The Transmission of Monetary Policy *Within* Banks: Evidence from India

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Qualifier

Views are personal.

Not necessarily the official viewpoint of RBI, or CAFRAL.

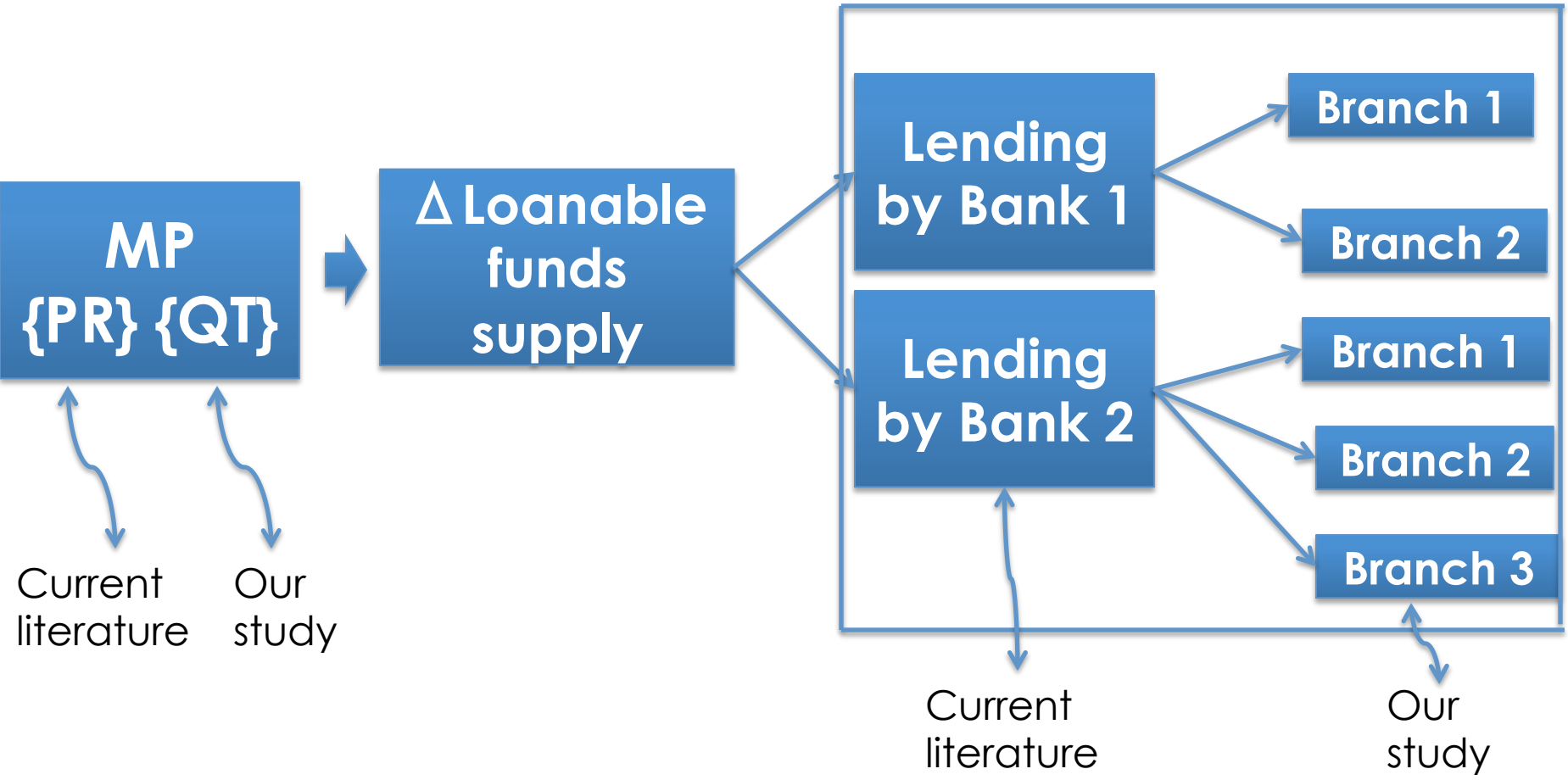
Old Question

- Transmission of monetary policy

Our Study

- How changes in MP moves banks?
- We look at lending response to MP *within* banks
  - Branch level analysis
  - Granular data @ bank-branch-year
- We look at quantitative tools of monetary policy
- We look at evidence from India, an EM.

Our Study


MP
{PR} {QT}
Δ Loanable funds supply
Lending by Bank 1
Lending by Bank 2
Branch 1
Branch 2
Branch 1
Branch 2
Branch 3
Current literature
Our study
Current literature
Our study

Why India #1

- Banks matter
  - Bank lending 40% of assets
    - 20% for US and 60% for Germany
- State owned and private banks, both significant
  - New literature (Morck, Yavuz, Yeung, 2014)
- Branches matter
  - See next slide

Branches

- Economically important
  - Actual lending @ branches
  - Decision making delegated to branches

- Quantitatively important

	# banks	# branches
• India	150	126,873
• USA	6,600	94,000

- Our study focuses on India but the issues are relevant to other markets too.

Why India #2

- Quantitative tools have been extensively used
- Cash Reserve Ratio (CRR)
- Advantages
  - **Direct**. Frees up or freezes *internal* funds directly
  - **Quick.**
  - **Potent**. CRR earns zero interest rates
  - **Frequent.**
  - **Identical.** across banks

Comparable Quantitative MP Tools

- QE programs
- Injections of *external* funds
  - Paravasini 2008

Preview of Findings

- MP through quantity tools affects lending "within" banks
  - The effect of changes in CRR on branch-lending depends on branch characteristics

Outline

- Related work and Contribution
- Data
- Empirical framework
- Empirical results
- Conclusions

Related Work

- Current literature focuses on across-bank variation
  - Kashyap and Stein (2000)
    - Liquidity, size, capital
  - Morck, Yavuz, and Yeung (2014)
    - State-owned banks

Contributions of this Study

- **Internal frictions matter for monetary transmission**
  - Literature focused on external frictions
  - Granular data on internal organization of banks

- **Reserve requirement offer unique experiment**
  - Release of bank's own funds
    - Direct, quick, potent, frequent, independent of bank characteristics
  - Different from QE programs and external funds

Contributions of this Study (contd.)

- **Different effects across type of banks**
  - State-owned vs private
    - Some evidence that transmission is sluggish for state-owned banks but
    - State-owned banks show stronger transmission to rural areas
    - State-owned banks less conscious of risk

- **Identification**
  - More granular controls for heterogeneity
    - Interactive bank-year and district-year FEs rule out more sources of heterogeneity

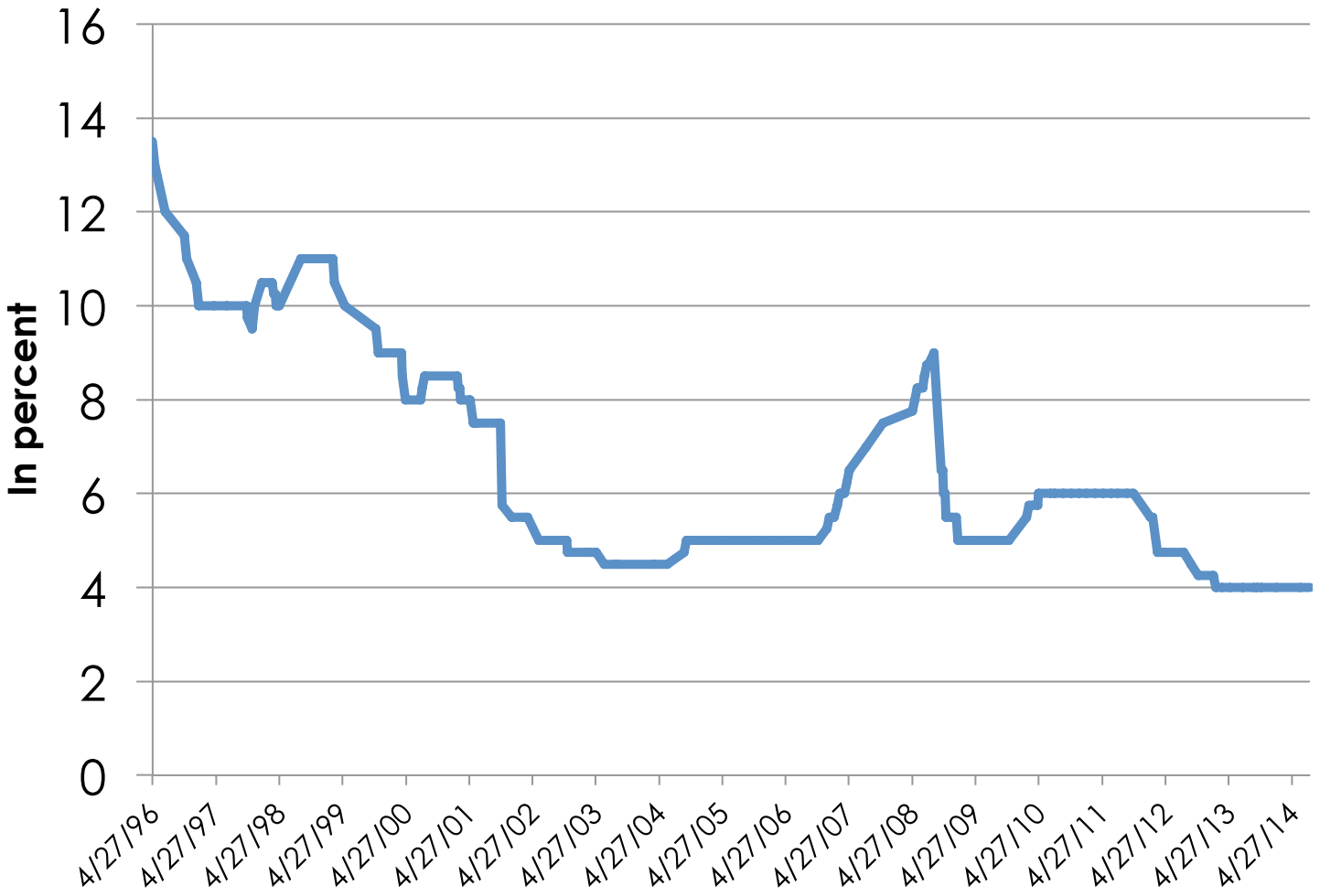
Data

Decomposition of Variation in Log(lending)

One-way Analysis of Variance				
In %	1996	2005	2009	2013
Between banks	27	24	18	10
Within Banks	**73**	**76**	**82**	**90**


AFGHANISTAN
Srinagar
JAMMU & KASHMIR
Jammu
HIMACHAL PRADESH
Shimla
PAKISTAN
Chandigarh
PUNJAB
Dehradun
UTTARAKHAND
HARYANA
DELHI
New Delhi
CHINA
NEPAL
SIKKIM
Gangtok
BHUTAN
Itanagar
ARUNACHAL PRADESH
Jaipur
UTTAR PRADESH
Lucknow
Dispur
ASSAM
NAGALAND
Kohima
Shillong
MEGHALAYA
RAJASTHAN
BIHAR
Patna
Imphal
BANGLADESH
MANIPUR
Agartala
Aizawl
TRIPURA
MIZORAM
Gandhinagar
Bhopal
JHARKHAND
Ranchi
WEST BENGAL
Kolkata
MADHYA PRADESH
GUJARAT
MYANMAR
Raipur
CHHATTISGARH
DAMAN & DIU
Daman
Silvassa
DADRA & NAGAR HAVELI
ODISHA
Bhubaneswar
Mumbai
MAHARASHTRA
BAY OF BENGAL
TELANGANA
Hyderabad
ARABIAN SEA
Yanam (Puducherry)
Panaji
GOA
ANDHRA PRADESH
KARNATAKA
Bengaluru (Bangalore)
Chennai
PUDUCHERRY (Pondicherry)
Mahe (Puducherry)
Karaikal (Puducherry)
LAKSHADWEEP (INDIA)
Kavaratti
TAMIL NADU
KERALA
Port Blair
ANDAMAN & NICOBAR ISLANDS (INDIA)
Thiruvananthapuram
Palk Strait
SRI LANKA
INDIAN OCEAN

CRR


In percent
16
14
12
10
8
6
4
2
0
4/27/96
4/27/97
4/27/98
4/27/99
4/27/00
4/27/01
4/27/02
4/27/03
4/27/04
4/27/05
4/27/06
4/27/07
4/27/08
4/27/09
4/27/10
4/27/11
4/27/12
4/27/13
4/27/14

Summary of Branch Variables

I. Branch organization variables		
Idea	**Measure**	**Transmission**
Complicated decision making	High ticket size of loans; long-term loans; low credit to deposit ratio	1. Weak
Better expertise	Large branches; more officers	2. Strong
More bureaucracy	High clerks/officers	3. Weak

II. Local funds		
Idea	**Measure**	**Transmission**
Poor local funding	Branch deposits	1. Strong if need based 2. Weak if incentive story

Summary of Branch Variables (contd.)

III. Branch location	
Idea/ Measure	Transmission
Rural	1. Weak if distance to lending 2. Strong if credit constraint

IV. Risk		
Idea	Measure	Transmission
More risky branches	Branch NPA	1. Strong if risk-taking 2. Weak

V. Credit Spreads		
Idea	Measure	Transmission
High credit spread	Interest rate spread	1. Weak/strong if indicate risk 2. Strong if indicate profits

Branch-level Heterogeneity: An example

State Bank of India, 2013			
Variable	Coefficient of variation	5th percentile	95th percentile
Credit/deposit ratio	0.8	0.08	2.83
Officers	2.1	1	11
Clerks/officers	0.5	0.75	3.5
Credit spreads	1.4	-2.7	0.97
Within Mumbai district			
Credit/deposit ratio	0.09	0.02	2.4
Officers	2.5	2	83
Clerks/officers	0.4	0.5	2.6
Credit spreads	0.8	-4.4	0.69

Empirical Framework

$$\ln L_{ijt} = \alpha + \beta B_{ijt-1} + \delta M_t * B_{ijt-1} + s_i * \pi_t + s_d * \pi_t + \varepsilon_{ijt}$$

L_{ijt} Value of lending at bank-branch-year level

B_{ij} Bank-branch characteristic

M_t Monetary policy instrument

S_i Bank fixed effects

S_d District fixed effects

π_t Year fixed effects

Standard errors clustered at bank-branch level

Results

Transmission of Monetary Policy to Branch Lending and Branch Characteristics. Multivariate Regression

Dependent variable: Log lending at bank x branch x year	
Intra bank organization	
CRR x High Ticket Size	0.039***
CRR x High Credit to Deposit	-0.033***
CRR x High Share of Long-Term Loans	0.027***
CRR x High Number of Officers	-0.099***
Local Funds	
CRR x Low Deposits	0.011***
Branch Location	
CRR x Rural	-0.006**
Risk and *Branch credit spread*	
CRR x High Share of NPAs	0.026***
CRR x High Interest Rate Spreads	0.047***
Observations	300,329

Transmission of Monetary Policy to Branch Lending and Branch Characteristics. Overall Effect

Dependent variable: Log lending at bank x branch x year	
CRR	-0.210***
CRR x High Ticket Size	0.052***
CRR x High Credit to Deposit	-0.047***
CRR x High Share of Long-Term Loans	0.037***
CRR x High Number of Officers	-0.035***
CRR x Low Deposits	0.014***
CRR x Rural	-0.016***
CRR x High Share of NPAs	0.025***
CRR x High Interest Rate Spreads	0.050***
Observations	300,329

So far..

- MP changes affects lending *within* banks
  - Effect on branch lending depends on branch characteristics

I. Intra bank organization

- Weaker transmission when decision making more complicated
- Stronger transmission when better expertise and less bureaucracy

II. Local funds

- Weaker transmission where low deposit mobilization

III. Geographical location

- Stronger transmission where households credit constrained

IV. Risk

- Weaker transmission where greater risk

V. Credit spreads

- Weaker transmission where higher credit spreads

Interaction Effects

- Type of bank
  - State owned and private banks

State Owned vs Private Banks

Dependent variable: Log lending at bank x branch x year

	State-owned	Private
Intra bank organization		
CRR x High Ticket Size	0.023***	0.152***
CRR x High Credit to Deposit	-0.024***	-0.080***
CRR x High Share of Long-Term Loans	0.023***	0.086***
CRR x High Number of Officers	-0.090***	-0.155***
Local Funds		
CRR x Low Deposits	0.010***	0.010
Branch Location		
CRR x Rural	-0.028***	0.111***
Risk and *Branch credit spread*		
CRR x High Share of NPAs	0.003	0.208***
CRR x High Interest Rate Spreads	0.042***	0.074***
Observations	271,629	28,700

Summary

- By ownership
  - lending by state-owned banks more sticky
  - state-owned banks lend more to rural areas
  - private banks more conscious of risk

Other Robustness

- Different samples
  - Include RRBs; exclude SBI
- Different specification
  - Lagged monetary policy
- Omitted variables
  - Election
  - Horse race with other macro variables e.g. inflation, other monetary policy tools

Conclusions

- We look at lending response to MP *within* banks
  - Branch level analysis
  - Quantitative tools
  - India

- Transmission *within* banks
  - Asymmetric effects across branches within the same bank
    - Intra bank organization, local funds, geographical location, and risk matter

Thank you!

Questions?