

# ECONOMICS 2





NEW

SZÉCHENYI PLAN

# ECONOMICS 2

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# ECONOMICS 2

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## Week 4

### **Money, inflation**

Chapters 6, 18

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# Outline

- What we know
- The concept of money
- Money supply
- Money demand
- The costs of inflation

# What we know

- Inflation is the joint increase in the prices of goods and services.
- It has various measures: CPI, GDP-deflator.
- Prices are measured in money, therefore the inflation means a decrease in the purchasing power of the money.

# What is money?

- Money is a device that can be used any time for settling transactions.
- Throughout the history various things have served as money (gold, bill, cigarette, paper money, bank deposit, etc.).

# Types of money

- If the money has intrinsic value then it is called commodity money.
- If it has no intrinsic value then it is called paper money (fiat money).

# Why did paper money evolve?

The commodity money makes transactions easier, but not as much as paper money does. The commodity money is heavy, its transportation and guarding are costly. Checking the cleanness of gold is also difficult and costly. There are devices like the bills which are transitions between the two types of money.

# Functions of money

- The **store of value** function of money is to postpone purchases and exchange those for future purchases.
- The **unit of account** function of money makes it possible to measure prices and debts.
- The **transaction** function of money makes possible to buy goods and services.

# Who provides the money?

- Only the state might print bank notes, but not only the state can generate money.
- The supply of money in modern economies is ensured by the so called two-level bank system.
- Policy which is directed towards the money market is called **monetary policy**. The central bank is responsible for it, in Hungary it is the MNB.

# How does the money evolve?

Assets	Debits
Reserve: 10 000 Ft	Deposit: 10 000 Ft



0 Ft



10 000 Ft sight deposit

Total money: 10 000 Ft

# How does the money evolve?

Assets	Debits
Reserve: 2000 Ft	Deposit: 10 000 Ft
Loan: 8000 Ft	



8000 Ft cash

8000 Ft debt

10 000 Ft sight deposit

Total money: 18 000 Ft

# Elements of money supply

**C:** Cash with the economic agents (only the central bank can produce it)

**R:** Reserves of banks

**B:** The **monetary base**  $B = C + R$

**D:** Sight deposits

**Money supply:**

$$M = C + D$$

How does the money supply change if the monetary base changes?

# Exogenous ratios

- The ratio of **cash and deposits**  $cr = C/D$ , the result of the preferences of the economic agents.
- The **reserve ratio**  $rr = R/D$ . The ratio of deposits which are in reserve at the banks. It is the result of rules and the decision of the banks.

# The money multiplier

$$M = C + D$$

$$B = C + R$$

$$\frac{M}{B} = \frac{C + D}{C + R} = \frac{\frac{C}{D} + 1}{\frac{C}{D} + \frac{R}{D}} = \frac{cr + 1}{cr + rr}$$

$$M = \frac{cr + 1}{cr + rr} B$$

Money multiplier

# Tools of monetary policy

- **Open market measures:** The central bank sells or buys government bonds.
- **Required reserve ratio:** The central bank can set the minimum ratio of reserves and deposits.
- **Interest rate of refinancing:** The central bank can set the interest rate at which it provides credit to commercial banks.

# Quantity theory of money

Money  $\times$  velocity of circulation = price  $\times$  output

$$\mathbf{M V = P Y}$$

$$\begin{aligned} \mathbf{M \% \text{ change} + V \% \text{ change} =} \\ \mathbf{= P \% \text{ change} + Y \% \text{ change}} \end{aligned}$$

Assuming constant  $\mathbf{V}$ :

$$\begin{aligned} \mathbf{P \% \text{ change} = M \% \text{ change} -} \\ \mathbf{- Y \% \text{ change}} \end{aligned}$$

# Conclusion

According to the quantity theory of money the inflation can clearly be influenced by the quantity of money supervised by the central bank. If we want to mitigate the inflation then we have to increase the money supply slowly.

# Seigniorage

How can the government cover its expenditures?

- Taxes
- Credit
- Issue money

If the government issues money it acquires income → at the same time the value of the money decreases → the money with its holders has lower value → inflation tax

# Inflation and interest rate

Notations:

**i**: nominal interest rate (offered by the bank);

**r**: real interest rate (my purchasing power increases at this rate if I have savings);

**$\pi$** : inflation.

**Fisher-equation:**

$$\mathbf{i} = \mathbf{\pi} + \mathbf{r}.$$

# Ex ante and ex post interest rates

What is wrong with the following reasoning?

According to KSH the inflation is 4%. Thus if someone gives me a credit on 8% nominal interest rate then its real interest rate is 4%.

The inflation refers to 12 months before, whereas I have to pay the interest in the next 12 months.

# Ex ante and ex post interest rates

The ex ante real interest rate is the difference between the now defined nominal interest rate and the **expected inflation** for the next 12 months. One year later the difference between the same nominal interest rate and the realized inflation is the ex post real interest rate.

The accurate form of the Fisher-equation:

$$\mathbf{i} = \mathbf{r} + \pi\epsilon$$

# Real quantity of money

Money  $\times$  velocity of circulation = price  $\times$  output

$$M V = P Y$$

$$M/P = Y/V$$

$$M/P = k Y$$

On the left hand side of the equation is the **real quantity of money**.

The relation shows that we would use more money with higher income.

# Costs of holding money

- If we hold our money in cash then its value decreases with the rate of inflation.
- If we hold our money in cash then we don't earn interests which we could earn with government bonds.
- Thus the higher is the nominal interest rate the more costly is to hold money.

# The money market

$$M/P = L(i, Y)$$

Substituting the Fisher-equation

$$M/P = L(r + \pi^e, Y)$$

The current price level and so the current inflation depend not only on the quantity of money but also on the expectations on future inflation.

# Social costs of inflation

## 1. The costs of expected inflation

- **Shoeleather costs:** the higher is the inflation the less cash we hold, and the more often we go to the bank.
- **Menu costs:** the prices have to be changes more frequently if the inflation is higher.
- The firms do not change prices at the same time and the volatility of relative prices is large.
- The tax rates might increase (e.g. multiple tax rates).
- The value of 1 Ft changes faster, which is the unit of prices.

# Social costs of inflation

## 2. Unexpected inflation

It can have worse effects than the expected inflation. We do not know how much our long run deposits will be worth in a few years, the risks of long term contracts and installment payments are higher.

High inflation is always unpredictable inflation.

# The classic dichotomy

- During the previous lectures we analyzed **real indicators**.
- Today we became familiar with **nominal indicators**.
- According to the classic dichotomy the nominal indicators do not affect the real indicators. Thus the **money is neutral**.