

# MONEY AND INFLATION

## 1. What is Money?

- Definition: the stock of assets that can be readily used to make transaction
- The functions of money
  - Store of value: a way to transfer purchasing power from the present to the future
  - Unit of account: the terms in which prices are quoted and debts are recorded
  - Medium of exchange: what we use to buy goods and services (liquidity)
- The types of money
  - Fiat money: money that has no intrinsic value  
e.g., dollar bills
  - Commodity money: money that has intrinsic value  
e.g., gold
    - Using raw gold as money is costly
- How the quantity of money (Money Supply) is controlled → monetary policy
  - Delegated to a partially independent institution
  - US: Federal Reserve (Fed), Federal Open Market Committee

- Open market operation: the purchase and sale of government bonds  
e.g., buy bonds from the public  $\rightarrow M^S \uparrow$
- How the quantity of money is measured (table 4-1, p.81)

## 2. The Quantity Theory of Money

- $\rightarrow$  How the quantity of money affects the economy
- Transactions and the quantity equation
  - Quantity equation: the link b/t transactions and money  
 $\rightarrow M \times V = P \times T$
  - 1)  $M$  : the quantity of money
  - 2)  $V$  : the transaction velocity of money  
(measures the rate at which money circulates in the economy)
  - 3)  $P$  : the price of a typical transaction  
(the number of dollars exchanged)
  - 4)  $T$  : total number of transactions during some period of time  $\rightarrow$  difficult to measure

$$\rightarrow M \times V = P \times Y,$$

$Y$  : Total output of the economy (real GDP)

$P$  : GDP deflator

$V$  : Income velocity of money

- Money demand function

$\rightarrow$  What determines the quantity of *real money balance* ( $M / P$ ) people wish to hold

$$\rightarrow M / P = kY$$

$$\rightarrow M(1/k) = PY$$

$$\rightarrow \text{If } V = 1/k, \quad M \times V = P \times Y$$

- The link b/t the demand for money and the velocity  
e.g., When people want to hold a lot of money for each dollar of income, money changes hands infrequently

- The quantity theory of Money

Assuming constant velocity,  $M \times \bar{V} = P \times Y$ .

$\rightarrow$  A change in the quantity of money must cause a proportionate change in nominal GDP

$\rightarrow$  i.e., If velocity is fixed, the quantity of money determines the dollar value of the economy's output

- Money, Price, and Inflation (fig. 4-1 – 4-2)

1) The factor of production & the production function  
→  $Y$

2) Money supply → the (nominal) value of output ( $PY$ )

3)  $P$  is determined

→ The price level is proportional to the money supply

% change in  $M$  + % change in  $V$  =

% change in  $P$  + % change in  $Y$

*cf)* “Inflation is always and everywhere a monetary phenomenon” (Milton Friedman)

### 3. Inflation and Interest Rates

- Nominal interest rate vs. Real interest rate

- Nominal interest rate ( $i$ ): the rate of interest that investors pay to borrow money

- Real interest rate ( $r$ ): the nominal interest rate corrected for the effects of inflation

$$\rightarrow r = i - \pi$$

- The Fisher Effect

- Fisher equation:  $i = r + \pi$

- Nominal interest rate can change b/c

- 1) real interest rate changes

- 2) inflation rate changes

- The Fisher effect: one-for-one relationship b/t the inflation rate and nominal interest rate (fig. 4-3 & 4-4, pp. 90-91)

- i.e., an increase in the rate of money growth of 1%

- 1% increase in the rate of inflation

- 1% increase in the nominal interest rate

#### **4. Nominal Interest Rate and the Demand for Money**

- The nominal interest rate is the opportunity cost of holding money
- The quantity of money demanded depends both on the level of income and on the nominal interest rate.

- $(M / P)^D = L(i, Y) = L(r + \pi, Y)$

- The linkage among money, price, and interest rates (fig. 4-5, p.94)

## 5. The Social Costs of Inflation

### *(1) The costs of “expected” inflation*

- The distortion of the inflation tax on the amount of money people hold
- Menu costs: firms change their posted price very often
- Variability in relative prices → microeconomic inefficiency
- The distortion of individuals’ tax liability
- Inconvenience of living in a world with a changing price level

### *(2) The costs of “unexpected” inflation*

- Arbitrarily redistributes wealth among individuals
- Hurt individuals on fixed pensions
- Uncertainty

## 6. Hyperinflation

- Inflation that exceeds 50 percent per month.
  - more than 100-fold increase in price level over a year
- The costs of hyperinflation
- The causes of hyperinflation
  - Excessive growth in the supply of money
- Hyperinflation in interwar Germany (fig.4-6, p.106)