Ch 25 Money, The Price Level, and Inflation

Principles of Macroeconomics

Econ 102

Outline

- What is money?
- Depository Institutions
- The Central Bank
- How Banks create money
- The Money Market
- The Quantity Theory of Money

What is Money?

- Three usage of money:
  1. Medium of exchange → money is acceptable for an exchange
  2. Unit of account → money is used to measure a price of goods and services
  3. Store of value → money can be stored for later use
     - Inflation lowers the value of money, so a store of value is great when inflation rate is low

Money Definition

- Money is defined based on how *liquid* it is in the market
  - M0 → cash and coins (currency)
  - M1 → currency, travelers checks and checking account
  - M2 → M1 + time deposits, savings deposits, mutual funds, etc
- Is M1 considered money? Go back to the 3 usage of money!
- What about M2? Not quite considered money
- Debit cards and credit cards are not money

Depository Institutions (1)

- Definition: a financial firm that takes deposits from households and firms
- There are 3 different types:
  1. Commercial banks
  2. Thrift institutions
  3. Money market mutual funds
- Depository institution can store money for their customers and turn it into 3 kinds of assets:
  1. Cash Assets → keep it as cash (currency)
  2. Securities → buy securities (eg. Bonds)
  3. Loans → provide loas

Depository Institutions (2)

- Having depository institutions presents economics benefits:
    1. Liquidity → providing loans while still maintaining the ability for their customers to withdraw cash
    2. Pool risk → risk is being shared by having a lot of customers
    3. Lower the cost of borrowing → firms would just straightaway come to depository institution when asking for loans
    4. Lower the cost of monitoring borrowers → the depository institution can do this instead of actual individual borrowers

Central Bank

- In the Kingdom, SAMA is the Central Bank
- The purposes of Central Bank are:
  1. Print money (currency reserves)
  2. Inject money to the economy
     - Controlling the monetary base → how much currency is in the economy
     - This is done by buying or selling securities that is owned by the public or the government

Open Market Operations

- When the Central Bank buys securities from:
  - the public, Central Bank will use the newly-printed money. The total money in the economy <u>will not change</u>, while the ratio of securities of the public <u>will change</u>
  - the government, Central Bank will use the newly-printed money. The total money in the economy <u>will be higher</u>, while the ratio of securities of the public <u>do not change</u>

Central Bank and Quantity of Money

- The Central Bank can control the monetary base by:
  1. Open Market operations (previous slide)
  2. Policy on required reserves ratio (will talk more about this later)
  3. Last resort loans → commercial banks can borrow cash from the Central Bank

How Banks Create Money (1)

- Bank create money by providing loans from deposits
  - H is high-powered money or currency (cash)
  - R is commercial bank cash reserves
  - C is cash held by the public
  - D is the size of commercial bank’s deposits
  - x is the required reserves ratio
  - b is the currency drain
- The total currency in the economy has to be based on the currency held by the bank and the public
  - $H = C + R$
- The total money in the economy has to be based on currency held by the public and the bank deposits
  - $M = C + D$

How Banks Create Money (2)

- The cash reserves amount of the bank has to be based on its required reserves ratio
  - $R = xD$
- The cash held by the public is based on the currency drain out of total deposits
  - $C = bD$
- From High-powered money,
  - $H = xD + bD$
  - $D = H / (x+b)$

How Banks Create Money (3)

- The total money in the economy would be
  - $M = C + D = bD + D$
  - $M = H * b / (b + x)$
- The money multiplier shows how big the total money in the economy compared to the currency (cash)
  - $b / (b + x)$

The Money Market

- When there is a market, there is supply and demand
- The demand of money is about how much money that you want to hold
  - Of course the amount should be infinity, but think about if you have 1 million SR, do you want all it in your wallet or checking account?
    - Or should you buy an asset? Or bonds? Or securities?
- The supply of money depends on how much money is available in the economy
  - Remember money supply!

Why hold money?

- There are 4 factors that influence money holding:
  1. The price level → if price level is higher, people would want to hold bigger nominal amount of money.
     - For real money, the price level will have no effect (real money is the nominal money divided by the price level)
  2. Nominal interest rate → when interest rate Is higher, the price of bonds are lower.
     - Probably a good time to buy bonds
  3. Real GDP → the higher the income, the higher the amount of money that you hold for spending
  4. Financial innovation → ATM, credit cards, debit cards, mobile banking, etc changes individuals behavior in how much money to hold

The Demand for money (1)

- The demand for money is the relationship between interest rate and quantity of money demanded
  - When interest rate is high, then bonds are cheap. People will buy more bonds and have less money to hold

The Demand for money (2)

- There can be a movement along the demand curve or a shift
  - A movement along the curve is caused by a change in interest rate
  - A shift will be cause by a shock affecting the public’s money holding

Money market equilibrium

- When quantity of money demanded and quantity of money supplied is equal, equilibrium is reached
- In the short-run,
  - Interest rate adjusts to reach money market equilibrium
  - When interest rate is too high, there is an excess supply of money. People buy bonds and the interest rate decrease
  - When the interest rate is too low, there is an excess demand of money. People sell bonds and the interest rate rises

Monetary Base

- The Central Bank can adjust the money supply
  - Open market operations, required reserves ratio regulations, last resort loans
- There will be a new equilibrium money market
  - A different equilibrium interest rate
  - A different quantity of money in the economy

Long run equilibrium

- In the long run,
  - The real GDP has to be equal to potential GDP
  - The money market, loanable funds market, the goods market, and the labor market also have to be in the long run equilibrium
- Since every markets are in equilibrium, the only thing that can change after a money market shock is the price level
  - Nothing real has changed

Quantity Theory of Money (1)

- Quantity theory of money propose that in the long run, an increase in the quantity of money will bring an equal percentage increase in the price level
  - The increase in Qmoney and inflation is proportional
- Velocity of circulation is the average number of times a dollar of money is used annually to buy goods and services that make up GDP
  - GDP = PY
  - V = PY / M
    - P is price level
    - V is velocity of money
    - M is quantity of money

Quantity Theory of Money (2)

- From the previous equation,
  - MV = PY
  - P = M (V / Y)
- Since V / Y is independent of M and thus, a change in M would bring a proportional change in P
- Inflation rate = money growth rate + rate of velocity change – real GDP growth rate
- In the long run, rate of velocity change and real GDP growth rate will be close to 0
  - Inflation rate would be equal to money growth rate