# Optimal Policy for Macro-Financial Stability

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## Motivation

- Global financial crisis proved very costly to resolve
  - Great recession in the US
  - Near-death experience in Europe
  - Strong and volatile capital flows in and out of emerging economies

## Motivation

- Debate on the role of policy for financial stability
  - Consensus before the crisis: intervene only during crises (e.g., Bailouts)
  - Current view: intervene before crises (e.g., Macro-prudential policies)
- Key questions:
  - When should policy makers intervene?
  - Which policy tools should they use?

## This paper

- Develop a framework to study the optimal stabilization problem before AND during financial crises
- DSGE model with occasionally binding financial friction: the crisis event is endogenous and nested in a regular business cycle
- This requires the numerical solution of an optimal policy problem in which policy functions are not differentiable

## Related literature

- Literature on financial frictions
- Lorenzoni (2008), Bianchi (2011), Bianchi and Mendoza (2010), Jeanne and Korinek (2011) Chang, Cespedes and Velasco (2012), Benigno et al. (2012)
- Methodology: Klein, Krusell, and Rios-Rull (2009)

## Framework

- Focus on a simple model: Mendoza (2002)
  - Small open economy
  - Two-goods that are consumed and produced
  - A liquidity constraint that limits consumers' borrowing to a fraction of their total income

## Why is there scope for government intervention?

- There is a pecuniary externality when the constraint binds:
  - Consumers do not take into account the effect of their choices on the price of collateral
  - This affects their ability to borrow
  - Which in turn affects the price of collateral
  - And so and so forth ...
  - Consumers and producers' decisions can be affected by this externality even when the borrowing constraint is not binding

## Main messages

- Role and design of macroprudential policies depends on the effectiveness of crises management policy (interaction between ex ante and ex post policy interventions is crucial)
- When price support policies are costly or not effective, macroprudential becomes desirable (A new, intrinsic rationale for macroprudential policies)
- How credit is allocated matters as much as total size of credit flows

## Outline

- Simplified version of the model
- Key results
- Some evidence
- Conclusions

## Preferences

- Utility function:

$$U^j \equiv E_0 \sum_{t=0}^{\infty} \left\{ \beta^t \log\left(C_j\right) \right\}, \tag{1}$$

- Consumption basket and price index:

$$C_t = \frac{\left(C_t^T\right)^{\omega} \left(C_t^N\right)^{1-\omega}}{\omega^{\omega}(1-\omega)^{1-\omega}} \tag{2}$$

$$P_t = \left(P_t^N\right)^{1-\omega}.$$

with $P_t^T = 1$.

## Constraints

- Budget constraint:

$$C_t^T + P_t^N C_t^N + B_{t+1} = Y_t^T + P_t^N Y_t^N + (1+r) B_t, \tag{3}$$

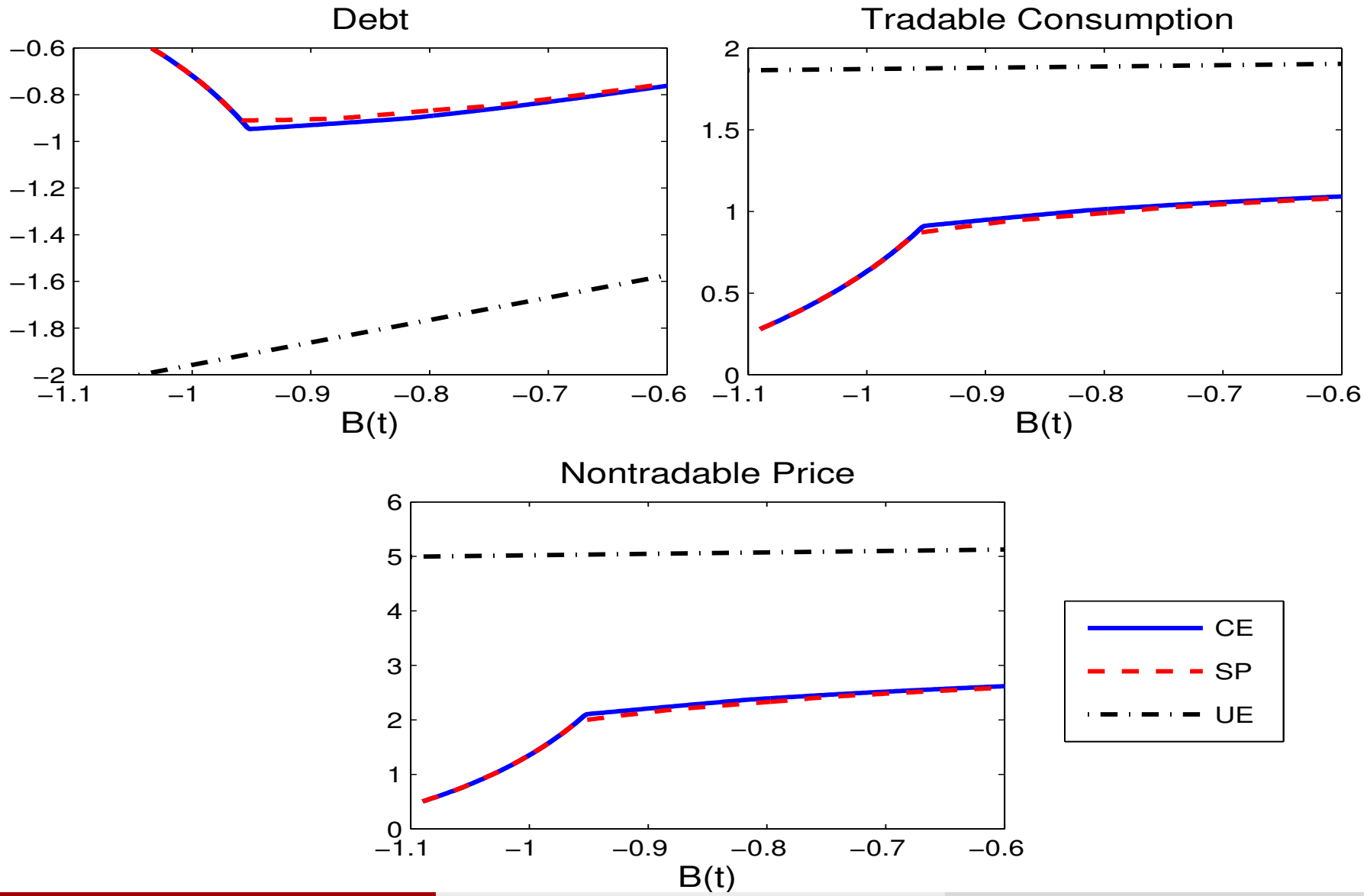
where $B_{t+1}$ denotes the bond holding at the end of period $t$, and $1+r$ is a given world gross interest rate with $\beta(1+r) < 1$.

- International Borrowing constraint:

$$B_{t+1} \geqslant -\frac{1-\phi}{\phi}\left[Y_t^T + P_t^N Y_t^N\right]. \tag{4}$$

- Crisis occurs when constraint binds endogenously.

# Allocations



## Government Policy

- Three policy instruments:
  - Macroprudential tool (e.g., Capital control): $\tau_t^B$
  - Price support tool (e.g., Real exchange rate targeting): $\tau_t^N$ or $\tau_t^T$
- Balanced budget:
  - Non distortionary taxation

$$T_t = \tau_t^N P_t^N C_t^N \text{ or } T_t = \tau_t^B B_{t+1}$$

  - Distortionary taxation

$$\tau_t^B B_{t+1} = \tau_t^N P_t^N C_t^N$$

- Ramsey approach: maximizes agents' utility subject to resource constraint, FOCs of competitive equilibrium, and government budget constraint conditional on policy tools available

## Comparing different tools

- R1: Macroprudential (Capital control) with lump-sum transfers/taxes achieves SP (Korinek, 2010; Bianchi, 2011)
- R2: Price support (Real exchange rate) with lump-sum transfers/taxes achieves UE
- **If costless**, price support policy dominates macroprudential policy

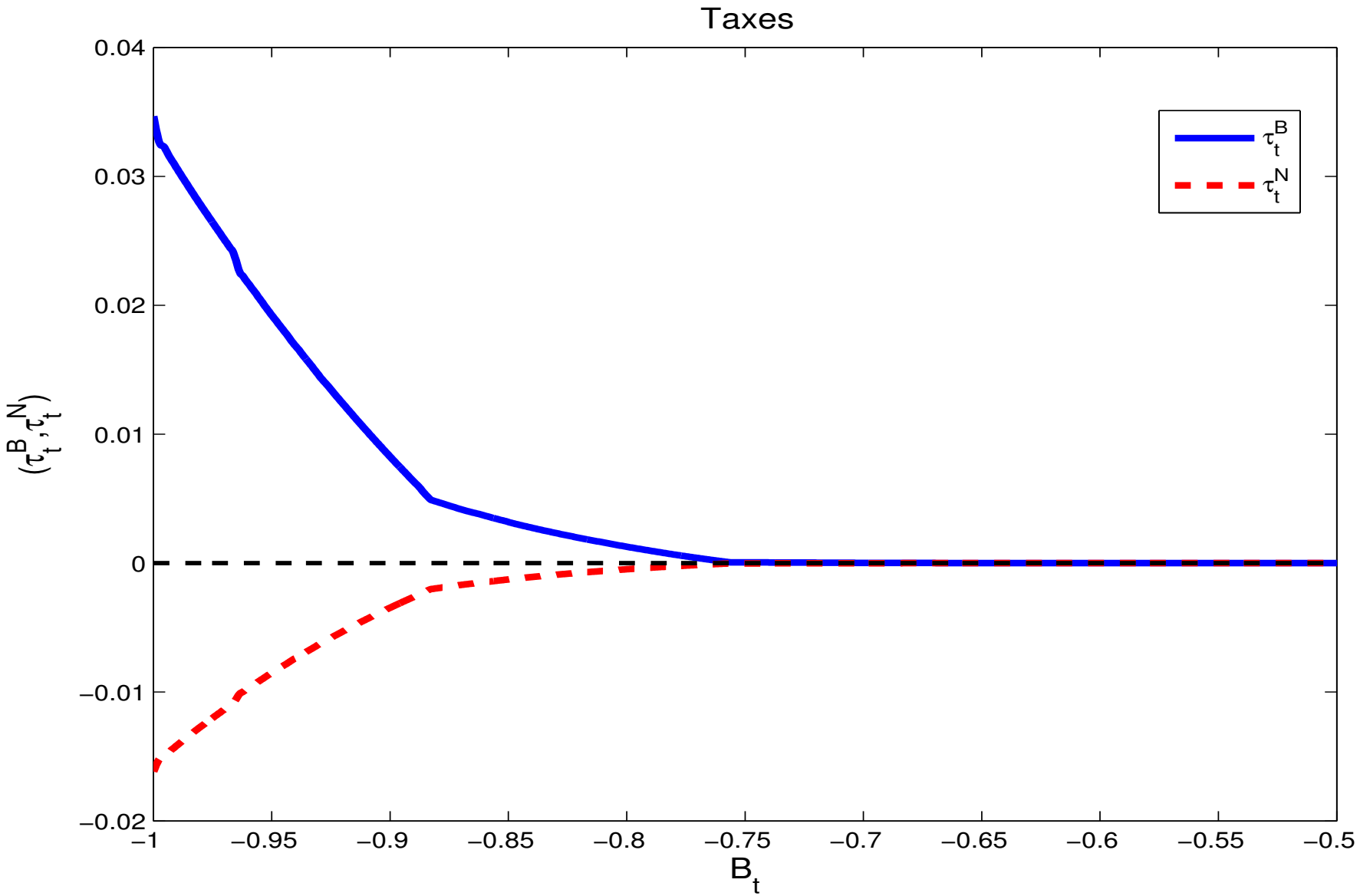
## Mechanism

- Relative price determination:

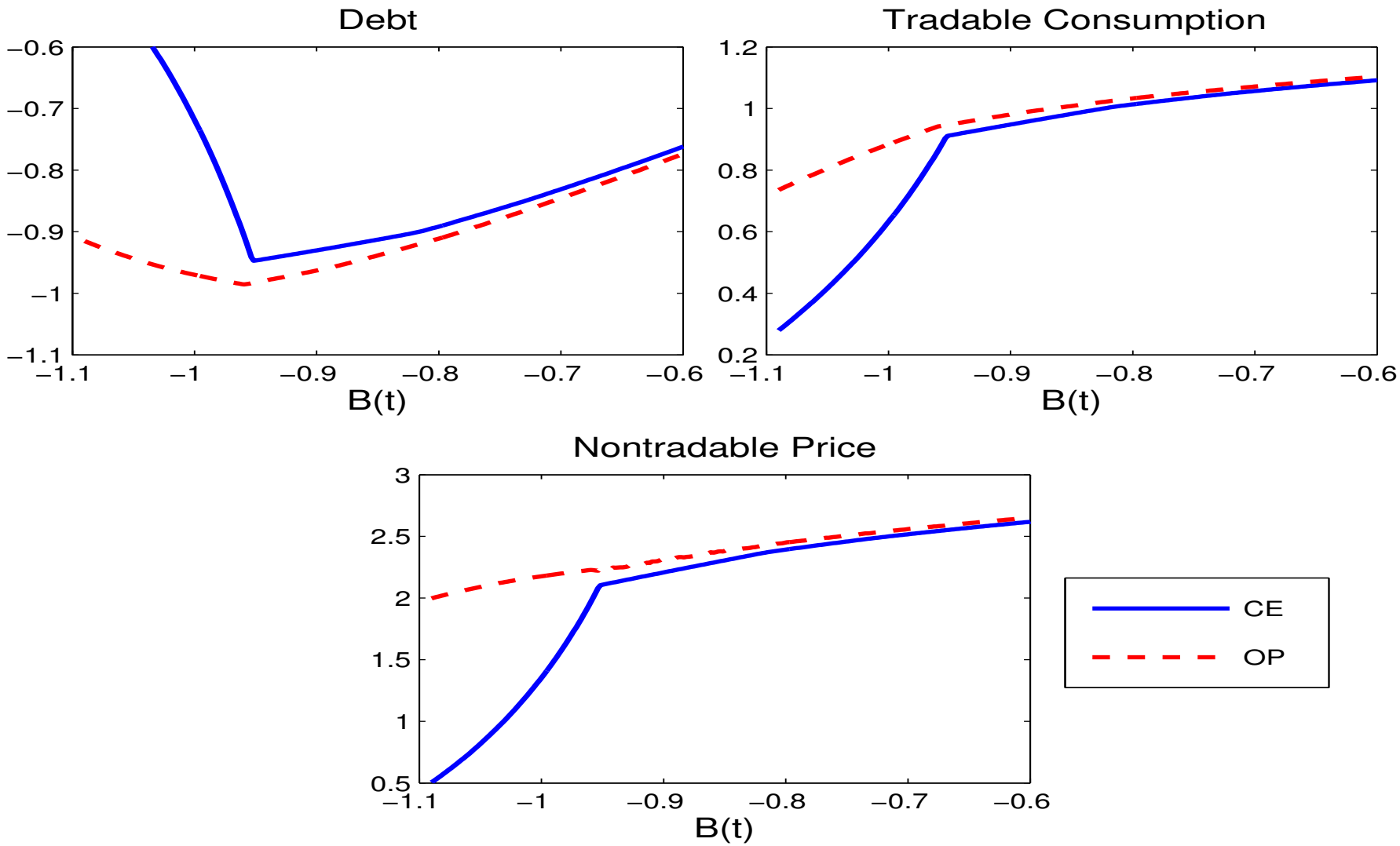
$$P_t^N \left(1 + \tau_t^N\right) = \frac{(1-\omega)\left(C_t^T\right)}{\omega C_t^N}. \tag{5}$$

- When the constraint does not bind $\tau_t^N$ is neutral (Euler equation and resource constraint determines tradable consumption)
- When the constraint binds, $\tau_t^N$ can affect the price of collateral, and hence the consumption of tradable goods

# Costly price support (Distortionary financing)



# Competitive Equilibrium (CE) and Optimal Policy (OP)



## Welfare Gains and Crisis Probabilities

| | Ergodic Averages | | |
|---|---|---|---|
| | Debt to Income | Prob. of Crisis | Welfare Gain |
| CE | $-29.2\%$ | $6.7\%$ | NA |
| SP | $-28.4\%$ | $1.2\%$ | $0.41\%$ |
| UE | NA | $0.0\%$ | $33.8\%$ |
| OP | $-30.5\%$ | $4.9\%$ | $1.10\%$ |

- Welfare gains from OP are quite large
- The economy with OP borrows more than the CE and macroprudential policies remain desirable

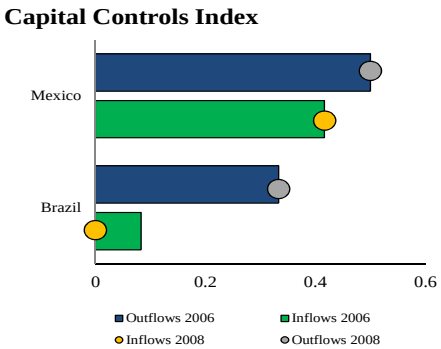
## Production

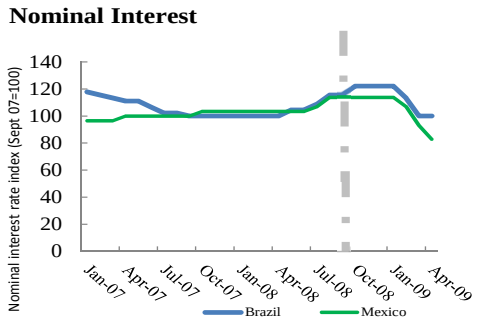
- Production economy: the same externality has effect on consumption and production choices.
- Logic of the results extend to production economy: effectiveness of ex-post policies determine optimal design of ex ante policies
- Price support policies tend to dominate macro prudential policies

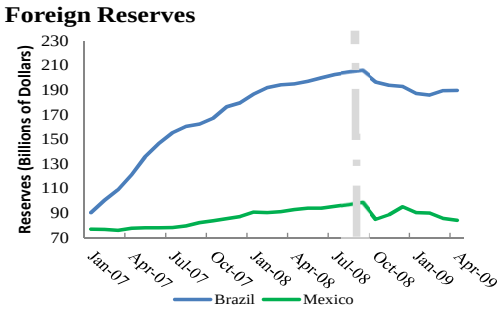
## What do countries do?

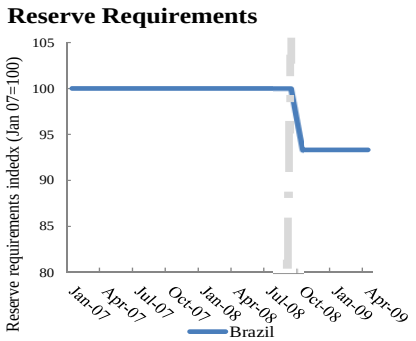
- Consider Brazil and Mexico before and after Lehmann's collapse: they had balance sheet mismatches in the corporate sector and used unconventional policy tools before and after the crisis

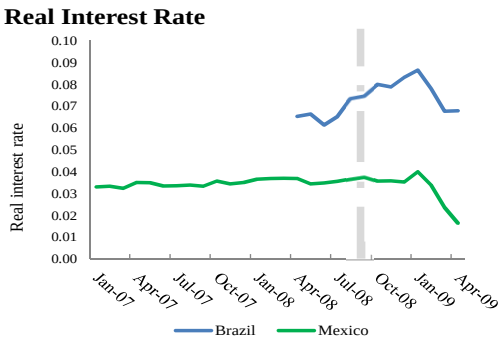
# Brazil and Mexico used a multiplicity of tools before and during crises

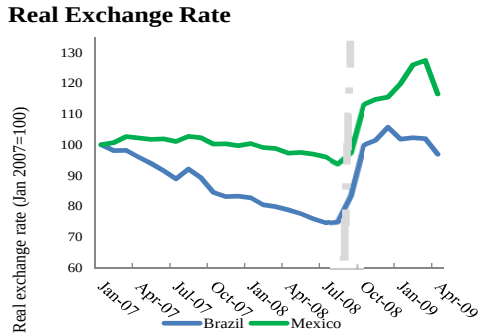


## Caveats and areas for future research

- General results extends to cases when the constraint depends on asset prices or is forward looking
- Simple framework in which there is no policy trade off: with multiple distortions there is an intrinsic rationale for macroprudential policies even if price support is costless (e.g., price and financial stability)

# Conclusions

- Study optimal stabilization policy in an environment in which financial crises are nested in regular cycles
- Role and design of macroprudential policies depends on the effectiveness of crisis management policies
  - When price support policies are costly, there is an intrinsic rationale for macropurdential policies
- Where credit goes is as important as how much credit flows ...

THANK YOU