14.02 Principles of Macroeconomics

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Due: September 21, 2001

PROBLEM SET 1 Solutions

Part I. EXPLAIN TRUE OR FALSE (40 points)

1. (4 points) True. It will always be $1 - c_1$, where $c_1$ is the marginal propensity to spend.
2. (4 points) False. Output is a flow so it can be measured as dollars per unit of time. But capital is a stock variable.
3. (4 points) False. True output is GDP plus all production that is not transacted in the market.
4. (4 points) False. If there is a deflationary process then Nominal output can decrease.
5. (4 points) True. Part of the oil production is used by firms to produce different final goods.
6. (4 points) True. Part of the oil production is sold directly to consumers as a final good.
7. (4 points) True. The payment is in exchange for a service (safety).
8. (4 points) False. The payment is in exchange for nothing. It is just a transfer.
9. (4 points) False. A strong dollar makes the American economy less competitive with respect to other countries.
10. (4 points) False. Japan is worried because of a recession and therefore low output growth (well below 3%) during the 90’s.

Part II. INFLATION AND REAL GROWTH (30 points)

Utopia produces only two goods: Coke and oil. In 2001 production reached 200 cans of Coke and 170 barrels of oil. With prices equal to 1 and 2 dollars respectively. The forecast for next year is 300 cans of coke and 130 barrels of oil with an estimated price of 0.5 and 3 dollars respectively. Last but not least, in order to produce 10 cans of coke one needs 1 barrel of oil.

1. (5 points) GDP in 2001 is $200 \times 1 + 150 \times 2 = 500$. GDP in 2002 is expected to be $300 \times 0.5 + 100 \times 3 = 450$. Therefore there is an expected decrease in nominal GDP of 10%.
2. The values for real GDP are (%)
• (5 points) Taking 2001 as your basis year, the expected real GDP for 2002 is 300 + 100*2 = 500. Therefore the expected change in real GDP is 0.

• (5 points) Taking 2002 as your basis year, real GDP in 2001 is 200*0.5 + 150*3 = 550. Therefore the expected change in real GDP is -100/550, i.e. -18%

3. (10 points) In the first case, the deflator for 2001 is 1 and for 2002 is 450/500 = 0.9. Therefore inflation is -10%

In the second case the deflator for 2001 is 500/550 = 0.9 and the deflator for 2002 is 1. Therefore inflation is 11%
Part III. THE GOODS MARKET (30 points)

You find the following economic data for Utopia:
Marginal propensity to consume = 0.6, Investment = 30, Government spending = 20 Government revenues = 20 (Tax collection) People will consume a minimum of 10, no matter what their income is.

1. (5 points) Equilibrium output is \( \frac{1}{1 - 0.6}(10 - 12 + 30 + 20) = 2.5 \times 48 = 120 \).
2. (5 points) The multiplier is equal to 2.5 while autonomous spending equals 48.
3. (5 points) Output will increase in 2.5 (the multiplier).
4. (5 points) Output will increase in 2.5*(1-0.6) = 1.
5. (10 points) The Savings paradox. AS long as investment does not change, savings will not change (I = S in equilibrium). What happens is that this contractionary policy decreases equilibrium output. People will be saving a larger proportion of a lower income, keeping total savings unchanged.