

14.02 Principles of Macroeconomics

Problem Set #1, Questions

Posted: Thursday, February 14, 2002

Due Date: Thursday, February 21, 2002

Please remember to write your TA's name and section time on the front page or your problem set.

Part I: True/False Questions: Decide whether each statement is true or false and justify your answer with a short argument. (5 points each, 50 points total)

1. Tightening law enforcement against illegal workers in the US can increase real wages.
2. Bush's call in State of the Union address for people to volunteer will decrease the unemployment because more people without jobs will be considered volunteers.
3. The NAIRU, also called the natural rate of unemployment, is the level of unemployment at which everyone who wants a job has one.
4. Young adults are more vulnerable for unemployment fluctuations than the adults in their 40-50s.
5. The data suggests that the unemployment rate and the inflation rate have been negatively correlated since the early of the past century.
6. As a rule of the thumb, if due to Enron bankruptcy the energy prices increase by one percentage point, then it's expected that the whole price inflation will increase by 0.2-percentage point.
7. The Bush's administrations can tradeoff an increase of one percentage point in inflation with a decrease of two percentage points of unemployment.
8. Higher exchange rate tends to decrease aggregate demand, and therefore, tends to cause a lower GDP in equilibrium.
9. Contrary to what is often stated by politicians, a reduction in the budget does not necessarily lead to an increase in investment
10. The company's total annual sales of \$200 to the households were generated through only the cost of \$50 wages and \$60 raw material. This means that this company's contribution to the GNP was \$140 in added value, \$200 in final goods or \$140 in household income.

Part II: A model of unemployment vs. changes in inflation (5 points each, 25 points total)

1. Assume the following wage setting format (with same definitions in class):

$$RW = RP_{-1} + A_0 - A_1 * (U - U^{VOL})$$

Interpret the terms and explain the relationship.

2. Prices are set by:

$$P = K * (W/A)$$

Interpret the terms and explain the relationship, and derive the inflation rate equation.

3. The mark-up is set by:

$$RK = B_0 - B_1 * (U - U^{VOL})$$

Interpret the terms and explain the relationship.

4. Derive the modified Philips equation. And draw the curve. Give a short interpretation.
5. How can you reconcile this finding with the fact that during the first half of the previous century, there was a negative correlation between the levels of inflation at and unemployment rate?

Part III: The National Accounts and government budget (5 points each, 25 points total)

Assume that an economy has one million households (consumers), each with the following consumption function (with same definitions in class):

$$C = \$150 + 0.6Y^d$$

1. (a) Interpret this equation. (b) Derive the aggregate consumption function. (c) Why you don't need the income distribution function?

Assume that:

$$I = \$100 \text{ million } -i, G = \$550 \text{ million and } X = M = 0.$$

2. (a) State the equilibrium condition for GNP and give a brief explanation of what it means. Solve for equilibrium GNP as a function of the unknown variables, i and T ; (b) Plot two demand curves: (1) in the aggregate demand-GNP space; and (2) in the i - Y space.
3. (a) What's the value for the multiplier and autonomous aggregate spending and GNP if $T=0$ and $i=10$? (b) What's the value for the multiplier and autonomous aggregate spending and GNP if the government budget is balanced and $i=10$?

4. **(a)** In how much will the GDP increase if the government decides to increase defense spending in \$400 million? Do you need information about T and i ? **(b)** In how much will output increase if the government increases defense spending in \$400 million, but keeping a balanced budget? What is the balanced-budget multiplier? Do you need information about T and i ?
5. The government decides to increase total savings in the economy. In order to do that it implements a new social security law that increases the marginal propensity to save by 0.1. In how much will GNP and total savings increase (assume $G=T=550$, $i=10$)? Explain.