Econ 1, Fall 2010 Your name: _____

University of California, Berkeley GSI's name: _____

Section #: _____

Problem Set #3

Due at the beginning of lecture Wednesday, September 29, 2010

NOTE: To ensure proper grading, write your answers in the area indicated.

1. Explain whether or not, why, and how the following items are included in the calculation of GDP:
   a. The sale of a washing machine that had been produced here at home last year and carried over in inventory.

   b. The sale of a washing machine newly-made at home this year.

   c. The sale of a washing machine newly-made abroad this year and imported.

   d. The sale of a washing machine made abroad and imported last year.

2. Solve for the equilibrium level of real GDP Y in the Keynesian framework: $Y = C + I + G + NX$, $C = c_o + c_y Y$:
   a. With c_o = \$5 trillion/year, $c_y = 2/3$, I = \$3 trillion/year, G = \$3 trillion/year, NX = -\$1 trillion/year

   b. With c_o = \$5 trillion/year, $c_y = 2/3$, I = \$4 trillion/year, G = \$2 trillion/year, NX = -\$2 trillion/year

   c. With c_o = \$4 trillion/year, $c_y = 1/2$, I = \$4 trillion/year, G = \$3 trillion/year, NX = -\$1 trillion/year

   d. With c_o = \$4 trillion/year, $c_y = 1/2$, I = \$3 trillion/year, G = \$4 trillion/year, NX = -\$2 trillion/year r

3. In the monetarist framework $Y = (M/P)\cdot V$—real GDP Y equals the money stock M divided by the price level P times the velocity of money V—and $M = \mu \cdot R$—the money stock equals the money multiplier μ times cash-and-reserves R, solve for the equilibrium price level P:
   a. If $V = 3$, Y = \$15 trillion, R = \$1 trillion, and $\mu = 4$

   b. If $V = 5$, Y = \$15 trillion, R = \$1 trillion, and $\mu = 5$

   c. If $V = 6$, Y = \$18 trillion, R = \$1.5 trillion, and $\mu = 4$

   d. If $V = 3$, Y = \$15 trillion, R = \$1.5 trillion, and $\mu = 4$

4. In the Phillips Curve framework in which $\pi = E(\pi) + \beta(u^* - u)$—the inflation rate π equals the previously-expected inflation rate $E(\pi)$ plus the "slope" β times the difference between the natural rate of unemployment u^* and the actual rate of unemployment u—calculate the rate of inflation π:
   a. If $E(\pi) = 4\%$ per year, $\beta = ½$, $u^* = 5\%$, $u = 5\%$

   b. If $E(\pi) = 9\%$ per year, $\beta = ½$, $u^* = 7\%$, $u = 5\%$

   c. If $E(\pi) = 1\%$ per year, $\beta = ½$, $u^* = 4\%$, $u = 8\%$

   d. If $E(\pi) = 1\%$ per year, $\beta = ½$, $u^* = 5\%$, $u = 9\%$

5. Websurf your way over to the Congressional Budget Office's most recent *Long-Term Budget Outlook* at <http://www.cbo.gov/ftpdocs/115xx/doc11579/06-30-LTBO.pdf>. Read it.
   a. What is federal health care spending currently as a percentage of GDP?

   b. What does the CBO think that federal health care spending—Medicare, Medicaid, CHIP, and Exchange Subsidies—is likely to be as a percentage of GDP in 2035?

   c. What does the CBO say that Social Security spending currently is as a percentage of GDP?

   d. What does the CBO think that Social Security spending is likely to be as a percentage of GDP by 2035?

6. Why, in your own words, does the CBO believe that the share of GDP the federal government spends on its major "mandatory" programs is going to rise between now and 2035?

7. What does the Congressional Budget Office project that the federal debt held by the public will be, as a share of GDP, in 2035, if congress and the president either adhere to the "baseline" of current federal programs or if they hold to PAYGO—that is, cut one program or raise taxes by the amount by which they raise another program? What, in your own words, is the logic behind this projection?

8. What does the Congressional Budget Office project that the federal debt held by the public will be, as a share of GDP, in 2035, if congress and the president continue to do business more-or-less as they have done business since 1980? What, in your own words, is the logic behind this projection?

9. Consider our budget equation:

$$\left[\frac{D}{Y}\right]_t = d^p + (1 + r - g)\left[\frac{D}{Y}\right]_{t-1}$$

That is, the debt-to-GDP ratio this year ("year t") is equal to this year's primary deficit to GDP ratio d^p, plus last year's debt-to-GDP ratio ($[D/Y]_{t-1}$) multiplied by one plus the real interest rate on government debt r and minus the growth rate of the economy g.

Suppose that the initial debt-to-GDP ratio is 60% (that is, suppose that $[D/Y]_0 = 0.6$). What will the debt-to-GDP ratio be in 25 years (that is, what will $[D/Y]_{25}$ be) if on average:

[You will want to use a spreadsheet or equivalent tool for this question, especially for part d.]

a. r = 3%/year, g = 3%/year, d^p = 2%

b. r = 3%/year, g = 3%/year, d^p = 0%

c. r = 5%/year, g = 3%/year, d^p = 0%

d. r = 4%/year, g = 2%/year, d^p = 2%

10. Use the budget equation given in question 9 above. Suppose that the initial debt-to-GDP ratio is 60% (that is, suppose that $[D/Y]_0 = 0.6$). What will the debt-to-GDP ratio be in 50 years (that is, what will $[D/Y]_{50}$ be) if on average:

    [Again, the use of a spreadsheet or equivalent tool is strongly recommended.]

    a. r = 3%/year, g = 4%/year, d^p = 3%

    b. r = 3%/year, g = 3%/year, d^p = 3%

    c. r = 5%/year, g = 3%/year, d^p = 3%

    d. r = 7%/year, g = 2%/year, d^p = 3%