

Capital Controls and Competitiveness: A Recent History of Spain

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September 22 2016

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Context

- EU opened up to capital flows in the 1990s
- **Theory**: capital should flow from rich to poor countries, helping poorer countries become more productive
- **Practice**: capital did flow from richer north to poorer south
 - ... but fuelled a consumption boom
 - Southern competitiveness eroded

What We Do

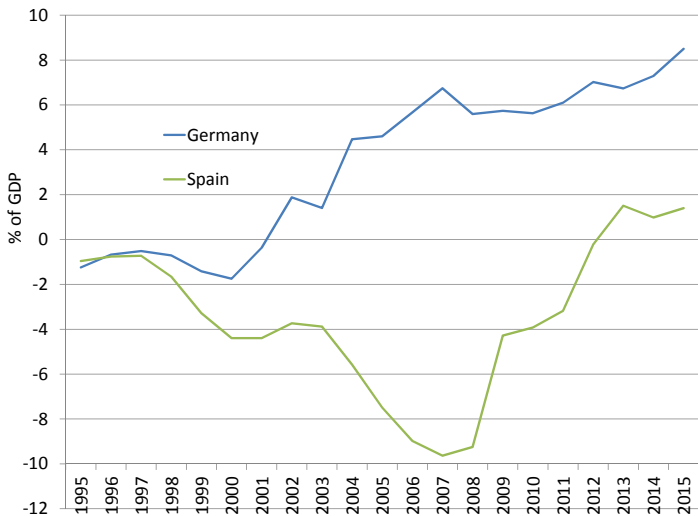
- Document dynamics of German, Spanish and Italian economies from the early 1990s
- Show that these dynamics are qualitatively consistent with a very simple international two-sector growth model
- Only driving force is a gradual reduction in restrictions on capital flows

Facts

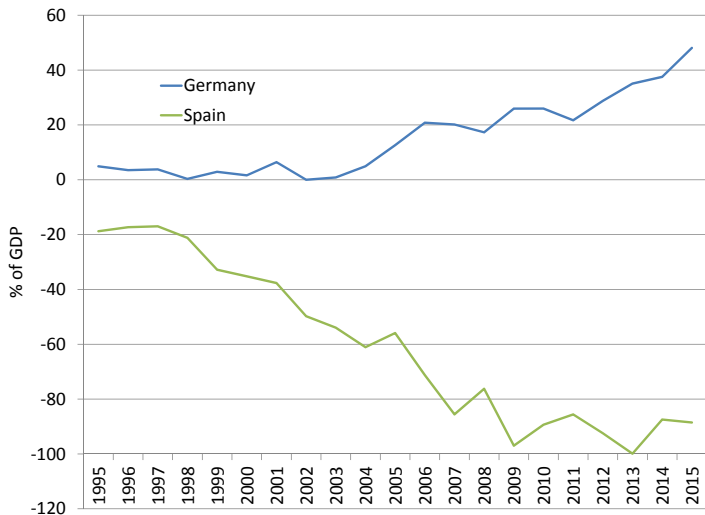
Two phases:

1. **Liberalization**: large capital flows to Southern Europe
2. **Maturity**: capital inflows slow

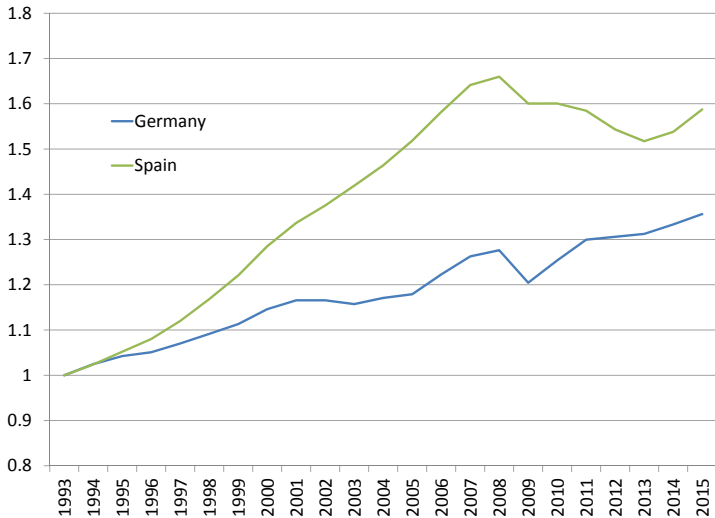
Current Accounts



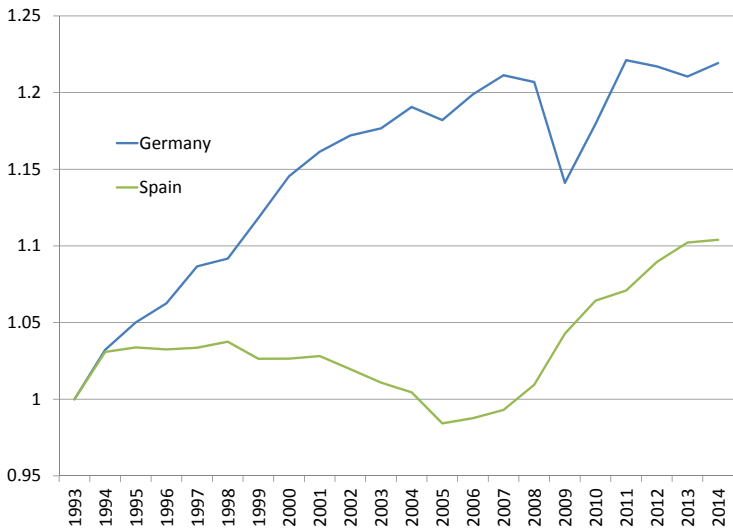
NFA



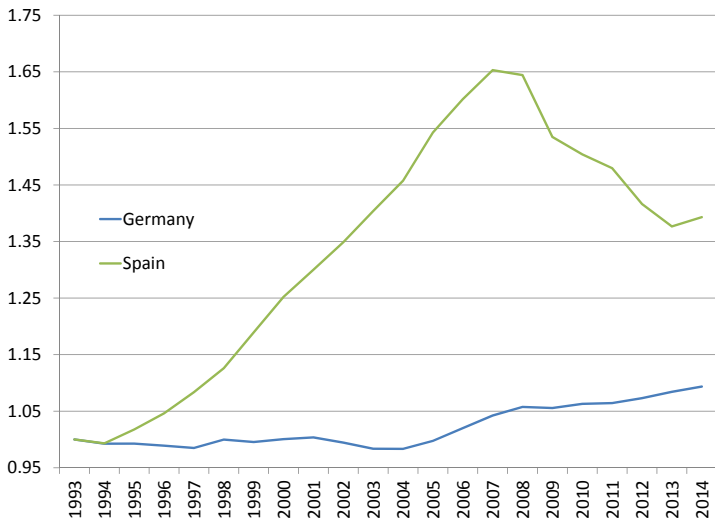
GDP



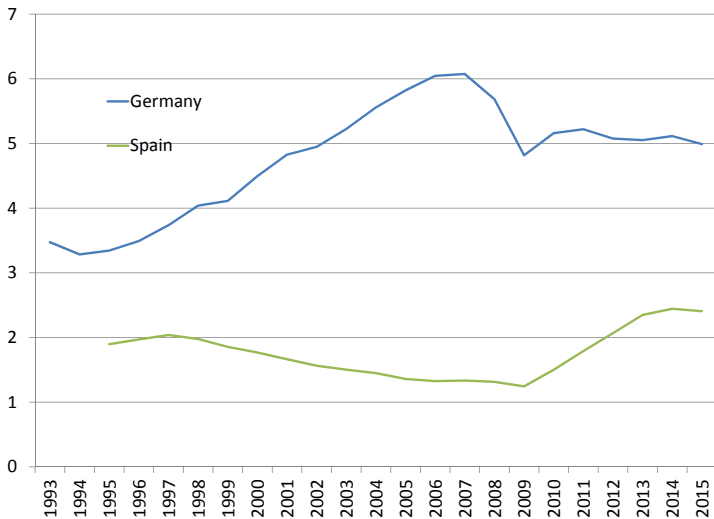
GDP per Employee



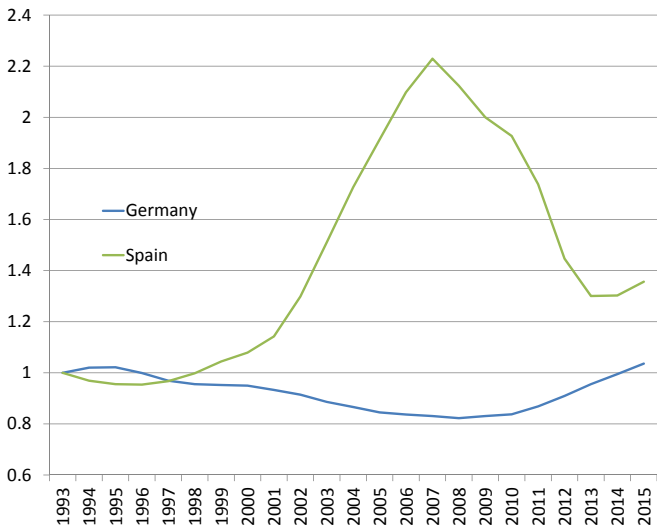
Employment



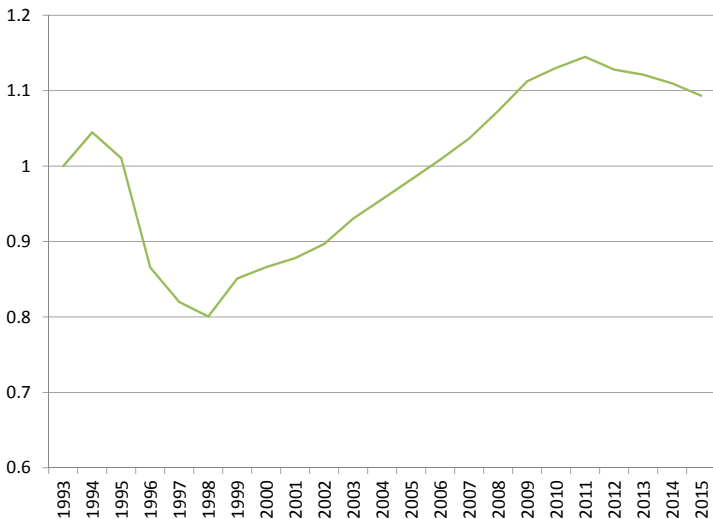
Manufacturing / Construction Value Added



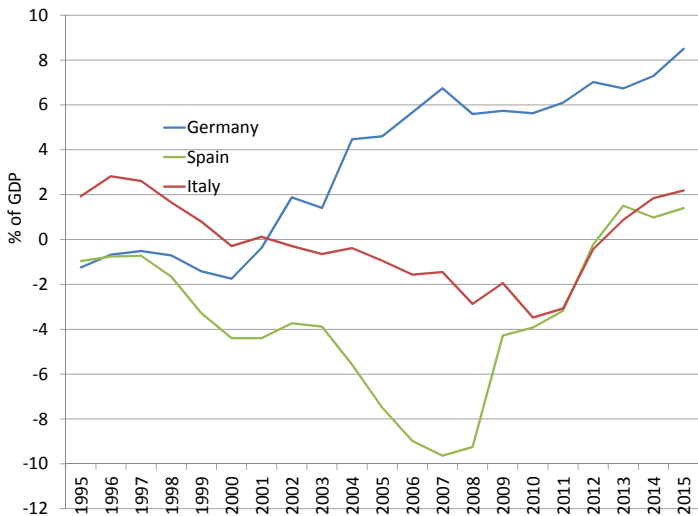
House Prices



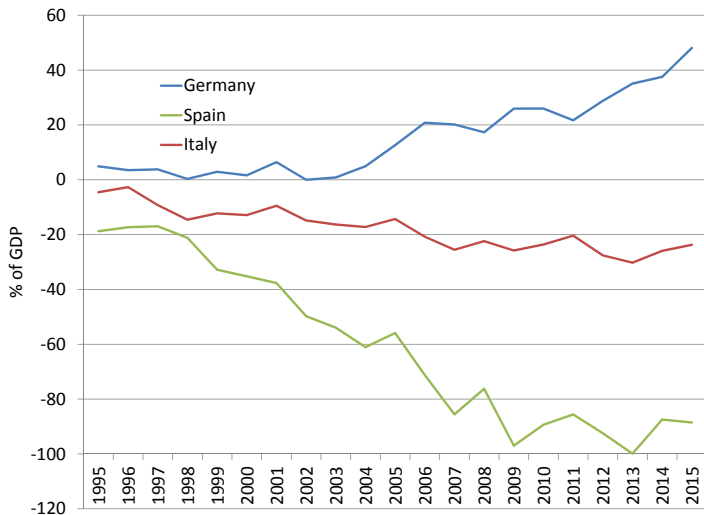
Spain / Germany Real Exchange Rate



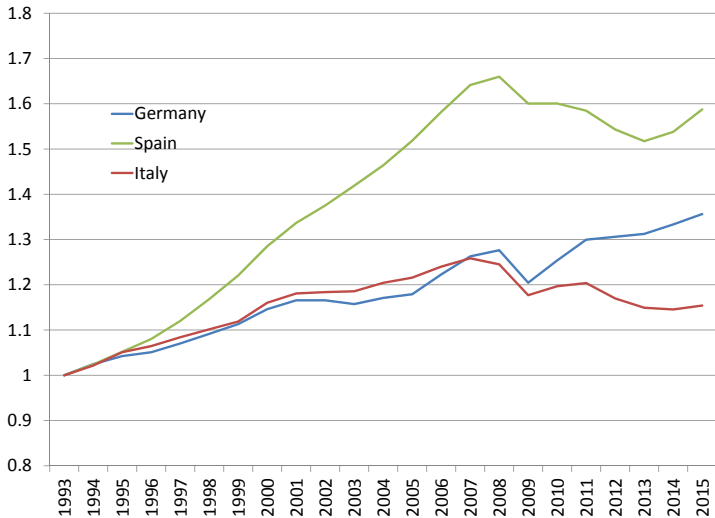
Current Accounts



NFA



GDP



Liberalization

- Spain starts to borrow, Germany starts to lend
- Consumption boom in Spain, reallocation of production to the non-tradable sector, boom in real estate prices
- Growth in Spain driven by boom in employment, in Germany by productivity
- Spanish wages rise and real exchange rate appreciates

Maturity

- Capital inflows stabilize
- Growth in Germany continues, but Spain sees output decline
- Spanish reallocation back towards tradable sector
- Spanish house prices decline, real exchange rate starts to depreciate
- Large fall in Spanish employment

Model

Related to Schmitt-Grohe & Uribe (2016, JPE), Benigno & Fornaro (2014, SJE), Heathcote & Perri (2016, IMF ER)

- Two countries: Spain and Germany
- Identical preferences and technologies, except Spanish are more impatient → natural borrowers post liberalization
- Each country produces country-specific non-tradable, and a freely traded tradable good, using domestic labor
- Labor mobile between sectors, but decreasing returns in each sector
- Non-traded sector relatively labor intensive
- International borrowing and lending subject to capital controls in form of taxes on foreign lending / borrowing

Households

$$\max_{c_{T,t}, c_{N,t}, l_t, b_{t+1}} \sum_t \beta^t u(c_{T,t}, c_{N,t}, l_t)$$

$$u(c_T, c_N, l) = \log \left(\left(\omega c_T^{\frac{\sigma-1}{\sigma}} + (1-\omega) c_N^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} - \frac{l^{1+\gamma}}{1+\gamma} \right)$$

$$p_{T,t} c_{T,t} + p_{N,t} c_{N,t} + q_t p_{T,t} b_{t+1} = w_t l_t + \pi_t + p_{T,t} b_t (1 - \tau_t B_t) + Tr_t$$

Household FOCs

$$\frac{\partial u_t}{\partial c_{Tt}} q_t = \beta E_t \left[\frac{\partial u_{t+1}}{\partial c_{T,t+1}} (1 - \tau_{t+1} B_{t+1}) \right]$$

$$\frac{c_{Nt}}{c_{Tt}} = \left(\frac{\omega}{1 - \omega} \right)^\sigma \left(\frac{p_{Nt}}{p_{Tt}} \right)^\sigma$$

$$l_t = w_t^{\frac{1}{\gamma}}$$

Firms

$$\max_{l_{Tt}, l_{Nt}} \{p_{Tt}y_{Tt} + p_{Nt}y_{Nt} - w_t(l_{Tt} + l_{Nt})\}$$

$$y_{Tt} = l_{Tt}^{\alpha_T}$$

$$y_{Nt} = l_{Nt}^{\alpha_N}$$

FOCs

$$p_{Tt}\alpha_T (l_{Tt})^{\alpha_T-1} = p_{Nt}\alpha_N (l_{Nt})^{\alpha_N-1} = w_t$$

Market Clearing

$$l_T + l_N = l$$

$$l_T^* + l_N^* = l^*$$

$$c_N = y_N$$

$$c_N^* = y_N^*$$

$$c_T + c_T^* = y_T + y_T^*$$

$$B + B^* = 0$$

Steady state

$$q = \beta(1 - \tau B)$$

$$q = \beta^*(1 + \tau B)$$

$$\Rightarrow B = \frac{\beta - \beta^*}{\tau(\beta + \beta^*)}$$

Experiment

- Start in steady state with high τ , small $|B|$
- Consider gradual deterministic reduction in τ
- Trace out equilibrium dynamics

Calibration

$$\alpha_T \quad 0.50$$

$$\alpha_N \quad 0.75$$

$$\omega \quad 0.5$$

$$\sigma \quad 0.74$$

$$\gamma \quad 1$$

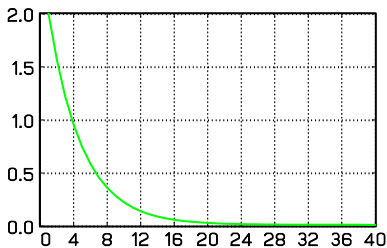
$$\beta \quad 0.95$$

$$\beta^* \quad 0.97$$

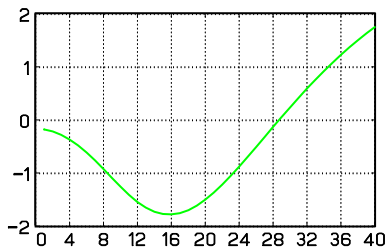
$$\tau : 2 \rightarrow 0.012 \Rightarrow \frac{B}{Y} : -0.5\% \rightarrow -94\%$$

Capital Flows

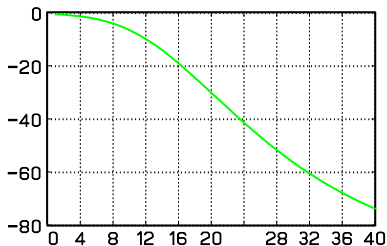
Tax Parameter



Spain NX/GDP



Spain Debt/GDP

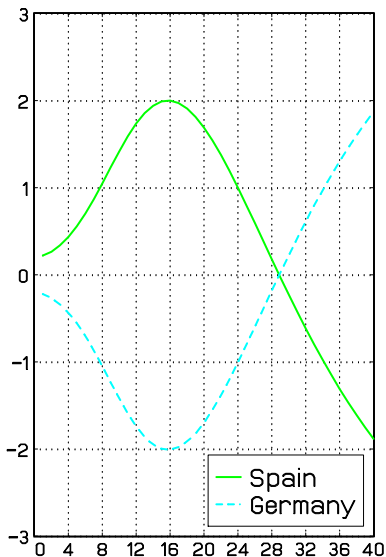


NFA Dynamics

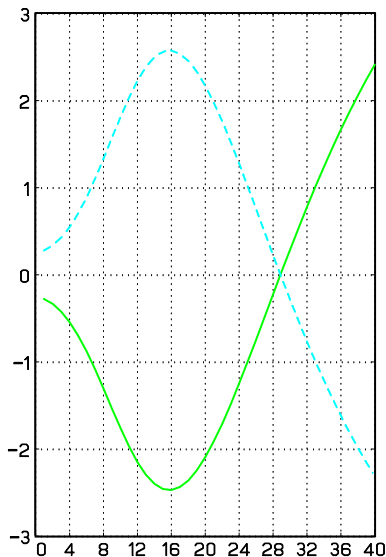
- Spain gradually ramps up borrowing in phase when capital control taxes declining
- Gradual convergence to large negative NFA position
- As debt converges to new steady state value, Spanish trade deficit must turn into a trade surplus
- Thus get a “current account reversal” without any shocks

Consumption Boom and Sectoral Reallocation

Consumption

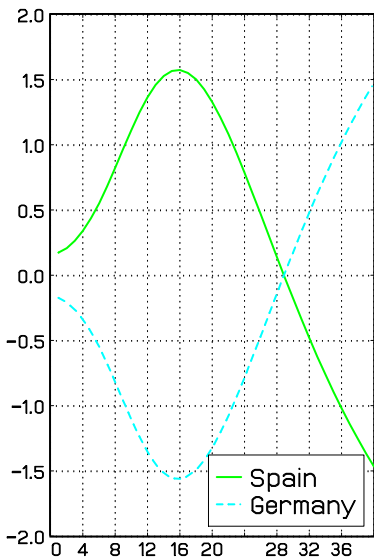


y_T/y_N

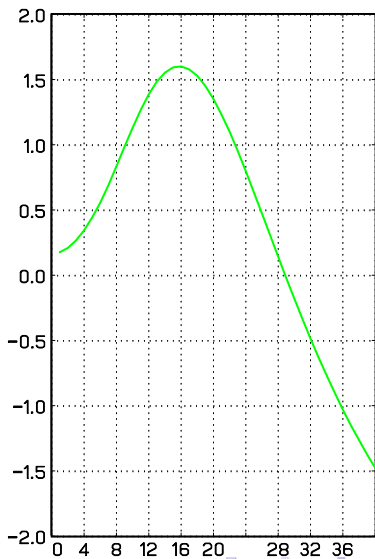


Prices

p_N/p_T

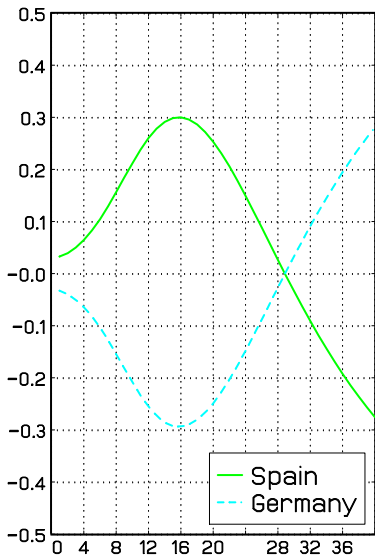


RER

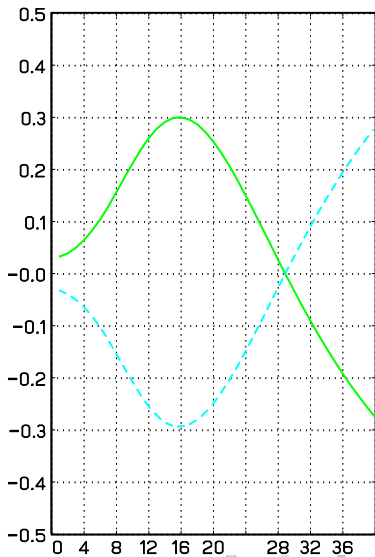


Wages and Hours

Wages

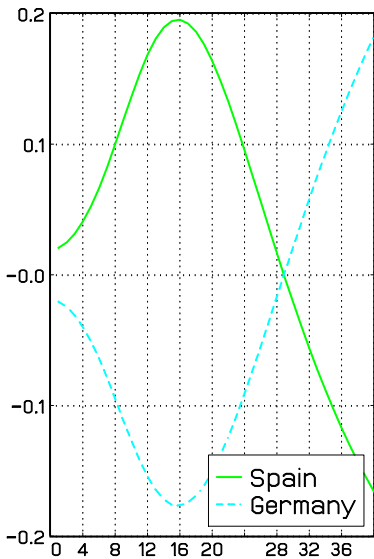


Hours

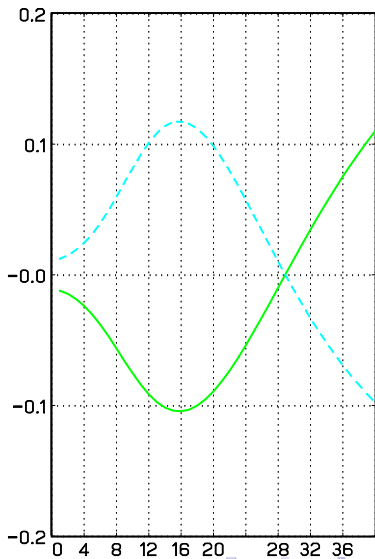


GDP and Productivity

GDP



GDP/Hours



Liberalization Phase

- Spain uses borrowing from Germany to finance a consumption boom
- Can borrow tradable consumption, but must produce non-tradable
- \Rightarrow Reallocation of production to non-tradable sector
- Decreasing returns \rightarrow increase in relative price of non-tradables + real exchange rate appreciation
- Greater labor intensity of non-traded sector \rightarrow increase in labor demand \rightarrow higher Spanish wages and employment
- But lower average labor productivity in non-tradable sector (little capital) \rightarrow Spanish productivity falls
- Germany is the mirror image

Maturity Phase

- Spanish consumption boom comes to an end, as foreign borrowing becomes increasingly costly
- Reallocation back towards tradable sector
 - Real exchange rate depreciates, Spanish wages and employment fall
 - Tradable sector must be larger than in initial steady state \Rightarrow wages, employment and output fall below initial steady state values

Welfare

- Is capital flow liberalization welfare improving?
- Yes: gains from inter-temporal trade thanks to differential preferences for timing of consumption
- Welfare gains for Spain and Germany are 0.27% and 0.41% of consumption
- Financial autarky not optimal, but some restrictions on international asset trade still potentially desirable

Sticky Wages

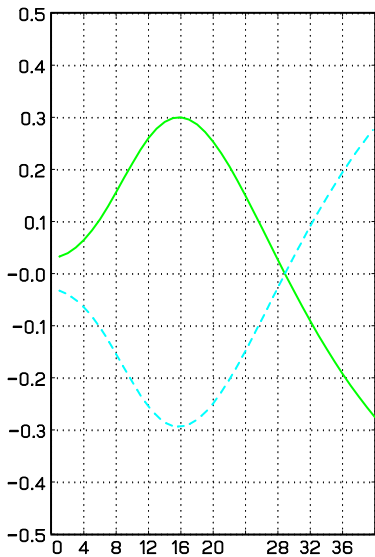
- Suppose real wages are sluggish (in Spain):

$$w_t = \kappa h_t^\gamma + (1 - \kappa)w_{t-1}$$

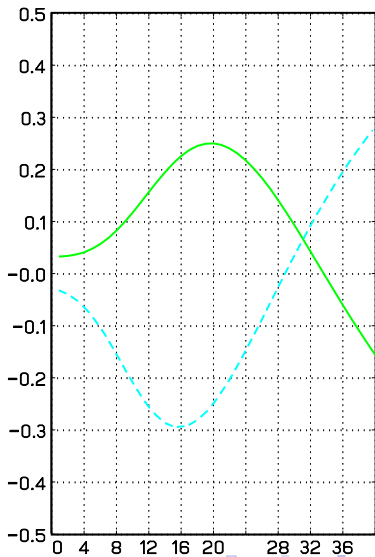
- Real wages rise more slowly in liberalization phase \Rightarrow boom amplified
- Real wages fall more slowly in maturity phase \Rightarrow downturn amplified

Wages

Wage flex

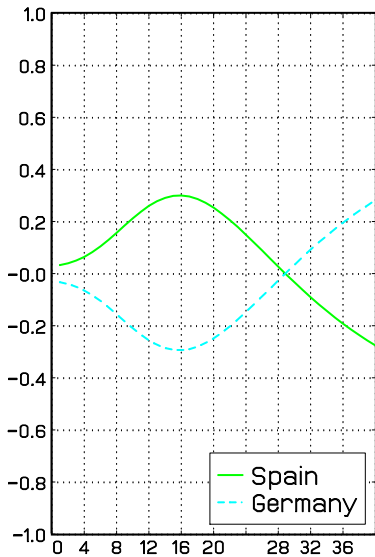


Wage sticky

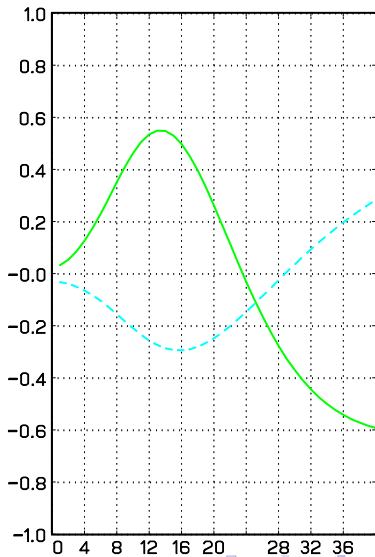


Hours

Hours flex

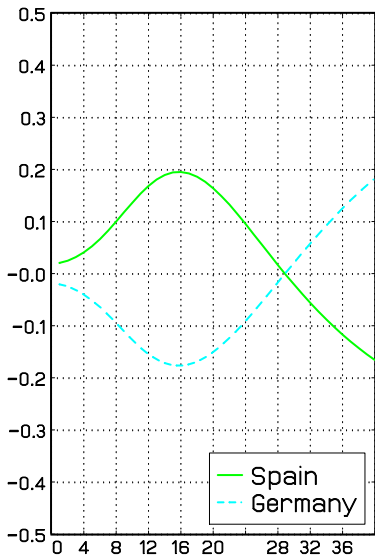


Hours sticky

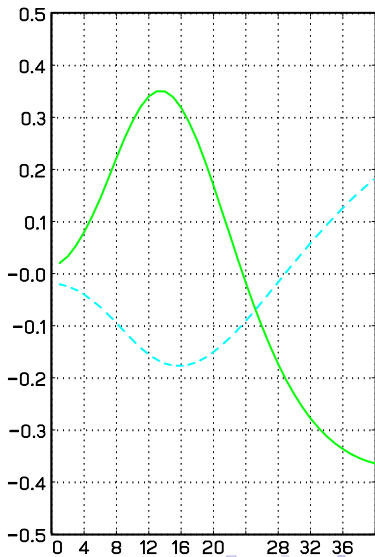


GDP

GDP flex



GDP sticky



Conclusion

- Debate over whether increased international capital mobility is good, bad, or irrelevant for growth
- Explored European financial integration as a case study
- Simple perfect foresight model delivers long-lived, non-monotone dynamics
- International capital flows can explain many of the differences between the growth dynamics of Germany versus Spain
 - Something that looks like a bubble, followed by something that looks like a slump
 - Boom and bust amplified with sticky real wages

Things to Do

- Extend the model to include capital, land
- More quantitative model-data comparison