6. Monetary Policy

EE 212 : (2/2012), sec:046042

April 2013

Outline

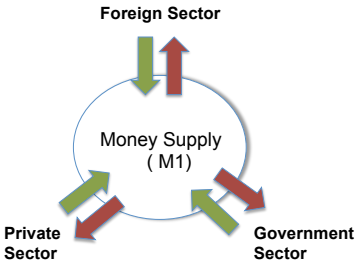
1. Introduction
2. Supply of money
3. Demand for money
4. Equilibrium in money market
5. Monetary policy

1 Introduction

- Financial sector is not the real sector, which produces final goods and services.
- It helps facilitating the real sector, by providing financial services (payment system, foreign exchange services, loans and deposits etc.)
- The presence of financial sector promotes saving and investment.
- Structure of financial market (depends on classification criterea)
  - Primary and Secondary market(classified by seasoning of the claims) :
    - New securities are sold to initial buyers : Primary market
    - Security that have been previously issued are resold: Secondary market
  - Organized and Unorganized market (classified by by formality)
    - Organized (must operate under certain rules and regulations)
    - Unorganized (operates under the agreement of the exchange partners)
  - Money and capital market (classified by maturity)
    - Short-Term (maturity < 1 year) Money Market
    - LongTerm (maturity > 1 year) Capital Market

2 Supply of Money

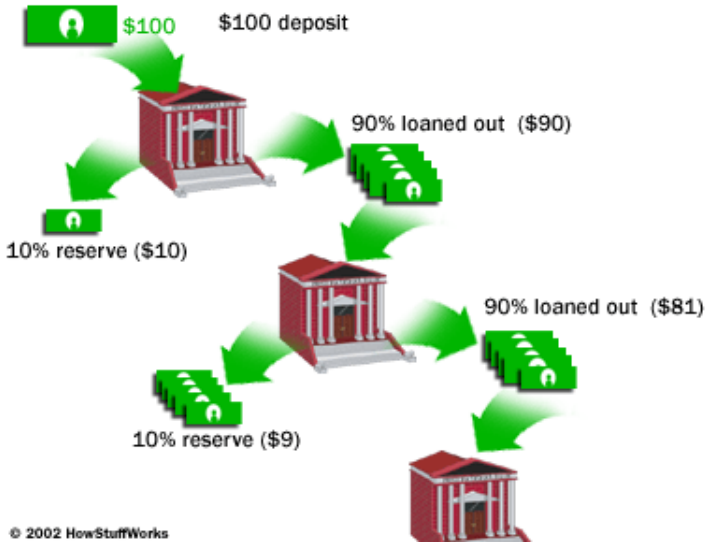
- The demand for and the supply of money will determine equilibrium interest rate.
- Money is anything that is accepted as a *medium of exchange*.
- Functions of Money:
  - Medium of exchange
    - This promotes economic efficiency as it reduces transaction costs and it also allows people to specialize in what they do.
  - Unit of account
    - It reduces transaction cost by reducing the number of prices that need to be considered
  - Store of value
    - Money is used as a way to store purchasing power over time
    - This function is useful as we do not always want to spend our income immediately upon receiving it
    - It provides more liquidity (the relative ease with which as asset can be converted into a medium of exchange than other assets
- Money Supply = total amount of "money" in the hand of public at a specific time. It is a stock concept.
- There are several standard measures of the money supply. The definitions of money differ by their liquidity or specifically how different they are from currency.
  1. Narrow definition of money supply : M1 = currency in circulation + demand deposits at commercial banks
  2. Broader definition of money supply : M2 = M1 + saving and time deposits at commercial banks
  3. M3 = M2 + savings of other financial institutions (specialized banks)
- The government and the central bank are in charge of the amount of currency in circulation. Only the central bank can issue the currency.
- This course will focus on only M1.



- Foreign Sector : export $\Rightarrow$ MS $\uparrow$, import $\Rightarrow$ MS $\downarrow$
  - export $\Rightarrow$ exporters recieve USD $\Rightarrow$ convert USD to Bht $\Rightarrow$ M1 $\uparrow$
  - Trade surplus $\Rightarrow$ MS $\uparrow$, Trade deficit $\Rightarrow$ MS $\downarrow$
- Govenment Sector : depends on how the government finance its deficits
  1. use saving (surplus from the past)
  2. borrow from abroad
  3. print more money
  4. borrow from private sector (issue bonds)

Creation of Money

- Private Sector : creation of money
  - deposit more money into the bank $\Rightarrow$ MS $\uparrow$
  - deposit more money into the bank $\Rightarrow$ MS $\downarrow$
- Bank can create money many times out of the initial deposits.
- Fractional Reserve Banking System
  - Banks retains cash equal to only a portion of its deposits, as readily available reserves (currency on hand at the bank plus deposit accounts for that bank at the central bank)
  - Central bank imposes reserve requirements, minimum ratio of reserves to deposit commercial banks has to maintain.
  - Excess reserves are bank reserves in excess of the reserve requirement set by a central bank.
  - Banks can lend out excess reserves.
  - Bank loans goes to the public. The public may deposit the money back to the bank.
  - Total deposits is much greater than the initial deposits.



- How many times total deposits is greater than the initial deposits?
- Suppose initial case deposits = $P = 100$.
- Legal reserve ratio = $rr = 10\%$.
- A = Excess cash reserve of the first bank
- Assumptions :

  (1) Excess reserve is all loaned. The whole banking system myst not keep excess cash reserve.

  (2) One must depost his money totally.

Bank	Deposits	Reserve (10%)	Loans
1	100	$(0.1 \times 100) =$	$(1 - 0.1) \times 100 =$ .....
2	90		
3	81		
...			
n			
Total			

$$\text{Total Deposits} = 100 + (1 - rr)100 + (1 - rr)^2 100 + (1 - rr)^n$$

- $=$

- Assumes that $n \to \infty$.
- Sum of a geometric sequence : $\sum_{k=0}^{\infty} ar^k = \frac{a}{1-r}$, where $0 < r < 1$.

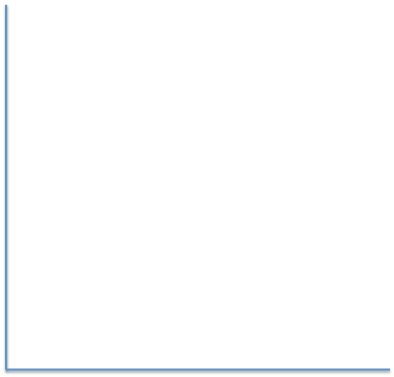
- Total Deposits $= \sum_{k=0}^{\infty} P(1-rr)^k$: $a =$ ..... , $r =$ .....

- Total Deposits $= \frac{P}{rr}$.
- Money multiplier $= \frac{1}{rr}$,
- Demand Deposits Created by Banking Sector (D), the maximum amount of money that can be created

$$D = \frac{P}{rr} - P = \frac{(1-rr)P}{rr} = \frac{A}{rr}.$$

- From the example,
  - $P =$ ....., $rr =$ ..... ,
  - Total Deposits =
  - Demand Deposits Created by Banking Sector (D)

- In theory, the maximum amount of money that can be created is $D = \frac{P(1-rr)}{rr}$.
- In practice, the amount of money that can be created is ..... than $\frac{P(1-rr)}{rr}$.
  - Excess reserve is ***not*** all loaned.
  - One ***does not*** depost his money totally.
- The private sector (financial institutions and the public) plays an important role, which could change the money supply.



- Money Supply does not depends on the interest rate
- Money supply $\uparrow$, MS shifts to the right
- Money supply $\downarrow$, MS shifts to the left

- Given the other things remain constant, if each of this following situation happens, how will the money supply change?

  1. The central bank increases the legal reserve ratio (rr).
  2. The central bank prints more money.
  3. The central bank issues bonds.
  4. The central bank gives loans to commercial banks and commercial banks provide more credits to the private sector.
  5. The public would like to hold more cash (less deposits).
  6. The public would like to hold more deposits (less cash).

3 Demand for Money

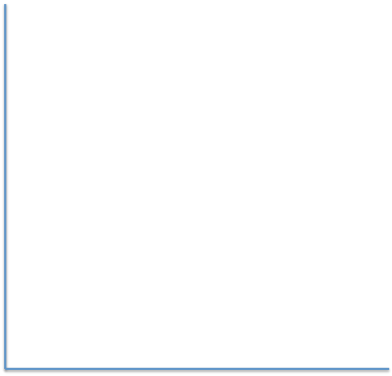
- Demand for money : the amount of wealth that everyone in the economy wishes to hold in the form of money balances
- liquidity = how easy an asset can be quickly converted in to the medium of exchange, with a little loss of value.
- Keynesian's Liquidity Preference Theory :
  - There are two main assets people use to store their wealth, Money and Bonds.
  - Opportunity cost of holding money = income that you could have earned if you hold the bonds (or deposit money in a bank), which is interest.
  - People hold the money because it provides liquidity.
- M1 = Currency in circulation + Demand Deposit
- Demand Deposit do not pay interest.
- Demand for Money consists of 3 components
  1. Transaction demand for money (M_T^d) : People want to hold money to meet their daily transaction
  2. Precautionary demand for money (M_P^d) : People hold some money to safeguard themself from something that they cannot detect beforehand.
  3. Speculative demand for (M_S^d) : People hold money for speculation
- $M^d = M_T^d + M_P^d + M_S^d$
- $M^d = f(Y, r, ...)$
- $Y \uparrow M^d$ .....
- $r \uparrow M^d$ .....
- Bond : A prototypical bond is a contract that commits the issuers to make a specified sequence of payments until a specified terminal date.

Government Bond
Pay 110 after one year

- Price of the bond is equal to 100. Interest rate is .....
- Price of the bond is increased, interest rate is .....
- Price of the bond is decreased, interest rate is .....

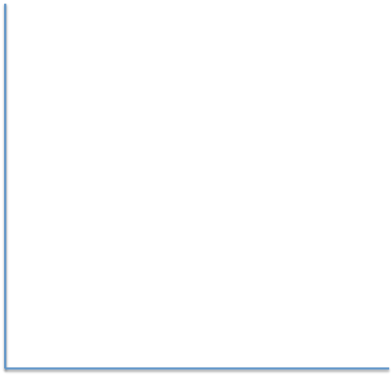
Bond price $\uparrow \Rightarrow$ Interest rate (r) $\downarrow$

- The relationship between money demand and interest rate



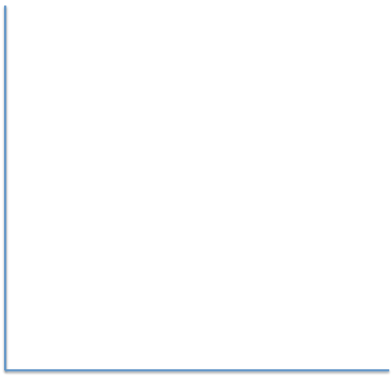
- An increase in interet rate would lead to ..... in the quantity demand for money, ceteris paribus (keep Y and other factors determining M^d constant).
- A decrease in interest rate would lead to ..... in the quantity demand for money, ceteris paribus (keep Y and other factors determining M^d constant).
- $\Delta r \Rightarrow$ movement along the Money Demand Curve

- Shift in M^d

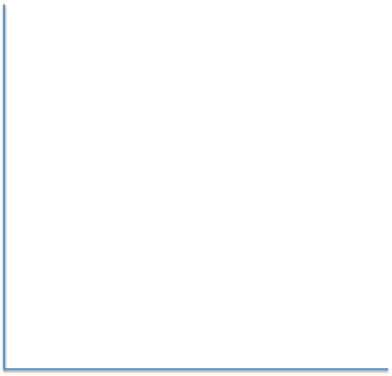


- An increase in national income (Y) will lead to ..... in demand for money, ceteris paribus. (Money Demand shifts to the .....)
- An decrease in national income (Y) will lead to ..... in demand for money, ceteris paribus. (Money Demand shifts to the .....)
- $\Delta Y \Rightarrow$ Shift in M^d

4 Equilibrium in Money Market



- If interest rate is *lower* than the equilibrium interest rate,
- there will be excess money .....
- agents will ..... (buy/sell) more bonds,
- (bond demand/bond supply) will (rise/fall)
- then bond price..... (increases/decreases),
- therefore the interest rate ..... (increases/decreases)



- If interest rate is *greater* than the equilibrium interest rate,
- there will be excess money .....
- agents will ..... (buy/sell) more bonds,
- (bond demand/bond supply) will (rise/fall)
- then bond price..... (increases/decreases),
- therefore, the interest rate ..... (increases/decreases)

- Implicit function : $M^s = M_0^S$, $M^d = M_0^d - m^d r$.

- Numerical Example: $M^s = 400$, $M^d = 800 - 50r$

- Given the other things remain constant, if each of this following situation happens, how would it affect equilibrium in the money market?
  - Real national income (Y) increases
  - Money Supply increases
  - Price level increases
  - Real national income (Y) decreases
  - Money Supply decreases
  - Price level decreases

5 Monetary Policy

- Monetary Policy to solve inflationary and deflationary gaps

Tools to control money supply

1. Open Market Operation (OMO)
   - Buy government bonds
   - Sell government bonds
2. Bank rate (rediscount rate = interest rate that the central banks charge the commercial banks when they borrow the money from the central bank.)
   - Bank rate ↑
   - Bank rate ↓
3. Minimum Legal reserve requirement (rr)
   - rr ↑
   - rr ↓

- Monetary Policy ⇒ Money Supply ⇒ Y?

Impact of money market to commodity market

Goods Market

$Y = C + I + G + (X - M) = DAE$
(determines Y)
I depends on r
($r \uparrow$, I....., DAE....., Y.....)
($r \downarrow$, I....., DAE....., Y.....)

Money Market

$M^s = M^d$
(determines r)
Money Demand depends on Y
($Y \uparrow \Rightarrow M^d$..... $\Rightarrow r$.....)
($Y \downarrow \Rightarrow M^d$..... $\Rightarrow r$.....)

Monetary Policy Transmission Mechanism

- MS ↑ ⇒ Interest Rate (r) .....
  ⇒ Investment (I) .....⇒ DAE shift ..... ⇒ Y_E .....
- MS ↓ ⇒ Interest Rate (r) .....
  ⇒ Investment (I) ..... ⇒ DAE shift ..... ⇒ Y_E .....

Types of Monetary Policy

1. Expansionary Monetary Policy : to increase monery supply, to stimulate economy, used when there is ..... gap.

   How?

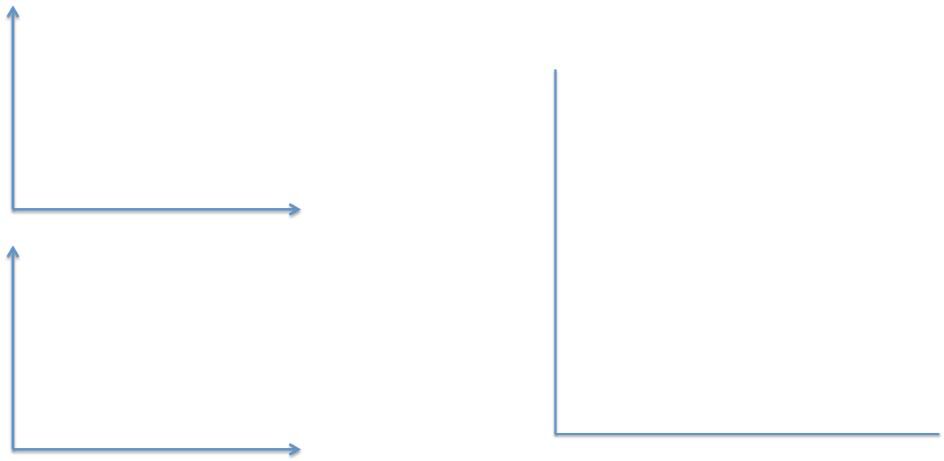
   - OMO : ..... government bonds
   - Bank rate/Rediscount rate .....
   - Minimum Legal Reserve Requirement (rr) .....

2. Contractionary Monetary Policy : to decrease money supply, to slow down the economy, used when there is ..... gap.

   How?

   - OMO : ..... government bonds
   - Bank rate/Rediscount rate .....
   - Minimum Legal Reserve Requirement (rr) .....

- Expansionary Monetary Policy



- Contractionary Monetary Policy