

Understanding the International Great Moderation

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Overview of the paper

- Is there a role for capital markets liberalization in explaining international great moderation?
- Analysis conducted along three dimensions:
 - i) empirical motivation;
 - ii) theoretical model;
 - iii) quantitative analysis.

Results

- Empirical analysis: (OECD countries (1970-2004)) index capital account openness (Chinn and Ito, 2005) versus macroeconomic variability (std of quarterly GDP growth over various time windows).

-Regression (cross section and time series data) shows that the coefficient of capital account openness is negative.

- Model:

- Two-country IRBC model with limited enforcement

- Credit shocks

- Degree of financial integration captured by transaction cost;

- Quantitative analysis:

Financial liberalization can lower GDP volatility by as much as 30%

Model

- Role of credit shock/enforcement contract;
- Open economy dimension.

Simplified version of the model:

- 2-period;
- no production externality;
- only labor input;
- perfect foresight.

Model: firms

Firms maximize:

$$V = d_1 + \beta d_2$$

subject to:

$$b_1 + d_1 = z l_1^\gamma - w_1 l_1 + \frac{b_2}{R}$$

$$b_2 + d_2 = Y_2$$

and the enforcement constraint:

$$\beta d_2 \geq A + z l_1^\gamma$$

Assume $b_1 = 0$, then FOCs:

$$z \gamma l_1^{\gamma-1} = \frac{w_1}{1 - \mu}, \quad \beta(1 + \mu) = \frac{1}{R}$$

Model: consumers

Consumers maximize:

$$\ln c_1 + \alpha \ln(1 - h_1) + \delta \ln c_2$$

subject to:

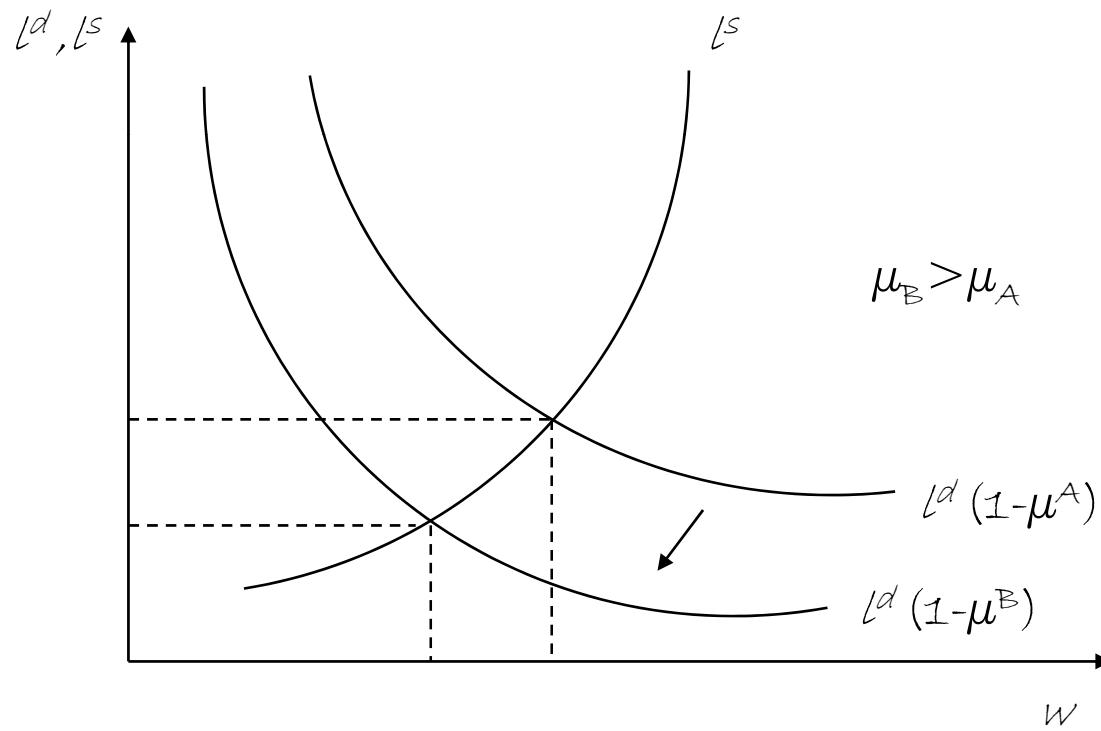
$$w_1 h_1 + b_1 = c_1 + \frac{b_2}{R}$$

$$c_2 = b_2$$

Assume $b_1 = 0$, then FOCs

$$\frac{c_2}{c_1} = R\delta, \quad \frac{\alpha c_1}{w_1} = 1 - h_1$$

Labour market equilibrium



Goods market equilibrium:

(assume that the enforcement constraint is always binding)

Equilibrium:

$$\frac{R\delta}{1 + \delta} w_1 h_1 = \frac{\beta Y_2 - A - z l_1^\gamma}{\beta}$$

workers firms

Transmission mechanism of credit shock:

if $A \uparrow$ (value of default is higher, demand of bonds decreases), $R \uparrow$ and because $\beta(1 + \mu) = \frac{1}{R}$ then $\mu \uparrow$ and this will lead to decrease in output.

Open economy

What happens in open economy?

Other country has similar enforcement problem

Assumptions: no mobility of physical capital

international borrowing made by consumers

only foreign bonds are traded internationally

What changes?

Budget constraints of home consumers:

$$w_1 h_1 = c_1 + \frac{b_2}{R} + \frac{n_2}{R^*}$$

$$c_2 = n_2(1 - \phi N_2) + b_2$$

FOC for foreign bonds:

$$\frac{c_2}{c_1} = R^* \delta (1 - \phi N_2)$$

combining with FOC for domestic bonds:

$$R = R^* \delta (1 - \phi N_2)$$

Equilibrium condition in the foreign bond market ($N_2 + N_2^* = 0$).

What is the transmission mechanism of credit shock across countries?

Is there any direct link (because of openness) between A and R^* ?

Equilibrium interest rate (goods market equilibrium condition):

$$\frac{R\delta}{1 + \delta} w_1 h_1 - \underbrace{N_2(1 - \phi N_2)}_{\text{workers}} = \underbrace{\frac{\beta Y_2 - A - z l_1^\gamma}{\beta}}_{\text{firms}}$$

Now if A rises, R has to increase less and fluctuations in output are smaller.

Openness reduces interest rate response to credit shock

Mechanism implies that decrease in output volatility is accompanied by increase in net foreign asset volatility

Limited enforcement provides additional source of shock.

Consider the case in firms can borrow in foreign bonds:

Enforcement constraint (demand of foreign bonds)

$$(1 - \phi N_2)n_2^f = \frac{\beta Y_2 - A - z l_1^\gamma}{\beta}$$

with

$$\beta(1 + \mu) = \frac{1}{R^*(1 - \phi N_2)}$$

with $N_2 = n_2^c + n_2^f$.

Workers:

$$(1 - \phi N_2)n_2^c = \frac{R^*\delta}{1 + \delta} w_1 h_1$$

Under liberalization:

$$n_2^f + n_2^c + n_2^{f*} + n_2^{c*} = 0$$

More generally:

Role of occasionally binding enforcement constraint.

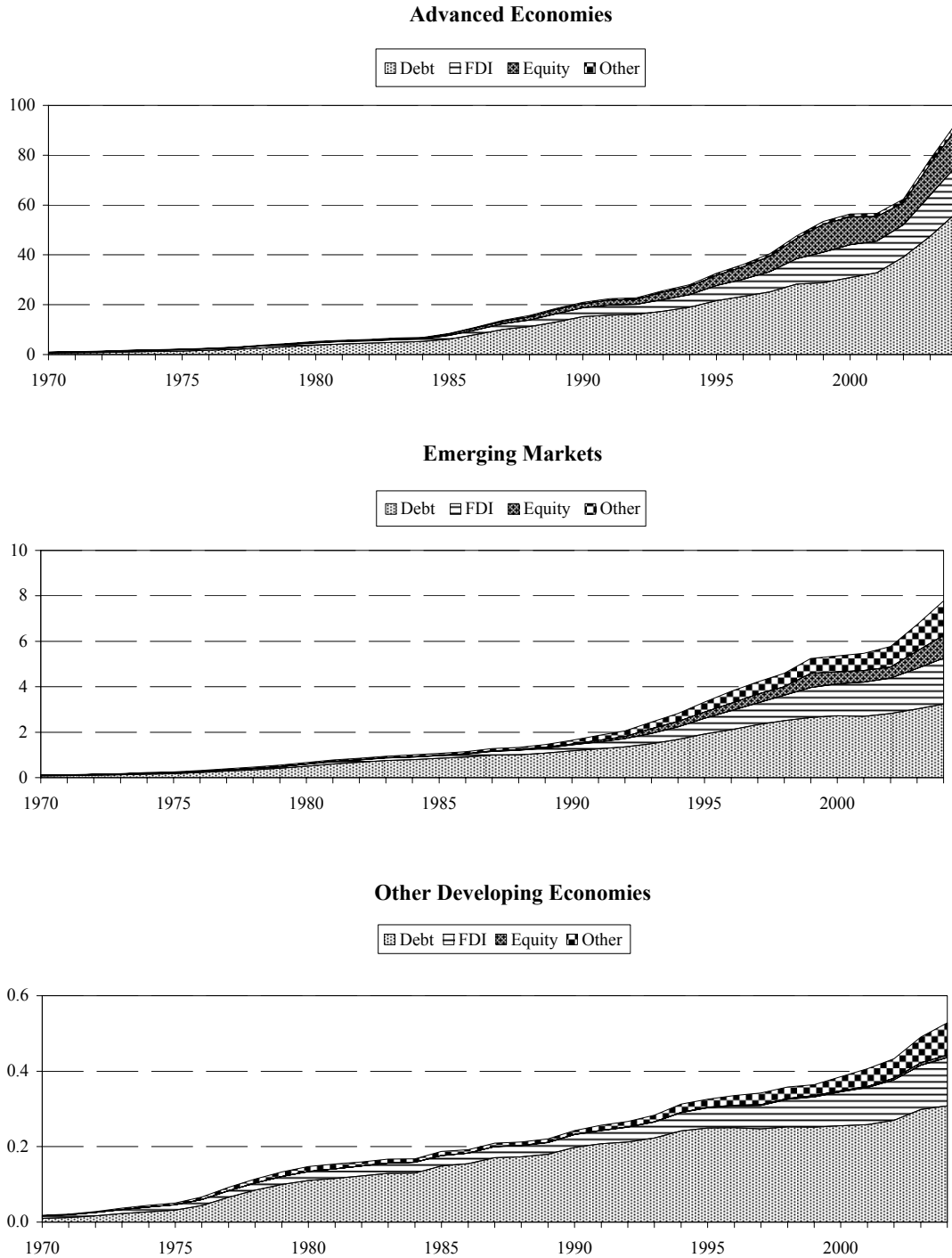
QP compares autarky with capital markets liberalization where liberalization means consumers are allowed to trade one riskless bond.

Why firms do not have direct access to international capital markets?

What about equity trading? FDI? (see Prasad et al., 2006).

Output volatility might be related to different type of capital flows

Figure 1. Gross International Financial Assets and Liabilities: 1970-2004
(trillions of U.S. dollars)



Notes: The financial integration data are based on a dataset constructed by Lane and Milesi-Ferretti (2006). The charts show how the components add up to the total integration measure in each period. Debt includes both official and unofficial debt. The category "Other" includes financial derivatives and total reserves minus gold. See the Data Appendix for a listing of countries in each group.

H. Cole (1993) analyzes the impact of different financial market structure on consumption, labor and trade balance.

-under market completeness following productivity shocks income effect might dominate substitution effect and labor variability might decrease.

-there is a source of reduction in volatility that might be independent from the existence of credit shocks.

-what would happen without credit shocks?

Quantitative analysis

Model is calibrated and estimated.

Estimation: autarky (pre-1980s) liberalization (post-1980s)

Estimation of shocks (productivity and credit shocks)

Why is credit shocks assumed to be more persistent?

Why is ϕ calibrated and not estimated (across the two periods for example)?

Empirical analysis

Use of the de jure index (Chinn and Ito, 2005) might overestimate effects of financial integration.

De jure index: (based on foreign exchange transaction; do not capture enforcement in capital controls)

Prasad et al. 2006 discusses de facto measures.

Summary

Is there a role of capital markets liberalization in reducing output volatility?

QP preliminary finding suggests yes.

Main issues:

a) Role of limited enforcement;

b) Financial liberalization proxied by capital market imperfection.