PGIM
India Mutual Fund

MACRO DEEP DIVE

December 2019

Money Supply

What does Money Supply in an Economy mean?

The money supply is the entire stock of "Money" in an economy as of a particular time. The money supply can include cash, coins, balances held in Banks as deposits, and other near money substitutes. Money supply is a key variable to understanding the macroeconomy.

It is a common notion that Money supply is controlled by the Central Bank of a country. This assumption is a simplification and, though the actions of the Central Bank of a country greatly influence the money supply in an economy, in reality the Central Bank only has an indirect control of the money supply in a country. The Money Supply in an economy is influenced by 3 main players in the economy, i.e. the Central Bank, the Banking Sector and the Public.

To better understand the concept of Money Supply we start with an example of a Country which has just established a Central Bank and the Central Bank has just issued a new currency (paper money).

The first Job of the Central Bank is to circulate this new currency amongst the population. The government of the country can decree the currency issued by the Central Bank to be the national currency and that it is a legal tender, i.e. that creditors are required to accept the money in settlement of debts and also accepting the new currency from public in payment of Taxes.

In general people accept paper money in payment of goods, services or assets because they expect to be able to use it to buy other goods, services or assets in the future. People accept paper money because they believe that other people will also accept it. The belief that money has value becomes self-justifying.

To circulate the new currency, the Central Bank can either buy assets from the public or the government can issue its debt to the Central Bank and accept money from the Central Bank. In either case, the money will be circulated in the economy.

We shall be assuming that the Central Bank buys government debt by paying the newly issued currency (money). We shall also assume that the government spends all the money it has received from the Central Bank by giving payments to the public for various works undertaken by the public for the government.

In the Central Bank's balance sheet, the currency it issues comes under the liability side as the money issued is the liability of the Central Bank. On the assets side, comes government securities issued by the government.

The liabilities of the Central Bank that are usable as Money are called the Monetary Base or high powered money.

Assuming that the Country has no banking system and hence no banking deposits and the government has spent all the money it received from the Central Bank, the paper currency held by the Public is the total Money Supply in the economy.

Hence in an all currency economy (one with no bank deposits) the money supply equals the Monetary Base (the liabilities of the Central Bank).

As the economy becomes more developed and sophisticated, a banking system develops in which banks show their willingness to accept deposits from the Public. Assuming that the public fears that the paper currency can be lost or stolen, the general public prefer to hold their money in bank deposits rather than in paper currency.

As the paper currency gets deposited in the banks (held in the bank's vault), the banking system assets are the paper currency and its liabilities are the deposits which are the banks obligation. The Central Bank's Balance sheet remains the same.

Bank reserves are liquid assets held by the banks to meet the demand for withdrawals by depositors or to pay the checks drawn on depositors' account.

Generally, bank reserves comprise currency held by banks in their vaults and deposits held by banks at the Central Bank of a country. In our example all the bank reserves are held as currency in the banks' vaults. As all the currency is held as reserves in the Banks' vaults, which equal the total deposits of the banks, this type of banking is called as 100% reserve banking as banks reserve equal 100% of the deposits. Under this 100% reserve banking system, banks are only acting as the safe keeper of the public deposits and cannot make money.

Assuming that in order to make banking viable, banks calculate that on an average banks do not need to keep more than

20% of the deposits as reserves to take care of the withdrawals or the switches from one account to another, the rest of the 80% of the deposit is free to be lent to earn interest for the bank. **This is known as Fractional Reserve Banking in which only a part of the banks deposit is held as reserve. The reserve deposit ratio is less than 1.** Fractional Reserve Banking is a profitable proposition for the banks as they can make interest bearing loans rather than keeping the deposits idle in their vaults.

Once the banking system makes loans to the extent of their deposits minus the reserves, the balance sheet of the banking system grows reflecting the loans given. These loans when given by the banks to the general public turn into equivalent deposits for the banks (assuming that the general public keep all the currency with the banks as deposits). This process keeps on repeating till the reserves of the banking system equal to 20% of the deposits. **This is known as the Money Multiplier concept which results in multiple expansion of loans and deposits under fractional reserve banking system.**

Money Supply at the end of this process equals the deposits held by the public (they are liquid assets which can be used for transactions) in the banks as we assumed earlier that the public do not hold any currency and have deposited all their currency with the banks as deposits.

Assuming no holding of currency by the Public, we would have the following relationship between the Money Supply and the monetary base with fractional reserve banking.

1. Assuming no Currency held by the Public, Money Supply Equals Bank deposits.

   M = DEP,
   Where, M= Money Supply, DEP= Total bank deposits

2. At the end of the Money Multiplier process, banks' reserves must equal the amount of currency distributed by the Central Bank (monetary base).

   BASE= DEP* res,
   Where, BASE = Monetary base, res= The bank's Reserve Deposit Ratio
   Thus, M = DEP = BASE/res

Hence, with the fractional reserve banking system and no currency held by the Public, the Money Supply equals the monetary base divided by the reserve deposit ratio. The money multiplier or the multiple expansion of loans and deposits allows the economy to create a Money Supply that is much larger than the Monetary Base. Thus each unit of monetary base permits creation of several units of Money supply.

What we have looked thus far is a simple example where the public does not hold money. Practically, in an economy the public holds both deposits in a bank and currency with itself. When the public holds both currency and deposits, the Money Supply is

M = CU + DEP
Where CU = Currency held by Public

Following from the above equation some of the monetary base is held as currency by the Public and the rest is held as reserves by banks, thus

BASE = CU + RES.
Where RES = total bank reserves

The Central Banks controls the amount of monetary base but does not directly control the money supply. Relating the money supply with the monetary base, we divide the money supply by the monetary base and get

$$M = \frac{CU + DEP}{BASE = CU + RES}$$

Next, we divide both the numerator and the Denominator on the right hand side of the above equation by deposits (DEP) to get

$$M = \frac{(CU / DEP) + 1}{BASE = (CU / DEP) + (RES / DEP)} \qquad \text{..... (A)}$$

The right hand of the above equation has two important ratios.

1. The first is the currency deposit ratio (CU+DEP) or CU, which is the ratio of the currency held by the Public to the Public's deposits in banks. The currency deposit ratio is determined by the public and depends on the amount of money the public wants to hold as currency versus the amount it wants to hold as deposits. The Public can raise the currency – deposit ratio to any level that it wants by withdrawing from banks (which increases currency held and reduces deposits) and similarly by depositing currency in banks, the public can lower the currency-deposit ratio.

2. The second important ratio is the 'reserve deposit ratio which is determined by the banks themselves'.

When the process of Multiple expansion of loans and deposits is complete, the currency deposit ratio equals the ratio desired by the Public and the reserve deposit ratio equals the ratio as desired by the banks.

Reconstituting the equation (A) given above by substituting cu for CU / DEP and res for RES / DEP and multiplying both sides by BASE, we arrive at the following equation:

$$M = \frac{(cu+1)}{(cu+res)} \text{ BASE}$$

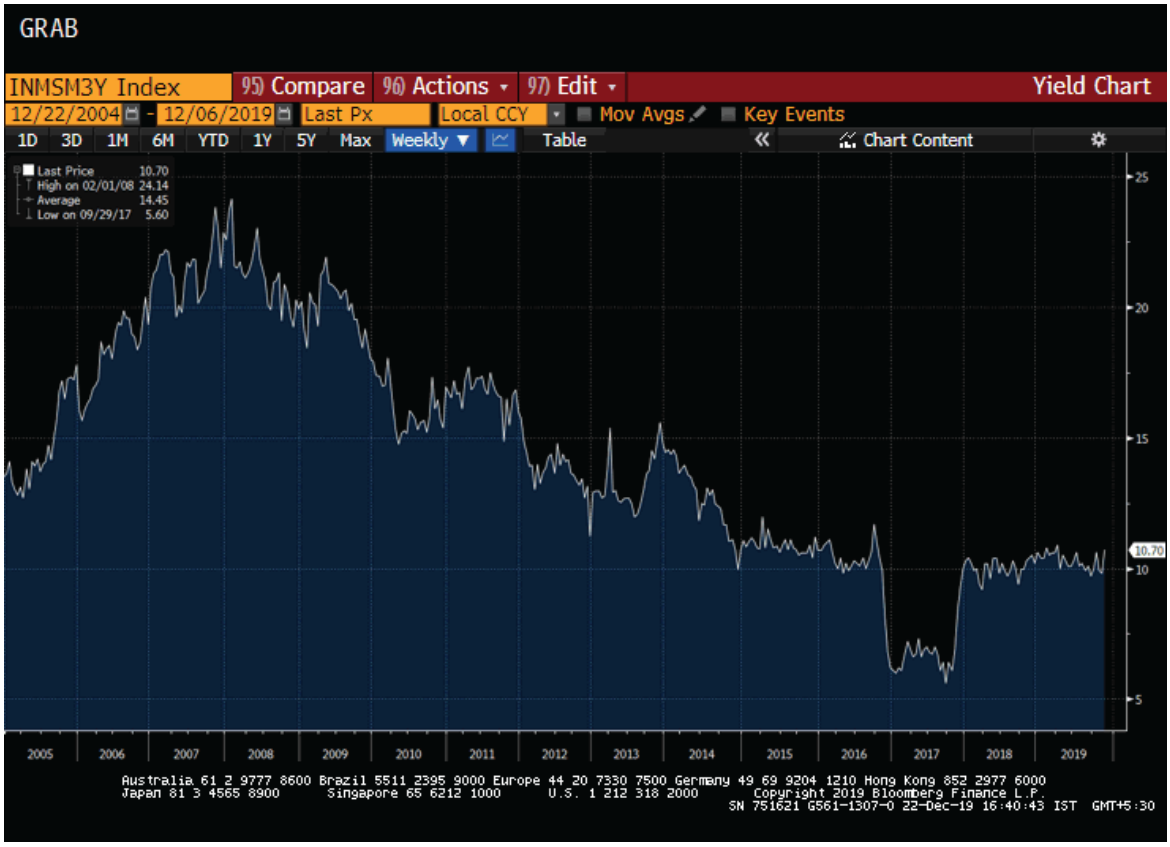
The above equation states that Money Supply is a multiple of the Monetary base. The relationship of the money supply to the monetary base depends upon currency deposit ratio determined by the public and the reserve deposit ratio chosen by the banks.

The factor (cu+1) / (cu+res) from the above equation is the number of units of money supply that can be created from each unit of monetary base. Thus it is called the Money Multiplier.

It is proven mathematically that the Money multiplier decreases when either the currency deposit ratio, cu, or the reserve deposit ratio, res, increases.

Thus, apart from looking at the concept pf Money Supply and some other related concepts, we have understood that a Central Bank in an economy only indirectly controls the money supply and that the money supply is greatly influenced by the other key players in the economy, i.e. by the public and the banking system.

In the current context of the Indian economy we can see that the Money Supply is at a multiyear low though the Central Bank has increased the reserve money. This can be explained by the low disbursement of loans by the banking system, thus holding higher reserves than necessary.



Document Date: December 30, 2019

Doc No: C198/19-20