

ECONOMIC FLUCTUATION, AGGREGATE DEMAND I

TRUE OR FALSE STATEMENTS

1. Due to a decrease in money supply, the Aggregate Demand curve shifts upward (to the right), price level and output increases.
2. As an effect of an adverse supply shock price level increases, output decreases, Aggregate Demand curve is unchanged, while the SRAS shifts downward.
3. A decrease in the Aggregate Demand decreases the price level in the short-run and decreases the output in the long-run.
4. Increasing the government purchase results in the LM curve shifting downward.
5. If we decrease money supply the Aggregate Supply curve will shift outwards.
6. Aggregate Demand curve has a positive slope. The higher the price level is (P), the more the real money balances (M/P) is and as a result the higher the demand for the products and services (Y) will be.

EXERCISES

1. In an economy the nominal supply of money is 1600, the velocity of money is 4. The natural level of income is 800.
 - a) Determine the short-run and the long-run aggregate supply curves.
 - b) Let suppose, that the central bank decreases money supply by 25 percent. What happens in the short run?
 - c) What changes would occur in the long run compared to the original situation of the market? Illustrate it.
2. In an economy the nominal supply of money is 3000, the velocity of money is 6. The price level is 4.
 - a) Determine the long-run aggregate supply curve.
 - b) Let suppose, that the central bank increases money supply by 20 percent. What happens in the short run and in the long run? Illustrate it.
3. In an economy the following data are known: nominal supply of money is 5000, the velocity of money is 2, the natural level of income is 5000.
 - a) Determine the short-run aggregate supply curve.
 - b) Let suppose, that the central bank increases money supply by 30 percent. What happens in the short run and in the long run? Illustrate it.
4. We know the following about the aggregate demand of an economy: if the price level is 300, the demand will be 6000. A 30 percent increase in the price level causes a 15 percent decrease in the demand. The aggregate demand curve is linear. The natural level of income is 2000.
 - a) Determine the equation of the AD curve.

- b) Because of an unfavourable economic situation, the short run aggregate supply curve shifts upward and as a result, the price level increases by 10 percent. How deep recession will be the result of this market change?
- c) The central bank increases the aggregate demand (the slope of the curve doesn't change) in order to avoid recession. Calculate the new aggregate demand curve.
5. We have the following information on a closed economy: $MPC=0.4$; $C_0=400$; $I=1200-6r$; $G=1200$; $T=500$; $TR=0$; $L=0.5Y-25r$.
- a) Calculate the aggregate demand as a function of nominal supply of money and the price level.
- b) Determine the equilibrium level of income and the equilibrium interest rate if $P=2$ and $M=4000$.
6. An economy can be characterised by the following equations: $Y=C+I+G$, where $Y=8000$, $G=3000$, $T=2000$, $Tr=100$, $MPC=0.8$; $C_0=300$, $I_0=700$ which decreases by 80 units if the interest rate increases by 1 percent.
- a) Determine the equilibrium interest rate.
- b) Calculate the amount of public, private and national savings.
7. The consumption function of an economy is $C=200+0.8(Y-T+Tr)$, investment is $I=300$, the government purchases (G) are 400, the tax function is $T=160+0.25Y$.
- a) Calculate the equilibrium level of income and the budget balance, if the government doesn't have any further revenues or expenditures.
8. The short run characteristics of an economy are the following: The saving function is linear, one unit increase in the income causes 0.6 increase in consumption (autonomous consumption is unknown). The investment function is $I=1000-2,4r$. Money supply is 10000, $P=5$, the demand for real money balances is $L=0.5Y-4r$.
- a) Determine the IS curve and the LM curve.
- b) Calculate the autonomous consumption if the money and the goods markets are in equilibrium and the equilibrium interest rate is 10 percent. Determine the equilibrium level of income.
- c) Let suppose, that the level of income is 5000 and the interest rate is 20. Characterise the situation of the market for goods and services and the money market.
9. An economy can be characterised by the following data: the autonomous consumption is 300, MPC is 0.8. The government purchases goods and services for 400 units while it pays 20 unit of transfer to the private sector. Taxpayers are to pay 200 of tax independently of their income (autonomous tax) and an additional income tax with a 25 percent tax rate. $I_0=500$ which decreases by 16 units if the interest rate increases by 1 percent. The demand for real money balances is $L=0.8Y-4r$. The nominal supply of money is 3930, the price level $P=2,5$.
- a) Determine the values of Y , r , C , I and T , in case of equilibrium.
- b) Calculate the budget balance in this case.
- c) How do the equilibrium values of the variables, calculated at point a) change, if the government abolishes transfers and autonomous tax, and increases the tax rate from 25 percent to 50 percent?

SOLUTIONS

1. a) $LRAS=Y=800$, $SRAS=P=8$; b) $M_2=1200$, $Y_2=600$; c) $LRAS=Y=800$, $P_2=6$
2. a) $LRAS=Y=4500$; b) $M_2=3600$, Short run: $SRAS=P=4$, $Y_2=5400$, Long run: $LRAS=Y=4500$, $P_2=4,8$
3. a) $SRAS=P=2$; b) $M_2=6500$, Short run: $Y_2=6500$, Long run: $P_2=2,6$
4. a) $AD: Y=9000-10P$; b) $SRAS_1=P_1=700$, $SRAS_2=P_2=770$; $Y_1=2000$, $Y_2=1300$, due to the recession output decreased by 35%; c) $AD_2: Y=9700+10P$, $Y=2000$.
5. a) IS: $Y=4333,3-10r$, LM= $0,5Y-25r$; AD: $Y=0,33M/P+3610,83$; b) AD: $Y^*=4270,83$, $r^*=6,25$
6. a) $r^*=11$; b) $S_{national}=-180$, $S_{public}=-1100$, $S_{private}=920$
7. a) $Y^*=1930$; b) $S_{public}=242,5$
8. a) IS: $Y=2,5C_0+2500-6r$, LM: $Y=4000+8r$; b) $C_0=656$, $Y^*=4080$; c) Excess supply in the market for goods and services, excess demand in the market for money.
9. a) IS: $Y=2640-40r$, LM: $Y=1965+5r$, $r^*=15$, $Y^*=2040$, $C=1380$, $I=260$, $T=710$; b) $S_{public}=290$; c) IS: $Y=2000-26,66r$, LM: $Y=1965+5r$, $r_2^*=1,1$, $Y_2^*=1970,5$

AGGREGATE DEMAND II

TRUE OR FALSE STATEMENTS

1. The sum of MPS and consumption rate is always 1.
2. While calculating disposable income it is enough to consider the level of income, autonomous tax and income tax.
3. Absolute values of autonomous consumption and autonomous saving are always the same.
4. An increase in autonomous investment shifts the LM curve to the left (downward).
5. The expenditure multiplier and the tax multiplier change the equilibrium income by the same ratio, but in different direction.
6. An increase in government purchases raises the equilibrium income and decreases the interest rate.

EXERCISES

1. In a closed economy $MPS=0.2$; autonomous consumption is 400. Investment is 500. Let suppose, that the government imposes 100 autonomous tax and 50 transfers while it makes a purchase for 200.
 - a) Determine the consumption and saving functions of the two sector economy (ignoring the state as an economic actor).
 - b) Determine the equilibrium level of income and the level of consumption and saving in this case, now consider the transfer and tax as well.

2. In an economy $TR=200$, $t=0.2$. The following table shows several levels of income, tax revenue and consumption (consumption function is linear).

Y	T	C
0		25
400	380	
800		505
1000	500	

- a) Calculate the autonomous tax, MPC and autonomous consumption.
 - b) Fill in the table.
3. We have the following information on an economy: the demand for real money balances is $L=0.4Y-100r$, the real income is 2000. Money supply is 1200, price level is 2.
 - a) Determine the equilibrium interest rate.
 - b) Let suppose that the real income increases by 10 percent and the price level increases by 5 percent. What change in money supply is needed to reach the equilibrium at constant interest rate?
 4. We have the following information on a closed economy: $MPC = 0.75$; $C_0=100$; $I=500-20r$; $G=600$; $T_0=300$; $t=0$; $TR=0$; $M=1000$; $L=0.25Y-20r$.
 - a) Determine the IS curve and the LM curve, if $P=2.5$.
 - b) Determine the equilibrium level of income and the equilibrium interest rate.
 - c) Calculate the amount of public, private and national savings.

5. We have the following information on an economy: $C=100+0.75Y$; $I=800-20r$; $M=1100$; $L=100+0.5Y-40r$.

- Find the equilibrium interest rate and the equilibrium level of income, if the price level is 1.
- Characterise the situation of the market for goods and services and the money market, if the actual interest rate is 12 and the real income is 2640 ($P=1$). What happens to markets?

6. We know the following about a closed economy: $MPC=0.75$, autonomous consumption is 500, the investment function is $I=3000-100r$, the tax function is $T=300+0.2Y$ (there's no transfer), government purchases are 4000, and the demand for real money balances is $L=0.2Y-200r$. Money supply is 3000; $P=2$.

- Determine the equilibrium level of income, the interest rate and the budget balance.
- The government wants to increase national income with fiscal policy measures. It raises government purchases by 500. Calculate the new values of Y and r . How high is the crowding-out effect?
- Let suppose that the central bank increases money supply so that the interest rate will not change. Calculate the new values of Y and the crowding out effect.
- Calculate the government expenditure multiplier.

7. An economy can be characterised by the following data: $S(Y)=0.3Y-100$; $I=425-45r$; $L=5Y-800r$; $M=1000$; $P=1$ and fixed. At the beginning, $r=3\%$, $Y=1100$.

- Determine the IS curve and the LM curve.
- Calculate the excess supply/excess demand in the markets.
- Determine the equilibrium level of income and the interest rate.
- How do the equilibrium values change, if the autonomous consumption increases by 100 and the government imposes an autonomous tax of 200 (the interest rate doesn't change)?

8. We know the following about a closed economy: one unit increase in the income causes 0.2 unit increases in savings. Autonomous consumption is 300. The investment function is $I=1000-40r$; $G=1200$, $T=500$, $TR=0$. The demand for real money balances is $L=0.3Y-20r$.

- Determine the equilibrium level of income and the equilibrium interest rate, if $P=4$ and $M=5000$.
- Calculate the budget balance in this case.

SOLUTIONS

1). a) $C(Y)=400+0.8Y$; $S(Y)=-400+0.2Y$. b) $Y=5300$; $C(Y)=4600$; $S(Y)=650$.

2). a) $T_0=300$; $C_0=100$; $MPC=0.75$

Y	T	C
0	300	25
400	380	265
800	460	505
1000	500	625

3). a) $r=2\%$; b) $M=1428$; $\Delta M=+228$ (19%)

4). a) IS: $Y=3900-80r$; LM: $Y=1600+80r$; b) $r^*=14.375\%$; $Y^*=2750$. c) $S_{public}=-300$; $S_{private}=512.5$; $S_{national}=212.5$.

5). a) $r^*=10\%$; $Y^*=2800$; b) Market for goods and services: equilibrium; money market: excess supply 160. LM shifts to the left.

6). a) $r^*=8.55\%$; $Y^*=16050$; $S_{public}=-490$; b) $Y^*=17050$; $r^*=9.55\%$; $I=2045$. Crowding out effect 100. c) $Y^*=17300$ crowding out effect=0 d) government purchase multiplier=2.5.

7). IS: $Y=1750-150r$; LM: $Y=200+160r$; b) Market for goods and services: excess demand 60; money market: excess demand 2100. c) $Y^*=1000$; $r^*=5\%$; d) $\Delta Y=-133.3$

8). $Y^*=5750.06$; $r^*=23.75\%$; b) $S_{public}=-700$