

## ECO 209Y MACROECONOMIC THEORY

### Problem Set 11

1. Consider the Keynesian model of a closed economy where the money supply is exogenously determined. Suppose this model is characterized by the following behavioural equations:  
$$C = 60 + 0.8 Y_D \qquad L = 0.2 Y - 10 i$$
$$I = 200 - 20 i + 0.2 Y \qquad M/P = 300$$
$$G = 300$$
$$TA = 0.25 Y$$
$$TR = 50$$
  - a) What is the equation for the IS curve?
  - b) What is the equation for the LM curve?
  - c) What are the equilibrium levels of income and interest rate?
  - d) Suppose that government purchases increase by 120. What is the equation for the IS curve now?
  - e) What are the equilibrium levels of income and interest rate after the increase in government purchases?
2. Consider the Neo-Keynesian model of a closed economy where the money supply is endogenously determined. Except for the money supply function, assume this model is characterized by the same behavioural equations as in the previous question.
  - a) Suppose the central bank implements monetary policy following a money supply rule where the endogenous money supply function is  $M/P = 200 + 10 i$ . What is the equation for the LM curve in this model?
  - b) What are the equilibrium levels of income and interest rate?
  - c) Suppose that government purchases increase by 120. What are the new equilibrium levels of income and interest rate?
  - d) Suppose now that the central bank implements monetary policy following an interest rate rule and sets the interest rate at 10. What are the equilibrium levels of income and interest rate when government purchases are 300?
  - e) Suppose that government purchases increase by 120. What are the new equilibrium levels of income and interest rate?
3.
  - a) In a clearly-labelled diagram, show all the equilibriums of questions 1 and 2 above.
  - b) Why are these equilibriums different? Briefly explain in economic terms.
4. Consider the following Post-Keynesian Structuralist model of a closed economy:
  - There are three rates of interest in this model: 1) the loans rate of interest ( $i_L$ ) set by the commercial banks; the bank rate ( $i^*$ ) set by the central bank; and the bond rate of interest ( $i$ ) determined by the demand and supply of money.
  - The equation of the demand for loans is  $i_L = -0.1 L + 0.019 Y$ , and banks are willing to supply any amount of loans at  $i_L = 1.5 i^*$ .
  - There is no currency in this model, so the money supply consists only of bank deposits.
  - Banks' reserves ( $R$ ) are kept constant at 5% of the money supply (i.e., bank deposits).

- Banks' assets consist only of loans ( $L$ ) and reserves ( $R$ ), and banks' liabilities only of clients' deposits. Banks' equity is 16.
  - The supply of money is  $M^S = M$  and the demand for money is  $M^D = 0.3 Y - 10 i - 130$ .
- a) If the bank rate is set at  $i^* = 4$ , what is the level of bank loans ( $L$ ) as a function of real income ( $Y$ )?
  - b) As a function of real income ( $Y$ ), what is the equation for the money supply ( $M^S$ )?
  - c) What is the equation for the  $LM$  curve?
  - d) If the equation for the  $IS$  curve is  $i = 15 - 0.01 Y$ , what are the equilibrium values of income and the bond rate of interest?
  - e) In equilibrium, what are the values of bank loans and the money supply?
  - f) What determines the sign of the slope of the  $LM$  curve? Briefly explain why the  $LM$  curve of part c) above has a positive slope.