The expectations-driven U.S. current account

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Preliminary Remark

- I discussed this paper one year ago.
- My discussion is very similar to my previous one .
- More useful (?) for the audience than for the authors...
- Even if the authors have a good recollection of my previous discussion,
- repetition is the ABC of pedagogy

Preliminary Remark

"Repetition and recollection are the same movement, except in opposite directions, for what is recollected has been, is repeated backward whereas genuine repetition is recollected forward." (Kierkegaard)

Roadmap

1. Summary
2. Endowment economy
3. Production economy

Summary

The story in one graph

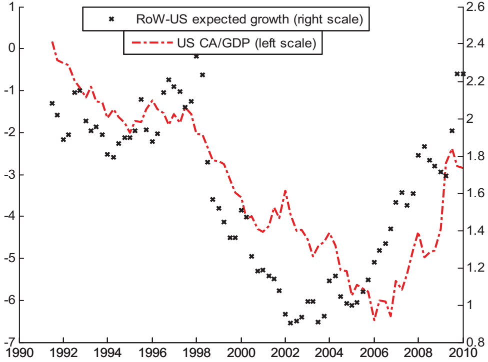


Figure 2: Consensus Forecast Growth Expectations and the Current Account

In a nutshell

Endowment economy

- Assume small open economy
- Perfect foresight
- Endowment ω_t
- Preferences $U = \sum \beta^t u(c_t)$
- Riskless one-period bonds traded with the r.o.w.
- Constant world interest factor R
- BC: $C_t + B_{t+1} = RB_t + \omega_t$
- Assume $\beta R = 1$ and $\omega_t = \omega$

In a nutshell

Equilibrium Allocations

- Allocations are given by ($\forall\ t$):

$$c_t = c_{t+1} \qquad \text{(Euler)}$$

$$\sum R^{-j} c_{t+j} = \sum R^{-j} \omega_{t+j} + RB_t \qquad \text{(I.B.C.)}$$

- With zero initial debt: $c_t = \omega\ \forall\ t$

In a nutshell

An increase in perceived future endowments

- Unexpectedly, it is announced in 0 that for $t \geq T$, $\omega_t = (1+\gamma)\omega$ with $\gamma > 0$.
- the I.B.C. now writes (assuming $B_t = 0$)

$$\sum_{t=0}^{\infty} R^{-t} c_t = \sum_{t=0}^{\infty} \omega_t$$

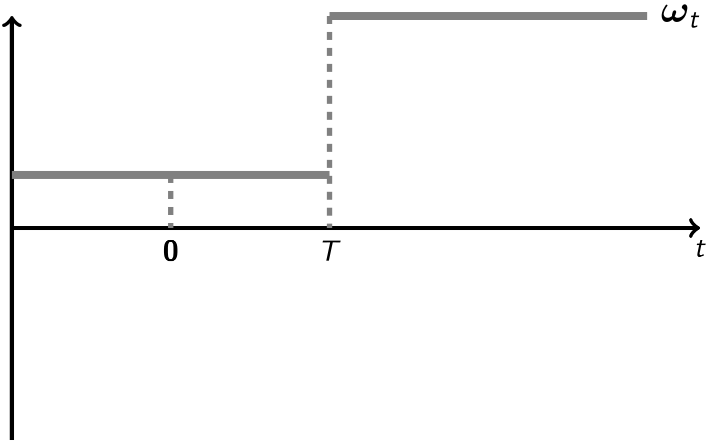
- Using the Euler equation, we obtain the new allocations

$$c_t = \omega + R^{-T} \gamma \omega$$

- From this path, we can derive the dynamics of the current account (B)

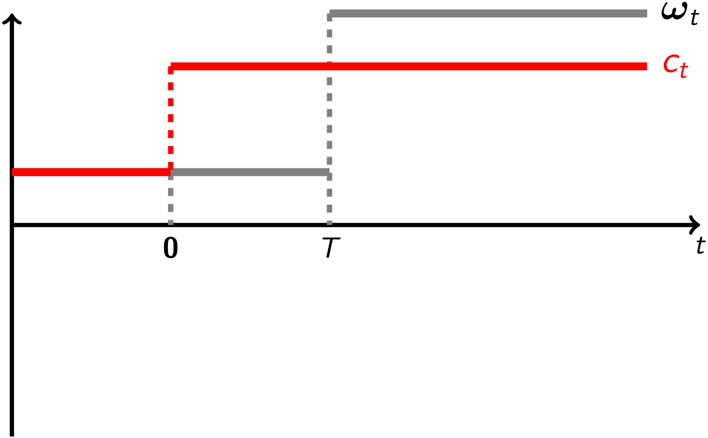
In a nutshell

An increase in perceived future endowments



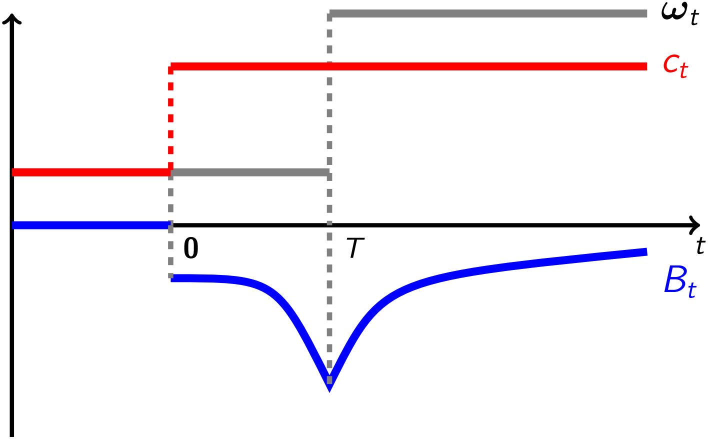
In a nutshell

An increase in perceived future endowments



In a nutshell

An increase in perceived future endowments



Basic Idea

Endowment economy

- Home country finances consumption increase by borrowing abroad.
- Home country will experience a current account deficit with a boom in consumption
- Makes sense when comparing the U.S.A. with an oil-rich country
- If one considers that cheap labor is an exhaustible resource in China, it also makes sense when comparing the U.S.A. with China
- Movements of C and B are amplified if $dR < \mathbf{0}$ at the same time

Moving to a production economy

- Things are not that easy when one considers a production economy with capital accumulation and variable labor suply.
- This comes from a peculiar property of “standard” neoclassical growth model first noticed by Barro & King [1984].
- Rosy expectations typically increase consumption and borrowings, but *decrease* I and L (and therefore Y), which is counterfactual.
- Paul Beaudry and myself have been working on this for a while.

A Framework to model changes in expectations

Basic Setup

- Representative agent model
- Competitive allocations
- One sector
- Preferences $U(C, 1 - L) + V(I, \Omega)$
- V is the expected (perceived) continuation value of investment, given an information set Ω
- Expectations can be rational or not, agents can learn or not, be optimistic or not, ...
- $V_1 > 0$, $V_{11} < 0$
- Let us assume that Ω is a scalar and that $V_{12} > 0$
- $d\Omega > 0$ is an increase in the perceived marginal value of capital
- Budget constraint: $C + I = wL$

A Framework to model changes in expectations

Basic Setup

- Technology is CRS, labor is the only input today

$$C + I = F(L)$$

A Framework to model changes in expectations

Competitive equilibrium

-
$$wU_1 = U_2 \quad (1)$$
$$U_1 = V_1 \quad \text{(Euler)} \quad (2)$$
$$C + I = F(L) \quad (3)$$
$$w = F'(L) \quad (4)$$

- Results can be generalized but I will take a parametric example with:
  - $U(C, 1 - L) = \log C - \frac{L^{1+\gamma}}{1+\gamma}$
  - $V(I, \Omega) = \Omega \log I$
  - $F(L) = AL$

A Framework to model changes in expectations

Competitive equilibrium – Parametric example

$$\frac{A}{C} = L^{\gamma} \quad \mathbf{(1)}$$

$$\frac{\mathbf{1}}{C} = \frac{\mathbf{\Omega}}{I} \quad \mathbf{(2)}$$

$$C + I = AL \quad \mathbf{(3)}$$

- The equilibrium boils down to 2 equations in C and L:
  - Labor market eq.:

$$\frac{A}{C} = L^{\gamma} \quad \mathbf{(1)}$$

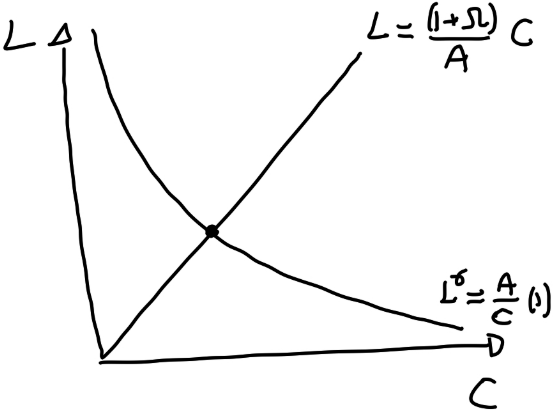
  - Good market eq.:

$$L = \frac{(\mathbf{1} + \mathbf{\Omega})}{A} C \quad \mathbf{(2)} \text{ and } \mathbf{(3)}$$

- We also have $I = A\mathbf{\Omega}(\mathbf{1} + \mathbf{\Omega})^{\frac{-\gamma}{1+\gamma}}$, with $\partial I / \partial \mathbf{\Omega} > \mathbf{0}$

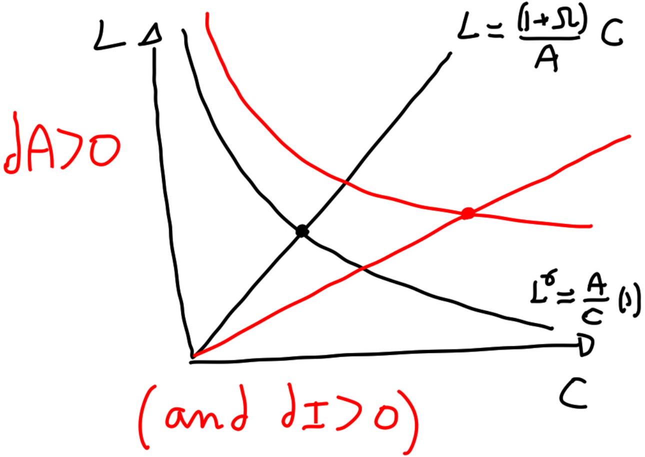
Basic Setup

Competitive equilibrium – Parametric example



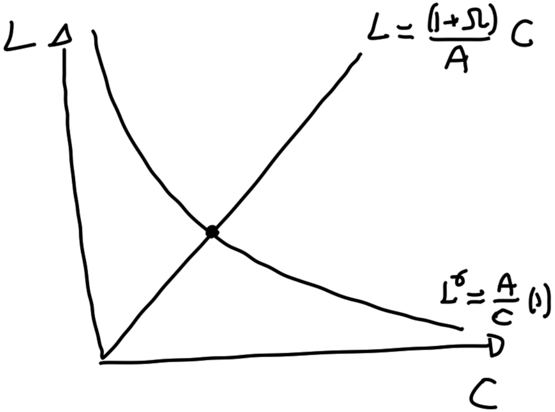
Basic Setup

A current technological shock $dA > \mathbf{0}$



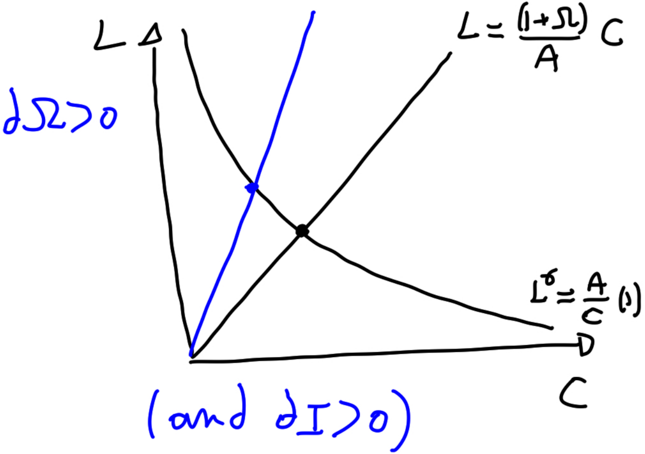
Basic Setup

Competitive equilibrium – Parametric example



Basic Setup

A Increase in the perceived value of investment $d\mathbf{\Omega} > \mathbf{0}$



Basic Setup
Barro-King result

- As we see it, in "standard" neoclassical models, a change in expectations cannot create an aggregate boom
- Typically, C on the one side and I, Y and L on the other side will move in opposite direction
- It is a pretty generic result
- As opposed to conventional wisdom, GHH preferences do not help at all (Y and L will be flat)

A Framework to model changes in expectations

GHH setup

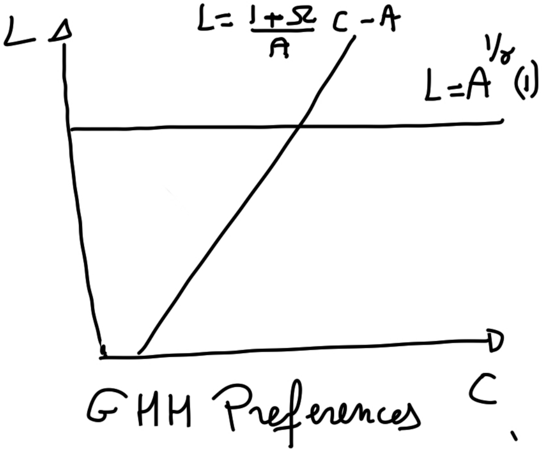
- $U = \mathbf{log}\left(C - \frac{L^{\mathbf{1}+\gamma}}{\mathbf{1}+\gamma}\right)$
- Then the equilibrium is given by:

$$A = L^{\gamma} \qquad \textbf{(1)}$$

$$L = \frac{(\mathbf{1}+\boldsymbol{\Omega})}{A} C - A \qquad \textbf{(2) and (3)}$$

GHH Setup

Competitive equilibrium



GHH Setup

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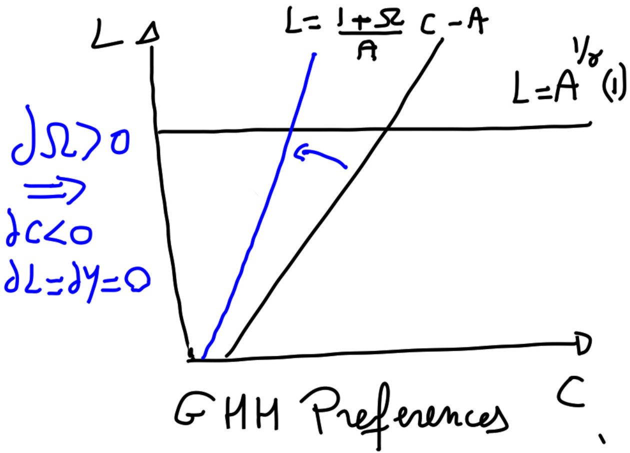


Small Open Economy

- Consider a small open economy (one could easily extend to a two-country world)
- Assume now $U(C, 1 - L) + V(K, \Omega) + W(B)$
- W defined on the real line, $W' < 0$, $W'' < 0$
- BC is $C + I + B = AL$

Small Open Economy

Parametric example

- $U(C, 1 - L) = \log C - \frac{L^{1+\gamma}}{1+\gamma}$
- $V(I, \Omega) = \Omega \log I$
- $W(B) = -\exp(-B)$
- $F(L) = AL$

Small Open Economy

Competitive equilibrium – Parametric example

$$\frac{A}{C} = L^{\gamma} \quad \textbf{(1)}$$

$$\frac{\mathbf{1}}{C} = \frac{\mathbf{\Omega}}{I} \quad \textbf{(2)}$$

$$\frac{\mathbf{1}}{C} = \mathbf{exp}(-B) \quad \textbf{(2')}$$

$$C + I + B = AL \quad \textbf{(3)}$$

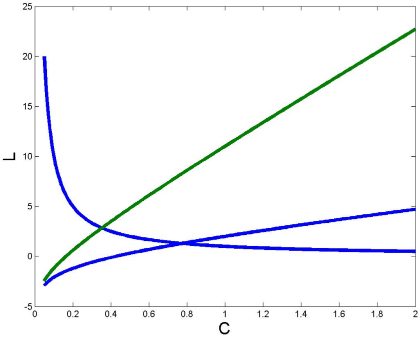
- The equilibrium boils down to 2 equations in C and L:

$$\frac{A}{C} = L^{\gamma} \quad \textbf{(1)}$$

$$L = \frac{\mathbf{(1+\Omega)}}{A} C + \frac{\mathbf{log}\, C}{A} \quad \textbf{(2), (2') and (3)}$$

Small Open Economy

A Increase in the perceived value of investment $d\mathbf{\Omega} > \mathbf{0}$



- $dI > \mathbf{0}$, $dL > \mathbf{0}$, $dB < \mathbf{0}$ (current account deficit) but $dC < \mathbf{0}$
- All signs can be reversed with different preferences, but no aggregate boom

A Solution: Adjustment costs to Investment

Investment is cheaper when C increases

- Basic assumption (lies in the very specific investment adjustment costs): $C + q(C) \times I = Y$ with $q' < 0$
- Story is (in a infinite horizon model):
  - Future high productivity $\rightsquigarrow$ I will be needed in the future
  - Investing today is also an investment in the investment installation technology $\rightsquigarrow$ I is cheap
- In the one sector close economy example, competitive equilibrium becomes:

$$\frac{A}{C + I q'(C)} = L^{\gamma} \tag{1}$$

$$\frac{\Omega}{I} = \frac{1}{C} \frac{q(C) + q'(C) I}{1 + q'(C) I} \tag{3}$$

$$C + q(C) I = AL \tag{3}$$

- This is the model chosen by the authors (taken from Jaimovitch-Rebelo)

A Solution: Adjustment costs to Investment

Investment is cheaper when C increases

$$\frac{A}{C + I q'(C)} = L^{\gamma} \tag{1}$$

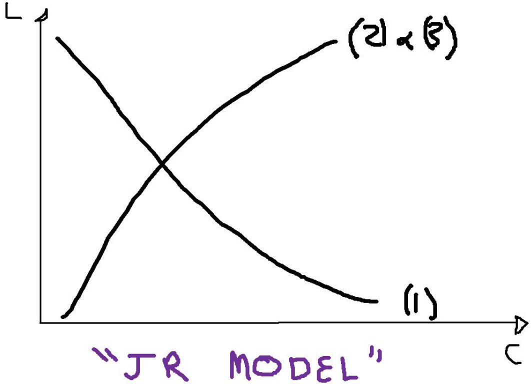
$$\frac{\mathbf{\Omega}}{I} = \frac{1}{C}\frac{q(C) + q'(C)I}{1 + q'(C)I} \tag{2}$$

$$C + q(C)I = AL \tag{3}$$

- Note that I now enters in equation (1)
- When on, boils down equation (2) and (3) to a single one, we can depict equations (1) and ((2),(3)) in the (C, L) plane and study the impact of a change in perceptions $\mathbf{\Omega}$.

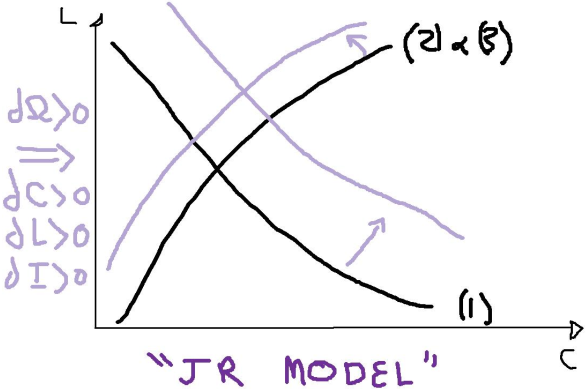
A Solution: Adjustment costs to Investment

Competitive equilibrium



A Solution: Adjustment costs to Investment

A Increase in the perceived value of investment $d\mathbf{\Omega} > \mathbf{0}$



Another Solution

Gains From Trade

- A counter intuitive and counterfactual implication of the adj. cost model: Investment is cheap in booms
- Other models with procyclical investment price can be constructed (with flex or sticky prices)
- I particularly like (☺) Beaudry & Portier (2011) "Gains from Trade" theory:
  - Agents are specialized in production in the short run: some produce investment, some produce consumption,
  - Expectation-driven boom periods are periods in which the gains from trade increase between those two types of agents.
- I would like to see the responses of Y, L, C and I in the simulations

To conclude

- Clear basic idea
- Very nice quantitative implementation - including the use of forecast surveys
- Convincing