Economics 105: Principles of Macroeconomics

Assignment set #7 answer key

1. Suppose that this year's money supply is $50 billion, nominal GDP is $1 trillion, and real GDP is $500 billion.

   (a) What is the price level? What is the velocity of money?
   (b) Suppose that velocity is constant and the economy's output rises by 5% each year. What will happen to nominal GDP and price level next year if the Bank of Canada keeps money supply constant?
   (c) What money supply should the Bank of Canada set next year if it wants to keep the price level stable, given output increases by 5%??
   (d) What money supply should the Bank of Canada set next year if it wants inflation of 10%, given output increases by 5%??

2. Suppose that a country's inflation rate increases sharply. What happens to the inflation tax on the holders of money? Why is wealth that is held in savings accounts not subject to a change in the inflation tax? Can you think of any way in which holders of savings accounts are hurt by the increase in the inflation rate?

3. If inflation is less than expected, who benefits – debtors or creditors? Explain.

4. If the tax rate is 40%, compute the before-tax real interest rate and the after-tax real interest rate in each of the following cases.

   (a) The nominal interest arte is 10% and the inflation rate is 5%.
   (b) The nominal interest rate if 6% and the inflation rate is 2%.
   (c) The nominal interest rate is 4% and the inflation rate is 1%.

5. Suppose that people expected inflation to equal 3%, but in fact prices rises by 5%. Describe how this unexpected inflation would help or hurt the following:

   (a) The government
   (b) A homeowner with a fixed rate mortgage
   (c) A union worker in the second year of a labour contract
   (d) A college that has invested some of its endowment in government bonds

Answer:

1.

(a) Price level is 2. Velocity is 20.
(b) Nominal GDP remains unchanged. P falls by 5%.
(c) To keep the price level stable, the Bank of Canada must increase the money supply by 5 percent, matching the increase in real GDP
(d) If the Bank of Canada wants inflation to be 10 percent, it will need to increase the money supply 15 percent.

2. If a country's inflation rate increases sharply, the inflation tax on holders of money increases significantly. Wealth in savings accounts is not subject to a change in the inflation tax because the nominal interest rate will increase with the rise in inflation. But holders of savings accounts are hurt by the increase in the inflation rate because they are taxed on their nominal interest income, so their real returns are lower.

3. If inflation is less than expected, creditors benefit and debtors lose. Creditors receive dollar payments from debtors that have a higher real value than was expected.

4.

(a) Before-tax real interest rate = 5%. With 40% tax on interest income, savers receive after-tax nominal interest rate of 6%, so the after-tax real interest rate is 1%.
(b) Before-tax real interest rate = 4%. After-tax nominal interest rate = 3.6%. After-tax real interest arte = 1.6%.
(c) Before-tax real interest rate = 3%. After-tax nominal interest rate = 2.4%. After-tax real interest arte = 1.4%.

5.

(a) Unexpected inflation helps the government by providing higher inflation tax revenue and reducing the real value of outstanding government debt.
(b) Unexpected inflation helps a homeowner with a fixed-rate mortgage because he pays a fixed nominal interest rate that was based on expected inflation, and thus pays a lower real interest rate than was expected.
(c) Unexpected inflation hurts a union worker in the second year of a labor contract because the contract probably based the worker's nominal wage on the expected inflation rate. As a result, the worker receives a lower-than-expected real wage.
(d) Unexpected inflation hurts a college or university that has invested some of its endowment in government bonds because the higher inflation rate means the college or university is receiving a lower real interest rate than it had planned.