The Implementation of Monetary Policy in China:
the role of regulation of deposit and bank lending rates

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Outline

- Motivation
- Framework of the Monetary Policy Implementation
- The Model
- Conclusion

Motivation

- Generally felt that People's bank of China (PBoC) uses a range of policy instruments, and Interbank rates are not good measures of monetary policy stance. (*He and Pauwel 2006 , Shu and Ng 2010 etc.*)
- Lack of integrated theoretical framework to understand the monetary policy implementation.
- Interest rate channel of monetary policy transmission is weak or non-existent.

Interest Rate Channel

Link 1 **Link 2**

Policy Instruments $\not\rightarrow$ Interest Rates $\not\rightarrow$ Credit Growth/Money Growth

Motivation

Link 2 Interest Rates $\not\rightarrow$ Credit Growth/Money Growth

Empirical Finding in the Literature:

- ✓ *Money market rate* does not have a tight and predictable relationship with loan and money growth. (*Geiger 2006*)
- ✓ *GDP* does not react to *money market rate* but to aggregate money (*Laurens and Maino 2007*)

Explanation:

- ✓ Financial market impediment
- ✓ Interbank market segmentation

Motivation

Link 1 Policy Instruments $\not\longrightarrow$ Interest Rates

Empirical Finding in the Literature:

- ✓ People's bank of China (PBoC) controls *reserve money* well but not *M2*. (Chang and Green 2006)

Observations from Past Episodes (2006):

Table 2: Episode 1

Period	Policy Actions		Interbank Rate Change bps	New Increased Loan Growth%
Sept. 15	Increase of RR by 0.5%	Withdrawal of liquidity by 73billion	-19	16
Sept. 19	Increase of the regulated deposit and lending rate by 27 bps			
Sept. 30				
October	Withdrawal of liquidity by 97.25 billion		22	-2.56

Source: CEIC and author's calculation

Explanation: non-available

Co-existence of regulation and market force

- Multiple Operational Targets: aggregate money, loan growth, exchange rate stability, maintain profitability of state-owned banks.

- Regulation of deposit and retail lending rates

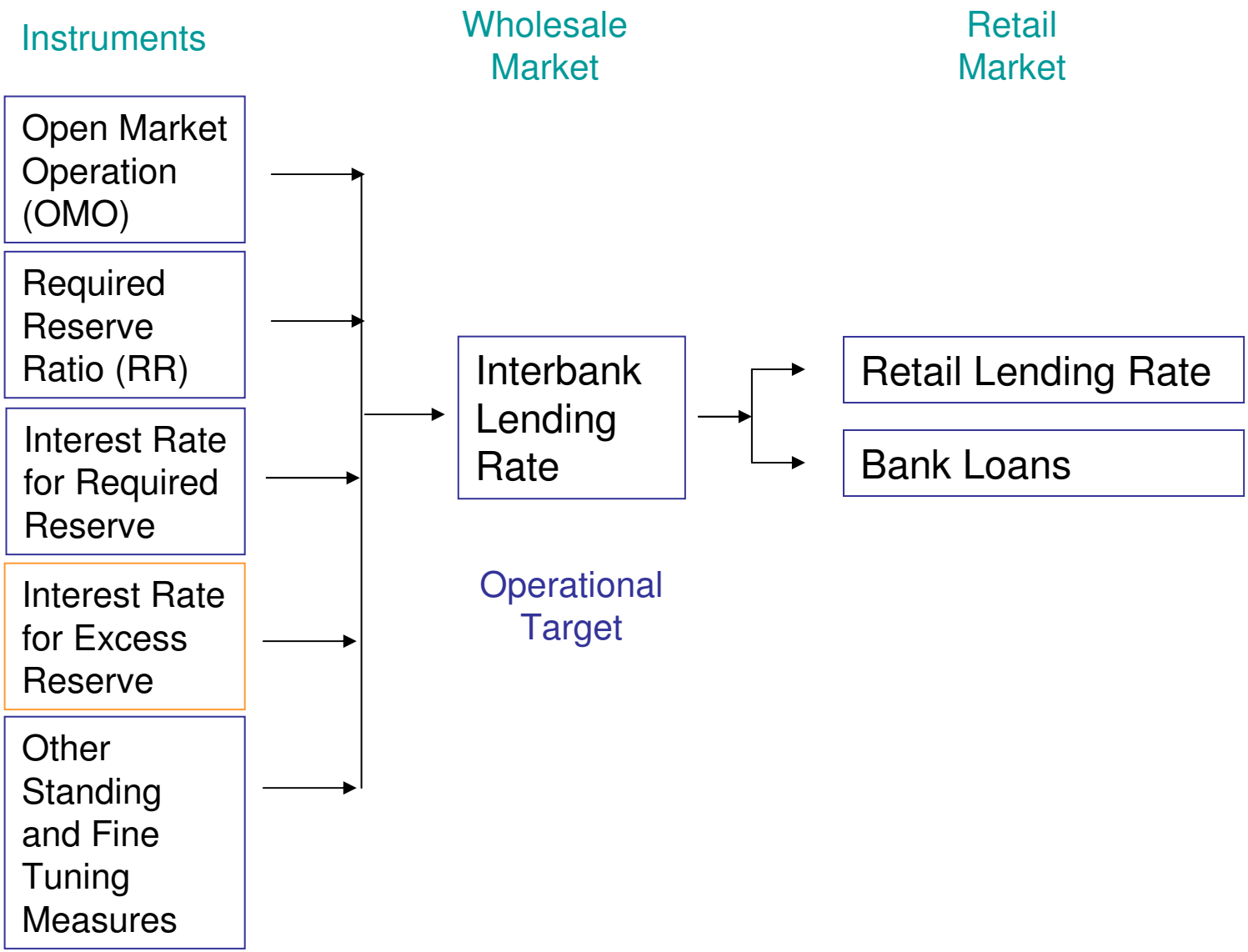
  Before Oct. 2004 : PBoC set the deposit and retail lending rates for domestic currency

  From Oct 2004 on: PBoC set a *ceiling* for deposit rates and a *floor* for retail lending rates.

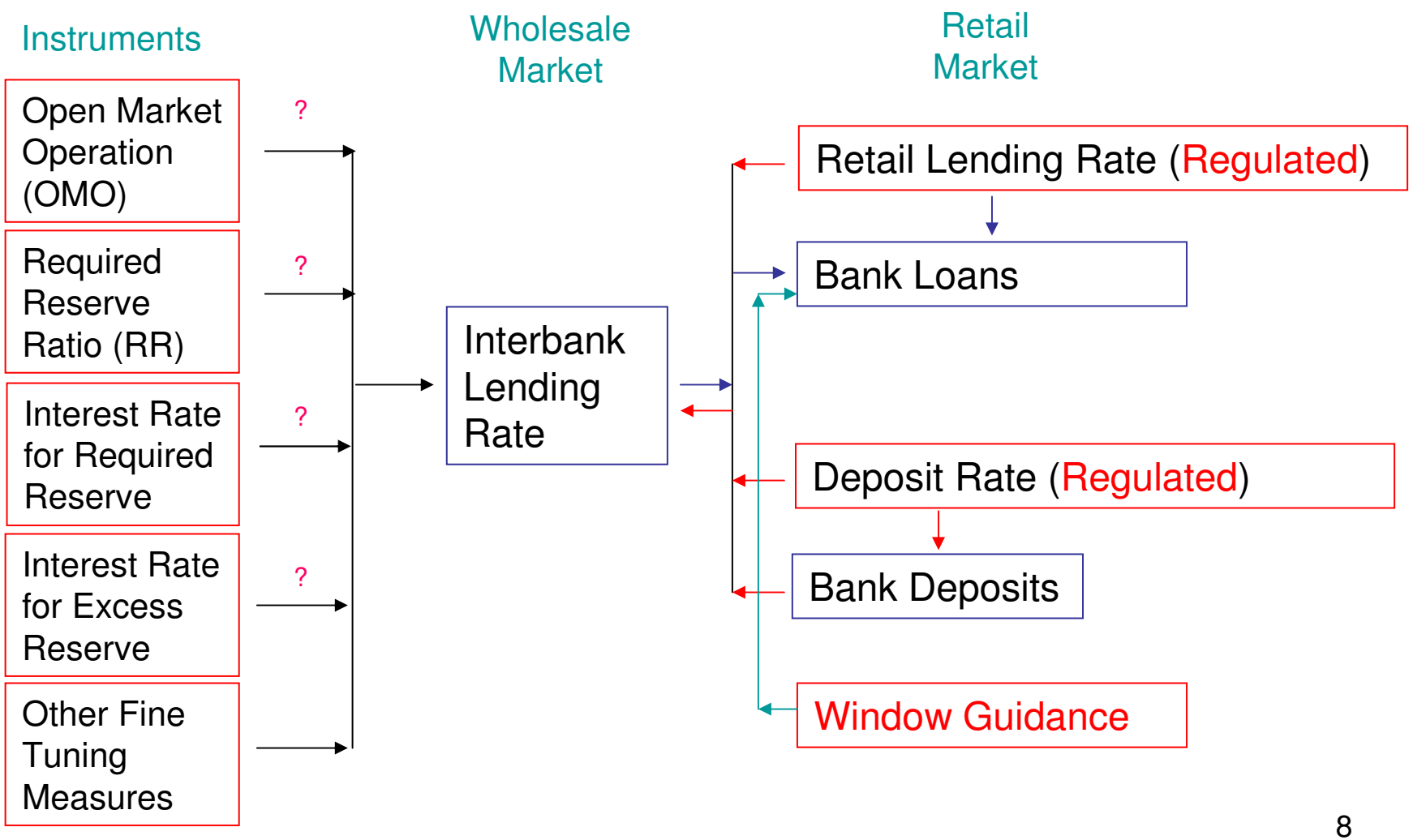
- National interbank market was established in 1996
  ------ wholesale money market rate is market determined.

- What does the co-existence of the regulation of the retail money market and the market force in the wholesale money market imply for the transmission of monetary policy?

Standard Framework of Monetary Policy Implementation in Advanced Economies



Framework of Monetary Policy Implementation in China (2004-present)



Model

Understand the transmission mechanism in a theoretical model developed based on (Porter and Xu 2009), in which

• banks compete,

• central bank sets the ceiling for the interest rates that banks pay for deposits and the floor for interest rates they charge for loans,

• central bank sets required reserve ratio, interest rates for required reserves and excess reserves, and conducts open market operation,

• interbank rate is market determined.

• Derive the effects of each policy instrument on interbank rate and bank loans

Model-Bank Behaviour and the interbank market

Bank maximizes profits:

$$\pi_i = \max_{L_i, E_i, D_i, B_i} \{ r_L L_i + r_E E_i + r_R \alpha D_i + r_B B_i + r M_i - r_D D_i - c(D_i, L_i) - \frac{\beta}{2}(E_i - E^T)^2 - \frac{\kappa}{2}(L_i - L_i^T)^2 \} \qquad (1)$$

Where

L_i : the level of loans,

E_i : the level of excess reserves,

$r_R \alpha D_i$: the amount of required reserves (with α being the RR and D_i the deposit level),

B_i : the quantity of central bank bill holdings and changes as a consequence of open market operations,

M_i : the net position in interbank market. The relevant interest rates are denoted as r_L, r_E, r_D, r_B, r .

Each bank's net position in the interbank market

$$M_i = D_i - L_i - E_i - \alpha D_i - B_i$$

Interbank rate is determined so as to clear the interbank market

$$F(\cdot) = \sum_{i=1}^{N} M_i = 0$$

Model-Standard Case

In the absence of regulation, r_L, and r_D are endogenously determined by clearing the deposit and retail lending market, and the interbank rate is to clear the interbank lending market.

$$F(\cdot) = \sum_{i=1}^{N} M_i = \underbrace{\sum_{i=1}^{N}(1-\alpha)D_i}_{deposits\ at\ equilibrium} - \underbrace{\sum_{i=1}^{N} L_i}_{bank\ loans\ at\ equilibrium} - \sum_{i=1}^{N} E_i - B = 0 \qquad (2)$$

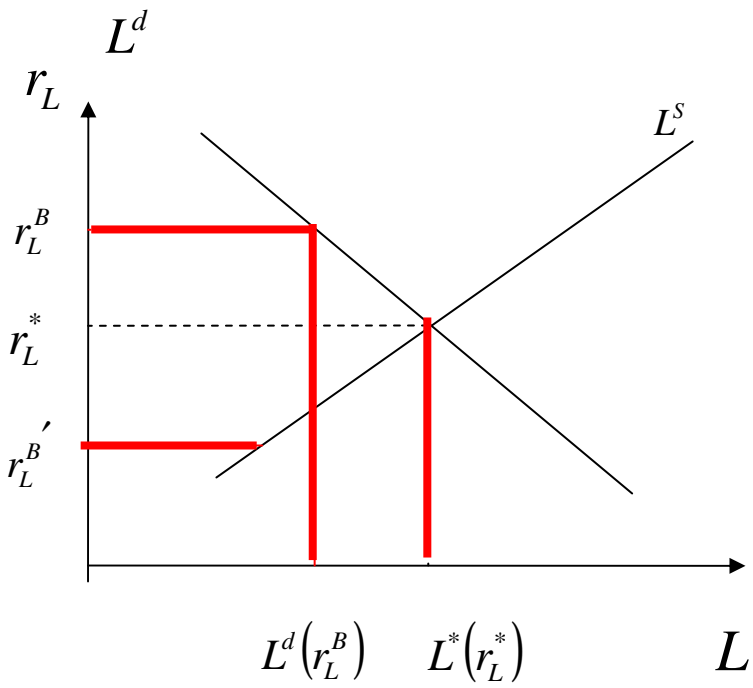
$$r^* = g(\alpha, r_R, r_E, B, Y, P)$$

The effect of monetary policy instruments based on Comparative statics

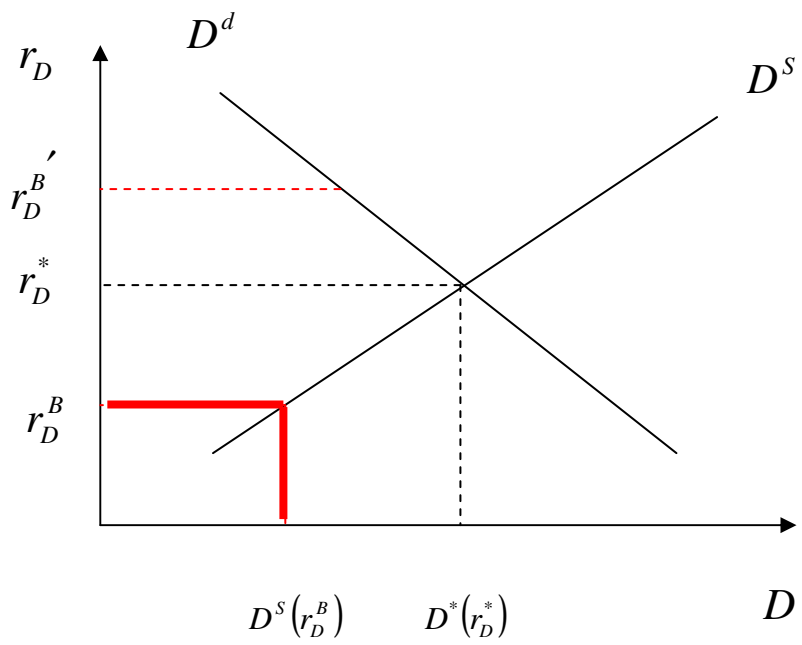
Instruments		Channel		Effect on interbank rate		Effect on Bank Loans	
Interest rate for required reserve	$r_R \uparrow$	⇨	$F(\cdot) \uparrow$	⇨	$r^* \downarrow$	⇨	$L^* \uparrow$ expansionary
Interest rate for excess reserve	$r_E \uparrow$	↘	$F(\cdot) \downarrow$	⇨	$r^* \uparrow$	⇨	$L^* \downarrow$ contractionary
open market operation	$B \uparrow$	↗					
required reserve ratio	$\alpha \uparrow$	⇨	$\sum_{i=1}^{N}(1-\alpha)D_i \uparrow\downarrow$	⇨	$r^* \uparrow\downarrow$	⇨	$L^* \uparrow\downarrow$ Contractionary if $r_R \le r$

Model-Presence of Regulation

Bank Lending Market



Deposit Market



Model-Selected Cases

Case 2.1: $r_L^B < r_L^*$ and $r_D^B < r_D^*$

Total deposits are determined by supply factors, the aggregate position in the interbank market is:

$$F(\cdot) = (1-\alpha)\mathbf{D}^s(\mathbf{r}_\mathbf{D}^\mathbf{B}) - L^d\left(r_L\left(\bar{r}, Y, P\right), Y, P\right) - {}_{i=1}^{N}\left(\frac{1}{\beta}(r_E - r) + E_i^T\right) - B \qquad (3)$$

Effect of changes in instruments on interbank rates that defer from the benchmark case :

Instruments	Channel	Effect on interbank rate	Effect on Bank Loans	
Regulated Deposit Rate	$r_D^B \uparrow \Rightarrow (1-\alpha)D^s(r_D^B) \uparrow \Rightarrow F(\cdot) \uparrow \Rightarrow$	$r^* \downarrow$	$\Rightarrow L^* \uparrow$	expansionary
Required Reserve Ratio	$\alpha \uparrow \Rightarrow (1-\alpha)D^s(r_D^B) \downarrow \Rightarrow F(\cdot) \downarrow \Rightarrow$	$r^* \uparrow$	$\Rightarrow L^* \downarrow$	contractionary
Interest rate for required reserve	$r_R \uparrow$ Affect bank demand for deposit only	0	0	

Model-Selected Cases

Case 2.2: $r_L^B \geq r_L^*$ and $r_D^B < r_D^*$

Total deposits are determined by supply factors, and the total bank loans are determined by demand factors, the aggregate position in the interbank market is:

$$F(\cdot) = (1-\alpha)\mathbf{D}^{\mathbf{s}}\left(\mathbf{r}_{\mathbf{D}}^{\mathbf{B}}\right) - \mathbf{L}^{\mathbf{d}}\left(\mathbf{r}_{\mathbf{L}}^{\mathbf{B}}\right) - \sum_{i=1}^{N}\left(\frac{1}{\beta}(r_E - r) + E_i^T\right) - B \qquad (4)$$

Effect of changes in instruments on interbank rates that defer from the benchmark case :

Instruments	Channel	Effect on interbank rate	Effect on Bank Loans	
Regulated Lending Rate	$r_L^B \uparrow \Rightarrow L^d(r_L^B) \downarrow \Rightarrow F(\cdot)\uparrow \Rightarrow$	$r^* \downarrow$	$L \downarrow$	contractionary
Regulated Deposit Rate	$r_D^B \uparrow \Rightarrow (1-\alpha)D^s(r_D^B)\uparrow \Rightarrow F(\cdot)\uparrow \Rightarrow$	$r^* \downarrow$	$\Rightarrow$ 0	
Required Reserve Ratio	$\alpha \uparrow \Rightarrow (1-\alpha)D^s(r_D^B)\downarrow \Rightarrow F(\cdot)\downarrow \Rightarrow$	$r^* \uparrow$	$\Rightarrow$ 0 unpredictable	
Interest Rate for Required Reserve	Affect bank demand for deposit only	0	0	

Conclusion

The presence of regulated rates have a large impact on the transmission of monetary policy. The effects of monetary policy on interbank rates and retail bank lending depend on how the regulated interest rates deviate from their equilibrium levels, defined as the rates we would observe in the absence of regulation.

- the interbank rate is not necessarily reflecting central bank's policy intention. It is not sufficient, and potentially misleading to characterize the stance of monetary policy.

- to the extent that the central bank does not observe the equilibrium rates, it may not know if a change of its policy instruments is expansionary or contractionary.

- the regulation framework provide one explanation for the loose and unpredictable relationship between interbank rate and retail lending.

- Liberalizing the regulated rates eliminates this uncertainty and improves the effectiveness of the monetary policy transmission mechanism.

Thank you!

Appendix 1: Interest Rates Set by the PBoC

	Interest Rates, p.a. %	Date of Adjustment
Central Bank Lending Rates		2008.12.23
20-day	2.79	
3-month	3.06	
6-month	3.24	
1-year	3.33	
Re-discount rate	1.80	
Interest Rates on Reserves		2008.11.27
Required Reserves	1.62	
Excess Reserves	0.72	
Commercial bank		
Benchmark Lending Rates		2010.10.20
6-month	5.10	
1-year	5.56	
1-3 year (including 3 year)	5.60	
3-5 year (including 3 year)	5.96	
Above 5-year	6.14	
Benchmark Deposit rates		2010.10.20
Demand Deposit	0.36	
3-month	1.91	
6-month	2.20	
1-year	2.50	
2-year	3.25	
3-year	3.85	
5-year	4.20	
Housing provident fund		
Personal housing loans		2010.10.20
Below 5 years (including 5 year)	3.50	
Above 5 years	4.05	