EC201: Macroeconomics

– 2023-2024 –

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Today: Outline

General Information

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Module hashtag is #EC201

Generally academic

Balance of Payments Accounting

Describe how each of the following transactions affects the U.S. Balance of Payments.

(Recall that each transaction gives rise to two entries in the Balance-of-Payments Accounts.)

Import of Merchandise

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Table U.S. International Transactions Account

Balance of Payments Item	$
Current Account	-120,000
Trade Balance	-120,000
Income Balance	0
Net Unilateral Transfers	0
Financial Account	120,000

Transactions Inside the Country

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Current Account	0
Financial Account	0

The Export of Merchandise

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- The export of merchandise to France improves the U.S. trade balance. The payment by check deteriorates the financial account correspondingly, because it amounts to a decrease in foreign-owned assets in the U.S. (i.e. a reduction in the French consumer's deposit at the New York bank). Assuming that the value of the transaction is X dollars, the U.S. international transactions account looks as follows.

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Table U.S. International Transactions Account

Item	$
Current Account	X
Trade Balance	X
Income Balance	o
Net Unilateral Transfers	o
Financial Account	-X

Domestic and International Transactions

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- Two different transactions take place. First, the sale of the subsidiary in the U.S. is an internal transaction that leaves the U.S. external wealth unchanged: therefore, both the current and the financial account remain unaffected. Second, the purchase of a French company gives rise to two entries in the financial account: an increase in U.S.-owned assets in France (which deteriorates the U.S. financial account) and an increase in French-owned dollars (which improves the U.S. financial account). These two effects cancel out: both the current and the financial account are zero. Assuming that the value of the transaction is X dollars, the U.S. international transactions account looks as follows.

Item	$
Current Account	0
Financial Account	0
Increase in foreign-owned assets in the U.S.	X
Increase in U.S.-owned assets abroad	-X

Spending Outside the Country

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- Renting a vacation home abroad amounts to importing a service, so it deteriorates the U.S. trade balance and the current account. The payment by credit card represents the sale of an asset, so it improves the U.S. financial account accordingly.

Table U.S. International Transactions Account

Item	$
Current Account	-2,500
Trade Balance	-2,500
Income Balance	0
Net Unilateral Transfers	0
Financial Account	2,500

Foreign Aid

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- Foreign aid gives rise to two offsetting entries in the current account: an export of goods (which improves the U.S. merchandise trade balance) and a unilateral transfer to waive the corresponding payment (which deteriorates the U.S. net unilateral transfers account). As the value of the merchandise is 400 million dollars, the U.S. international transactions account looks as follows.

Table U.S. International Transactions Account

Item	$
Current Account	0
Trade Balance	400,000,000
Income Balance	0
Net Unilateral Transfers	-400,000,000
Financial Account	0

Class Questions - B -

NIIP and Balance of Payments

1) Outland starts 2015 with holdings of 100 shares of the German car company Volkswagen. These securities are denominated in euros. The rest of the world holds 200 units of dollar-denominated bonds issued by the Outlandian government. At the beginning of 2015, the price of each Volkswagen share is 1 euro and the price of each unit of Outlandian bond is 2 dollars. The exchange rate is 1.5 dollars per euro. Compute the net international investment position (NIIP) of Outland at the beginning of 2015.

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- Outland has 100 VW Shares in € and each is €1
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$$\begin{aligned} NIIP_{2015} &= Assets - Liablities \\ &= 100 \times 1\,\text{EUR} \times 1.5\,\text{USD/EUR} - 200 \times 2\,\text{USD} \\ &= -\$250 \end{aligned}$$

Current Account and NIIP

2) **During 2015**, Outland exports toys for 7 dollars and imports shirts for 9 euros. The rate of return on the Volkswagen shares was 5 percent and the rate of return on Outlandian bonds was 1 percent. Residents of Outland received money from relatives living abroad for a total of 3 euros and the government of Outland gave 4 dollars to a hospital in Guyana. Calculate the Outlandian trade balance, net investment income, and net unilateral transfers in 2015. What was the current account in that year? What is the Outlandian NIIP at the end of 2015 expressed in dollars.

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??? 2015^{during} = Trade Balance // Net Investment Income // Net Unilateral Transfer // CA

??? 2015^{end} = NIIP in \$

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$$\begin{aligned} TB_{2015} &= 7\,\text{USD} - 9\,\text{EUR} \times 1.5\,\text{USD/EUR} \\ &= -6.5\,\text{USD} \end{aligned}$$

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$$\begin{aligned} IB_{2015} &= 0.05 \times 150\,\text{USD} - 0.01 \times 400\,\text{USD} \\ &= 3.5\,\text{USD}. \end{aligned}$$

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The Net International Investment Position at the end of the year is

$$\begin{aligned} NIIP_{2015}^{end} = & -250\ \text{USD} - 2.5\ \text{USD} \\ = & -252.5\ \text{USD} \end{aligned}$$

Financial Assets

3) Suppose that at the end of 2015, Outland holds 110 Volkswagen shares. How many units of Outlandian government bonds are held in the rest of the world? Assume that during 2015, all financial transactions were performed at the beginning-of-year prices and exchange rate.

Financial Assets

Remember = Zero Sum Game

We make use of the following accounting identity:

$$NIIP_t = A_t - L_t$$

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- Holdings of Outlandian Government Bonds.

We plug in the information we have got about Outland's end-of-year shareholding in Volkswagen, the price of those shares, the price of Outlandian government bonds and the nominal exchange rate. Then we solve for the quantity of bonds held by the rest of the world:

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$$\overbrace{-252.5\ \text{USD}}^{NIIP\ from\ Q2} = 110 \times 1\ \text{EUR} \times 1.5\ \text{USD/EUR} - X \times 2\ \text{USD}$$
$$X = 208.75$$

Valuation Changes

4) Suppose that at the end of 2015, the price of a Volkswagen share falls by 20 percent and the dollar appreciates by 10 percent. Calculate the end-of-year NIIP of Outland in dollars. (To answer this question, start with the international asset and liability positions calculated in the previous item.)

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Adverse asset price and exchange rate movements affect Outland's external assets:

$$110 \times (1 - 0.2)\,\text{EUR} \times \left(\frac{1}{1.1}\right) 1.5\,\text{USD/EUR} = 120\,\text{USD}$$

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Since these macroeconomic developments leave Outland's external liabilities unaffected, the net international investment position at the end of the year is as follows:

$$NIIP_{2015}^{end} = 120\,\text{USD} - 208.75 \times 2\,\text{USD} = -297.5\,\text{USD}$$

Net International Investment

1) Indicate whether the statement is true, false, or uncertain and explain why.

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a) The net international investment position of South Africa was -70.5 billion USD in 2010 and -19.7 billion USD in 2011. The current account in 2011 was -10.1 billion USD. There must be an error in the official numbers. The correct figure should be a net international investment position of -80.6 billion USD in 2011.

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1) Indicate whether the statement is true, false, or uncertain and explain why.

a) The net international investment position of South Africa was -70.5 billion USD in 2010 and -19.7 billion USD in 2011. The current account in 2011 was -10.1 billion USD. There must be an error in the official numbers. The correct figure should be a net international investment position of -80.6 billion USD in 2011.

- The statement is false: the numbers that we see are not necessarily the consequence of an error. Changes in the net international investment position (NIIP) of a country are not caused by current account (CA) balances alone: they also depend on valuation changes (VC), according to the accounting identity

$$\Delta NIIP = CA + VC. \tag{1}$$

Net International Investment

We are given the following information about South Africa:
$NIIP_{2010} = -70.5$ bn USD,
$NIIP_{2011} = -19.7$ bn USD,
$CA_{2011} = -10.1$ bn USD.
If the official numbers are correct, then
$\Delta NIIP_{2011} = +50.8$ bn USD.
By equation (1), this requires substantial valuation gains:
$VC_{2011} = +60.9$ bn USD.
This is a large number for an economy with a negative net international investment position.
Does South Africa own large underestimated foreign assets, or is it earning very positive return differentials on its external assets and liabilities?

Zero Sum Game

b) The fact that the United States made large valuation gains on average over the past 30 years means that the rest of the world as a whole made equally large valuation losses. After all, this is a zero sum game.

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- The statement is true. Since the world is a closed system, changes in the net international investment position of the U.S. must be the opposite of those of the rest of the world:

$$\Delta NIIP_{US} + \Delta NIIP_{ROW} = 0.$$

For the same reason, current account balances in the world must sum up to zero:

$$CA_{US} + CA_{ROW} = 0.$$

Zero Sum Game

Combined with condition (1), these two observations imply that any valuation gain enjoyed by an economy must be mirrored by an equivalent valuation loss suffered by the rest of the world:

$$VC_{US} + VC_{ROW} = 0.$$

For this reason, recent studies of valuation effects have uncovered an entire “geography of wealth transfers” across the world operating through international asset markets.

Unrecorded Foreign Assets

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- The statement is uncertain. Although it is possible that the U.S. owns some intangible assets abroad that are difficult to measure, their size remains unknown. As explained in the text, it is unlikely that these unrecorded assets are large enough to explain the discrepancy between the positive net investment income enjoyed by the U.S. and its negative NIIP. Modest return differentials between *recorded* external assets and liabilities, instead, represent a plausible alternative explanation that is sufficient to fully solve the paradox.

Current Account

In the absence of valuation changes the current account measures the change in the net international investment position of a country, that is,

$$CA_1 = B_t^* - B_{t-1}^*$$

where CA_t denotes the country's current account in period t and B_t^* the country's net international investment position at the end of period t.

- If the current account is in deficit, $CA_t < 0$, then the net international investment position falls,

$$B_t^* - B_{t-1}^* < 0$$

.

- Similarly, if the current account displays a surplus, $CA_t > 0$, then the net international investment position improves.

$$B_t^* - B_{t-1}^* > 0$$

Savings, Investment, and the Current Account

In any period, say period 1, savings, investment, and the current account are linked by the identity

$$CA_1 = S_1 - I_1$$

- This expression is intuitive. Savings in excess of what is needed to finance domestic investment must be allocated to purchases of foreign assets. But the change in the net foreign asset position is precisely the current account.
- To derive the above identity more formally, recall that a country's aggregate supply of goods and services in any given period is the sum of gross domestic product, denoted Q1, and imports, denoted IM_1.
- The aggregate demand for goods and services is the sum of private consumption, C_1, government consumption, G_1, investment, I_1, and exports, X_1:

$$Q_1 + IM_1 = C_1 + G_1 + I_1 + X_1$$

Savings, Investment, and the Current Account

$$Q_1 + IM_1 = C_1 + G_1 + I_1 + X_1$$

Now add net investment income, rB_0^*, to both sides of the previous expression and recall that the trade balance is the difference between imports and exports, or $TB_1 = X_1 - IM_1$, to get

$$Q_1 + rB_0^* = C_1 + G_1 + I_1 + TB_1 + rB_0^*$$

The sum of GDP and net investment income is known as **National Income**, denoted Y_1.
Also, recall that the sum of net investment income and the trade balance is the current account,

$$CA_1 = rB_0^* + TB_1$$

Domestic Absorption, National Income, and the CA

Thus, we can write

$$y_1 = C_1 + G_1 + I_1 + CA_1 \tag{2}$$

Finally, the difference between national income and private and public consumption is national savings, or

$$S_1 = Y_1 - C_1 - G_1$$

Combining this expression with the one above, we get the expression we were looking for

$$CA_1 = S_1 - I_1$$

Domestic Absorption, National Income, and the CA

Domestic absorption is defined as the sum of private consumption, government consumption, and investment. Letting A1 denote domestic absorption, we have

$$A_1 = C_1 + G_1 + I_1$$

combining this expression with (2), we can express the current ac- count as

$$CA_1 = Y_1 - A_1$$

, which states that the current account is the gap between national income and the domestic absorption of goods and services.

Changes in the NIIP and the CA

In the absent of valuation changes, current account surpluses increase a country's net foreign asset position and current account deficits decrease it.
The change in the country's net foreign asset position is

$$B_1^* - B_0^*$$

Thus we have that

$$CA_1 = B_1^* - B_0^*$$

Changes in the NIIP and the CA

- A country that is a net external debtor cannot run a perpetual trade balance deficit.
- A country that is a net external debtor cannot run a perpetual deficit in the current account. This result applies to economies that last for any finite number of periods.
- We derived four alternative expressions for the current account:

$$CA_t = B_t^* - B_{t-1}^*$$

$$CA_t = rB_{t-1}^* + TB_t$$

$$CA_t = S_t - I_t$$

$$CA_t = Y_t - A_t$$

- You should always keep in mind that all four of the above expressions represent accounting identities that must be satisfied at all times in any economy.