Second Challenge: Solutions
Eco 403, Spring 2009

Question 1 (10 points)

In a liquidity trap, increases in high powered money are held as money demand in the form of cash in consumers' wallets (or mattresses in the Great Depression) or in banks as excess reserves, rather than being spent. Hence, an increase in high powered money has little effect on interest rates or investment spending. A liquidity trap often occurs during banking panics or extreme volatility in financial markets. In this case, consumers lose confidence in the financial system and increase their demand for cash, while banks increase their excess reserves.

Question 2 (10 points)

Brazil will have more seniorage in the long run. Overtime, as Brazil borrows, it's debt and therefore interest payments pile up. Eventually, Brazil is unable to get new loans as it has more debt than it can repay. At that point, Brazil uses seniorage to raise revenue, creating very high inflation.

Question 3 (8 points)

If inflationary expectations rise, but inflation is unchanged, then some firms raise prices too much. They see a decrease in demand, as customers can get cheaper products elsewhere. The firms misperceive the change in demand as relative, and therefore reduce output and layoff workers, creating unemployment.

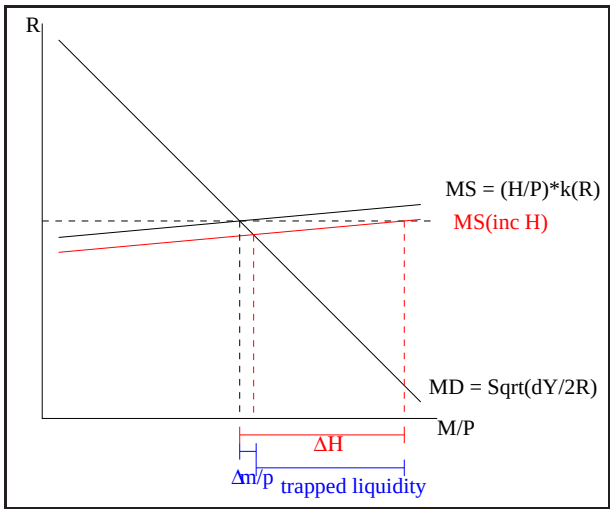
Question 4 (15 points)

a. The inflation tax is a relatively good tax on efficiency grounds. The inflation tax taxes money and so households hold less money and instead hold wealth in interest bearing accounts. This tends to increase investment over time, causing new factories to be built which in turn increases employment and wages. Costs such as menu costs and the misallocation of resources are presmuably small, as long as inflation is not too high.

b. The inflation tax is not a good tax on progressive grounds. The poor hold a relatively large fraction of their wealth in cash, whereas the rich have better access to interest bearing accounts.

c. The inflation tax has relatively low collection costs as no IRS or other collection agency is required. However, only the printed money is "collected" while the entire money supply is taxed, so some collection costs are incurred with the inflation tax.

Question 5 (10 points)

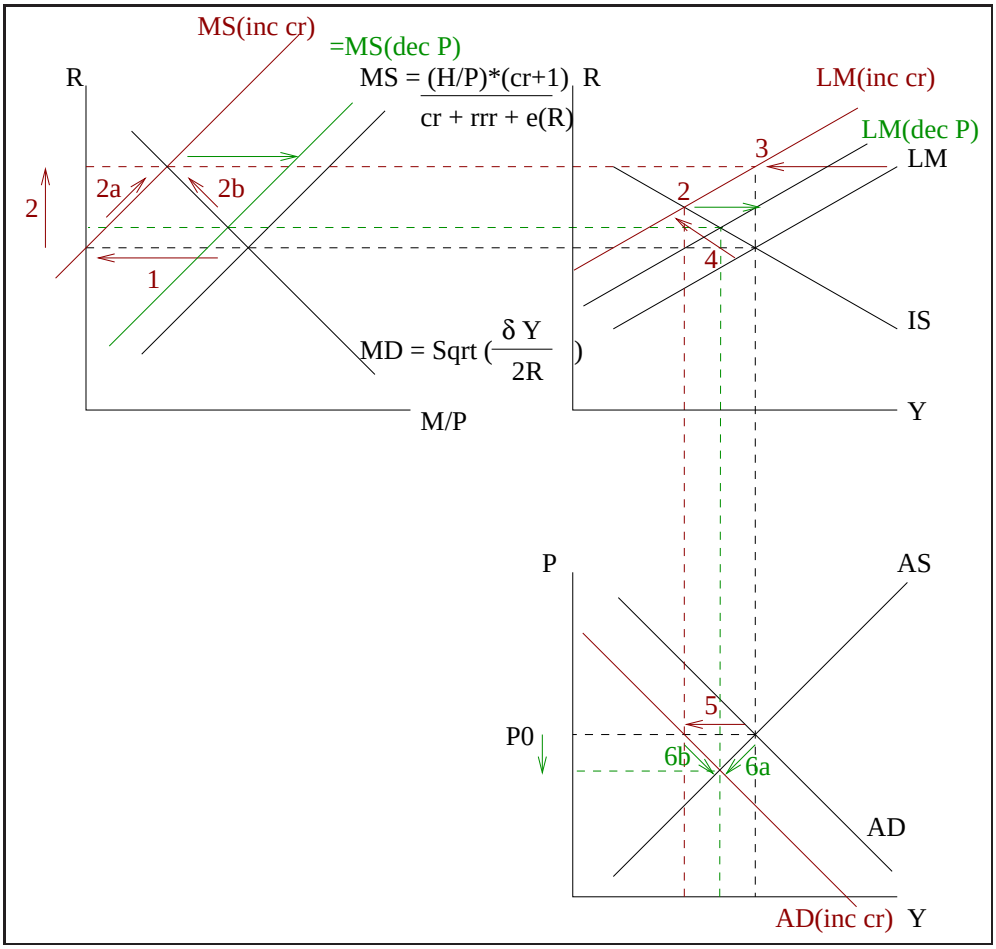


The increase in H went to excess reserves.

Longer Questions

Question 6 (25 points)

a. Here is the graph.



- Households covert checking deposits to cash in wallets, which by itself does not change the money supply since both are included. However, there is now less cash moving through the banking system which means less checking accounts are created, which reduces the money suppy. Thus the money supply falls, which is a shift to the left of the money supply curve ('1' on the graph).
- Money supply is now less than money demand which increases the interest rate (2). In turn, the increase in interest rates increases the opportunity cost of holding excess reserves (banks can loan excess reservers for higher interest rates) which causes excess reserves to fall and the money supply to rise (2a), although overall the money supply is still down.
- The increase in interest rates increases the opportunity cost (interest that could be earned in the interest bearing account) of holding money for households. Households keep money in the interest bearing account longer by making more withdraws, decreasing money demand (2b).
- The interest rate is higher, but we have not yet changed spending. Thus the LM curve must shift to the left (3).

- Higher interest rates means less demand for new houses, factories, and equipment. Investment spending falls. Since investment spending is part of total spending, total spending falls as well (4).
- Prices have not yet changed, but total spending or aggregate demand is lower. So the aggregate demand shifts left (5).
- Aggregate demand is less than aggregate supply so prices fall. A decrease in prices raises real wages since nominal wages are fixed in the labor market. Firms respond by hiring less workers and causing existing workers to work less. Hours worked and therefore production, or aggregate supply, falls (6a).
- Lower prices means the existing money supply buys more goods. The increase in real money supply lowers interest rates, which increases investment spending and total spending (6a and the green arrows), but not enough to offset the initial decrease in spending.

b. From the graphs and explanations, overall interest rates rise, equilibrium money supply which equals money demand falls, withdraws rise, investment spending falls, and output falls. Prices fall. Excess reserves fall.

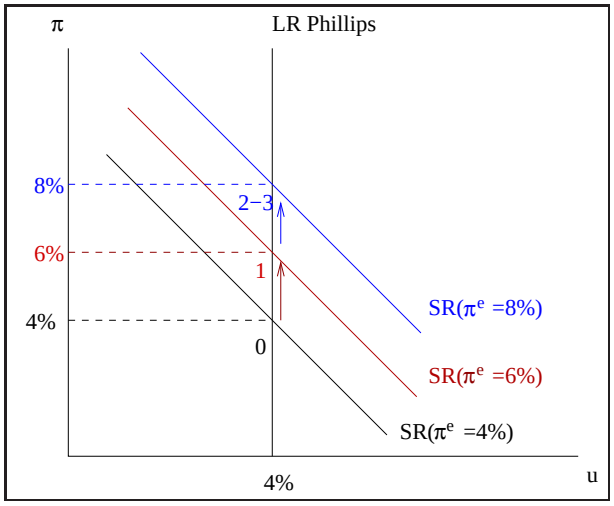
c. Policy choices are to increase H or decrease the required reserve ratio.

Question 7 (22 points)

a. Inflation is given for each period and expectations are equal to actual inflation. Thus:

period	inflation	expectations	unemployment
0	4	4	$u = NR + (3/2)(\pi_t^e - \pi_t) = 4 + 0 = 4$
1	6	6	$u = 4 + (3/2)\,0 = 4$
2	8	8	4
3	8	8	4

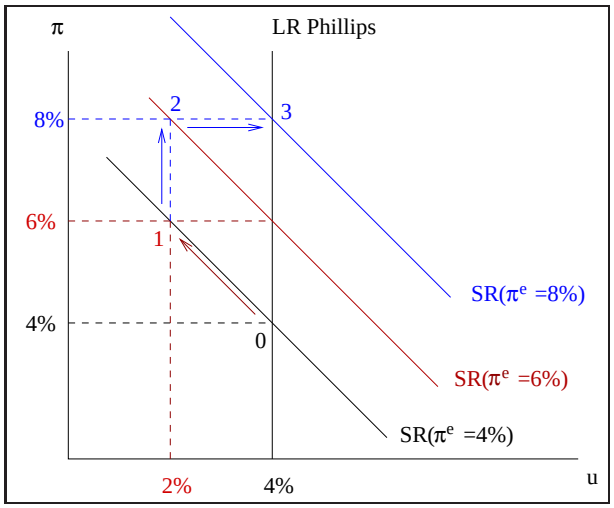
Graphically, the Phillips curve shifts each period since expectations are changing, but we are on the long run Phillips curve for all points.



b. The difference is that expectations are equal to previous inflation.

period	inflation	expectations	unemployment
0	4	4	4
1	6	4	$u = 4 + (3/2)(4 - 6) = 2$
2	8	6	2
3	8	8	4

Graphically, in period one expectations do not change so we move along the curve. We shift and move along the curve in periods two and three.



c. Transparency made monetary policy purely inflationary, as in the classical model, since there are no misperceptions. On the other hand, the no transparency case generated a decrease in unemployment and the same amount of inflation so no transparency was best.

d. Reducing inflation has the opposite property. A transparent policy results in a reduction in inflation with no unemployment, as was the case after WWI, when the promise to decrease inflation was credible. On the other hand, a policy which is not transparent results in high unemployment. Since no transparency is only beneficial if inflation is going to increase, some investors take a lack of transparency as a sign of higher future inflation.