

Economics 500 Macroeconomic Theory and Policy
Fall 2010
Homework 1

Bill Polley

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Due date: Thursday, September 16, 2010

1. Briefly explain any policy implications associated with the switch from fixed-weighted real GDP calculations to chain-weighted real GDP calculations. One or two paragraphs will suffice. (See the readings on the course web page.)
2. Using a spreadsheet such as MS Excel, construct a chart showing the percentage change in real GDP from 1980 to the present. To do this, follow these instructions.
 - (a) Use the data site at the St. Louis Fed.
<http://research.stlouisfed.org/fred2/> Find the quarterly, 3 decimal series for Real Gross Domestic Product. (GDPC96) (NOTE: I know that you can print a chart directly from FRED. That's not the point. The point is more of a diagnostic test to make sure you can quickly and easily calculate growth rates and generate charts in Excel!)
 - (b) Click on "Download Data" and select the Excel file. It should be `GDPC96.xls`.
 - (c) Open this file in Excel or save it to disk and then open it.
 - (d) In a column next to the original data, compute the percentage change from one quarter to the next and annualize it. A simple formula that does the job is:

$$\text{percent change in period } t = \left(\frac{y_t}{y_{t-1}} \right)^4 - 1.$$

Use the graphing tool in Excel to graph the series of percentage changes from 1980 to the present.

- (e) Label the chart and turn it in (no need to print or turn in the raw data... just the chart).
3. In his paper, "The Stories We Tell...", David Colander writes,

The problem of the AS/AD presentation of macro to students reflects larger problems in macro. It is not just a pedagogical problem; it is a problem of the way economists think about the macroeconomy and the way we treat textbook models.

What is that problem? What are the implications for the way we do and teach macro? What, if anything, should be done about it? References to the Solow paper might be appropriate. Don't worry if you don't have much of an idea about what should be done. By the final exam, you might!

4. Suppose that planned expenditure is given by

$$E = C(Y - T) + I(r) + G.$$

- (a) How do equal increases in G and T affect the position of the IS curve? Specifically, what is the effect on Y for a given level of r ?
- (b) How do equal increases in G and T affect the position of the AD curve? Specifically, what is the effect on Y for a given level of π ?
5. Suppose that tax revenues, T , instead of being exogenous, are a function of income

$$T = T(Y) \text{ where } T'(Y) > 0.$$

$T'(Y)$ can be thought of as the marginal tax rate.

- (a) How does an increase in $T'(Y)$ affect the slope of the IS curve?
- (b) How does an increase in $T'(Y)$ affect the sensitivity of Y to changes in G at a fixed price level?

Note: Drawing graphs might help for both problems 1 and 2, but you need to do these analytically as well. This is problem #5.3 in Romer and is a classic problem based on Haavelmo's 1945 *Econometrica* paper. (You are joining the many generations of macro students who have had to solve this one!)

6. Suppose the following model of imperfect capital mobility and fixed exchange rates:

$$\begin{aligned} CF(r - r^*) &= 10000(r - r^*) \\ NX &= 100\bar{\epsilon}. \end{aligned}$$

Assume that the exchange rate, $\bar{\epsilon}$, is equal to 2 and that $r^* = 0.08$.

- (a) At what interest rate is there no change in bank reserves?
- (b) Suppose the following:

$$\begin{aligned} E^{dom} &= 0.8(Y - T) + I + G \\ I &= 500 - 2500r \\ G &= 300 \\ T &= 300. \end{aligned}$$

Sketch the IS curve for $\bar{\epsilon} = 2$.

(c) Suppose the central bank policy rule is

$$r(Y) = 0.06 + \frac{1}{10000}(Y - 2950), \text{ if } CF(r(Y) - r^*) + NX(\bar{\varepsilon}) > 0$$
$$r(Y) = r_0 \text{ otherwise, where } r_0 \text{ is the interest rate you found in part a.}$$

Find the equilibrium Y and r .

(d) Repeat parts (a) through (c) when $\bar{\varepsilon} = 1$. That is, when there is a revaluation of the home currency. Explain the economic intuition behind the result.