Econ 375 Marietta College
Problem Set 1 Spring 2008

**Data of Macroeconomics**

1. Suppose that a women marries her butler. After they are married, her husband continues to wait on her as before, and she continues to support him as before (but as a husband rather than as a wage earner). How do you think the marriage affects GDP? How should it affect GDP?

2. Identify which of the following purchases is counted as part of GDP: You purchase a used lawn mower at a garage sale. General Motors purchases tires from Goodyear to equip new Chevrolets. General Motors purchases tires from Goodyear to replace worn tires on executives' company cars. A neighbor hires you to baby-sit for an evening. You purchase a share of AT&T. A neighbor breaks your window with a golf ball, and you purchase a new window. You pay your tuition for the semester.

3. Suppose that automobile purchases were to be treated like housing purchases in the national income accounts. How would that affect saving? Investment?

4. Obtain the appropriate data from the latest issue of the Economic Report of the President (available at www.access.gpo.gov/eop/) to complete the following table for the latest calendar year. For each series state your statistical source and table number.

| | | ($ in billions) |
|---|---|---|
| Gross Domestic Product | ➔ | |
| | EQUALS | |
| Consumption | | |
| + Investment | | |
| + Government Purchases | | |
| + Exports | | |
| - Imports | | |

Confirm that GDP = C + I + G + NX.

5. Consider an economy that produces and consumes bread and automobiles. In the table below are data for two different years.

| | **Year 2008** | **Year 2009** |
|---|---|---|
| Price of an automobile | $60,000 | $70,000 |
| Price of a loaf of bread | $10 | $20 |
| Number of automobiles produced | 100 | 120 |
| Number of loaves of bread produced | 600,000 | 500,000 |

a) Using the year 2008 as the base year, compute for each year nominal GDP, real GDP, the implicit price deflator for GDP, and a fixed-weight price index such as the CPI.

b) How much have prices risen between year 2008 and year 2009? Compare the answers given by the Laspeyres and Paasche price indexes. Explain the difference.

c) Suppose you were a senator writing a bill to index Social Security and federal pensions. That is, your bill would adjust these benefits to offset changes in the cost of living. Would you use the GDP deflator or the CPI? Why?

**National Income: Where it comes from and where it goes**.

6. Assume that the production function is given by $Y = AK^{.5} L^{.5}$, where Y is GDP, K is the capital stock, and L is labor. The parameter A is equal to 10. Assume also that capital is 100, labor is 400, and both capital and labor are paid their marginal products:

a) What is Y?
b) What is the real wage of labor?
c) What is the real rental price of capital?

7. The table below describes the key elements in deriving a labor demand curve for a bakery. Complete the table and answer the following questions.

| Number of Workers | Number of Loaves Baked per hour | MP of Labor | Price per loaf | P x MP | Nominal Wage Rate (W) | Real Wage Rate (W/P) |
|---|---|---|---|---|---|---|
| 0 | 0 | -- | $1 | -- | $8 | $8 |
| 1 | 20 | 20 | $1 | $20 | $8 | $8 |
| 2 | 36 | | $1 | | | |
| 3 | 48 | | $1 | | | |
| 4 | 56 | | $1 | | | |
| 5 | 60 | | $1 | | | |
| 6 | 62 | | $1 | | | |

a) At what employment level does the firm encounter diminishing marginal returns?
b) Draw a graph of the (PxMP) column. Plot the number of workers on the horizontal axis and dollars on the vertical axis. What does this curve represent?
c) How many workers will the bakery hire if the nominal wage rate is $8?
d) Suppose the price of bread increased to $2 per loaf. How many workers will the bakery hire if the nominal wage rate is $8? How many workers will the bakery hire if the nominal wage rate is $16?

8. Use the neoclassical theory of distribution to predict the impact on the real wage and the rental price of capital of each of the following events:

a) a wave of immigration increases the labor force.
b) an earthquake destroys some of the capital stock.
c) a technological advance improves the production function.

9. The government raises taxes by $100 billion. If the marginal propensity to consume is 0.7, what happens to:

a) public saving?
b) private saving?
c) national saving?
d) investment?

10. Suppose that an increase in consumer confidence raises consumers' expectations of future income and thus the amount that they want to consume today. This might be interpreted as an upward shift in the consumption function. How does this shift affect investment and the interest rate?

11. Suppose that GDP (Y) is 6,000. Consumption (C) is given by the equation C = 600 + 0.6(Y-T). Investment (I) is given by the equation I = 2000 - 100r where r is the real interest rate in percent. Taxes (T) are 500, and government spending (G) is also 500.

a) What are the equilibrium values of C, I, and r?
b) What are the values of private, public, and national saving?
c) If government spending rises to 1000, what are the new equilibrium values of C, I, and r? Does the amount of investment that the change in G "crowds out" depend on the value of the MPC?
d) What are the new values of private, public, and national saving?
e) Suppose that G is once again 500 but that T rises to 1000. What are the new equilibrium values of C, I, and r? Does the amount of investment that the change in G "crowds in" depend on the value of the MPC?
f) What are the new values of private, public, and national saving?
g) Now suppose that both G and T are 1000. What are the new equilibrium values of C, I, and r? Why is investment lower than in part (a), and why is the interest rate higher?
h) What are the new values of private, public, and national saving?
i) If you were an adviser to the President of the US and you were asked whether, other things equal, a government budget surplus or a government budget deficit was more favorable to investment, what would you answer, based on the models of textbook Chapter 3? Why?

**Unemployment**

12. The natural rate of unemployment is also the steady-state unemployment rate. Once the economy reaches this steady state, the unemployment rate tends to remain the same. Now consider the following example: Suppose that there are 2,300 employed people in the economy and 200 unemployed people. Suppose, further, that 23 percent, or 0.23, of the unemployed find jobs each month and that 2 percent, or 0.02, of the employed lose their job each month.

a) During the next month, how many of the currently unemployed people will find a job?
b) During the next month, how many of the currently employed people will lose their job and become unemployed?
c) Consequently, at the beginning of the next month, how many total people will be unemployed? How many will be employed?
d) Why is this situation an example of a steady-state unemployment rate?
e) Calculate the unemployment rate.

13. If the rate of job separation is 0.02 per month and the rate of job finding is 0.10 per month, what is the natural rate of unemployment?

14. If the economy were at a steady-state unemployment rate with a separation rate of 0.02 per month and a job-finding rate of 0.10 per month, and the labor force was 100 million, how many individuals would lose their jobs each month?

15. In which two ways does unemployment insurance affect the natural rate of unemployment? Explain how each way changes the rate of unemployment.

16. Some economists who have studied differences across countries in labor markets have suggested that the relationship between unemployment and unionization resembles an inverted letter "U." That is, they find that the natural rate of unemployment is low if unionization is very low or very high, and that intermediate levels of unionization lead to the highest rates of unemployment. Why might this be true?

17. Give three reasons for why the real wage may remain above the level that equilibrates labor supply and labor demand.

18. Describe the difference between frictional and wait unemployment.

**Inflation**

19. Which of the three functions of money is satisfied by each of the following?
a) a $50 traveler's check
b) a $10 food stamp
c) a vacation home in the Caribbean

20. Ask one of your grandparents (or parents) if they remember how much they earned in their first full-time job. Calculate the current dollar value of those earnings using the CPI.

21. In the country of Retseemeled, the velocity of money is constant. Real GDP grows by 5% per year, the money stock grows by 14% per year, and the nominal interest rate is 11%. What is the real interest rate?

22. Suppose you are advising a small country (such as Bermuda) on whether to print its own currency or to use the money of its larger neighbor (such as the United States). What are the costs and benefits of a national money? Does the relative political stability of the two countries have any role in this decision?

23. Assume that a series of inflation rates is 1 percent, 2 percent, and 4 percent, while nominal interest rates in the same three periods are 5 percent, 5 percent, and 6 percent.
a) What are the ex post real interest rates in the same three periods?
b) If the expected inflation rate in each period is the realized inflation rate in the previous period, what are the ex ante real interest rates in periods two and three?
c) If someone makes a loan in period two, based on the ex ante inflation expectation in part b, will he or she be pleasantly or unpleasantly surprised?

24. During WWII, both Germany and England had plans for a paper weapon: they each printed the other's currency with the intention of dropping large quantities by airplane. Why might this have been an effective weapon?

25. Calvin Coolidge once said that "inflation is repudiation." What might he have meant by this? Do you agree? Why or why not? Does it matter whether the inflation is expected or unexpected?

26. Assume that the demand for real money balance (M/P) is $(M/P)^d = 0.6Y - 100i$, where Y is national income and i is the nominal interest rate. The real interest rate, r, is fixed at 3 percent by the investment and saving functions. The expected inflation rate equals the rate of nominal money growth.
a) If Y is 1,000, M is 100, and the growth rate of nominal money is 1 percent, what must i and P be?
b) If Y is 1,000, M is 100, and the growth rate of nominal money is 2 percent, what must i and P be?