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CHAPTER 6: CENTRAL BANK AND MONETARY POLICY

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Sources:

Mishkin, F.S. (2010), *The Economics of Money, Banking and Financial markets*, 9th ed, The Addison – Wesley Series in Economics.

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2. The money supply process
3. Monetary policy
4. Inflation and money supply

1. Central bank

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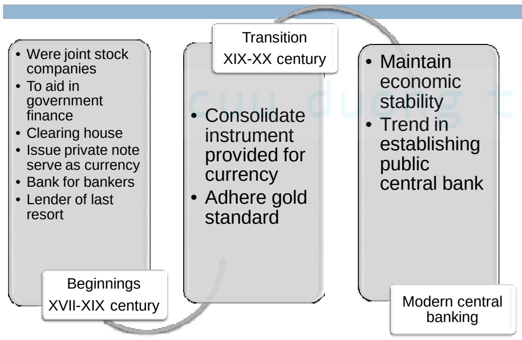
- Definition of central bank
- The origins of central bank
- The independence of central banks
- Functions of central banks

Definition of central bank

- **Central bank** is the authority responsible for policies that affect a country's supply of money and credit.
- More specifically, a central bank uses its tools of monetary policy to affect short-term interest rates and the monetary base (currency held by the public plus bank reserves) and to achieve important policy goals.

The origins of central bank



The independence of central banks

- Nowadays, central banks in the world have different level of independence from the government. It would be shown in 2 basic models:
  - Central banks that are independent from the government
  - Central banks that are government agencies

Independence from the government

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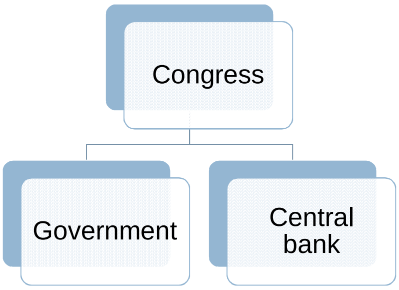

Independence from the government

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- Eg: Federal Reserve of the US, European Central Bank...
- Central bank have the right to decide and implement monetary policy
- Government do not have the control on central bank, there is only co-operative relationship

Central bank is a government agency

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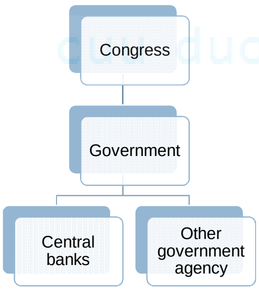

Central bank is a government agency

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- Eg: Bank of England, Bank of Japan, State bank of Vietnam
- The central bank is a government agency
- The government have direct control on human resource, budget and decisions related to the making and implementing monetary policy.

Independence of central banks

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- So what model is better, independent or dependent?
- Current trend?

Functions of central banks

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- Monopoly of note issue
- Banker, agent and adviser to the government
- Bank of bankers
- Lender of last resort
- Clearing agent

Monopoly of note issue

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- Note (currency) issue is a main function of central bank in every country, and the central bank have the monopoly of the sole right to issue the note.
- Advantages:
  - Better control over the money supply in the country. It increases public confidence in the monetary system of the country
  - Uniformity in the monetary system of note issue and note circulation
  - Enables the central bank to exercise control over the creation of credit by the commercial banks.
  - Monetary management of the paper currency becomes easier. The central bank has full information about the monetary requirements of the economy and, therefore, can change the quantity of currency accordingly.

Banker, agent and adviser to the government

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- The central bank functions as a banker, agent and financial adviser to the government
  - As a banker to government, the central bank performs the same functions for the government as a commercial bank performs for its customers
  - As an agent, it raises loans from the public and thus manages public debt. It also represents the government in the international financial institutions and conferences
  - As an adviser, the central bank gives advise to the government on economic, monetary, financial and fiscal matters such as deficit financing, devaluation, trade policy, foreign exchange policy, etc.

Bank of bankers

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- The central bank acts as the bankers' bank in three capacities:
  - custodian of the cash preserves of the commercial banks;
  - as the lender of the last resort; and
  - as clearing agent.

Custodian of the cash reserves

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- *As a custodian of the cash reserves* of the commercial banks the central bank maintains the cash reserves of the commercial banks.
- Every commercial bank has to keep a certain percentage of its cash balances as deposits with the central banks.
- These cash reserves can be utilised by the commercial banks in times of emergency.

Lender of last resort

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- In case the commercial banks are not able to meet their financial requirements from other sources, they can, as a last resort, approach the central bank for financial accommodation.
- The central bank provides financial accommodation to the commercial banks by rediscounting their eligible securities and exchange bills.

Clearing agent

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- Since all banks have their accounts with the central bank, the central bank can easily settle the claims of various banks against each other with least use of cash

2. The money supply process

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- Players in the money supply process
- The central bank's balance sheet
- Control of the monetary base
- Multiple deposit creation: a simple model
- The money multiplier
- Factors that determine the money supply

Players in the money supply process

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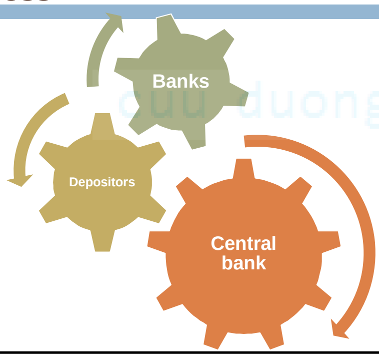

The central bank's balance sheet

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Assets	Liabilities
Government securities	Currency in circulation (C)
Discount loans	Reserves (R)

•Monetary base (MB) = C+R
•Central bank assets earn income, but central bank liabilities cost nothing

The central bank's balance sheet

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Assets	Liabilities
Government securities	Currency in circulation (C)
Discount loans	Reserv (R)

Monetary base (

Currency in circulation: is the amount of currency in the hands of the public

The central bank's balance sheet

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Reserves = deposits at the central bank + currency held by banks (vault cash)

	Liabilities
	Currency in circulation (C)
	Reserves (R)

Monetary base (MB) = C+R

The central bank's balance sheet

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Assets	Liabilities
Government securities	Currency in circulation (C)
Discount loans	Reserves (R)

Monetary b

Reserves = required reserves + excess reserves

The central bank's balance sheet

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Assets	Liabilities
Government securities	Currency in circulation (C)
Discount loans	Reserves (R)

Monetary b

Government securities: central bank holding of government securities

The central bank's balance sheet

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Assets	Liabilities
Government securities	Currency in circulation (C)
Discount loans	Reserves (R)

Discount loans: loans that central bank offer to banks Discount rate: interest rate charged banks for these loans

Control of the monetary base

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- Central bank open market operation
  - **Open market purchase**: a purchase of bonds by the central bank
    - Open market purchase from a bank
    - Open market purchase from the nonbank public
  - **Open market sale**: a sale of bonds by central bank
- Shift from deposits into currency
- Discount loans

Multiple deposit creation: a simple model

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Creation of Deposits (assuming 10% reserve requirement and a $100 increase in reserves)

Bank	Increase in Deposits ($)	Increase in Loans ($)	Increase in Reserves ($)
First National	0.00	100.00	0.00
A	100.00	90.00	10.00
B	90.00	81.00	9.00
C	81.00	72.90	8.10
D	72.90	65.61	7.29
E	65.61	59.05	6.56
F	59.05	53.14	5.91
.	.	.	.
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.	.	.	.
Total for all banks	1,000.00	1,000.00	100.00

Multiple deposit creation: a simple model

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- **Simple deposit multiplier** is the multiple increase in deposits generated from an increase in the banking system's reserves
- Formula for the multiple expansion of deposits:

$$\Delta D = \frac{1}{r}\Delta R$$

- In which:
  - ΔD: change in total checkable deposits in the banking system
  - r: required reserve ratio (10% in the example)
  - ΔR: change in reserves for the banking system ($100 in the example)

The money multiplier

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- **Money multiplier (m)** tell us how much the money supply changes for a given change in the monetary base.

$$M = m \times MB$$

- In which:
  - M: is the money supply
  - MB: is the money base
  - m: is the money multiplier

The money multiplier

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- If we have: $c = \left\{\frac{C}{D}\right\} = currency\ ratio$

$$e = \left\{\frac{ER}{D}\right\} = excess\ reserves\ ratio$$

- In which:
  - C: is the money in circulation
  - ER: is the excess reserves
  - D: is the checkable deposits
- then

The money multiplier

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$$MB = R + C = RR + ER + C = r \times D + ER + C$$

$$MB = (r + e + c) \times D$$

$$\Rightarrow D = \frac{1}{r + e + c} \times MB$$

$$\Rightarrow M = D + C = D + (c \times D) = (1 + c) \times D$$

$$= \frac{1 + c}{r + e + c} \times MB$$

$$\Rightarrow \boldsymbol{m = \frac{1 + c}{r + e + c}}$$

Factors that determine the money supply

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- Changes in the non-borrowed monetary base, MB_n
- Changes in borrowed reserves, from the central bank
- Changes in the required reserve ratio, r
- Changes in currency holdings
- Changes in excess reserves, ER

Overview of the money supply process

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Money Supply Response

Player	Variable	Change in Variable	Money Supply Response	Reason
Federal Reserve System	Nonborrowed monetary base, MB_n	↑	↑	More *MB* for deposit creation
	Borrowed reserves, *BR*	↑	↑	More *MB* for deposit creation
	Required reserve ratio, *r*	↑	↓	Less multiple deposit expansion
Depositors	Currency holdings	↑	↓	Less multiple deposit expansion
Depositors and banks	Excess reserves	↑	↓	Less loans and deposit creation

Note: Only increases (↑) in the variables are shown. The effects of decreases on the money supply would be the opposite of those indicated in the "Money Supply Response" column.

3. Monetary policy

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- Definition of monetary policy
- Goals of monetary policy
- Tools of monetary policy

Definition of monetary policy

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- **Monetary policy:** is a macro economic policy in which the central bank uses its tools to control interest rate and money supply to reach social economic targets.

Goals of monetary policy

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- Price stability, low and stable inflation
- Economic growth
- High employment
- Stability of financial markets
- Interest rate stability
- Stability in foreign exchange market

Tools of monetary policy

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- Open market operations
- Discount policy
- Reserve requirements

Open market operations

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- **Open market operations** are the operations of central bank in which the central bank sell and buy securities on the open market to change reserves, monetary base and though it change the interest rate.
- Open market operations are the most important monetary policy tool.
  - Open market purchase vs. Open market sale
  - Dynamic open market operations vs. Defensive open market operations

Open market operation

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- Open market operation have influences on:
  - Bank reserves
  - Money supply on money market, therefore changing the market interest rates
- Advantages:
  - Central bank has complete control over the volume
  - Flexible and precise, can be used to any extent.
  - Easily reversed
  - Can be implement quickly.

Discount policy

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- **Discount window**: the facility at which banks can borrow reserves from the central bank
- Central bank's discount loans to the banks include 3 types:
  - **Primary credit** (standing lending facility): for healthy banks. Interest on this loan called *discount rate*
  - **Secondary credit:** for banks with financial troubled or liquidity problems. It has higher interest than the discount rate.
  - **Seasonal credit:** meet the needs of banks that have seasonal pattern of deposits.
- **Lender of last resort:** is the role of central bank to provide reserves for banks when no one else would, to prenvent bank and financial panics

Discount policy

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- Discount policy have influences on:
  - Lending interest rates
  - Lending volume then on Money supply
- Advantages:
  - Central bank can perform as lender of the last resort
- Disadvantages:
  - Central bank can not completely control the outcome
  - Not easy to reverse

Reserve requirements

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- **Reserve requirements** are reserves that central bank requires each bank to hold in an account of that bank opened at central bank. The required reserves are base on central bank decision and determined by *required reserve ratio* on total deposits at the bank.

Reserve requirements

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- Reserve requirements have the influence on
  - Money supply multiplier
  - Therefore on money supply
- Advantages:
  - Have equal influence on all banks
  - Have strong influence
- Disadvantages:
  - Cause immediate liquidity problems for banks
  - Inflexible, hard to reverse

4. Inflation and money supply

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- Milton Friedman stated that "*inflation is always and everywhere a monetary phenomenon.*"
- He postulated that the source of all inflation episodes is a high growth rate of the money supply: Simply by reducing the growth rate of the money supply to low levels, inflation can be prevented.

Definition of inflation

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- **Inflation** is defined as the persistent and rapid rise in the price level.
- Inflation rate is calculated through *Consumer price index*:

$$\pi_k = \left(\frac{CPI_k}{CPI_{k-1}} - 1\right) \times 100\%$$

Inflation – A monetary phenomenon

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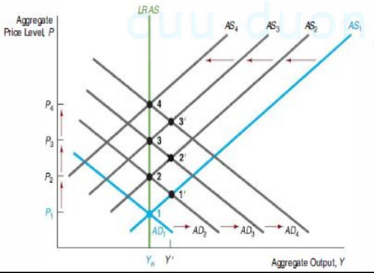
- According to classic economists: when there is a higher rate of money growth, inflation happens.



Origins of inflationary monetary policy

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- High employment targets and inflation
- Budget deficit and inflation
- Inflation following changes in exchange rates