

Problem Set 2: The Keynesian Cross; Liquidity Preference Theory
IS-LM Analysis

Answer all the parts of the questions separately giving your reasons for your answer.

1. Consider the Consumption Function: $C = c_0 + c_1(Y - T)$
 - a) What is the intuition for the form of the consumption function?
 - b) c_0 is often called autonomous consumption. What does represent?
 - c) What does c_1 called? What does it represent? Does it face any particular restrictions?
 - d) Suppose there was a shift in tastes of consumption. How could that be represented in the equation above?

2. Lets start with our workhorse Keynesian Model. [Question 2 in Blanchard's Chapter 3, pg. 62].

Suppose the economy is characterized by the following behavioral equations:

$$C = 160 + 0.6Y_D$$

$$I = 150$$

$$G = 150$$

$$T = 100$$

Solve for:

- a. Equilibrium GDP (Y)
 - b. Disposable Income (Y_D)
 - c. Consumption Spending (C)
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3. Consider the Investment Function: $I = I_0 - br$
 - a) What is I_0 ? What does it represent?

- b) What is b ? What does it represent? Are there any parameter restrictions on b ?
- c) What is the intuition for the negative relationship between investment and real interest rates? What assumption have we made?
- d) [Harder] What happens if there is a shift in expectations of inflation? How does that affect the investment function? [Hint: Use your answer to the last part of (c) to give you some idea.]

4. The IS curve represents equilibrium in the goods market. One way it can be derived is from the Keynesian Cross, where aggregate expenditure equals aggregate income in the economy, i.e. $Y = E$ where $E = C + I + G$ and G is exogenous government expenditure. Its functional form can be represented as:

$$Y = \frac{c_0 + I_0 + G - c_1 T}{1 - c_1} - \frac{b}{1 - c_1} r$$

- a) Draw the IS curve in (real) interest rate & output space, i.e. (r, Y) space.
- b) What is the slope of the IS curve?
- c) Suppose there is an increase in c_0 . What happens to the IS curve?
- d) What is meant by the multiplier effect? What is the government multiplier, i.e. what is the full effect on Y from a unit increase in G , i.e. $\frac{\Delta Y}{\Delta G}$?
- e) What variables cause a shift of the IS curve? What variables cause a movement along the IS curve?

5. Suppose investment also depends positively on output so that $I = I_0 + aY - br$ with $a > 0$ (this is sometimes referred to as an "accelerator" effect).

- (a) Why do you think such an effect might be present?
- (b) How is the slope of the IS curve affected?
- (c) How is the value of the multiplier affected?
- (d) What happens in (b) and (c) if $a + c > 1$? Explain!

6. Consider the demand for money equation: $L(r, Y) = m_0 + kY - hr$

- a) What is the intuition for the form of the demand for money equation?
- b) What does k represent? Is there any parameter restriction?
- c) What does h represent? Is there any parameter restriction?
- d) What assumption is being made here with respect to the fact that the demand for money is a function of the real interest rate? Why may this be important?

7. The LM curve represents equilibrium in the money market, where the demand for money equals the amount of real money balances in the economy i.e. $\frac{M^S}{P} = L(r, Y)$. This can be written as:

$$\frac{M^S}{P} = m_0 + kY - hr$$

- a) Draw the LM curve in (real) interest rate & output space, i.e. (r, Y) space.
 - b) What is the slope of the LM curve?
 - c) Suppose there is an injection of money into the economy by the government, i.e. M^S increases. What happens to the LM curve?
 - d) What would cause a shift of the LM curve? What causes a movement along the LM curve?
 - e) Suppose that incomes go up. This leads to disequilibrium in the money market. What is the mechanism by which equilibrium is restored once again in the money market?
8. (Blanchard, question 4, Chapter 5: pg 111). Consider the following IS-LM model:

$$\begin{aligned}C &= 200 + 0.25Y_D \\I &= 150 + 0.25Y - 1000i \\G &= 250; T = 200 \\ \left(\frac{M}{P}\right)^d &= 2Y - 8000i \\ \frac{M}{P} &= 1600\end{aligned}$$

- a. Derive the IS relation.
- b. Derive the LM relation.
- c. Solve for equilibrium output.
- d. Solve for the equilibrium real interest rate.
- e. Solve for the equilibrium values of C and I and verify the value you obtained for Y by adding up C, I and G.
- f. Now suppose that the money supply increases to $\frac{M}{P} = 1840$. Solve for Y, i, C and I and describe in words the effects of an expansionary monetary policy.
- g. Set $\frac{M}{P}$ equal to its initial value of 1600. Now suppose that government spending increases to $G = 400$. Summarize the effects of an expansionary fiscal policy on Y, i and C .