

Ljubljana Summer school, July 2012

Macroeconomics

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Exercise List 1

Lecture 1: 10/07/2012

1. Decide whether the following statements are true or false.
 - (a) We can say that macroeconomics consists of two parts. On the one hand, the observation and description of reality, which pertains to the collection and analysis of macroeconomic data. On the other hand, the interpretation of reality, which refers to the formulation of macroeconomic theories. In the descriptive part, on top of the national accounts we use price indexes, wages, and statistics referring to the labor market, among other things. The theories propose hypotheses in order to interpret reality and construct models in order to explain the macroeconomic problems that an economy may face.
 - (b) In good economic periods the unemployment is low and the wages tend to be high, while in recessions both the unemployment and the wages are high.
 - (c) The variables in macroeconomic models can be either endogenous or exogenous, depending on the model considered. In other words, a variable can be exogenous in one model and endogenous in another model.
2. Consider the market of bread. Suppose that there exists only one type of bread, and that flour is the only input used in its production. Develop analytically this market according to the model of supply and demand.

Variables:

- quantity of bread demanded (Q^D);
- quantity of bread supplied (Q^S);
- price of bread (P);
- aggregate income of the economy (Y);

- price of flour, that is, the price of an input used in production (P^F).
- (a) Determine the general functional form of demand and supply of bread.
 - (b) Identify which variables are exogenous and which are endogenous in the model.
 - (c) Represent graphically the demand curve and the supply curve.
 - (d) Determine the equilibrium price and the equilibrium quantity of bread.
 - (e) What happens to the equilibrium price and quantity if the price of flour falls?
 - (f) What happens if, on top of the decrease in the price of flour, there is also an increase in the aggregate income?
3. Suppose that the economy produces only 3 goods (A, B, and C). We have data on the quantities produced and the price of these goods for 3 consecutive periods.

Period	P^A	Q^A	P^B	Q^B	P^C	Q^C
0	15	120	8	80	20	200
1	18	150	9	100	22	250
2	21	130	10	100	25	220
3	19	140	10	110	21	240

- (a) Compute the nominal GDP in period 0, 1, 2, and 3.
 - (b) Setting period 0 as the base period, compute the real GDP for the 4 periods.
 - (c) Compute the growth rate of nominal and real GDP between periods 0 and 1, 1 and 2, 2 and 3, and between periods 0 and 3.
 - (d) Interpret the previous results. How did the production of this economy evolve over the periods we took into account?
4. Consider an economy that produces and consumes bread and cars. The table below reports the data for 2 different years.

Variable	2000	2010
Price of a car	50000	60000
Price of a baguette	10	20
Number of cars	100	120
Number of baguettes	500000	400000

- (a) Compute the following indicators for each year using 2000 as the base year: the nominal GDP, the real GDP, and the GDP deflator.
 - (b) How much did the prices increase between 2000 and 2010?
5. Gregory only consumes apples. In year 1, the red apples cost 1 euro each and the green apples cost 2 euros each. Gregory buys 10 red apples. In year 2, the red apples cost 2 euros each and the green apples cost 1 euro each. Gregory buys 10 green apples.
- (a) Compute the nominal GDP in apples. How does it change from year 1 to year 2?
 - (b) Compute the real GDP using year 1 as the base year for the prices. How does it evolve from year 1 to year 2?
 - (c) Compute the GDP deflator for each year. How does it change from year 1 to year 2?

Lecture 2: 11/07/2012

1. Use the Neoclassical theory of distribution to predict the impact on the real wage and the real 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.
2. The government raises taxes by 100 billion euros. If the marginal propensity to consume is 0.6, what happens to the following? Do they rise or fall? By what amounts?
 - (a) Public saving.
 - (b) Private saving.

- (c) National saving (public+private).
 - (d) Investment.
3. Suppose that an increase in consumer confidence raises consumers' expectations about their future income and thus increases the amount 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?
 4. Suppose that the government increases taxes and government purchases by equal amounts. What happens to the interest rate and investment in response to this balanced-budget change? Does your answer depend on the marginal propensity to consume?
 5. Suppose that consumption depends negatively on the real interest rate. Draw the graph of the loanable funds market in this case.

Lecture 3: 12/07/2012

1. What are the three functions of money? Which of the functions do the following items satisfy? Which do they not satisfy?
 - (a) A credit card.
 - (b) A painting by Rembrandt.
 - (c) A subway token.
 - (d) A favor by a friend of yours.
2. In the country of Chickenland 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?
3. A newspaper article once reported that the US economy was experiencing a low rate of inflation. It said that "low inflation has a downside: 45 million recipients of social security and other benefits will see their checks go up by just 2.8% next year."
 - (a) Why does inflation affect the increase in social security and other benefits?
 - (b) Is this effect a cost of inflation as the article suggests? Why or why not?

4. Consider the quantity theory of money, where the quantity equation is $M \times V = P \times Y$. Suppose that the velocity is constant. The money supply grows by 12% per year and the real income grows by 4% per year.
 - (a) What is the average inflation rate?
 - (b) How would the inflation be different if real income growth were higher? Explain.
 - (c) Suppose, instead of a constant velocity, the velocity of money was growing steadily because of financial innovation. How would that affect the inflation rate? Explain.
5. During World War II, 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?
6. If your country had a high public debt, would you prefer higher or lower inflation? Explain.

Note: several of these exercises are based on the exercise lists in Chapter 1, 2, 3, and 4 of "Macroeconomics" by N. Gregory Mankiw (7th ed.).