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
- 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:
  \[ U^j \equiv E_0 \sum_{t=0}^{\infty} \{ \beta^t \log(C_j) \} , \]  
  \[ (1) \]

- Consumption basket and price index:
  \[ C_t = \frac{(C_t^T)^\omega (C_t^N)^{1-\omega}}{\omega^\omega (1-\omega)^{1-\omega}} \]  
  \[ (2) \]

\[ P_t = \left( P_t^N \right)^{1-\omega} \]

with \( P_t^T = 1 \).
Budget constraint:

\[ C_T^t + P_N^t C_N^t + B_{t+1} = Y_T^t + P_N^t Y_N^t + (1 + r) B_t, \]  \hspace{1cm} (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:

\[ B_{t+1} \geq - \frac{1 - \phi}{\phi} \left[ Y_T^t + P_N^t Y_N^t \right]. \]  \hspace{1cm} (4)

Crisis occurs when constraint binds endogenously.
Allocations

Debt

Tradable Consumption

Nontradable Price
Government Policy

- Three policy instruments:
  - Macropurulent tool (e.g., Capital control): $\tau^B_t$
  - Price support tool (e.g., Real exchange rate targeting): $\tau^N_t$ or $\tau^T_t$

- Balanced budget:
  - Non distortionary taxation
    \[ T_t = \tau^N_t P^N_t C^N_t \text{ or } T_t = \tau^B_t B_{t+1} \]
  - Distortionary taxation
    \[ \tau^B_t B_{t+1} = \tau^N_t P^N_t C^N_t \]

- 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
Relative price determination:

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

<table>
<thead>
<tr>
<th>Ergodic Averages</th>
<th>Debt to Income</th>
<th>Prob. of Crisis</th>
<th>Welfare Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>−29.2%</td>
<td>6.7%</td>
<td>NA</td>
</tr>
<tr>
<td>SP</td>
<td>−28.4%</td>
<td>1.2%</td>
<td>0.41%</td>
</tr>
<tr>
<td>UE</td>
<td>NA</td>
<td>0.0%</td>
<td>33.8%</td>
</tr>
<tr>
<td>OP</td>
<td>−30.5%</td>
<td>4.9%</td>
<td>1.10%</td>
</tr>
</tbody>
</table>

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

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

- Capital Controls Index
- Nominal Interest Rate Index
- Foreign Reserves
- Reserve Requirements
- Real Interest Rate
- Real Exchange Rate

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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 macroprudential policies

- Where credit goes is as important as how much credit flows ...
THANK YOU