The Federal Reserve controls the monetary policy of the economy. The policy tools available to the Fed are:

1. Required Reserve Ratios (RR): %age of deposits any depository institution has to hold as reserves.
2. Discount Rate: It is the lending rate at which the Fed (which is called the ‘lender of last resort’) lends reserves to depository institutions.
3. Open Market Operations: It is the purchase or sale of government securities (US Treasury Bills & Bonds) by the Fed in the open market.

How the Federal Reserve controls the money supply of the economy using these various measures:

a. Reserve ratio: When the Fed increases the RR, banks must hold more reserves. This means that their capacity to make loans goes down. This means the money multiplier \( (money\ multiplier = 1/RR) \) process is weakened, leading to the creation of less deposits in the economy. Hence money supply goes down. The reverse occurs for a fall in the RR.

b. Discount rate: For a higher discount rate, banks must pay a higher price to borrow any reserves from the Fed. So they borrow lower reserves from the Fed. But given the legal reserve requirement, this means that they have to lend less from their deposits. This too weakens the process of additional deposit creation in the economy, and curtails money supply. The reverse occurs for a lower discount rate.

c. Open market operation: In an open market operation, the Fed can buy or sell Government Treasury bills & bonds from either commercial banks or the general public.

Let us be clear at this point about what happens when the Fed engages in an open market purchase. In an open market purchase, the Fed buys T-bills/bonds from either the public or commercial banks, and pays them the price (in dollars) for them. So in this transaction, the Fed gets these promissory notes as the buyer, and the sellers get currency in return. But this new currency that gets injected into the economy via the open
market operation increases the money supply, both due to the initial increase in currency and the chain of deposit creation this increase brings about through the money multiplier process, due to the lending activities of the banking sector.

(Recall: The money multiplier process was described in lecture 16)

Note:

1. We must be careful not to double count the increase in currency due to the open market operation and the initial change in deposits it brings about when it is deposited in a bank. In any case, we must remember that even without open market operations if there is an increase in deposits occurring due to circulating currency being deposited in a bank, we should account for this conversion to avoid double counting.

2. If all the new currency created by the open market purchase is not deposited in banks but held as currency, then the money multiplier effect of the Fed’s purchase will be dampened [as this will constitute a ‘leakage’ from the money (deposit) creation process through the lending activities of commercial banks].

On the other hand, when the Fed engages in an open market sale, it sells T-bills/bonds to either the public or commercial banks, and gets paid their price (in dollars). So in this transaction, the Fed parts with these promissory notes as the seller, and the buyers give it currency in return. But this currency that gets taken away from the economy and decreases the money supply, both due to the initial decrease in currency and the chain of lower deposit creation this decrease brings about through the money multiplier process.

Q. So, what essentially is the Federal Reserve doing using all these policy measures?

Ans. It is shifting the supply curve in the money market in the direction it desires. That essentially is what monetary policy does.

This, in turn, affects the money market equilibrium. And as we saw in the last lecture, the equilibrium rate of interest in the money market has implications for the goods market equilibrium, through its effect on aggregate demand.
Let us now look at the following questions:

   a. What is the effect of monetary policy in the short run?
   b. What is its effect in the long run?

More specifically, we shall look at what happens to the money market equilibrium and the goods market equilibrium due to monetary policy, in both the short as well as the long run.

**The effect of a change (increase) in money supply undertaken by the Fed in the Short Run**

Consider an economy with the following features:

1. There is unemployment in the labor market (inflexible money wages).
2. Hence the goods market equilibrium is below the long-run potential output level.
3. Let the government use one or all of the monetary policy instruments to increase money supply in the economy.

(See diagram drawn in class):

- An increase in money supply decreases the interest rate in the money market.
- This shifts the AD curve upwards in the goods market (which was initially at an equilibrium below the potential level, as per our assumption).
- It now intersects the SAS at the intersection of the LRS and the SAS, rather than at a point to the left of it, as it was initially doing.
- The short run supply curve does not shift, as money wages are inflexible (as there is unemployment in the economy, it is possible to raise output by hiring more workers without raising the real wage rate).\(^1\)
- So in the short run, the economy moves from the equilibrium below the potential level, to the potential level. Monetary policy cures the unemployment problem.

**The effect of a change (increase) in money supply in the Long Run**

This is an economy in the long run equilibrium, with full flexibility of prices and wages. Hence it has the following features:

1. There is full employment in the labor market.

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\(^1\) Note that if you can employ more people without paying them higher money wages, it automatically implies (where the price level is not falling) that you do not need to pay higher real wages to hire more people.
2. The goods market equilibrium is at the long-run potential output level.

3. Let the government use one or all of the monetary policy instruments to increase money supply in the economy.

(See diagram drawn in class):

- An increase in money supply decreases the interest rate in the money market.
- This shifts the AD curve upwards in the goods market (which was initially at the potential level of output, as per our assumption).
- As output now increases beyond the potential level, and the labor market was already at the full employment level, this leads to an increase in real wages (employment can rise above the market clearing level only if higher real wages are offered), which means that the money wage paid to laborers has increased.
- Due to this the SAS curve shifts to the left since as money wages have increased, firms will supply same output only at a higher price (recall that we keep money wages fixed when we draw the SAS curve: a change in the money wage will shift it).
- The economy settles back to an equilibrium in which output is at the potential level, but prices are higher. Ultimately, the price increase pushes down the real wage rate again to its full-employment equilibrium level.
- So in the long run all that monetary policy has done is create inflation in the economy.