

Does a Currency Union Need a Capital Market Union?

Joseba Martinez Thomas Philippon

NYU, NBER and CEPR

Toward a Genuine Economic and Monetary Union

Oesterreichische Nationalbank

September 2015

Motivation

- Eurozone crisis: sudden stop in a currency union
- 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”

- Reversal of intra-EMU capital flows → very large country specific borrowing spreads:

$$r_t \rightarrow r_t^j, j \in \{spain, germany, greece, \dots\}$$

- Policy response: “whatever it takes”, Banking Union

Our Goal

- Does new EMU financial architecture provide enough insurance against:
 1. Deleveraging shocks?
 - Salient feature of financial crisis
 2. Other macro shocks?
 - Competitiveness
 - Productivity
- Departure: optimistic view of banking union
 - Assume credit markets function perfectly
- Is this enough?

Our model of the EZ economy

- Two countries, each populated by borrowers and savers
- Share a currency, trade goods with each other
- Home bias: consumption tilted towards domestic goods
- No labor mobility across them
- New-Keynesian model:
 - Labor market frictions → sticky wages
 - Product market imperfections → firms earn rents

Our model of the EZ economy

- Borrowers and savers interact in union-wide capital markets
- We compare three versions of this economy:
 - Complete markets (perfect insurance)
 - “Banking union”: agents can save and borrow at a union-wide interest rate
 - “Capital markets union”: banking union + diversified claims to profits

Preferences and Demographics

- Two countries: home and foreign
 - A country? Segmented labor markets, home bias in consumption
- Two types of households $i = b, s$, borrower and saver, $\beta_b < \beta_s$, fraction χ of borrowers

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

- Consumption of home and foreign goods with home bias ($\alpha_t < 0.5$)

$$C_{i,t} = \left[(1 - \alpha_t)^{\frac{1}{\eta}} (C_{h,i,t})^{\frac{\eta-1}{\eta}} + \alpha_t^{\frac{1}{\eta}} (C_{f,i,t})^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}}$$

Budget and Borrowing Constraints

- Impatient agent budget constraint: nominal debt

$$P_t C_{b,t} = \frac{B_{t+1}}{R_t} + W_t N_t - T_t - \tilde{B}_t$$

- Borrowing constraint:

$$B_{t+1} \leq \tilde{B}_{t+1}$$

- Assume impatient enough (β_b low) s.t.:

$$B_{t+1} = \tilde{B}_{t+1}$$

- Deleveraging shock: \tilde{B}_{t+1} stochastic

Budget Constraints and Market Clearing

- Savers: nominal debt and claims to profits

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

- Clearing bond markets

$$(1 - \chi) S_{t+1} + (1 - \chi^*) S_{t+1}^* = \chi B_{t+1} + \chi^* B_{t+1}^*$$

- Clearing stock markets:

$$\varphi_h + \varphi_h^* = 1$$

$$\varphi_f + \varphi_f^* = 1$$

Firms

- Intermediate goods producers
 - Monopolistically competitive
 - Supply intermediates to domestic final good producer
- Technology

$$y_{j,t} = a_t n_{j,t}$$

- Marginal cost = W_t (normalize $a = 1$)
- Monopolistically competitive:

$$p_{j,t} = \mu_t W_t$$

- Rents:

$$d_t = (\mu_t - 1) W_t N_t$$

Firms

- Domestic final good producers
 - Perfectly competitive
 - Buys intermediates from domestic producers and bundles them together

$$C^h = \left[\int_0^1 c(j)^{\frac{\varepsilon_t - 1}{\varepsilon_t}} dj \right]^{\frac{\varepsilon_t}{\varepsilon_t - 1}}$$

- $\mu_t \equiv \frac{\varepsilon_t}{\varepsilon_t - 1}$
- Intermediate producers all produce same quantity and charge same price,

$$p_{h,t} = \mu_t W_t$$

Consumption Basket

- Consumers in home and foreign buy home and foreign final goods

$$C_h = (1 - \alpha_t) \left(\frac{p_h}{P} \right)^{-\eta} C$$

$$C_f = \alpha_t \left(\frac{p_f}{P} \right)^{-\eta} C$$

- CPI (home)

$$P = \left[(1 - \alpha_t) (p_h)^{1-\eta} + \alpha_t (p_f)^{1-\eta} \right]^{\frac{1}{1-\eta}}$$

- LOOP: $p_h = p_h^*$, $p_f = p_f^*$

Wages

- Wages follow a simple Phillips Curve

$$W_t = W_{t-1} (1 + \kappa(N_t - N^*))$$

- Model set up such that in equilibrium

$$W_{s,t} N_{s,t} = W_{b,t} N_{b,t}$$

Taylor Rule

- Taylor rule
- $\pi_t = P_t/P_{t-1}$ (CPI inflation)

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

Market clearing in goods and equilibrium

- Market clearing in goods

$$N_t = \frac{Y_t}{p_{h,t}} = (1 - \alpha_t) \left(\frac{p_{h,t}}{P_t} \right)^{-\eta} ((1 - \chi) C_{s,t} + \chi C_{b,t}) \\ + \alpha_t \left(\frac{p_h}{P_t^*} \right)^{-\eta} ((1 - \chi) C_{s,t}^* + \chi C_{b,t}^*) + G_t$$

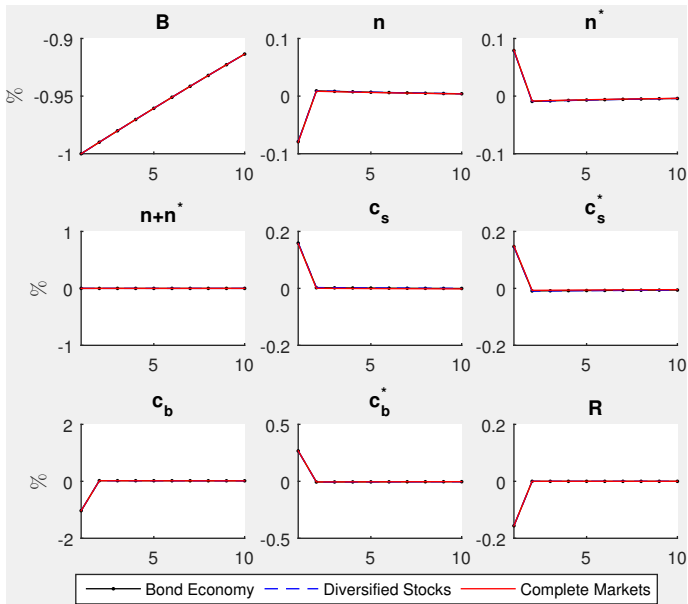
- Equilibrium: allocations $\{C_{s,t}, C_{b,t}, N_t, C_{s,t}^*, C_{b,t}^*, N_t^*\}$ and prices $\{p_{h,t}, p_{f,t}, W_t, W_t^*, R_t\}$ such that:
 - Borrowing constraints satisfied
 - Savers on their Euler
 - Markets clear
- Complete markets (λ is Lagrange multiplier on savers' budget constraint):

$$\lambda_t = \lambda_t^*$$

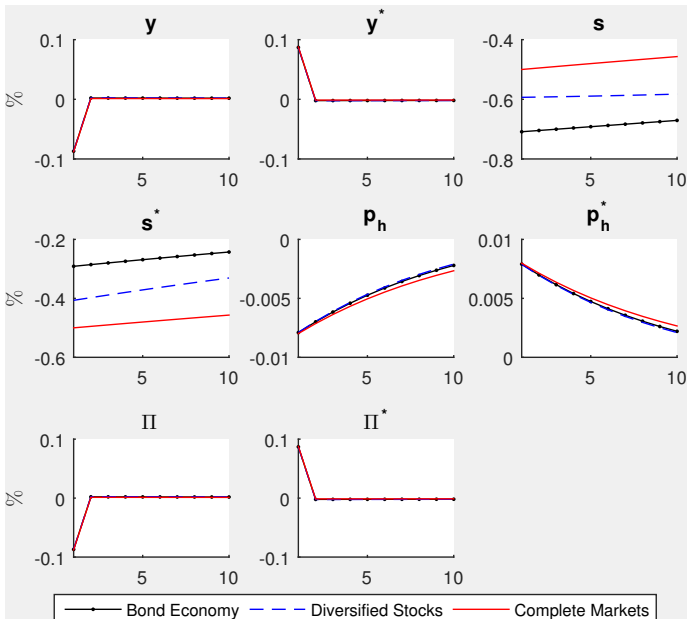
Experiments

- Deleveraging shock: persistent reduction in domestic borrowing limit
- Technology shock: home bias parameter
- Competitiveness shock: markups
- IRFs comparing response to each shock in linear approximation around deterministic steady state
 - Bond economy: banking union, all profits stay domestic
 - Diversified stocks: capital markets union, rents shared equally between savers ($\varphi = \varphi^* = 0.5$)
 - Complete markets: $\lambda = \lambda^*$

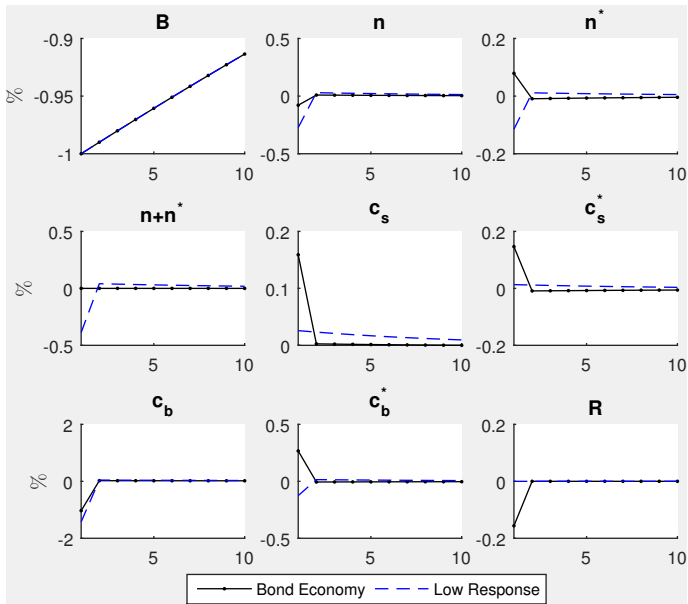
Deleveraging shock



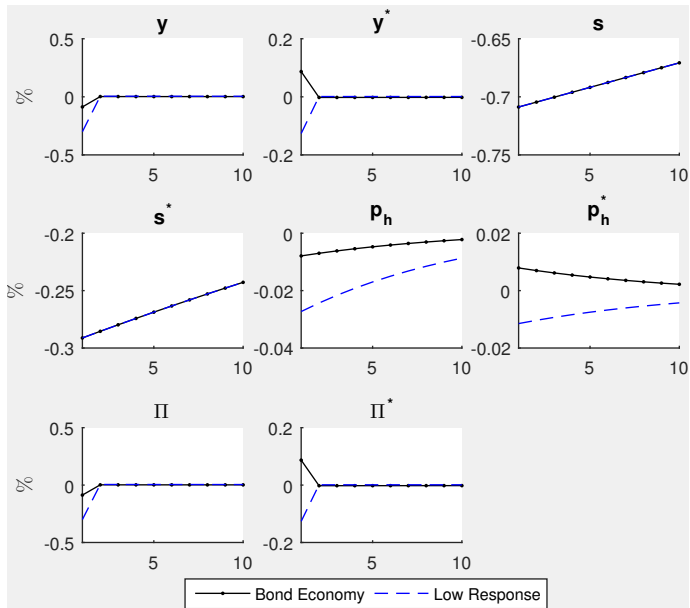
Deleveraging shock



Deleveraging shock - no accomodation



Deleveraging shock - no accomodation



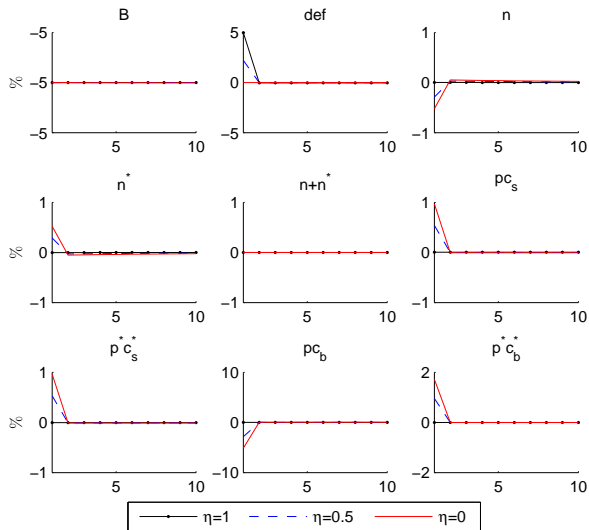
Implications

- Banking union \therefore don't need to worry about deleveraging shocks?
- Better risk sharing among savers doesn't improve welfare of borrowers
- Monetary policy not very effective (as we know)
- Policies that redistribute towards borrowers?

Debt Restructuring

- Now suppose that borrowers can default
 - η = 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 ω
- Example: banks make loans to households, bank equity is held by foreign savers
 - capital market integration of bank equity

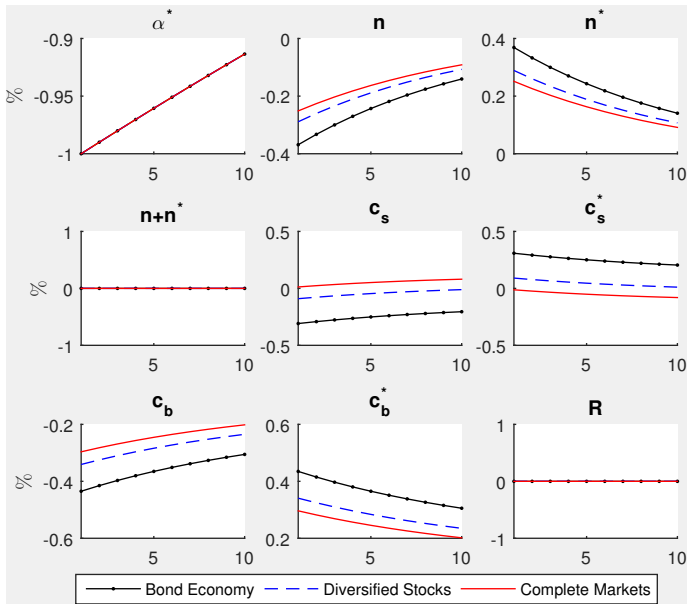
Impulse response with default, $\omega = 0.5$



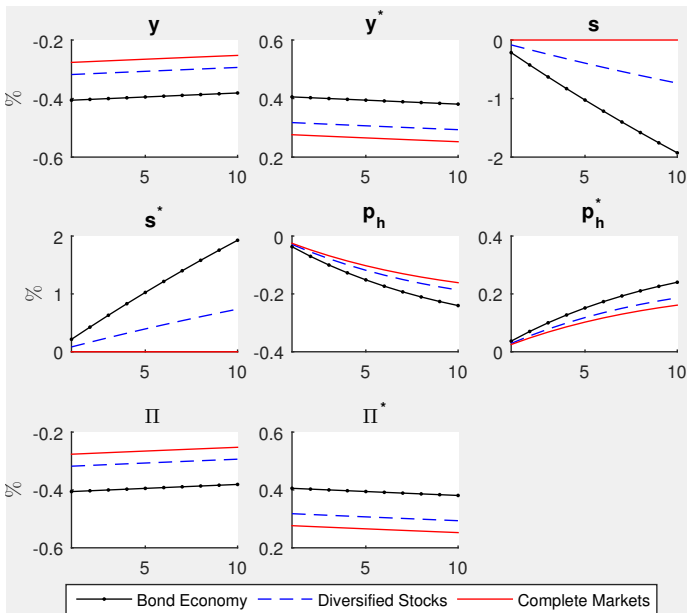
Other types of shocks

- When does the frictionless bond economy provide enough risk-sharing?
- Shocks don't
 - change relative wealth "too much"
 - distort relative prices "too much"
- These caveats do not apply to technology or competitiveness shocks

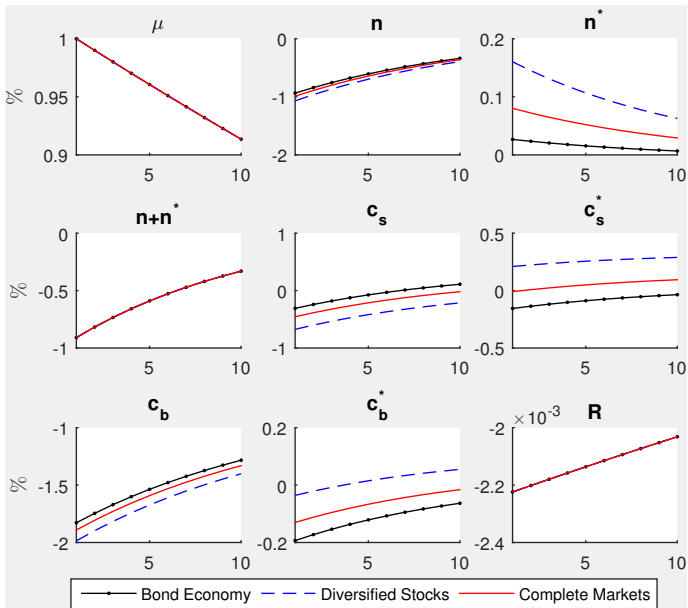
Impulse response to preference shock (α^* increase)



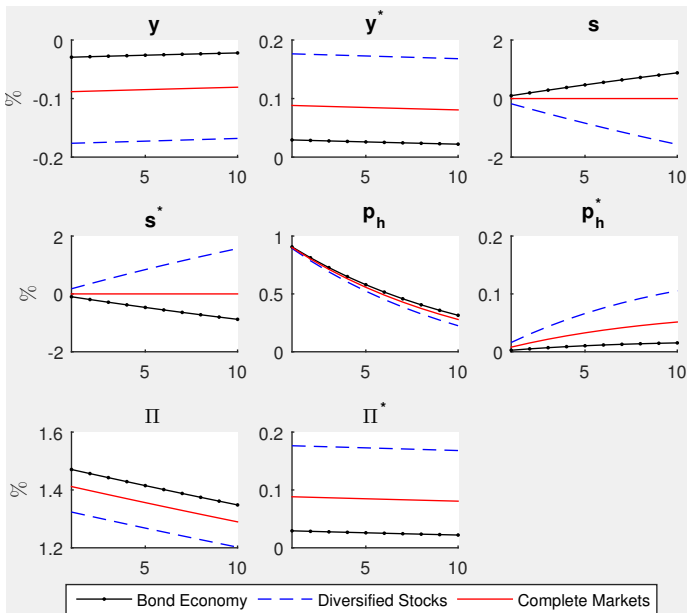
Impulse response to preference shock (α^* increase)



Impulse response to markup shock (μ increase)



Impulse response to markup shock (μ increase)



Conclusions

- “Perfect” banking union emulates full insurance with respect to deleveraging shocks
- 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