

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.
  - (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
  - (c) Why would a country want a fixed exchange rate? What are the potential benefits?
  
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.]
  - (c) Net unilateral transfers. [BEA calls this secondary income.]
  - (d) The capital account.
  - (e) The financial account.
  
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?
  
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?]

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.
  - (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.
  - (c) Suppose  $W_{-1} = 100$ ,  $r^* = 0.1$ . Can all three trade balances ( $TB_0, TB_1, TB_2$ ) be positive? Explain your answer.
  - (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.]
  - (e) List the values of  $W_0, W_1$ , and  $W_2$  associated with your answers in part (d).