

## ECO 209Y MACROECONOMIC THEORY Problem Set 10

1. Consider the Neo-Keynesian model of money and banking. Suppose the Canadian banking system is characterized as follows: 1) there is only one commercial bank; 2) the desired reserve ratio is 10% against demand deposits; 3) the commercial bank does not hold any reserves above the desired level; 4) the public's currency-deposit ratio is 0.15. Considering only the M1 definition of money supply answer the following questions:

a) What is the value of the money multiplier?

Now assume that the public already has any cash it wants, and that any extra cash is redeposited in the individuals' chequing accounts.

- b) For any additional change in the stock of high-powered money, what is the value of the money multiplier now?
- c) Suppose the Bank of Canada purchases \$1 Billion in Government Bonds from the public. What is the total (final) change in the money supply? (In your answer, show the changes in the balance sheets of the public, the commercial bank, and the Bank of Canada.)
- d) Suppose that the Bank of Canada sells \$1 Billion in Government of Canada bonds to the public. How is the money supply affected? (In your answer, show the changes in the balance sheets of the public, the commercial bank, and the Bank of Canada.)
- e) Suppose now that the government borrows \$1 Billion from the public to finance its deficit (that is, the government sells \$1 Billion in bonds to the public). How is the stock of high-powered money affected? How is the money supply affected? (In your answer, show the changes in the balance sheets of the public, the government, the commercial bank and the Bank of Canada.)
- f) Same as in part (e) but suppose that now the government borrows \$1 Billion from the Bank of Canada in order to finance its deficit (that is, the government sells \$1 Billion in bonds to the Bank of Canada).

Now let us go back to the initial situation where the public's currency-deposit ratio is 15%, that is, to the situation where the public does not redeposit all extra cash in their chequing accounts.

- g) Suppose the Bank of Canada purchases \$1 Billion in Government Bonds from the public. What is the total (final) change in the money supply? (In your answer, show the changes in the balance sheets of the public, the commercial bank, and the Bank of Canada.)

2. Consider the Neo-Keynesian model of money and banking. The banking system of a hypothetical economy consists of only one commercial bank, and this commercial bank does not hold any reserves above the desired level. The public also holds money in the desired ratio between currency and chequable deposits. The balance sheets (T-accounts) of the public and this commercial bank look as follows:

Public				Commercial Bank			
Currency	200	Loans	800	Currency	100	Deposits	1 000
Deposits	1 000	Equity	1 700	Deposit at B of C	100	Other liab.	500
Other assets	1 300			Loans	800		
				Gov't bonds	200		
				Other assets	300		

Note: Public's "Deposits" refers to chequable deposits only, and "Deposit at B of C" represents the deposits that this commercial bank holds at the Bank of Canada.

Given the information in the above balance sheets and considering only the M1 definition of money supply, answer the following questions:

- a) What is the value of the bank's target reserve ratio?
- b) What is the public's desired currency-deposit ratio?
- c) What is the value of the money multiplier?
- d) Suppose that the bank's deposits at the Bank of Canada increase by \$100 million as a result of the bank selling \$100 worth of government bonds to the Bank of Canada. Show all the changes in the balance sheets of the public and the commercial bank, i.e., show the new final values for all items.

Public		Commercial Bank	
Currency	Loans	Currency	Deposits
Deposits	Equity	Deposit at B of C	Other liab.
Other assets		Loans	
		Gov't bonds	
		Other assets	

- e) What is the final change in the bank's reserves?
  - f) What is the final change in the money supply?
3. Consider the Neo-Keynesian model of money and banking. Suppose that the demand for money function was  $M_D = 4Y - 1\,000i$  where  $M_D$  is the quantity of money demanded,  $i$  is the rate of interest (an interest of 5 means 5 percent in this problem), and  $Y$  is real national income which currently is 1 500. The supply of money is 1 000, the target reserve ratio is 10 percent, there is no cash drain in the banking system, and the recessionary gap is 250. The price level does not change in this problem.
- a) What is the equilibrium value for the interest rate? What is the level of cash reserve of the banking system?
  - b) Suppose that the Bank of Canada estimates that a reduction of the rate of interest to 4 percent would move the economy to full employment. Given this estimate, what would be the quantity of money demanded at full employment?
  - c) Suppose the Bank of Canada reduces the target for the overnight rate prompting commercial banks to reduce the market rate of interest to 4 percent. Are the commercial banks experiencing now a situation of excess cash reserves or of too little cash reserves? What is the size of this excess/insufficient cash reserves when  $Y = 1\,500$ ?
  - d) What will the commercial banks do to eliminate this excess/insufficient cash reserves? By how much should the level of cash reserves of the banking system change for the economy to move to full employment?