

**EC 205 Macroeconomics**

Fall 2023

Problem Session 6**1. Basics of the Keynesian Cross**

Consider a closed economy to which the Keynesian-cross analysis applies. Consumption is given by the equation $C = 200 + 2/3(Y-T)$. Planned investment is $I=300$ (which is independent of the real interest rate), and government spending and taxes are constant at $G=T=300$, as well.

- a. Graphically illustrate the planned expenditure using the Keynesian Cross we studied in class.
- b. If Y is 1,500, what is the level of planned spending? What is the level of inventory accumulation or decumulation? Should the equilibrium Y be higher or lower than 1,500? Why?
- c. What is the equilibrium level of Y ?
- d. What are equilibrium consumption, private saving, public saving, and national saving levels?
- e. How much does the equilibrium income increase/decrease when G is reduced from 300 to 200? What is the multiplier for government spending?
- f. How much does the equilibrium income increase/decrease when T is reduced from 300 to 200? What is the multiplier for tax?

2. IS/LM Numerical Example

- a. Suppose the goods-market of the economy of Macronium is described by the following set of equations:

Consumption: $C = 450 + 0.5(Y - T)$

Investment: $I = 250 - 1000r$

Government Expenditure: $G = 200$

Taxes: $T = 200$

Derive the IS relation, which gives equilibrium output in terms of the real interest rate.

- b. Suppose the money market is described by the following equations:

Money Demand: $(M/P)^d = Y - 4000r$

Money Supply: $(M/P)^s = 1,300$

Derive the LM relation, which gives the equilibrium output Y , in terms of the real interest rate, r .

- c. Solve for the equilibrium real interest rate.
- d. Solve for the equilibrium real output.
- e. The government now increases its expenditures by 150. What is the effect of this change on the equilibrium output?
- f. Repeat part e, only now suppose the Fed has implemented an interest rate target (that you calculated in part c: The Fed will change the money supply in order to maintain the same interest rate as before in part c) What is the effect of the increase of government spending now? What should the new money supply be under this new equilibrium? Compare this result to that of part e and explain why the change in output is higher/lower.
- g. Calculate consumption, investment, private saving, public saving & national saving under the equilibrium you calculate in part f.

3. IS/LM Numerical Example

Assume that an economy is characterized by the following equations:

$$C = 100 + (2/3)(Y - T), T = 600, G = 500, I = 800 - (50/3)r$$

$$M_s/P = M_d/P = 0.5Y - 50r$$

- a. Write the numerical IS curve for the economy, expressing Y as a numerical function of G , T , and r .
- b. Write the numerical LM curve for this economy, expressing r as a function of Y and M/P .
- c. Solve for the equilibrium values of Y and r , assuming $P = 1.0$ and $M = 1,200$. How do they change when $P = 2.0$? Check by computing C , I , and G .
- d. Write the numerical aggregate demand curve for this economy, expressing Y as a function of G , T , and M/P .