

# *A Monetary Business Cycle Model for India:* Discussion

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## Disclaimer

*The views in this discussion are solely the responsibility of the presenter and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or of any other person associated with the Federal Reserve Board.*

# Background

- Common problem in emerging market economies
  - Weak monetary transmission to interest rates
  - Prevalent credit channel
    - : Mishra & Montiel (2012), Montiel et al. (2014)
- Monetary transmission in India
  - Empirical Work
    - : Das (2015), Mohanty (2012), Segupta (2014), Singh (2011)

# Summary

- Why is aggregate demand channel of monetary transmission weak in India?
- Examine using DSGE framework
  - NK model augmented to include fiscal dominance
    - : statutory liquidity ratio
    - : administered interest rates on small deposits
  - Real & monetary shocks
- Show effect of fiscal dominance on amplification & propagation of shocks
  - Argue fiscal dominance does not weaken monetary transmission

# Outline

## 1. Modelling

- Modelling fiscal dominance
- Comment on banking system in model

## 2. Quantitative

- Calibration
- Measuring monetary transmission

## A Model of Fiscal Dominance

- Transmission hindered by conflicting incentives between gov't and CB
  - CB wants to control inflation and output gap
  - Gov't wants to sustain fiscal deficit
    - ⇒ pressure to monetize deficit with low interest rates
- Case of India
  - Gov't holds some portion of monetary base captive through SLR and regulated deposits

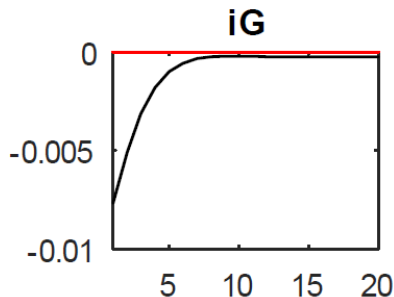
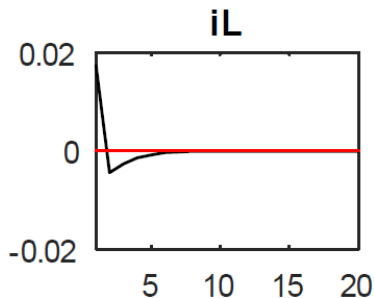
## A Model of Fiscal Dominance

- Model imposes policy by specifying
  - Money Supply Rule:  $gr_{MS} = \pi$ , *C.P.*
  - Taylor rule for government bond rate
  - Exog. gov't spending
- By what mechanism does high gov't borrowing transmit to interest rates?
  - Gov't bond rate and money supply fixed by policy
  - Interest rate on reserves theoretically could adjust, but appears to be fixed
  - Appear to transmit through taxation

## Interest rate setting in the model

- Perfect competition in banking
  - Loan-deposit spread driven by hh liquidity preference
- Does the model replicate income gap in data?
  - Captures bank reponse to interest rate risk (Gomez et al. 2016)
- Deposit rates pegged to policy rate:  $1 + i_t^D = \zeta \cdot (1 + i_t^G)$ 
  - Maturity pattern of deposits in India tilted towards longer duration (> 1yr) term deposits
  - Deposit rates have large impact of volatilities in model
  - Deposit rate channel can drive loan supply with mkt power
    - : Drechsler et al. (2017)

# Response of Interest Rates to Policy Shock



## Market Power in Banking

- Allow loans/deposits to be differentiated by retail banks

- Demand for loans:  $L_t = \left( \int l_{jt}^{\frac{\eta-1}{\eta}} \cdot dj \right)^{\frac{\eta}{\eta-1}}$

- Supply of deposits:  $D_t = \left( \int d_{jt}^{\frac{\zeta-1}{\zeta}} \cdot dj \right)^{\frac{\zeta}{\zeta-1}}$

- Deposit/loan rates set according to

- Loan demand func.  $l_{jt} = \left( \frac{i_{jt}^L}{\bar{i}_t^L} \right)^{-\eta} L_t$ , adjustment costs  $\phi^L(i^L)$

- Deposit supply func.  $d_{jt} = \left( \frac{i_{jt}^D}{\bar{i}_t^D} \right)^{-\zeta} D_t$ , adjustment costs  $\phi^D(i^D)$



# Market Power in Banking

- Market power  $\implies$  Loan-deposit spread & sluggish adjustment

$$i_{jt}^L = \kappa_0^L(\eta, \phi^L) \cdot i_t^L + \kappa_1^L(\eta, \phi^L) \cdot i_{jt-1}^L + \kappa_2^L(\eta, \phi^L) \cdot \mathbb{E}_t \cdot i_{jt+1}^L$$

$$i_{jt}^D = \kappa_0^D(\zeta, \phi^D) \cdot i_t^D + \kappa_1^D(\zeta, \phi^D) \cdot i_{jt-1}^D + \kappa_2^D(\zeta, \phi^D) \cdot \mathbb{E}_t \cdot i_{jt+1}^D$$



## Parameterization of Model

- By what metric does this parameterization fit the data?
  - Most of reported volatilities miss by order of magnitude
  - Reported cross-correlations seem weak
    - : text notes that sign is generally correct
    - : not good enough standard for paper that seeks to answer a quantitative question
- Why not pursue moment-matching exercise?
  - NK model will never match everything
  - Can plausibly match key moments of interest rate channel
    - : elasticities of deposit/loan rates, etc...



# Measuring Monetary Transmission

- Key quantitative result:
  - Monetary shocks account for small share in output & inflation variance decomposition
  - Variance decomposition of output invariant to SLR and administered interest rates
- Is this the best way to think about monetary transmission?
  - By how much do loan/deposit rates respond to a given change in the policy rate? output, loans, etc...?
  - How long does this take?
  - How do these responses change with fiscal dominance, structure of banking sector, etc...

# Summary

- Paper addresses important question for EMEs in structural way
- Calibration and evaluation of model needs to be improved before quantitative insights can be credited
- Is the environment rich enough to capture fiscal dominance problem, frictions in deposit/loan markets?