6.58^{***}	pv=0.00

- If the triple-interaction term

$$g_{t-1}\mathscr{I}\left(\text{Bank}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$$

were left out of regression (4), the double-interaction term $g_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$ would capture the effect of monetary policy changes on risky entrusted borrowing *no matter who is the trustee*.

Types of loans interacting with types of banks

- Risky loans interacting with state and non-state banks separately:

$$\log \mathscr{S}_s = \alpha + \alpha_t + \alpha_{sec} + \alpha_g g_{t-1} + \beta_s g_{t-1} \mathscr{I}\left(\text{Nonstate}_b\right) + \beta_\ell g_{t-1} \mathscr{I}\left(\text{State}_b\right) + \gamma_n g_{t-1} \mathscr{I}\left(\text{Risky}_i\right) + \gamma_s g_{t-1} \mathscr{I}\left(\text{Nonstate}_b\right) \mathscr{I}\left(\text{Risky}_i\right) + \gamma_\ell g_{t-1} \mathscr{I}\left(\text{State}_b\right) \mathscr{I}\left(\text{Risky}_i\right) + \text{Control}_{ib} + \varepsilon_s. \quad (5)$$

- Estimated results of regression (14)

Explanatory variable	Coefficient	(Std. Err.
g_{t-1} : α_g	-5.21^{*}	(2.87)
$g_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$: γ_n	5.25^{**}	(2.39)
$g_{t-1}\mathscr{I}\left(\text{State}_b\right)$: β_ℓ	2.63	(2.85)
$g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)$: β_s	2.66	(2.82)
$g_{t-1}\mathscr{I}\left(\text{State}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_ℓ	-2.70^{*}	(1.69)
$g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_s	-5.02^{***}	(1.81)
Impact of money growth on *risky loans* via NBTs: $\alpha_g + \gamma_n$	0.04	pv=0.99
Impact of money growth on *risky loans* via state banks: $\alpha_g + \beta_\ell + \gamma_\ell$	-5.28^{**}	pv=0.03
Impact of money growth on *risky loans* via non-state banks: $\alpha_g + \beta_s + \gamma_s$	-7.57^{***}	pv=0.00

Without using the NBT instrument

- With this exclusion, the effective sample size is reduced to 650.
- The triple-interaction regression represented by (4) is reduced to the following double-interaction regression:

$$\log \mathscr{S}_s = \alpha + \alpha_t + \alpha_{sec} + \alpha_g g_{t-1} + \gamma_r g_{t-1} \mathscr{I}\left(\text{Risky}_i\right) + \text{Control}_i + \varepsilon_s. \quad (6)$$

- Estimated results of regression (15)

Explanatory variable	Coefficient	(Std. Err.)
g_{t-1} : α_g	-2.31	(1.56)
$g_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$: γ_r	0.93	(2.01)
Impact of money growth on non-risky loans via banks: α_g	-2.31	pv=0.14
Impact of money growth on *risky loans* via banks: $\alpha_g + \gamma_r$	-1.38	pv=0.41

Without using the NBT instrument

- Using the state-bank data as an instrument:

$$\log \mathscr{S}_s = \alpha+\alpha_t+\alpha_{sec}+\alpha_g g_{t-1}+\beta_s g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)+\gamma_\ell g_{t-1}\mathscr{I}\left(\text{Risky}_i\right) + \gamma_s g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)\mathscr{I}\left(\text{Risky}_i\right)+\text{Control}_{ib}+\varepsilon_s. \quad (7)$$

- Estimated results of regression (16)

Explanatory variable	Coefficient	(Std. Err.
g_{t-1} : α_g	-1.93	(1.98)
$g_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$: γ_ℓ	1.70	(2.08)
$g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)$: β_s	-0.59	(1.93)
$g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_s	-2.22^{**}	(1.08)
Impact of money growth on non-risky loans via state banks: α_g	-1.93	pv=0.33
Impact of money growth on *risky loans* via state banks: $\alpha_g+\gamma_\ell$	-0.23	pv=0.91
Impact of money growth on *risky loans* via non-state banks: $\alpha_g+\beta_s+\gamma_s$	-4.74^{**}	pv=0.02

Robust checking

- M2 growth is now replaced by deposit growth:

$$\log \mathscr{S}_s = \alpha + \alpha_t + \alpha_{sec} + \alpha_d d_{t-1} + \beta_s d_{t-1} \mathscr{I}\left(\text{Nonstate}_b\right) + \beta_\ell d_{t-1} \mathscr{I}\left(\text{State}_b\right) + \gamma_n d_{t-1} \mathscr{I}\left(\text{Risky}_i\right) + \gamma_s d_{t-1} \mathscr{I}\left(\text{Nonstate}_b\right) \mathscr{I}\left(\text{Risky}_i\right) + \gamma_\ell d_{t-1} \mathscr{I}\left(\text{State}_b\right) \mathscr{I}\left(\text{Risky}_i\right) + \text{Control}_{ib} + \varepsilon_s. \quad (8)$$

- Estimated results of regression (17)

Explanatory variable	Coefficient	(Std. Err.
d_{t-1} : α_d	-5.31^{*}	(2.71)
$d_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$: γ_n	5.08^{**}	(2.27)
$d_{t-1}\mathscr{I}\left(\text{State}_b\right)$: β_ℓ	2.80	(2.67)
$d_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)$: β_s	2.73	(2.65)
$d_{t-1}\mathscr{I}\left(\text{State}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_ℓ	-2.74^{*}	(1.68)
$d_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_s	-5.01^{***}	(1.79)
Impact of deposit growth on *risky loans* via NBTs: $\alpha_d + \gamma_n$	-0.23	pv=0.92
Impact of deposit growth on *risky loans* via state banks: $\alpha_d + \beta_\ell + \gamma_\ell$	-5.25^{**}	pv=0.03
mpact of deposit growth on *risky loans* via non-state banks: $\alpha_d + \beta_s + \gamma_s$	-7.59^{***}	pv=0.00

Banks' risk-taking behavior

- Entrusted loans showed up on banks' balance sheets in the form of ARI, especially for non-state banks.

Assets	Liabilities
Cash	Deposits
Bank loans	
Account-receivable investment (ARI)	Equity

- Non-state banks, eager to make profits to compensate regulatory costs, understood the government's implicit guarantee and were willing to advance credit to the risky industry, most of which belong to **heavy industries**.

Evidence for ARI and entrusted loans

- Micro evidence for all entrusted loans:

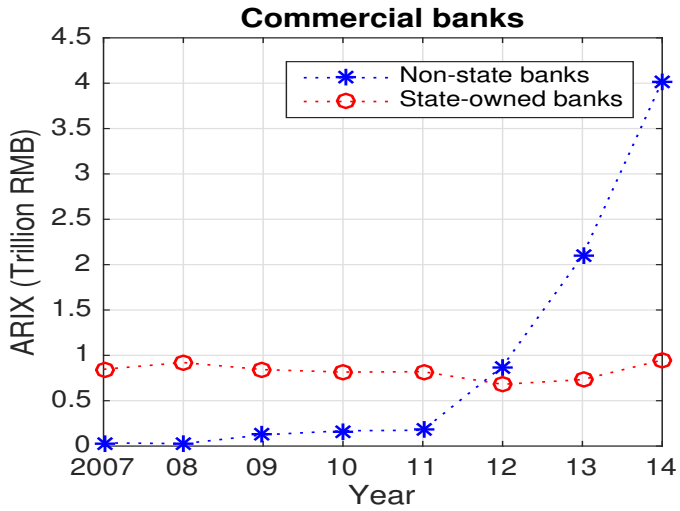
Description	2007-2013 Sample		2010-2013 Sample	
	Nonstate banks	State banks	Nonstate banks	State banks
Corr $(\Delta \text{ARI}, \mathscr{L})$	.467*** (.001)	-.092 (.617)	.495*** (.007)	.025 (.929)

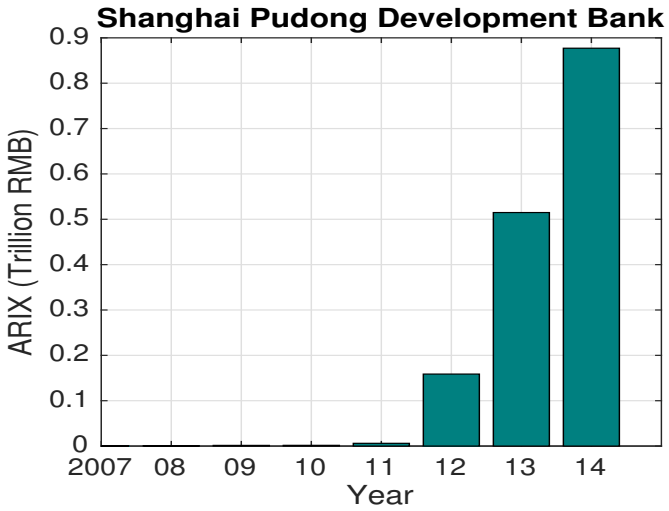
- Micro evidence for risky entrusted loans:

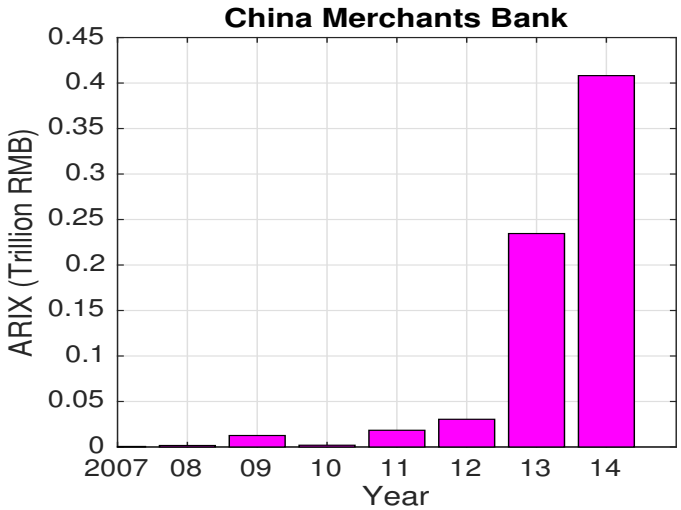
Description	2007-2013 Sample		2010-2013 Sample	
	Nonstate banks	State banks	Nonstate banks	State banks
Corr $(\Delta \text{ARI}, \mathscr{L}^r)$	.433*** (.003)	-.058 (.754)	.501*** (.002)	.176 (.459)

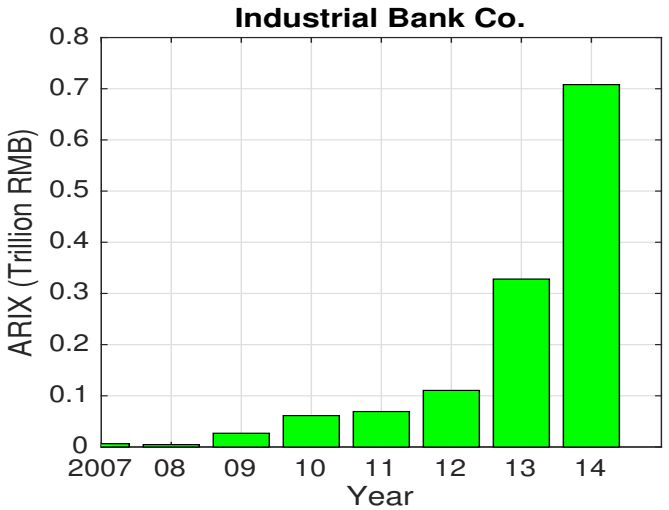
Asset-backed securities

Backed assets are those of borrowing firms in the risky industry.

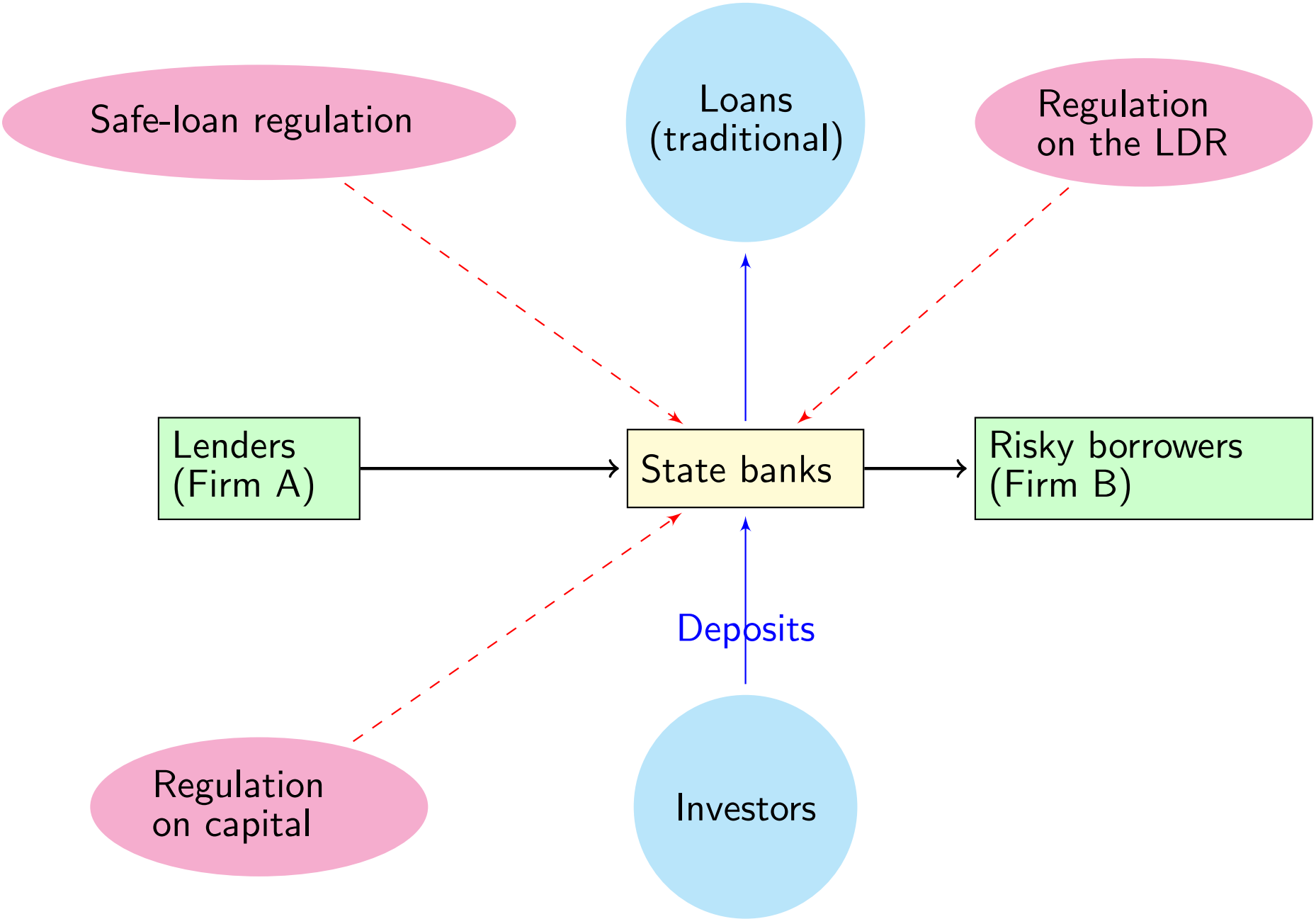




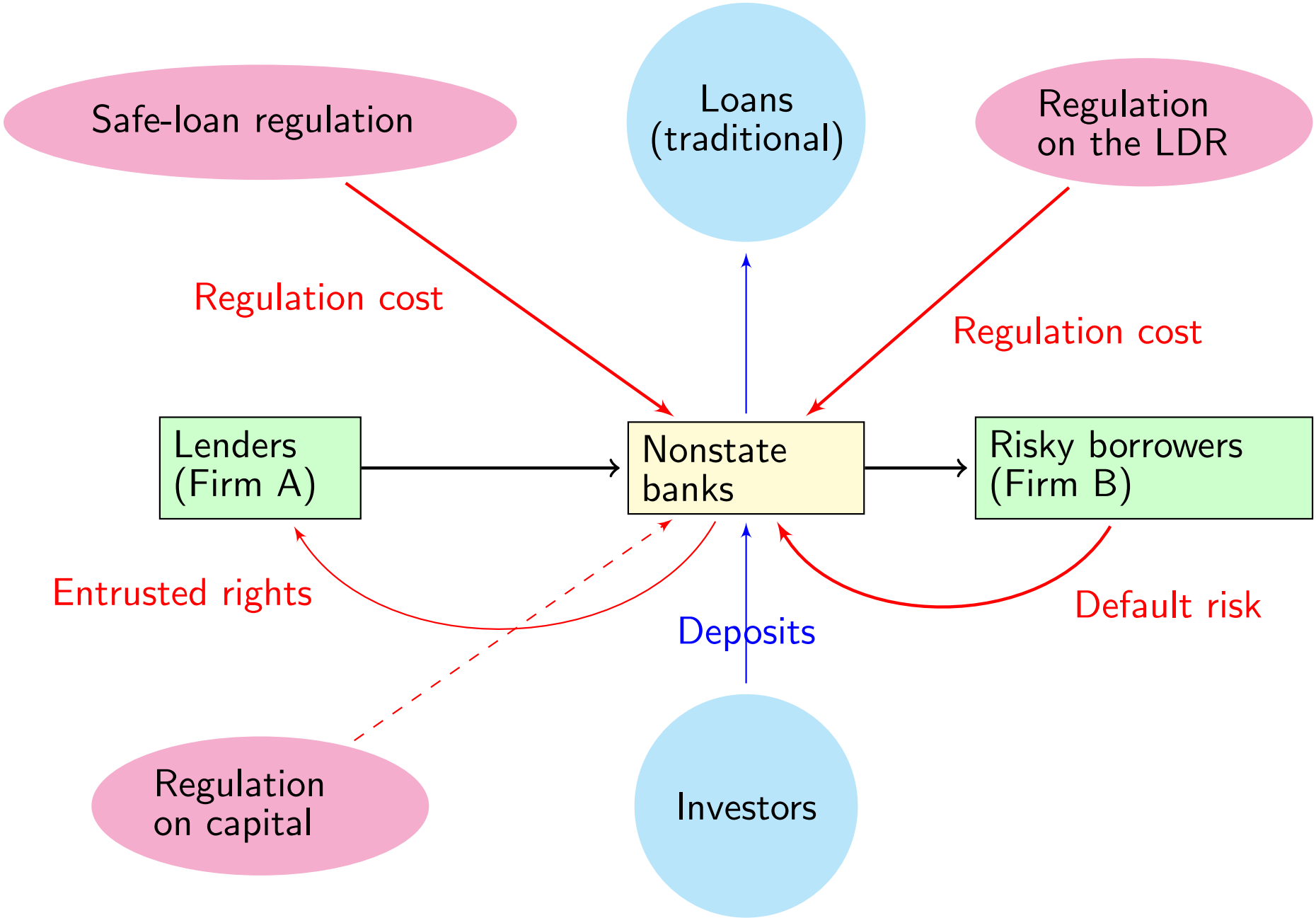




Chinese institutional characteristics for state banks



Chinese institutional characteristics for non-state banks



Main theoretical result

Proposition

As monetary policy tightens, the bank's optimal portfolio choice is to increase the amount of risky assets.

- The asset-pricing equation governing a tradeoff between bank loans and risky nonloan investment:

$$E_\varepsilon(R^I) - \underbrace{\left[-\frac{\mathrm{Cov}_\varepsilon\left(R^I, E_\omega(R^E)^{-\gamma}\right)}{E_\varepsilon\left[E_\omega(R^E)^{-\gamma}\right]}\right]}_{\text{default risk premium}} = R^B - \underbrace{r^b p^w}_{\text{expected regulation cost}},$$

where R^E is the return to bank's equity after dividend payout.

Conclusion

- Identify the risk-taking behavior of non-state banks through shadow banking.
- Show the effects of the interactions between monetary and regulatory policies.

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Supplementary slides.

Usual suspects for differences between state and small banks

Description	Capital adequacy ratio		Excess reserve ratio		Loan-to-deport ratio	
	2007-2013	2010-2013	2007-2013	2010-2013	2007-2013	2010-20
State banks	12.60%	12.87%	1.95%	1.60%	64.03%	66.22%
Nonstate banks	11.88%	12.30%	4.47%	3.17%	70.82%	67.89%
Overall	12.35%	12.65%	2.51%	2.01%	66.22%	66.80%

China's two well-intended regulatory policies and institutional asymmetry

- We identify two specific ones that created an incentive for nonstate banks to play an active role in entrusted lending.
  1. Safe-loan law enacted during the monetary tightening period by the Chinese Banking Regulatory Commission (CBRC), which prevented banks from making loans to the risky industry.
  2. Loan-to-deposit ratio regulation, enacted by the PBC in 1994 and strictly enforced during the monetary tightening period, imposed a 75% ceiling on the ratio of bank loans to bank deposits.
- The "last-minute rush" (*chongshidian* in Chinese) to meet a sudden shortfall of deposits:
  - **Nonstate banks**. In practice, the last-minute actions taken by *non-state banks* to pay high prices to *artificially increase temporary deposits* in order to recoup deposit shortfalls when the monitoring time is near.
  - **State banks**. The state banks' long-standing customer relationships with a broad base of firms and households enabled them to weather deposit shortages without much cost.

Theory embedded in micro data and Chinese institutions

The bank, non-state or state

- The bank has three types of assets:
  - cash,
  - traditional loans (B) subject to the safe-loan regulation as well as regulation risks associated with random deposit shortfalls,
  - and risky nonloan assets (I^r) subject to the default risk but not to the regulation risks as I^r are not counted as part of B according to the LDR regulation.
- Balance sheet at the beginning of the period:

Assets	Liabilities
Cash $(C + (1-\delta)B)$	Deposits (D)
Loans $(q\delta B)$	Equity $(\mathscr{E})$

or

Assets	Liabilities
Cash (C)	Deposits $(D - (1-\delta)B)$
Loans $(q\delta B)$	Equity $(\mathscr{E})$

Lending stage

$$\tilde{C} = C + \varphi, \tag{9}$$

$$\tilde{B} = \delta B + S, \tag{10}$$

$$\tilde{D}/R^D = D - (1-\delta)B + \mathrm{DIV} + \varphi + q^r I^r + qS, \tag{11}$$

Balancing stage

Two idiosyncratic shocks occur at this stage.

1. All banks (state and non-state) are subject to idiosyncratic withdrawal shocks to deposits.
   - The idiosyncratic risk is represented by ω such that

$$\omega = \begin{cases} \omega^h & \text{with probability } p^\omega \\ \omega^l & \text{with probability } 1 - p^\omega \end{cases}. \tag{12}$$

   - Note p^ω represents an **aggregate shock**.
2. Risky asset I^r is defaulted with probability p^r and denote

$$\varepsilon = \begin{cases} 1 & \text{with probability } 1 - p^r \text{ (the no-default state)} \\ 0 & \text{with probability } p^r \text{ (the default state)} \end{cases}.$$

Balancing stage

- Let the LDR ceiling set by the PBC be θ and denote

$$\tilde{x} = q\tilde{B} - \theta\frac{(1-\omega)\,\tilde{D}}{R^D} \tag{13}$$

and

$$\chi(\tilde{x}) = \begin{cases} r^b\tilde{x} & \text{if } \tilde{x} \geq 0 \\ 0 & \text{if } \tilde{x} < 0 \end{cases},$$

where $r^b > 0$ is the extra cost of obtaining additional deposits $\tilde{x}$ for *nonstate banks* and $r^b = 0$ for state banks.

The bank's complex optimization

The bank chooses $(\text{DIV}, \varphi, S, I^r)$ to solve

$$V^I(C, B, D; z) = \max U(\text{DIV}) + \beta E_{M,\omega,\varepsilon}\left[V^I\left(\tilde{C} - \omega\tilde{D}, \tilde{B}, (1-\omega)\tilde{D} + \left[\chi(\tilde{x}) - \frac{\varepsilon R^{D\prime} I^r}{q^r}\right]; z'\right)\middle| z\right]$$

subject to $U(\text{DIV}) = \frac{\text{DIV}^{1-\gamma}}{1-\gamma}$, (9), (10), (11),

$$\tilde{D}/R^D \leq \kappa\left[\mathscr{E} - \text{DIV}\right],$$
$$\mathscr{E} = \tilde{C} + \text{DIV} + q^r I^r + q\tilde{B} - \tilde{D}/R^D,$$

where $z = \{r^b, p^\omega, q, q^r, R^D\}$, $z' = \{r^{b\prime}, p^{\omega\prime}, q', q^{r\prime}, R^{D\prime}\}$, and E_M represents the mathematical expectations w. r. t. macroeconomic factors such as p^ω, the risk of deposit withdrawal.

Intuition

- The asset-pricing equation governing a tradeoff between safe bank loans and risky nonloan investment:

$$E_\varepsilon(R^I) - \underbrace{\left[-\frac{\mathrm{Cov}_\varepsilon\left(R^I, E_\omega(R^E)^{-\gamma}\right)}{E_\varepsilon\left[E_\omega(R^E)^{-\gamma}\right]}\right]}_{\text{default risk premium}} = R^B - \underbrace{r^b p^w}_{\text{expected regulation cost}},$$

where R^E is the return to bank's equity after dividend payout and

$$R^I = \frac{\varepsilon R^D}{q^r},\ R^B = \frac{q' + 1 - \delta}{q}.$$

- Micro evidence:

Description	2007-2013	2010-2013
Bank loans	6.16%	6.00%
Non-risky entrusted loans	7.92%	7.71%
Risky entrusted loans	9.22%	9.05%

What Does This Paper Do?

Take three steps:

1. Construct a transaction-based micro dataset for entrusted lending and *the precise information about types of trustees*: banks or nonbank trustees.
2. Establish robust empirical evidence that commercial banks, especially non-state banks, were prone to engage in channeling *risky* entrusted loans, while nonbank trustees were not.
3. Identify two well-intended regulations and institutional asymmetry between state and non-state banks as a cause for creating an incentive for non-state banks to exploit *regulatory arbitrage* by bringing off-balance-sheet risks into the balance sheet.

Approach

- Microdata.

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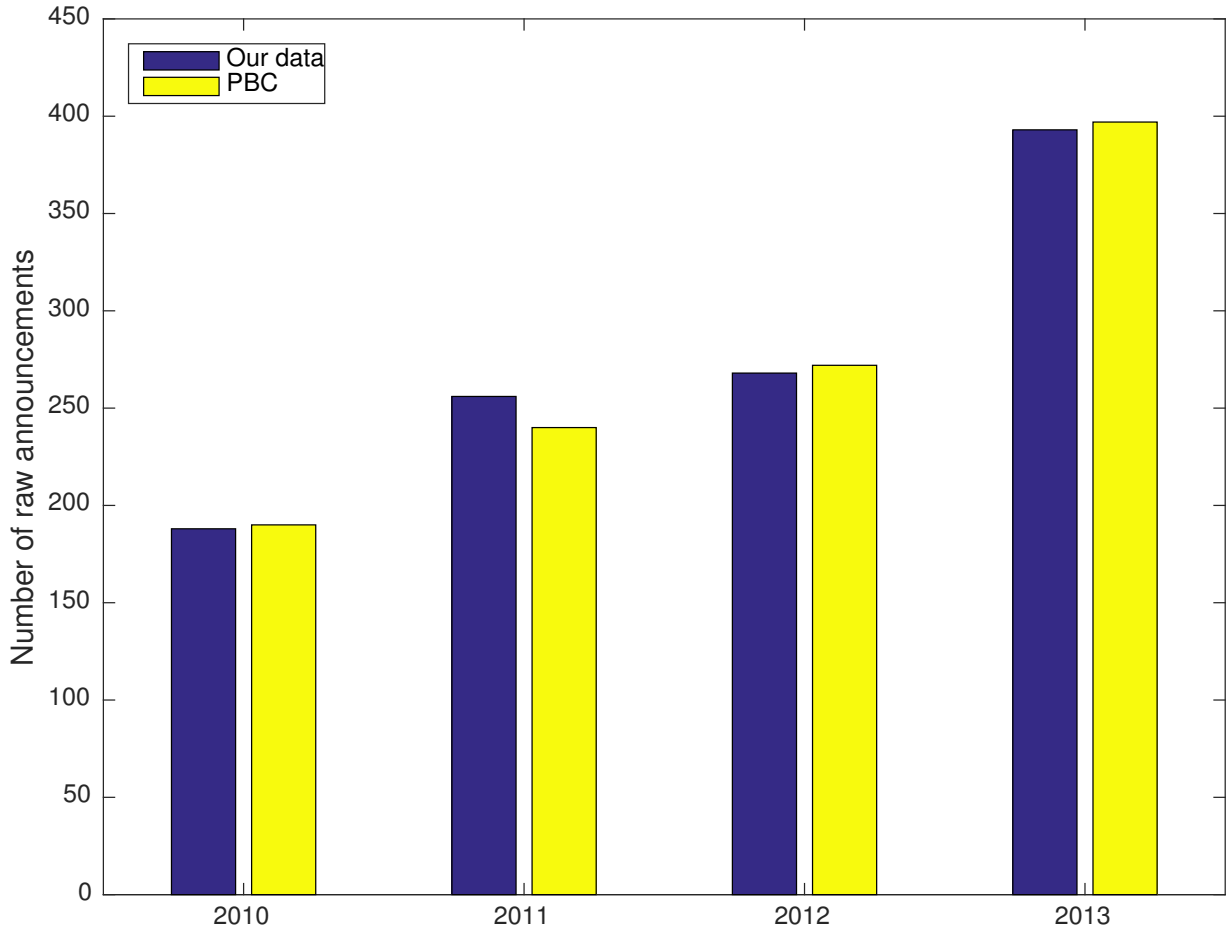
- Robust empirical evidence based on the micro data.
- China's institutional characteristics.
- A theoretical framework grounded in micro data and institutional details.

Microdata

- Transactions of entrusted loans between Chinese firms, facilitated by trustees as middlemen.
- The sample is from 2007 to 2013.
- Read various data sources line by line and combine them to ensure the accuracy of our manually constructed dataset: announcements, PBC, Bankscope, WIND, annual reports of banks and nonfinancial firms.
- Problems:
  - Duplications in reporting transactions.
  - Outstanding vs. newly originated loans.
  - Chinese language nuances in reporting how the transaction of an entrusted loan was conducted (planned vs executed).
  - Delays in announcing transactions.
  - Announcement time vs. transaction time.

Data verification

Number of raw announcements we collect versus number published by the PBC's Financial Stability Reports. Data source: WIND.



Data (2007-2013)

- Number of announcements made by lenders and borrowers:

Description	NLA	NBA	NLABA	Total
Number of observations	644	134	-3	775

- A breakdown of the total number of transactions by types of trustees and types of loans:

Description	NBTs	State banks	Nonstate banks	Total
Non-affiliated loans	3	87	135	225
Affiliated loans	122	188	240	550
Total	125	275	375	775

- Proportions (%) of loan transactions and loan volume according to different types of trustees:

Description	NBTs	State banks	Nonstate banks	Total
Number of transactions	16.13	35.48	48.39	100
Loan volume	24.33	34.85	40.82	100

Types of loans interacting with types of banks

- Risky loans interacting with state and non-state banks separately:

$$\log \mathscr{S}_s = \alpha + \alpha_t + \alpha_{sec} + \alpha_g g_{t-1} + \beta_s g_{t-1} \mathscr{I}\left(\text{Nonstate}_b\right) + \beta_\ell g_{t-1} \mathscr{I}\left(\text{State}_b\right) + \gamma_n g_{t-1} \mathscr{I}\left(\text{Risky}_i\right) + \gamma_s g_{t-1} \mathscr{I}\left(\text{Nonstate}_b\right) \mathscr{I}\left(\text{Risky}_i\right) + \gamma_\ell g_{t-1} \mathscr{I}\left(\text{State}_b\right) \mathscr{I}\left(\text{Risky}_i\right) + \text{Control}_{ib} + \varepsilon_s. \quad (14)$$

- Estimated results of regression (14)

Explanatory variable	Coefficient	(Std. Err.
g_{t-1} : α_g	-5.21^{*}	(2.87)
$g_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$: γ_n	5.25^{**}	(2.39)
$g_{t-1}\mathscr{I}\left(\text{State}_b\right)$: β_ℓ	2.63	(2.85)
$g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)$: β_s	2.66	(2.82)
$g_{t-1}\mathscr{I}\left(\text{State}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_ℓ	-2.70^{*}	(1.69)
$g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_s	-5.02^{***}	(1.81)
Impact of money growth on *risky loans* via NBTs: $\alpha_g + \gamma_n$	0.04	pv=0.99
Impact of money growth on *risky loans* via state banks: $\alpha_g + \beta_\ell + \gamma_\ell$	-5.28^{**}	pv=0.03
Impact of money growth on *risky loans* via non-state banks: $\alpha_g + \beta_s + \gamma_s$	-7.57^{***}	pv=0.00

Without using the NBT instrument

- With this exclusion, the effective sample size is reduced to 650.
- The triple-interaction regression represented by (4) is reduced to the following double-interaction regression:

$$\log \mathscr{S}_s = \alpha + \alpha_t + \alpha_{sec} + \alpha_g g_{t-1} + \gamma_r g_{t-1} \mathscr{I}\left(\text{Risky}_i\right) + \text{Control}_i + \varepsilon_s. \tag{15}$$

- Estimated results of regression (15)

Explanatory variable	Coefficient	(Std. Err.)
g_{t-1} : α_g	-2.31	(1.56)
$g_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$: γ_r	0.93	(2.01)
Impact of money growth on non-risky loans via banks: α_g	-2.31	pv=0.14
Impact of money growth on *risky loans* via banks: $\alpha_g + \gamma_r$	-1.38	pv=0.41

Without using the NBT instrument

- Using the state-bank data as an instrument:

$$\log \mathscr{S}_s = \alpha+\alpha_t+\alpha_{sec}+\alpha_g g_{t-1}+\beta_s g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)+\gamma_\ell g_{t-1}\mathscr{I}\left(\text{Risky}_i\right) + \gamma_s g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)\mathscr{I}\left(\text{Risky}_i\right)+\text{Control}_{ib}+\varepsilon_s. \quad (16)$$

- Estimated results of regression (16)

Explanatory variable	Coefficient	(Std. Err.
g_{t-1} : α_g	-1.93	(1.98)
$g_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$: γ_ℓ	1.70	(2.08)
$g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)$: β_s	-0.59	(1.93)
$g_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_s	-2.22^{**}	(1.08)
Impact of money growth on non-risky loans via state banks: α_g	-1.93	pv=0.33
Impact of money growth on *risky loans* via state banks: $\alpha_g+\gamma_\ell$	-0.23	pv=0.91
Impact of money growth on *risky loans* via non-state banks: $\alpha_g+\beta_s+\gamma_s$	-4.74^{**}	pv=0.02

Robust checking

- M2 growth is now replaced by deposit growth:

$$\log \mathscr{S}_s = \alpha + \alpha_t + \alpha_{sec} + \alpha_d d_{t-1} + \beta_s d_{t-1} \mathscr{I}\left(\text{Nonstate}_b\right) + \beta_\ell d_{t-1} \mathscr{I}\left(\text{State}_b\right) + \gamma_n d_{t-1} \mathscr{I}\left(\text{Risky}_i\right) + \gamma_s d_{t-1} \mathscr{I}\left(\text{Nonstate}_b\right) \mathscr{I}\left(\text{Risky}_i\right) + \gamma_\ell d_{t-1} \mathscr{I}\left(\text{State}_b\right) \mathscr{I}\left(\text{Risky}_i\right) + \text{Control}_{ib} + \varepsilon_s. \quad (17)$$

- Estimated results of regression (17)

Explanatory variable	Coefficient	(Std. Err.
d_{t-1} : α_d	-5.31^{*}	(2.71)
$d_{t-1}\mathscr{I}\left(\text{Risky}_i\right)$: γ_n	5.08^{**}	(2.27)
$d_{t-1}\mathscr{I}\left(\text{State}_b\right)$: β_ℓ	2.80	(2.67)
$d_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)$: β_s	2.73	(2.65)
$d_{t-1}\mathscr{I}\left(\text{State}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_ℓ	-2.74^{*}	(1.68)
$d_{t-1}\mathscr{I}\left(\text{Nonstate}_b\right)\mathscr{I}\left(\text{Risky}_i\right)$: γ_s	-5.01^{***}	(1.79)
Impact of deposit growth on *risky loans* via NBTs: $\alpha_d + \gamma_n$	-0.23	pv=0.92
Impact of deposit growth on *risky loans* via state banks: $\alpha_d + \beta_\ell + \gamma_\ell$	-5.25^{**}	pv=0.03
mpact of deposit growth on *risky loans* via non-state banks: $\alpha_d + \beta_s + \gamma_s$	-7.59^{***}	pv=0.00

Usual suspects for differences between state and small banks

Description	Capital adequacy ratio		Excess reserve ratio		Loan-to-deport ratio	
	2007-2013	2010-2013	2007-2013	2010-2013	2007-2013	2010-20
State banks	12.60%	12.87%	1.95%	1.60%	64.03%	66.22%
Nonstate banks	11.88%	12.30%	4.47%	3.17%	70.82%	67.89%
Overall	12.35%	12.65%	2.51%	2.01%	66.22%	66.80%

Regulations for all banks

Among a host of regulations, two key well-intended regulations that gave way to potential regulatory arbitrage for *all banks*:

1. *Safe-loan regulation*. The CBRC took concrete steps in 2010 to curtail expansion of traditional credit from the banking sector to the risky industry.
2. *LDR regulation*. The PBC's 1994 regulation of a 75% ceiling on the ratio of traditional loans to total bank deposits for *the entire banking system* was not credibly enforced until the late 2000s.

Institutional asymmetry

The "last-minute rush" (*chongshidian* in Chinese) for deposits by all banks:

- **Nonstate banks**. In practice, the last-minute actions taken by *non-state banks* to pay high prices to *artificially increase temporary deposits* in order to recoup deposit shortfalls when the monitoring time is near.
- **State banks**. The state banks' long-standing customer relationships with a broad base of firms and households enabled them to weather deposit shortages without much cost.

Balance-sheet risks for non-state banks

- According to our micro data,
  - more than 60% of the total amount of entrusted loans was channeled to the risky industry between 2007 and 2013;
  - out of these risky entrusted loans, 77% was facilitated by commercial banks.
- When non-state banks were engaged in risky entrusted lending during the period of 2007-2013, they purchased the beneficiary rights of those loans (entrusted rights), which were recorded in the category of account-receivable investment (ARI).
- This nonloan investment category on the asset side of the bank's balance sheet, was immune from both LDR and safe-loan regulations.
- Which gave non-state banks an incentive to funnel risky entrusted loans by either purchasing entrusted rights or offering implicit guarantees to such loans.