Comparative Statics

- One of the main reasons for exploring the microfoundations of CA dynamics is that it provides a clear basis for comparative statics predictions. That is, given a change in a country's external environment or govt. policy, how will its CA change?

- The text pursues a graphical approach, with an emphasis on showing how various shocks influence the country's budget constraint. From that analysis, it's clear that virtually anything can happen after a shock, depending on the relative strength of income + substitution effects and the relative income effects on current + future consumption.

- To get clear predictions, economists often consider explicit functional forms, which place restrictions on income + substitution effects.

- We will do the same here. Let's first solve for the CA as a function of the exogenous variables, and then use this solution to make comparative statics predictions.

- Suppose preferences take the following form:

$$U(C_1, C_2) = \ln C_1 + \beta \ln C_2 \qquad \beta < 1$$

For simplicity, assume $B_0^* = 0$ (no initial net foreign assets).

Optimality Condition

$$\frac{U_1}{U_2} = 1+r \Rightarrow \frac{C_2}{\beta C_1} = 1+r$$

$$\Rightarrow C_2 = \beta(1+r)C_1$$

Note that the nature of the optimal consumption plan depends on the relationship between the interest rate, r, and the country's rate of "time preference", ρ, where $\beta \equiv \frac{1}{1+\rho}$:

1.) If $\rho > r$ $\Rightarrow$ country is relatively impatient
$\Rightarrow \beta(1+r) < 1$
$\Rightarrow c_2 < c_1$
$\Rightarrow$ falling consumption path

2.) If $\rho < r$ $\Rightarrow$ country is relatively patient
$\Rightarrow \beta(1+r) > 1$
$\Rightarrow c_2 > c_1$
$\Rightarrow$ rising consumption path

3.) $\rho = r$ $\Rightarrow$ country has same patience as other countries
$\Rightarrow \beta(1+r) \equiv 1$
$\Rightarrow c_2 \equiv c_1$
$\Rightarrow$ consumption-smoothing

- The first 2 cases predict that a country's wealth will be either falling or rising indefinitely. It's hard to imagine real world examples of this. So let's take as our benchmark

$$\beta(1+r) = 1 \Rightarrow C_2 = C_1$$

- Substituting this into the budget constraint,

$$\left(1 + \frac{1}{1+r}\right) C_1 = Q_1 + \frac{Q_2}{1+r}$$

$$\Rightarrow C_1 = \frac{1+r}{2+r}\left(Q_1 + \frac{Q_2}{1+r}\right)$$

Since $B_0^* = 0$,

$$CA_1 = TB_1 = Q_1 - C_1$$

$$\Rightarrow \boxed{CA_1 = \frac{1}{2+r}(Q_1 - Q_2)}$$

Temporary Output Shocks

Suppose output falls temporarily.

$\Delta Q_1 < 0$ $\quad \Delta Q_2 = 0$

$\Rightarrow \Delta CA_1 < 0 \quad (= \frac{1}{2+r} \Delta Q_1)$

$\Rightarrow$ Current Acct. Deficit

Interpretation: Country borrows to cushion the blow of the temporary output loss.

Permanent Output Shocks

Now suppose output falls permanently.

$\Delta Q_1 = \Delta Q_2 < 0$

$\Rightarrow \Delta CA_1 = 0$

$\Rightarrow$ Currt. Doesn't Change

Interpretation: No reason to borrow now, since income will be lower in the future too. Consumption just declines by the full drop in income.

Anticipated Change in Future Income

Suppose income is expected to rise in the future $\Delta Q_1 = 0 \quad \Delta Q_2 > 0$

$\Rightarrow \Delta CA_1 < 0 \quad \left(= -\frac{1}{2+r} \Delta Q_2\right)$

$\Rightarrow$ Current Acct. Deficit

Interpretation: Country borrows on the basis of its higher future income.

Punchline

> Current Accts. respond to temporary shocks, but not to permanent shocks.

This result is more general than this simple model might suggest. It extends to settings with many (infinite) periods, uncertainty, and more general preference specifications.

Terms of Trade Shocks

- In the real world, there's more than one good! Typically, the goods that a country buys on world markets are different from the goods it sells.

- Changes in the price of a country's exports relative to the price of its imports are among the most important real world shocks.

- Define $TT = \frac{P_x}{P_m}$ = Terms of Trade

$TT \uparrow \Rightarrow$ Terms of Trade Improvement

$\Rightarrow$ Get more imports for each unit of exports you give up.

Suppose international Bonds are denominated in importable goods. The budget constraints become:

$$C_1 + B^*_1 - B^*_0 = r_0 B^*_0 + TT_1 \cdot Q_1$$

$$C_2 + B^*_2 - B^*_1 = r_1 B^*_1 + TT_2 \cdot Q_2$$

Combining and imposing the TVC ($B^*_2 = 0$),

$$C_1 + \frac{C_2}{1+r_1} = (1+r_0)B^*_0 + TT_1 \cdot Q_1 + \frac{TT_2 \cdot Q_2}{1+r}$$

Note that Terms of Trade shocks operate just like income shocks. In particular, we have:

The Current Acct. responds to temporary or expected future Terms of Trade shocks, but not to permanent Terms of Trade shocks.

Uncertainty and the Trade Balance

Consider an economy that initially has known and constant income $Q_1 = Q_2 = Q$, with preferences,

$$U(c_1, c_2) = \ln c_1 + \ln c_2$$

Suppose $B_0^* = 0$ and $r = 0$.

Now the optimality condition implies $c_2 = c_1$. Substituting into the budget constraint

$$2c_1 = Q_1 + Q_2 = 2Q$$

$$\Rightarrow c_1 = Q$$

$$\Rightarrow TB_1 = CA_1 = 0$$

Now suppose everything is the same except Q_2 becomes risky

$$Q_2 = \begin{cases} Q + a & \text{with prob. } \frac{1}{2} \\ Q - a & \text{with prob } \frac{1}{2} \end{cases}$$

Now households must maximize expected utility

$$\ln C_1 + E \ln C_2$$

where

$$C_2 = \begin{cases} 2Q + a - C_1 & \text{in good state} \\ 2Q - a - C_1 & \text{in bad state} \end{cases}$$

Subbing in,

$$\max_{C_1} \ln C_1 + \tfrac{1}{2}\ln(2Q + a - C_1) + \tfrac{1}{2}\ln(2Q - a - C_1)$$

First-Order Condition

$$\frac{1}{c_1} = \frac{1}{2}\left[\frac{1}{2Q+a-\epsilon_1} + \frac{1}{2Q-a-\epsilon_1}\right]$$

$$\Rightarrow c_1 < Q$$

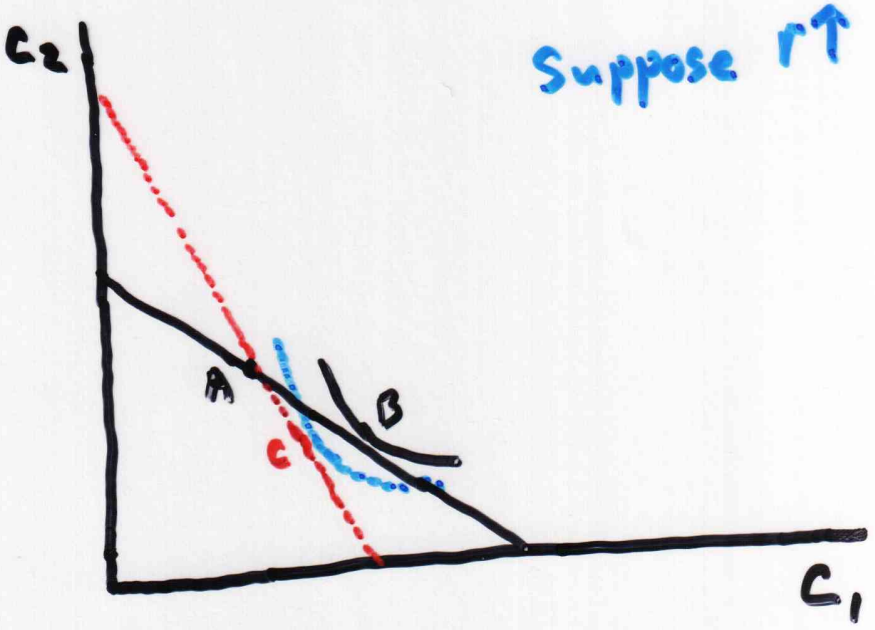
$$\Rightarrow TB_1 > 0$$

Interpretation: Greater uncertainty leads to precautionary saving

Conjecture: Explains reserve accumulation in Asia following the 1997-98 Asian Crisis?

World Interest Rate Shocks

- We have one loose end from last time - How does the CA respond to world interest rate shocks in an endowment economy?
- We can visualize this as follows:



A = endowment point

B = initial equil. (CA deficit)

C = new equil. (smaller CA deficit)

- We can decompose the shift from B to C into 2 parts:

1.) Substitution Effect: A (hypothetical) movement along the original Indifference Curve to a point of tangency with the new budget constraint. Note, this necessarily leads to $C_1 \downarrow$.

$r \uparrow \Rightarrow$ relative price of $C_1 \uparrow$

$\Rightarrow$ people substitute toward future consumption

Intuitively, when $r \uparrow$ the rate of return to saving rises, so people save more.

2.) Income Effect: Since the country was assumed to be borrowing initially ($CA < 0$), an interest rate increase represents a negative income effect $\Rightarrow C_1 \downarrow$ and $C_2 \downarrow$. In this case, the income effect reinforces the substitution effect, and so $C_1 \downarrow$ unambiguously. Since Q_1 is fixed, we know the CA deficit shrinks.

- What if the country had initially had a CA surplus?
- What if $r \downarrow$ instead?