

First challenge: Review solutions
spring 2012

Short answer questions (1-2 sentences)

Question 1

- a. A decrease in the interest rate decreases the opportunity cost of holding money. Therefore, households make less withdraws and save on the cost of withdraws.
- b. A decrease in withdraws implies households must withdraw enough money for many day's purchases. Money held for future purchases sits in wallets and checking accounts for longer before being spent. Therefore on average, households hold more money or money demand increases.
- c. Since dollars are held in wallets and checking for longer before being spent, each dollar is spent less times, which decreases velocity.

Question 2

- a. If the FED is believed, inflationary expectations will be low (less than 2%) and stable.
- b. Households will use the current inflation rate of 3% to predict future inflation rates. Therefore, inflationary expectations will be 3%, higher than in part (a).

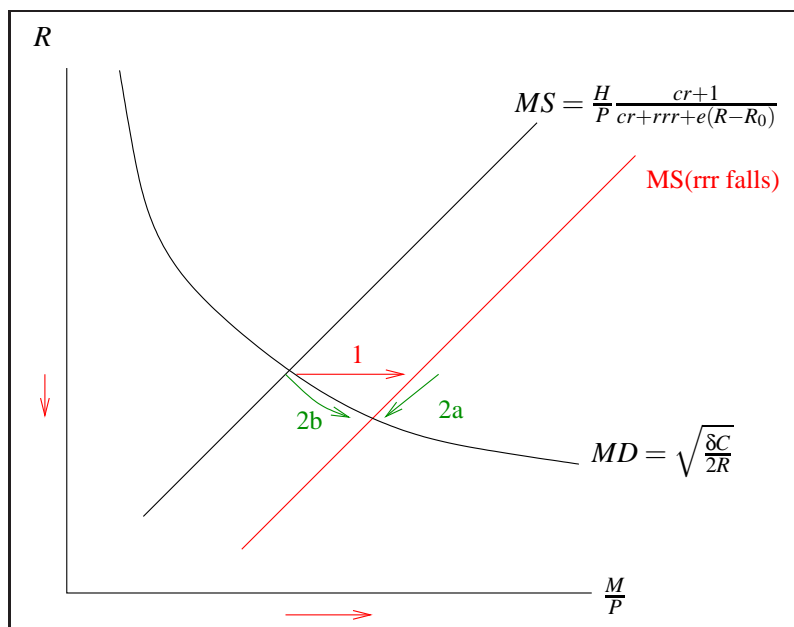
Question 3

An increase in inflationary expectations means households expect money to lose value quickly, and so money demand falls. A decrease in money demand means a decrease in the value of money. When money is less valuable, firms demand more money per unit of good, which is an increase in the price, which is inflation.

Longer Questions

Question 4.

We have:



So a decrease in the required reserve ratio causes banks to take some currency in reserve and use it to make more loans. In turn, some of the loans is kept in wallets as cash, increasing the money supply. The rest is redeposited at banks, creating checking accounts which increases the money supply and so on. Thus money supply increases regardless of the interest rate which is a shift to the right of money supply ('1' on the graph).

Since money supply exceeds money demand, the interest rate falls. The fall in R makes loans less attractive to banks, who will therefore hold more excess reserves. The money supply then falls as currency is removed from circulation. Thus money supply falls. Because the decrease in money supply is caused by a decrease in R , we move along the money supply curve ('2a' on the graph).

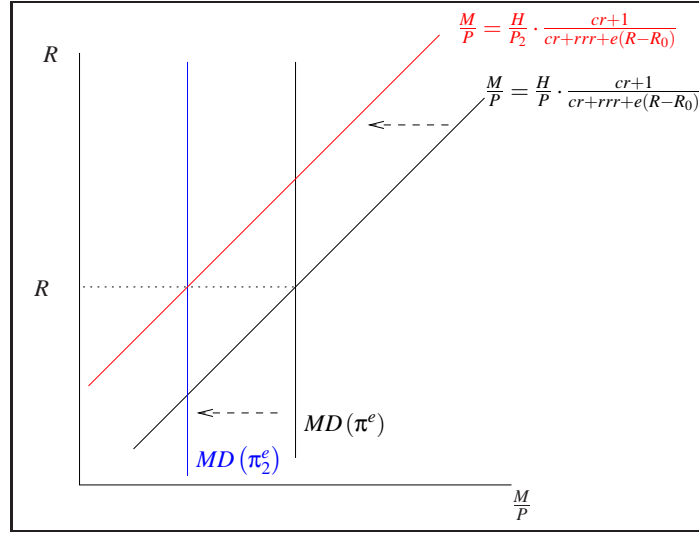
On the demand side, the falling interest rate causes households to make less withdraws since the foregone interest is less. Thus households hold more money on any given day as they are holding money both for today's expenses and expenses later in the month. Thus money demand rises. Because the increase in money demand is caused by a decrease in R , we move along the money demand curve ('2b' on the graph).

- a. The equilibrium interest rate falls due to the increase in money supply.
- b. The supply of real money balances rises as banks loan out reserves, some of which are redeposited as checking accounts.
- c. The number of withdraws per period falls due to the fall in interest rates.
- d. Total excess reserves rises due to the fall in interest rates.

- e. Total checking deposits rises. Money in circulation rises then falls but is overall higher. Therefore, more money is circulating through the banking system.
- f. Total bank lending rises as more money is circulating through the banking system.
- g. Consumption velocity falls, since withdraws fall.

Question 5.

We have:



- a. Inflationary expectations rise. Money demand falls, since people anticipate money will lose value quickly. Thus the opportunity cost of holding money rises, and people make less withdraws. Finally, because people are demanding less money, the value of money falls. Firms are less willing to accept dollars in exchange for goods, and so more dollars are required per good purchased. This is an increase in prices, or higher inflation. Because money demand decreases, velocity rises. Interest rates are constant in the Cagan model.
- b. Yes. Because people believed inflation would rise, inflation did rise, with no change in the money supply.

Question 6

a. We have:

$$k_{M2}(R) = \frac{cr + 1 + sr}{cr + rrr + e(R - R_0)}. \tag{1}$$

Plugging in gives:

$$k_{M2}(R) = \frac{\frac{1}{3} + 1 + 4}{\frac{1}{3} + \frac{1}{6} + \frac{1}{3} - \frac{1}{12}(4 - 2)} = 8. \quad (2)$$

b. We have:

$$M2 = k_{M2} \cdot H, \quad (3)$$

$$16 = 8H \rightarrow H = 2. \quad (4)$$

c. We have for example:

$$H = (cr + rd)D, \quad (5)$$

$$2 = \frac{2}{3}D \rightarrow D = 3. \quad (6)$$

$$cr = \frac{C}{D}, \quad (7)$$

$$\frac{1}{3} = \frac{C}{3} \rightarrow C = 1. \quad (8)$$

$$H = C + TR, \quad (9)$$

$$2 = 1 + TR \rightarrow TR = 1. \quad (10)$$

$$sr = \frac{S}{D}, \quad (11)$$

$$4 = \frac{S}{3} \rightarrow S = 12. \quad (12)$$

d. We have:

$$rrr = \frac{RR}{D}, \quad (13)$$

$$\frac{1}{6} = \frac{RR}{3}, \quad (14)$$

$$RR = \frac{1}{2}. \quad (15)$$

$$TR = RR + ER, \quad (16)$$

$$1 = \frac{1}{2} + ER \rightarrow ER = \frac{1}{2}. \quad (17)$$

e. We have:

$$\Delta M2 = k_{M2}\Delta H, \quad (18)$$

$$24 - 16 = 8\Delta H \rightarrow \Delta H = 1. \quad (19)$$

The FED would buy mortgage bonds.