

::Solutions::

Problem Set #3: Due end of class October 23, 2018

You may discuss this problem set with your classmates, but everything you turn in must be your own work.

1. Suppose the home country fixes its exchange rate to the foreign country. Capital moves freely across the two countries.
 - (a) How is the money supply in the home country determined in the short run (i.e., when prices are sticky)? Explain your answer.

In the short run, we have that UIP holds, so the home interest rate is set to match the foreign interest rate $i_H = i_F$. The quantity theory of money demand is

$$M = L(i_H)Y_H\bar{P}_H$$

which determines money supply, since the price level is given, real output is given, and $i_H = i_F$.

- (b) In which of the following situations would the home country be more likely to abandon a fixed exchange rate? Explain your answer.
 - i) a recession in the home country and an expansion in the foreign country
 - ii) a recession in the home country and a recession in the foreign country

The country would be more likely to abandon a fixed exchange rate in case i). When the foreign country is in an expansion, the central bank would want to keep interest rates high, which means interest rates in the home country must also be high. This is not the monetary policy the home central bank wants during a recession. The only way for the home country to have a lower interest rate is to abandon the fixed exchange rate.

- (c) Why would a country want a fixed exchange rate? What are the potential benefits?

Perhaps the two biggest reasons are to: 1) encourage international trade and investment by eliminating foreign exchange rate risk and 2) to serve as a nominal anchor for central banks with poor reputations.

2. Download the file `bop.xlsx` from the course website. It contains data on the U.S. balance of payments from 1960–2017. Notice that each row of the data has an associated line number. Using the line numbers, write out formulas for the following.
 - (a) The trade balance. [I'll do this one as an example. $TB = \text{line 2} - \text{line 10}$.]
 - (b) Net factor income from abroad. [BEA calls this primary income.]

$$NFIA = \text{line 5} - \text{line 13}$$

(c) Net unilateral transfers. [BEA calls this secondary income.]

$$NUT = \text{line 8} - \text{line 16}$$

(d) The capital account.

$$KA = \text{line 17} - \text{line 18}$$

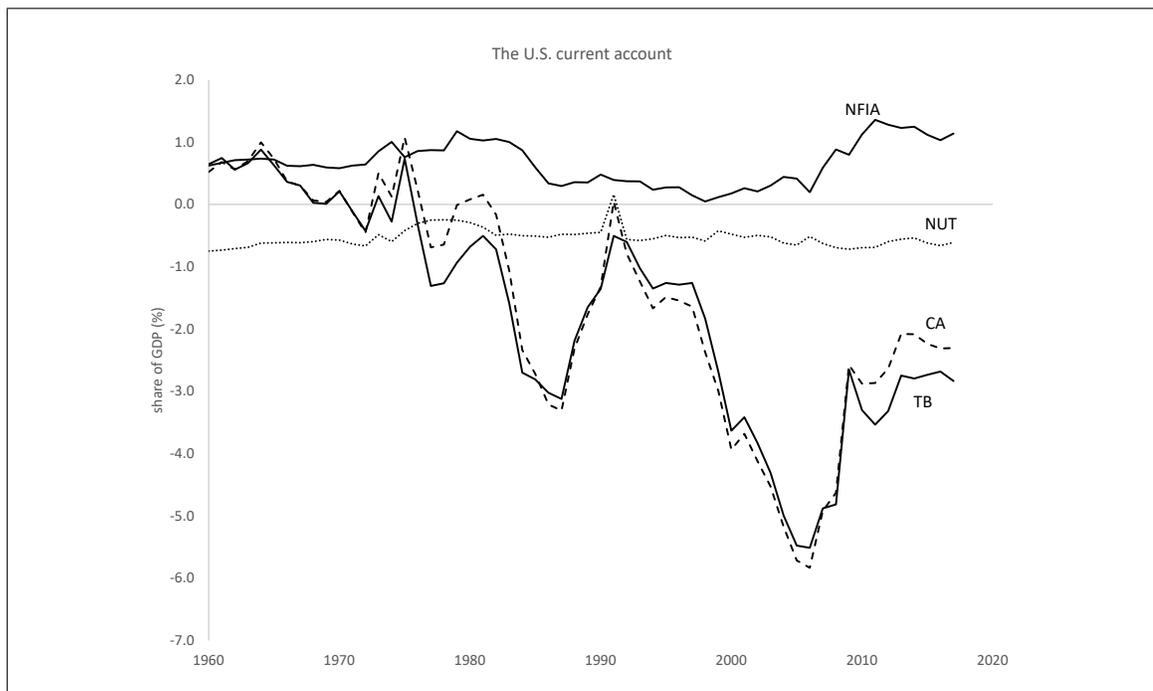
(e) The financial account.

$$FA = \text{line 24} - \text{line 19}$$

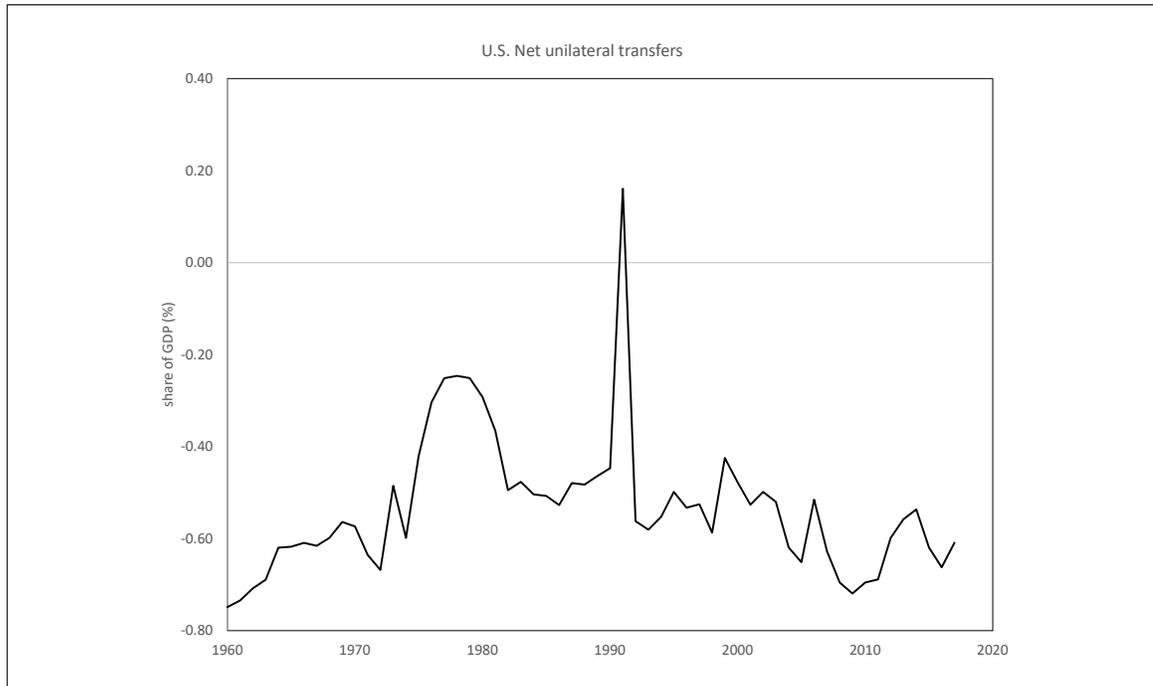
3. In the excel workbook, compute the variables you defined in question 2 for each year. You can check that your formulas are correct by summing the current account, capital account, financial account, and the statistical discrepancy. The value should be zero (although, I find it to be -1 , due to rounding error.)

Turn in one chart for each part below. The charts should be neat and carefully labeled. **You do not need to turn in a printout of your workbook — only the charts.**

(a) For the years 1960–2017, plot the current account, trade balance, net factor income from abroad, and net unilateral transfers, each as a percentage of GDP. The GDP data are in row 54 of the workbook. All four variables should be on the same plot. The x-axis should be years.



- (b) Plot the net unilateral transfer balance, as a percentage of GDP, for 1960–2017. The x-axis should be years.



4. Describe the evolution of the U.S. current account. What component(s) of the current account are most important for the current account's behavior?

The current account was near zero until the 1980s, when it was in a deficit. The deficit closed in the early 1990s, but since then has been persistently negative. The current account is being driven almost entirely by the trade balance. In the last 10 years or so, the increase in net factor income from abroad has made the current account a bit less negative than the trade balance.

5. Summarize the net unilateral transfer balance. Is the U.S. predominately a recipient or a giver? [For those of you who are curious: The U.S. was the major actor in the gulf war of 1991. What might that have to do with the behavior of the unilateral transfer balance?]

Net unilateral transfers are small (less than one percent of GDP) and almost always negative. The U.S. is a net giver of transfers.

The positive spike in 1991 is the transfers made by the U.S. allies in the Gulf War. The U.S. did most of the fighting, and other countries made transfers to the United States.

6. Consider a world with three periods, $t = 0, 1, 2$. A country has initial wealth W_{-1} , the interest rate is r^* for all periods, and the country can have a non-zero trade balance in each period. At the end of the third period, the country's wealth must be equal to zero.

- (a) Write out the country's budget constraint for each period.

$$\begin{aligned} W_0 &= TB_0 + (1 + r^*)W_{-1} \\ W_1 &= TB_1 + (1 + r^*)W_0 \\ 0 &= W_2 = TB_2 + (1 + r^*)W_1 \end{aligned}$$

- (b) Combine the three budget constraints from (a) to create the long-run budget constraint. Write out the long-run budget constraint in present-value form.

$$-(1 + r^*)W_{-1} = TB_0 + \frac{TB_1}{1 + r^*} + \frac{TB_2}{(1 + r^*)^2}$$

- (c) Suppose $W_{-1} = 100$, $r^* = 0.1$. Can all three trade balances (TB_0, TB_1, TB_2) be positive? Explain your answer.

No, since the country is holding positive wealth, the country's present value of the trade balance must be negative. The country must receive more from the rest of the world than the rest of the world receives from the country.

- (d) Suppose $W_{-1} = -50$, $r^* = 0.1$, and $TB_0 = 20$. Give values for TB_1 and TB_2 such that the long-run budget constraint holds. [There are many correct answers, just provide one.]

$$TB_1 = 38.5 \text{ and } TB_2 = 0$$

- (e) List the values of W_0, W_1 , and W_2 associated with your answers in part (d).

$$W_0 = -35$$

$$W_1 = 0$$

$$W_2 = 0$$