14.02 Principles of Macroeconomics
Problem Set 1
Fall 2005

Posted: Monday, September 12, 2005
Due: Wednesday, September 21, 2005

Part I. True/False/Uncertain
Justify your answer with a short argument.

1.   Because of a natural disaster, the government purchases $100 million worth of bottled water and blankets. This increases GDP by $100 million.

2.   Because of a natural disaster, the government increases unemployment insurance benefits to those who are affected. This increases GDP.

3.   The multiplier (Keynesian multiplier) is always less than 1 if T = 0, G = 0, and NX = 0.

4.   It is impossible for a real GDP increase to be coupled with a decrease of nominal GDP.

5.   Inflation is bad for the economy because goods and services are more expensive.

6.   The growth rate of nominal GDP per capita is the best summary measure of changes in material living standards in a country over time.

7.   GDP deflator is the best measure of inflation.

II. UNEMPLOYMENT

Total population: 1,000,000
Number of adults employed: 450,000
Number of unemployed adults: 90,000
Labor force: 500,000

1. Calculate the unemployment rate.

2. If 200,000 migrate to a neighboring country, what happens to the unemployment rate?

3. If this country's unemployment rate decreases, what do we know about its real GDP?

Part III. NATIONAL ACCOUNTS (GDP, GDP DEFLATOR & CPI)

For part II, assume the following: MIT is a closed economy.
The only good/service produced & consumed at MIT is undergrad (freshmen) education.

1.   Fill in the following:

year	# of MIT freshmen (quantity)	Price (Tuition)	nominal GDP	real GDP (1950$)	real GDP (2000$)
1950	100	$1,000			
2000	800	$20,000			
2001	1000	$21,000			
2002	1100	$22,000			
2003	1000	$24,000			
2004	1200	$31,000			

2.   Find the growth rate of nominal GDP for 2001, 2002, 2003, 2004.

3.   Find the growth rates of real GDP (using 2000$) and (using 1950$) for 2001, 2002, 2003 and 2004.

Year	nominal GDP growth (%)	real GDP growth (1950$) (%)	real GDP growth (2000$) (%)
2001			
2002			
2003			
2004			

4.   In this example, is the choice of base year important for calculating the growth rate of real GDP? Would your answer to this question change if the economy in this example produced more than one good?

5.   Compute inflation using GDP deflator (using 2000$) for 2001, 2002, 2003, 2004.

	GDP deflator	inflation rate (%)
2000		
2001		
2002		
2003		
2004		

Part IV. THE GOODS MARKET   (Closed Economy)
(All units are millions of US dollars)

$C = 220 + (0.6)Y_D$
$I = 50$
$T = 200$
$G = 250$
$NX = 0$

1.   Solve for the good market equilibrium. (Find equilibrium Y, Z, C, and Y_D.)

2.   Graph (with correct labels) equilibrium Y and Z.

3.   Solve for private saving and public saving.

4.   What is the value of marginal propensity to consume (mpc)? What does it mean?

5.   What is the value of marginal propensity to save (mps)?

6.   What is the relationship between mpc and mps?

7.   Find the multiplier and autonomous spending. Explain what they mean.

8.   Now, in order to deal with a natural disaster, the government purchases $100 million worth of supplies. Find the new equilibrium demand, output, consumption, and disposable income, then graph. (Instead of calculating from scratch, try to reason out your answer from the original equilibrium calculations followed by a discussion of multiplier.)