

Assumptions:

- A. no capital controls: anyone in the country can borrow or lend freely at the world interest rate  $r^*$
- B. small open economy: takes the world interest rate  $r^*$  as given ( $r^*$  is exogenous)
- C. all prices flexible: thus, long run analysis
- D. no unilateral transfers ( $NUT = 0$ )
- E. no capital gains on external wealth, the only income on external wealth is interest income
- F. the only transfers of factor income (NFIA) are interest income. NFIA equals interest income the U.S. earns on its holdings of foreign assets minus interest income foreigners earn on their holdings of U.S. assets.
- G. zero non-market capital transfers

1. What is the relationship between GNI and GNDI?

Normally,  $GNDI = GNI + NUT$ . Assumption D says  $NUT = 0$ , so  $GNI$  and  $GNDI$  are equal.

2. What is the difference between GNE and GDP?

$$\text{GDP} - \text{GNE} = \text{TB} = \text{EX} - \text{IM}$$

This is true in general, and none of the assumptions above change it.

3. Let  $A$  = total U.S. holdings of foreign assets, also called external assets, and let  $L$  = total foreign holdings of U.S. assets, also called external liabilities. Let  $W = A - L$ .  $W$  is called external wealth. Write down an expression for NFIA that involves any or all of these variables:  $\{W, A, L, r^*\}$

NFIA = income earned by U.S. factors abroad – income paid to foreign factors working in the U.S. (“factors” is short for “factors of production,” such as labor or capital)

Assumption F says that NFIA only includes interest income. Thus,

“income earned by U.S. factors abroad” =  $r^*A$  = interest earned on U.S.-owned foreign assets

“income paid to foreign factors in the U.S.” =  $r^*L$  = interest paid on foreign-owned U.S. assets

Hence,  $NFIA = r^*A - r^*L = r^*(A - L) = r^*W$

4. Write down an expression for the current account (CA) that reflects the assumptions made above and incorporates your answer to 3, if appropriate.

Normally,  $CA = \text{TB} + \text{NFIA} + \text{NUT}$

Assumption D says  $NUT = 0$ , and in question 3 we learned that  $NFIA = r^*W$ .

Thus, we can write the current account as:

$$\text{CA} = \text{TB} + r^*W$$

5. The BOP identity from Chapter 5/16 is:  $CA + FA + KA = 0$ . Solve it for FA and simplify using the assumptions and, if appropriate, any results you obtained from 3 or 4.

$$FA = -CA - KA$$

Using assumption G ( $KA = 0$ ) and the answer to 4, we get:

$$FA = -(TB + r^*W)$$

6.  $FA = EX_a - IM_a$ . Write down the name and intuitive meaning of each of these variables. (I'll get you started:  $EX_a$  is the U.S.' exports of assets, or foreign purchases of U.S. assets, which essentially means foreign lending to the U.S.) Then, tell me what is the relationship, if any, between  $EX_a$  and L and W? What is the relationship, if any, between  $IM_a$  and A and W? What is the relationship, if any, between FA and W?

Name and intuitive meaning of variables:

$EX_a$  = exports of assets = inflows of financial capital (or "capital inflows") = foreign purchases of U.S. assets = foreign lending to the U.S.

$IM_a$  = imports of assets = outflows of financial capital (or "capital outflows") = U.S. purchases of foreign assets = U.S. lending to ROW

FA = net exports of assets = net capital inflows = foreign lending to U.S. minus U.S. lending to ROW = U.S. net borrowing from ROW

Relationship between  $EX_a$  and L and W:

$$EX_a = \Delta L = -\Delta W$$

Borrowing from abroad causes our liabilities to ROW to rise and our external wealth to fall.

Relationship between  $IM_a$  and A and W:

$$IM_a = \Delta A = \Delta W$$

Lending to ROW causes our external assets and external wealth to rise.

Relationship between FA and W:

$$FA = EX_a - IM_a = \Delta L - \Delta A = -\Delta W$$

If  $EX_a$  (our borrowing from ROW) exceeds  $IM_a$  (our lending to ROW), then

we are a net borrower ( $FA > 0$ ) and

our liabilities to ROW rise faster than our assets ( $\Delta L > \Delta A$ ), so our external wealth falls.