Does a Currency Union Need a Capital Market Union?

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Differing views on the Eurozone crisis

- Hans Werner Sinn (2010)
  - “The lesson to be learned from the crisis is that a currency union needs ironclad budget discipline to avert a boom-and-bust cycle in the first place”

- Paul Krugman (2012)
  - “On the eve of the crisis (Spain) had low debt and a budget surplus. Unfortunately, it also had an enormous housing bubble, a bubble made possible in large part by huge loans from German banks to their Spanish counterparts”

- Paul de Grauwe (2012)
  - “The situation of Spain is reminiscent of the situation of emerging economies that have to borrow in a foreign currency...they can suddenly be confronted with a “sudden stop” when capital inflows suddenly stop leading to a liquidity crisis”
Why so much disagreement?

1. Because it's complicated
2. Because there was no model to think about these issues together

- Martin-Philippon (2014) build a model and propose an identification strategy
  1. fiscal imbalances
  2. private debt imbalances
  3. sudden stop
Why is it complicated?
Using U.S. States as Control Group

Deleveraging in Ireland

Employment

- Actual
- Predicted using USA

- Ireland
- Arizona


Actual Predicted using USA

Ireland Arizona

− 0.08 − 0.06 − 0.04 − 0.02 0 0.02
Next Step: Spillover

- Martin-Philippon provides:
  - identification strategy and a model that broadly fits all the cross-sectional facts
  - counter-factual (fiscal, macropru, sudden stop): large effects

- But
  - SOE paper: no spillover, no monetary policy
  - capital markets limited to short term debt

- General equilibrium effects of deleveraging and other shocks?
  - Compare three versions of a two-country economy with fixed nominal exchange rate
    - Banking union: cost of debt equalized across regions
    - Capital markets union: diversified equity ownership
    - Complete markets
Preferences and Demographics

- Two types of households $i = b, s$, borrower and saver, $\beta_b < \beta_s$, fraction $\chi$ of borrowers

$$\mathbb{E}_t \sum_{t=0}^{\infty} \beta_i^t [\log C_{i,t} - v(N_{i,t})], \text{ for } i = b, s$$

- Gali-Monacelli framework

$$C_{i,t} = (1 - \alpha) \log \left( \frac{C_{h,i,t}}{1 - \alpha} \right) + \alpha \log \left( \frac{C_{f,i,t}}{\alpha} \right)$$

- Borrowing constraint: $B_{t+1} < \tilde{B}_{t+1}$

- Sticky Wages $W_t$
Pricing and Profits

- Final good $C_h = \left[ \int_0^1 c(j) \frac{\epsilon-1}{\epsilon} \, dj \right] \frac{\epsilon}{\epsilon-1}$
  - Markup $\mu \equiv \epsilon / (\epsilon - 1) \rightarrow$ Profits
    \[ \Pi_t = (P_{h,t} - W_t) N_t = (\mu - 1) W_t N_t \]

- Different economies
  - Bond economy
  - Capital markets union: domestic savers have claim to fraction $\varphi$ of foreign profits
Budget Constraints and Market Clearing

- **Borrowers**
  \[ P_t C_{b,t} = \frac{\tilde{B}_{t+1}}{R_t} + W_t N_t - T_t - \tilde{B}_{t} \]

- **Savers**
  \[ S_t + W_t N_t - T_t + (1 - \varphi^*) \frac{\Pi_t}{1 - \chi} + \varphi \frac{\Pi_t^*}{1 - \chi} = P_t C_{s,t} + \frac{S_{t+1}}{R_t} \]

- **Clearing bond markets**
  \[ (1 - \chi) S_{t+1} + (1 - \chi^*) S_{t+1}^* = \chi B_{t+1} + \chi^* B_{t+1}^* \]
Taylor Rule

- Taylor rule

$$R_t = R_{ss} \left( \left( \frac{Y_t}{Y_{ss}} \right)^{N_{ss}} \left( \frac{Y_t^*}{Y_{ss}^*} \right)^{N_{ss}^*} \right)^{\phi_Y} \left( \left( \frac{\pi_t}{\pi_{ss}} \right)^{N_{ss}} \left( \frac{\pi_t^*}{\pi_{ss}^*} \right)^{N_{ss}^*} \right)^{\phi_{\pi}}$$
Experiments

- Deleveraging experiment: permanent 5% reduction in domestic borrowing limit
  - This shock may be large enough to make ZLB bind: changes aggregate outcome but not comparison between bond/capital/complete
- “Quality” shock: persistent 10% increase in $\alpha^*$
  - TFP shocks as well
- Default and debt restructuring
Impulse response to home deleveraging shock
Take Away 1: Deleveraging Shocks

- Banking union (or anything that guarantees equal cost of funds across regions) is enough to deal with leveraging and deleveraging shocks

- Why?
  - in SOE savers' spending does not react because NFA does not change
  - in GE, interest rate responds
  - but with BU, interest rates remain the same everywhere
  - QED
  - true even if ZLB binding
Impulse response to quality shock

\[
\begin{align*}
\alpha^* &\quad \text{capital union} & \quad \text{banking union} & \quad \text{complete markets} \\
n &\quad \text{capital union} & \quad \text{banking union} & \quad \text{complete markets} \\
n^* &\quad \text{capital union} & \quad \text{banking union} & \quad \text{complete markets} \\
n + n^* &\quad \text{capital union} & \quad \text{banking union} & \quad \text{complete markets} \\
p^*_c &\quad \text{capital union} & \quad \text{banking union} & \quad \text{complete markets} \\
p^*_b &\quad \text{capital union} & \quad \text{banking union} & \quad \text{complete markets} \\
R &\quad \text{capital union} & \quad \text{banking union} & \quad \text{complete markets}
\end{align*}
\]
Take Away 2: Productivity Shocks

• Banking union is not enough to smooth productivity/quality/ToT shocks

• Why?
  • relative wealth shocks → savers’s spending go in opposite direction
  • foreign equity ownership soften the shock
Debt Restructuring

• Now suppose that borrowers can default
  • \( \eta \) = amount of deleveraging achieved by default
  • Ex-post efficient: need to cut spending less

• But who bears the cost of default?
  • domestic savers?
  • foreign savers? fraction \( \omega \)

• Example: banks make loans to households, bank equity is held by foreign savers
  • capital market integration of bank equity
Impulse response with default, $\omega = 0.5$
Conclusions

- Banking union achieves complete markets allocation with respect to deleveraging shocks
  - BU helps smooth all kinds of shocks but for demand shocks it replicates complete market
- Sharing of other types of shocks requires more capital markets integration
  - Capital union improves on banking union in case of productivity shocks
- Debt restructuring can be ex-post efficient
  - Integration of bank equity ownership
Extra: US vs EZ, 2007-2010


- DEU
- AUT
- BEL
- FRA
- ITA
- NLD
- GRE
- ESP
- IRL
- USA
- CA
- AZ
- NV
- NY
- TX
- PA
- OH
- MI
- IL
- FL
- NJ
- OH

-0.06
-0.04
-0.02
0
0.02
0.04
0.06
-0.1
0.1
0.2
0.3
0.4
0.5

Change Emp/Pop 2007–2009

Change Household Debt/GDP 2003–2007
Extra: Martin-Philippon, Fiscal counterfactual: public debt
Extra: Martin-Philippon, Fiscal counterfactual: employment