

101562: Intermediate Macroeconomics

Problem Set 1

Shanghai University of Finance and Economics - Fall 2015

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The solutions are due *Thursday September 24* at the beginning of class. Enjoy!

Exercise A (T/F)

Please label each statement true (T) or false (F) and briefly explain.

1. Value of hours spent by a housewife providing care to her young children is counted as part of the GDP.
2. If the China CPI is currently at 110 and the Korea CPI is now at 115, then the Korean rate of inflation is higher than the Chinese rate of inflation.
3. According to Okun's law, the high unemployment rate causes output to decrease.
4. Assume $NX = 0$ (consider the closed economy). Given fixed investment, public saving crowds in (i.e. increases) private saving.
5. Suppose that the salary of a Chinese economist working in the U.S. increased by \$30,000 from 2014 to 2015. This is good for Chinese GDP.

Exercise B (Twin Deficits of the U.S.)

1. Using the equivalence of income and expenditure approaches to compute GDP, derive the relationship between investment, saving, and net export.
2. In the United States, private savings rate (S/Y) is really low while investment rate (I/Y) is relatively higher than private savings rate. In addition, there is a large federal deficit in the U.S. i.e. there is a large difference between total saving and investment in the U.S.. Explain how investment can be much higher than saving by using the relationship you derive in the above question.

Exercise C (Computing GDP)

There are three firms in an economy; Firm 1 produces raw materials using labor and capital, Firm 2 produces intermediate goods using labor, capital, and raw materials, and Firm 3 produces final goods using labor, capital, and intermediate goods. Each firm is owned by households, so any

(remaining) profits will be owned by households. In addition, the households supply both labor and capital. Finally, households consume final goods. Following is the detailed information about each firm's cash flow:

(1) Firm 1: It sells the raw materials for \$100 to Firm 2. Firm 1 pays its workers \$30 and rents capital from households at \$50.

(2) Firm 2: It sells the intermediate goods for \$250 to Firm 3. Firm 2 pays its workers \$40 and rents capital from households at \$60.

(3) Firm 3: It sells the final goods for \$500 to households. Firm 3 pays its workers \$80 and rents capital from households at \$120.

1. Compute GDP using the value-added approach (add value-added of each firm).
2. Compute GDP using the income approach.
3. Compute GDP using the expenditure approach.

Exercise D (CPI)

Suppose that there is only one consumer, Robinson, in the economy. He only consumes apples where there are two types of apples in this economy; red apples and green apples. Following summarizes the relevant information about prices and consumptions in year 1 and year 2:

	red apple		green apple	
	p	c	p	c
year 1	\$1	10	\$2	0
year 2	\$2	0	\$1	10

Here p is the price of the apple and c is the amount of apple consumed.

1. Compute a CPI for apples for each year by assuming that year 1 is the base year in which the consumer basket is fixed.
2. Compute Robinson's nominal spending on apples in each year. How does it change from year 1 to year 2?
3. Suppose that the two apples are perfect substitutes for Robinson. i.e. his utility is given as $u(c^r, c^g) = c^r + c^g$ where r (resp. g) indicates red (resp. green) apples. How much has the true cost of living increased for Robinson? Connect your answer with CPI that you computed in question 1.

Exercise E (Unemployment Rate)

Suppose that the unemployment rate is 5%, the total working-age population (P) is 250 million, and the number of unemployed (U) is 10 million.

1. Compute (i) the number of employed workers (E), (ii) the number of workers who do not participate in the labor force (N), and (iii) the employment/population ratio (E/P).

2. Suppose that because of the recession, 10 million workers lose their jobs and they are staying in the labor market to receive the unemployment insurance. What is the new unemployment rate? What is the employment/population ratio? (you may use your calculator to compute the rates to two decimal places)

3. Consider the following changes in the labor market. Before, by some regulations, some workers could not receive the unemployment benefits so they decided not to actively search for jobs. i.e. they did not participate in the labor market. Now, the government changes the rule, say it increases the length of the total periods that an unemployed worker can receive the benefits. Suppose that 10 million workers (who were out of the labor force) are benefited from this policy change, and they decide to participate in the labor market in order to claim their benefits. Assume that they cannot find jobs immediately. What is the unemployment rate after the policy change? What is the employment/population ratio? (you may use your calculator to compute the rates to two decimal places)

4. Compare your answers in 2 and 3. What can we learn from the comparison?