# Lecture 13 - Recommended Problems Solutions

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## ☆☆☆ Chapter 17, Problems 2

**Consider two fictional economies, one called the domestic country and the other the foreign country. Given the transactions listed in (a) through (g), construct the balance of payments for each country. If necessary, include a statistical discrepancy.**

a. **The domestic country purchased \$100 in oil from the foreign country.**

From the perspective of the domestic economy, this purchase is accounted as imports in the trade balance. From the perspective of the foreign economy, this purchase is accounted as exports in the trade balance.
<u>Comment</u>. Note that if the price of oil increases, for example because the dollar depreciates, then then net exports decrease, because that value of imports increases in dollar terms. This is why it's so important that imports be divided by $\epsilon$ in $NX = X - IM/\epsilon$.

b. **Foreign tourists spent \$25 on domestic ski slopes.**

From the perspective of the domestic economy, this accounts as exports, since is income paid by foreigners on the US consumption of services. From the perspective of the foreign economy, this accounts as imports.
<u>Comment</u>. Note that all touristic activities in general, done in the US by foreigners, counts as US service exports. Thus, something does not have to cross a border in order to count as an export.
If you want to help Greece balance its current account deficit and repay its external debt to foreigners by accumulating trade surpluses, one option might thus be take a vacation in Greece.

c. **Foreign investors were paid \$15 in dividends from their holdings of domestic equities.**

From the perspective of the domestic economy, this transaction is captured in the income balance as Investment income paid. From the perspective of the foreign economy, this transaction is captured in the income balance as Investment income received.
<u>Comment</u>. Again, these \$15 in dividends were produced in the US, so are included in GDP. They however contribute negatively to Net Income (NI), and are not included in GNP since they are not produced for US residents.

d. **Domestic residents gave \$25 to foreign charities.**

From the perspective of the domestic economy, this transaction is included as net transfers received, but with negative sign since reflects that the domestic economy is a net donor. From the perspective of the foreign economy, this transaction is included as net transfers received.

<u>Comment</u>. On average, the US is a net donor, so NT is typically negative for the US. Again, net transfers correspond to "gifts" which no counterparts in terms of acquired assets (it allows foreign charities to "import for free" from the US, without them incurring a debt vis à vis the US).

e. **Domestic businesses borrowed \$65 from foreign banks.**

From the perspective of the domestic economy, this accounts as an increase of foreign holdings of domestic assets. From the perspective of the foreign economy, this accounts as an increase of domestic holdings of foreign assets.

f. **Foreign investors purchased \$15 of domestic government bonds.**

From the perspective of the domestic economy, this accounts as an increase of foreign holdings of domestic assets. From the perspective of the foreign economy, this accounts as an increase of domestic holdings of foreign assets.

<u>Comment</u>. In both previous cases, foreign investors are lending to the domestic economy.

g. **Domestic investors sold \$50 of their holdings of foreign government bonds.**

From the perspective of the domestic economy, this accounts as reduction of domestic holdings of foreign assets. Or equivalently, as an increase of foreign holdings of domestic assets. From the perspective of the foreign economy, this accounts as reduction of foreign holdings of domestic assets. Or equivalently, as an increase of domestic holdings of foreign assets.

In the end, we obtain the following table:

|  | Domestic | Foreign |
|---|---|---|
| **Current account** |  |  |
| Exports | 25 | 100 |
| Imports | 100 | 25 |
| **Trade balance** | **-75** | **75** |
| Investment Income received |  | 15 |
| Investment Income paid | 15 |  |
| **Net income** | **-15** | **15** |
| **Net transfers received** | **-25** | **25** |
| **Current account balance** | **-115** | **115** |
| **Capital Account** |  |  |
| Increase in foreign holdings of Domestic assets | 65+15=80 | -50 |
| Increase in Domestic holdings of foreign assets | -50 | 65+15=80 |
| **Capital account balance** | **130** | **-130** |
| **Statistical discrepancy** | **-15=115-130** | **15=130-115** |

# ☆☆☆ Chapter 17, Problem 4

Consider a world with three equal-sized economies (A, B, and C) and three goods (clothes, cars, and computers). Assume that consumers in all three economies want to spend an equal amount on all three goods. The value of production of each good in the three economies is given in the table below.

|           | A  | B  | C  |
|-----------|----|----|----|
| Clothes   | 10 | 0  | 5  |
| Cars      | 5  | 10 | 0  |
| Computers | 0  | 5  | 10 |

   a. **What is GDP in each economy? If the total value of GDP is consumed and no country borrows from abroad, how much will consumers in each economy spend on each of the goods?**

   Recall that GDP is defined as *the market value of the goods and services produced by labor and property located in the US*. We have in the table the value of production of each good within each economy, therefore total GDP in countries A, B and C is 15. Also, if consumers want to spend an equal amount on all three goods, total expenditure in each economy (also GDP) is divided between the three goods: consumers will spend 5 on each good.

   b. **If no country borrows from abroad, what will be the trade balance in each country? What will be the pattern of trade in this world (i.e., which good will each country export and to whom)?**

   Trade balance is zero in each country. Note that each country exports 5 of either good (clothes, cars or computers) and imports 5 of either good. Specifically, Country A exports clothes to Country B, Country B exports cars to Country C, and Country C exports computers to Country A.

   c. **Given your answer to part (b) will country A have a zero trade balance with country B? with country C? Will any country have a zero trade balance with any other country?**

   No, country A exports to B but B does not export to A. Similarly, C exports to A, but A does not export to C. In general, no country will have a zero trade balance with any other country.

   d. **The United States has a large trade deficit. It has a trade deficit with each of its major trading partners, but the deficit is much larger with some countries (e.g., China) than with others. Suppose the United States eliminates its overall trade deficit (with the world as a whole). Do you expect it to have a zero trade balance with every one of its trading partners? Does the especially large trade deficit with China necessarily indicate that China does not allow U.S. goods to compete on an equal basis with Chinese goods?**

   If the US eliminates its trade deficit with the world as a whole, there is no reason to expect that the United States will have balanced trade with any particular country. For

example, it can have a large trade surplus with Hong Kong, but a similarly large deficit with China, which means that trade deficit is zero, but not the bilateral trade deficit. And finally, a particularly large trade deficit with one country, in this case China, may reflect the pattern of specialization rather than the use of mercantilist policies by China. In general, trade deficits should therefore not be looked at on a bilateral basis, but rather on a multilateral basis.

# ☆☆ Chapter 17, Problem 7

**Retrieve the most recent World Economic Outlook (WEO) from the Web site of the International Monetary Fund (`http://www.imf.org`). In the Statistical Appendix, find the table titled "Balances on Current Account," which lists current account balances around the world. Use the data for the most recent year available to answer parts (a) through (c).**

a. **Note the sum of current account balances around the world. As noted in the chapter, the sum of current account balances should equal zero. What does this sum actually equal? Why does this sum indicate some mismeasurement (i.e., if the sum were correct, what would it imply)?**

   The sum of world current account balances should be zero. In 2017, the sum was positive (371 US Billion dollars), which implies literally that the world as a whole was lending (See table below). Obviously, this cannot have been true and reflects statistical discrepancy probably due to the different sources of information provided by each reporting country. According to Gabriel Zucman at UC Berkeley, balance of payments are systematically being misreported because of tax havens and tax optimization of many multinational companies.

b. **Which regions of the world are borrowing and which are lending?**

   In 2017, the US was the world's biggest borrower with a deficit of $ 466.2 Bn. The rest of the advanced economies as a whole were lenders. The Euro area was a lender in 2017, with a surplus of $ 442.4 Bn. Developing economies in Asia were other large lenders, with a surplus of 152 US Billions dollars. And Latin American countries, emerging countries in Europe and middle eastern countries were net borrowers with a joint deficit of 163 US Billion dollars.

c. **Compare the U.S. current account balance to the current account balances of the other advanced economies. Is the United States borrowing only from advanced economies?**

   In 2017, the total saving of the advanced economies including the United States was 396.2 US Billion dollars. The US was dissaving by 466.2 US Billion dollars. Thus the US could be borrowing only from advanced economies – other advanced economies have a sufficiently high positive external position to do that.
   However, we also know that in practice, the US is borrowing also from China: the Chinese central bank holds a lot of US Treasuries in the form of reserves, which means that some of the financing of the US current account balance comes from emerging economies.

d. **The statistical tables in the WEO typically project data for two years into the future. Look at the projected data on current account balances. Do your answers to parts (b) and (c) seem likely to change in the near future?**

Projections for 2018 and 2019 still show the US as the world's biggest borrower with an increasing deficit of 30% from 2017 to 2018 and 18% from 2018 to 2019. However the rest of advanced economies remain as lenders with a relatively stable surplus in 2018 and 2019. Developing economies in Asia are still lenders, with a slight reduction in their surplus in 2018 and 2019. While Latin American countries are still net borrowers with an increase in their deficit of around 30% in 2018 and 15% in 2019. Emerging European countries are still net borrowers with an increase in their deficit of around 26% in 2018, which remains stable in 2019. Middle Eastern countries, however, are projected to have a surplus in 2018 and a very small deficit in 2019.

| Current Account Balances ($Bn) | 2017 | 2018* | 2019* |
|---|---|---|---|
| **Advanced Economies** | **396.2** | **345.8** | **287.2** |
| US | -466.2 | -614.7 | -727.3 |
| Euro Area | 442.4 | 460.8 | 478.1 |
| Japan | 195.4 | 194.5 | 199 |
| UK | -106.7 | -110.1 | -103.2 |
| Canada | -49.3 | -57.3 | -48.6 |
| Other Advanced Economies | 346.1 | 393.5 | 406.4 |
| **Emerging and Dev. Asia** | **151** | **122.9** | **131.4** |
| **Emerging and Dev. Europe** | **-49.6** | **-62.2** | **-63.2** |
| **LAC** | **-85.4** | **-116.9** | **-133.6** |
| **Middle East** | **-28** | **17.8** | **-9.1** |
| **World** | **371** | **322.2** | **211.2** |

# ☆ Chapter 17, Problem 8

**Saving and investment throughout the world. Retrieve the most recent World Economic Outlook (WEO) from the Web site of the International Monetary Fund (http://www.imf.org). In the Statistical Appendix, find the table titled "Summary of Net Lending and Borrowing," which lists saving and investment (as a percentage of GDP) around the world. Use the data for the most recent year available to answer parts (a) and (b).**

a. **Does world saving equal investment? (You may ignore small statistical discrepancies.) Offer some intuition for your answer.**

In theory, world saving should equal world investment: the world is a closed economy, for which indeed $S + (T - G) = I$. Only for an open economy can we have a difference between the two given by $CA = S + (T - G) - I$. The small differences shown in the IMF data (less than 0.1 percent) reflect statistical errors. See the table below.

b. **How does U.S. saving compare to U.S. investment? How is the United States able to finance its investment? (We explain this explicitly in the next chapter, but your intuition should help you figure it out now.)**

In 2017, US savings was 17.5 % of GDP, but US investment was 19.8 % of GDP. The US was able to finance its investment by financing its current account deficit, that is selling assets to the rest of the world. (these assets are de facto, promises that the US will export more than it imports sometime in the future, at least if these assets correspond to an eventual repayment)

c. **From the FRED economic database, download real GDP (variable GDPC1) and real GNP (variable GNPC96) for the years 1947 to the latest data. Calculate the percentage difference between GNP and GDP in the United States. Which is larger? Why is that the case?**

Real GNP is around 0.3 and 1.6 percent larger than real GDP. This difference is captured by net income payments. In the case of the US, positive net income payments imply that income received from the rest of the world is larger than income paid to the rest of the world. Or in other words, Americans earn more income from American assets held abroad than non-Americans do on foreign assets held in the United States. This is because In part, this is because the United States earn very large profits from its multinationals abroad, such as Mc Donalds, Starbucks, Apple, etc.

| Summary of Net lending and borrowing | 2017 |
|---|---|
| Percent of GDP | |
| **US** | |
| Savings | 17.5 |
| Investment | 19.8 |
| **World** | |
| Savings | 26.1 |
| Investment | 25.6 |

Figure 1: REAL GNP VS REAL GDP