

# MACROECONOMICS

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Course Material Developed by Department of Economics,  
Faculty of Social Sciences, Eötvös Loránd University Budapest (ELTE)

Department of Economics, Eötvös Loránd University Budapest

Institute of Economics, Hungarian Academy of Sciences

Balassi Kiadó, Budapest



Authors: Áron Horváth, Péter Pete

Supervised by: Péter Pete

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## **Week 12**

# **Keynesian model, rigid prices**

## **Disequilibrium model**

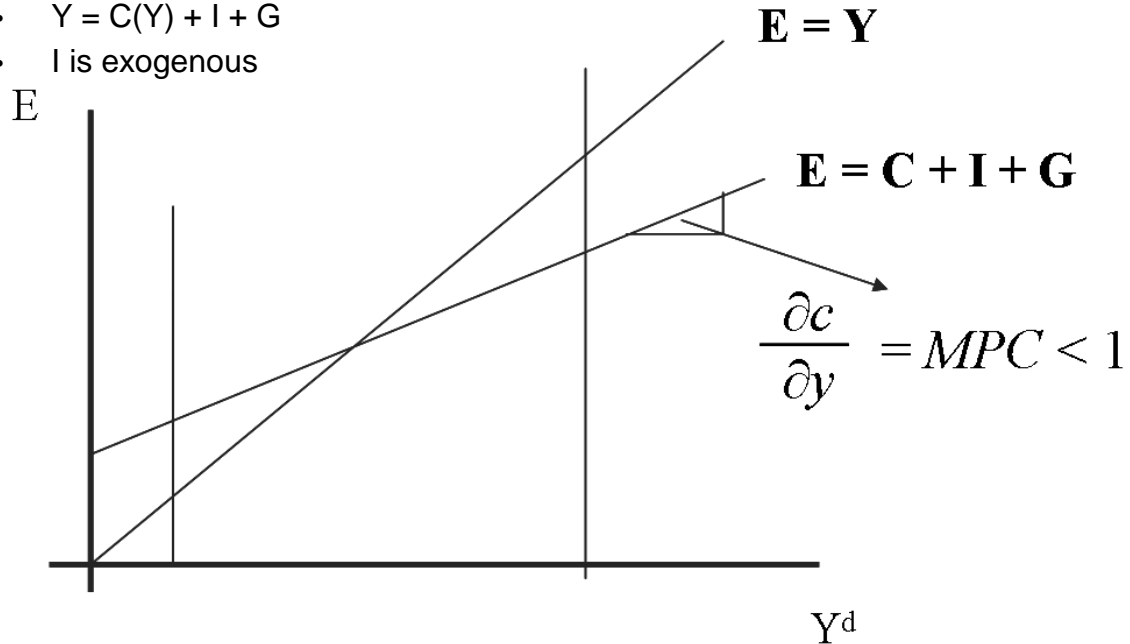
- In some markets prices are rigid or adjust slowly
- Up until full adjustment in prices quantities adjust
- They still sell as much as the quantity others buy, but they do not sell as much as they wish
- Short side rules

## **Handling of price rigidities**

- In the original Keynesian models there is no micro foundation, the price level is simply exogenous
- The supply side is not worked out, supply simply adjusts to the changes in demand. Some capacity underutilization is exogenously assumed
- The model is static, if expectations have a role, they are exogenous

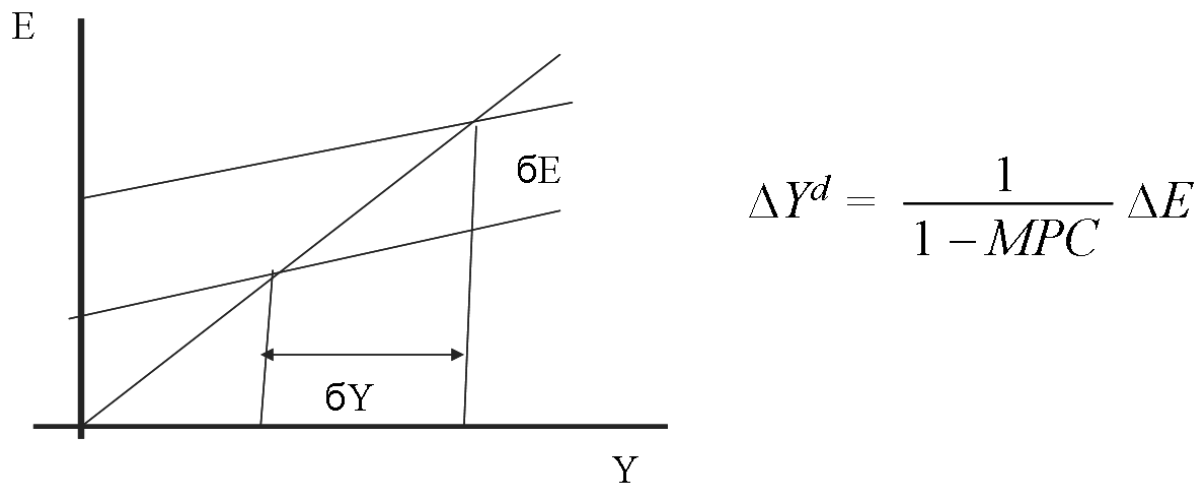
# Keynesian depression model

- $Y = C(Y) + I + G$
- $I$  is exogenous



## Multiplier effect

- Exogenous demand shocks cause larger swings in output, because consumption also depends on output

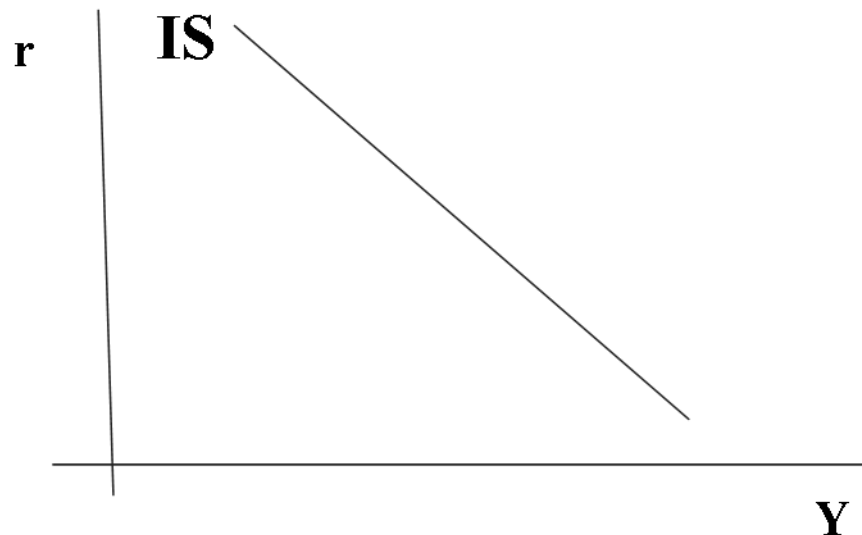


# Multiplier effect

- The size of the multiplier effect is unrealistically large in this setting, as everything that dampens it is assumed away
- Policy conclusion: (partly ideological) the macroeconomy of a market system is unstable. It requires government stabilization measures, large degree of government involvement
- Empirical evidence on the multiplier effect

## IS curve

- $Y = C(Y) + I(r) + G$
- This resembles the output demand curve in the RBC model. However, as supply adjusts passively to demand, this is also equilibrium output



## Shifts in the IS curve

- Any exogenous event, that is, any changes apart from changes in  $Y$  and  $r$  would shift the curve
- Examples

- Government spending
- Taxes
- Business sentiments, investments
- Shifts in the consumption behavior

## The interest rate

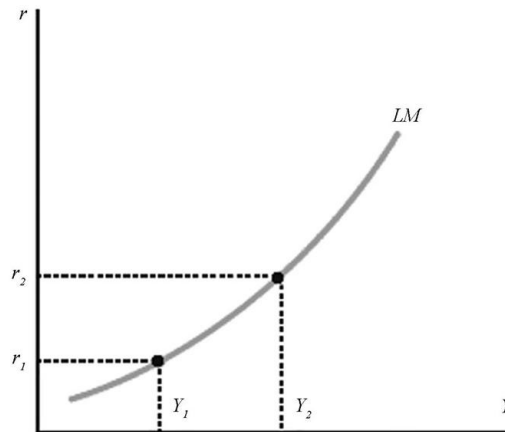
- In the RBC model  $r$  was determined by intertemporal substitution and through this it influenced current labor supply
- In the static Keynesian model  $r$  is not relative price between the present and the future, but the relative price influencing portfolio decision between holdings of money and bonds (interest bearing assets), Therefore  $r$  is determined on the money market

## Money market

- Demand for money: result of a portfolio decision. How to divide existing wealth among two types of assets
- Money is means of transactions and store of wealth
- Larger  $Y$  is, more transactions require more money
- Money does not have return, therefore the return on other assets ( $R$ ) influences the wish for holding money
- $P$  is given exogenously, there is no inflation, therefore  $R = r$
- $M^d = PL(Y, r)$ , and  $M = M^s$
- Money market equilibrium
- $M = PL(Y, r)$
- In the RBC model  $Y$  and  $r$  was given from the goods market, money influenced  $P$  only
- Money was neutral
- Here  $P$  is exogenous (constant)
- $M/P = L(Y, r)$
- $M$  determines the *real* quantity of money
- Money market reaches its equilibrium through adjustments in  $Y$  and  $r$
- LM curve: all the combinations of  $Y$  and  $r$  that bring the money market into equilibrium given  $M$  and  $P$

## LM curve

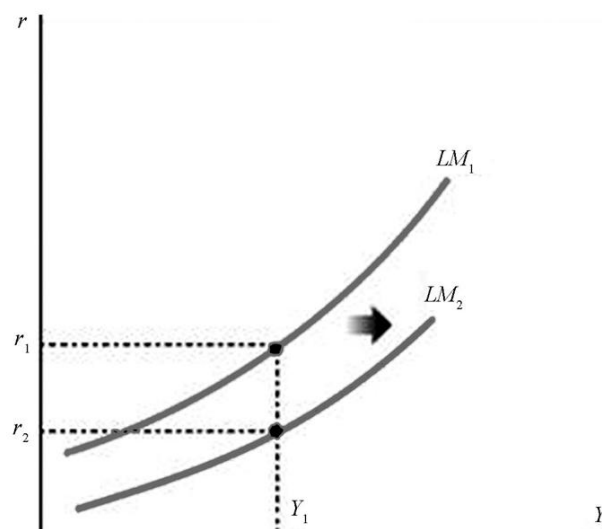
- Given the real quantity of money, features of the LM curve are determined by the L function



- Equilibrium condition of the money market, given the real money supply
- Has a positive slope. Any increase in  $Y$  increases the real demand for money. Given the supply,  $r$  has to increase so that money demand decreases back to the given level of supply

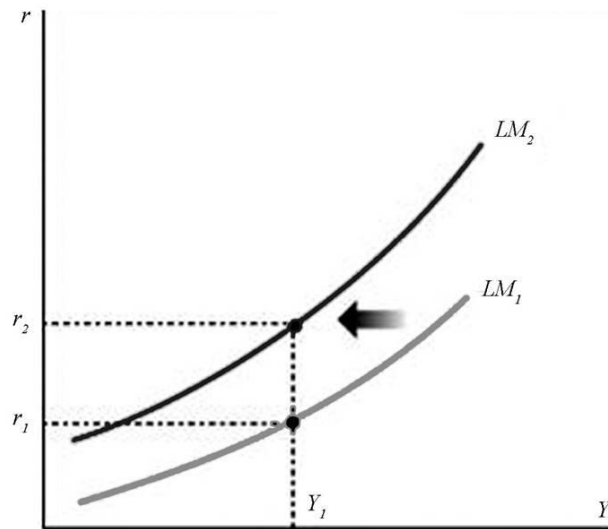
## Shifts of the LM curve

- Expansionary monetary policy: an increase in  $M$  (given  $P$ )



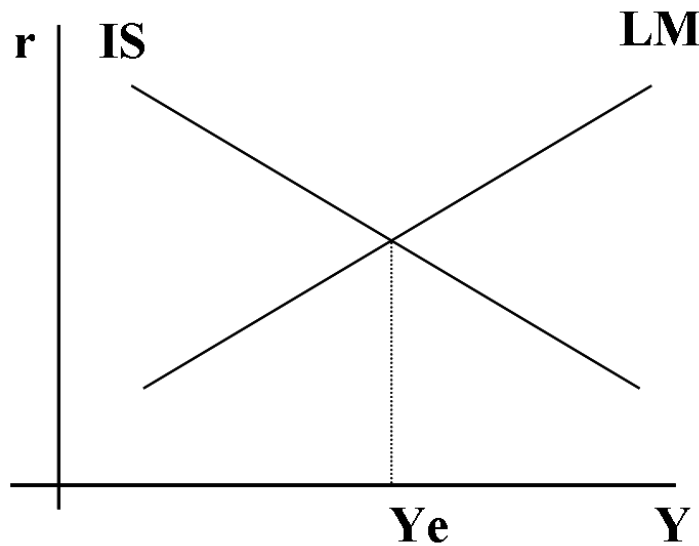
## Shifts in the LM curve

- An increase in the demand for real money



## IS-LM equilibrium

- $M/P = L(Y, r)$
- $Y = C(Y) + I(r) + G$
- Two markets determine two variables,  $Y$  and  $r$



## Comparative statics

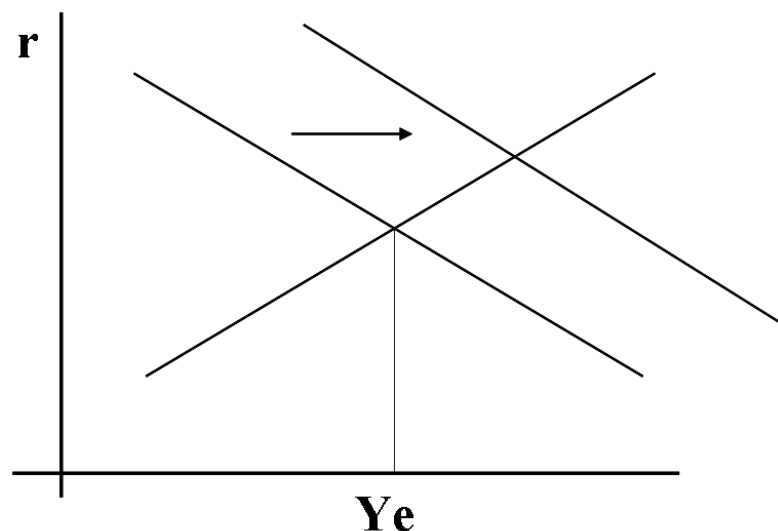
- Any exogenous change influencing any of the markets shifts one or both of the curves, resulting in new equilibrium values of  $Y$  and  $r$
- Comparative static analysis
- Examples
- Fiscal policy
- Monetary policy etc.

## Economic policy

- Variables controlled by the government  
( $G$ ,  $T$ ,  $M$ ) are considered to be exogenous. Government can manipulate them in order to influence some other macro variables
- Supply is not modeled in this model. The government can try to manipulate demand only
- Fiscal policy,  $G$  and  $T$
- Monetary policy  $M \rightarrow r \rightarrow I \rightarrow Y$

## Economic policy

Fiscal expansion crowds out investment due to the increase in the interest rate





## Evaluation of the IS-LM model

- Static, lacks micro foundation, expectations are handled exogenously
- Price level is not explained, it is given
- Production, supply is not modeled, it does not restrict adjustments
- As a result of the above: it gives extremely optimistic predictions on the efficiency of demand management policy
- You just create demand and that is it

## Long run – short run

- In the long run macro performance of output cannot be independent of production possibilities, resources, supply conditions
- Keynesian model can be applied as an explanation of the short run cyclical movements around normal capacity utilization, caused by demand disturbances
- A model of demand determined cycles
- Natural rate – potential output
- The level of output that would prevail if prices were flexible
- Prices are rigid, rather than flexible in the short run, therefore the measured output is not the same as the potential
- In the long run the price level can adjust, and this draws demand back to the level of potential output

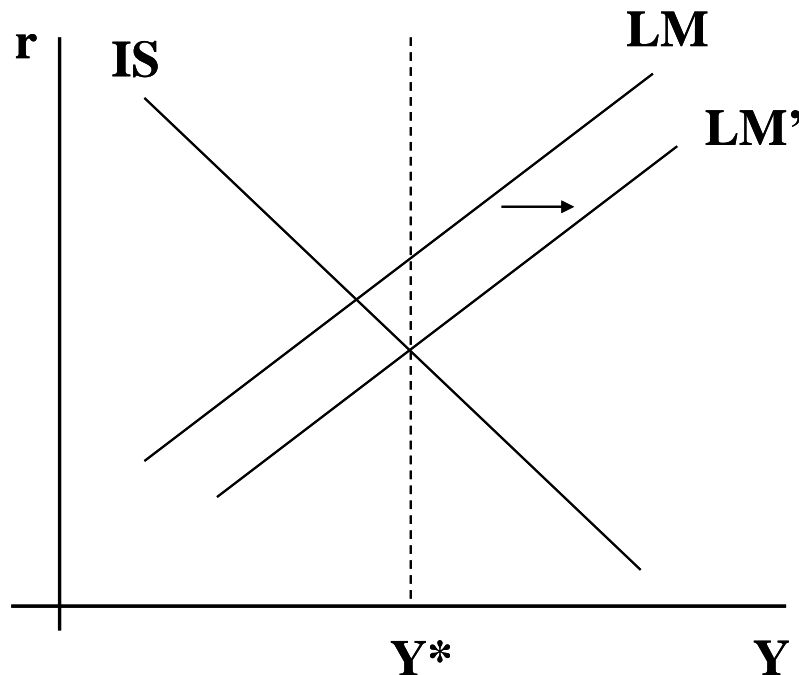
## Equilibrium in the short run and in the long run

- $M/P = L(Y, r)$
- $Y = C(Y) + I(r) + G$
- Short run  $P = P^*$
- Long run  $Y = Y^*$  exogenous

- In the long run if  $Y > Y^*$  sooner or later  $P$  will increase. In the opposite case  $P$  will decrease
- Given  $M$ , changes in  $P$  would change the value of the real money supply causing  $r$  to change

## IS-LM long run

If  $Y < Y^*$ ,  $P$  will increase shifting LM backwards

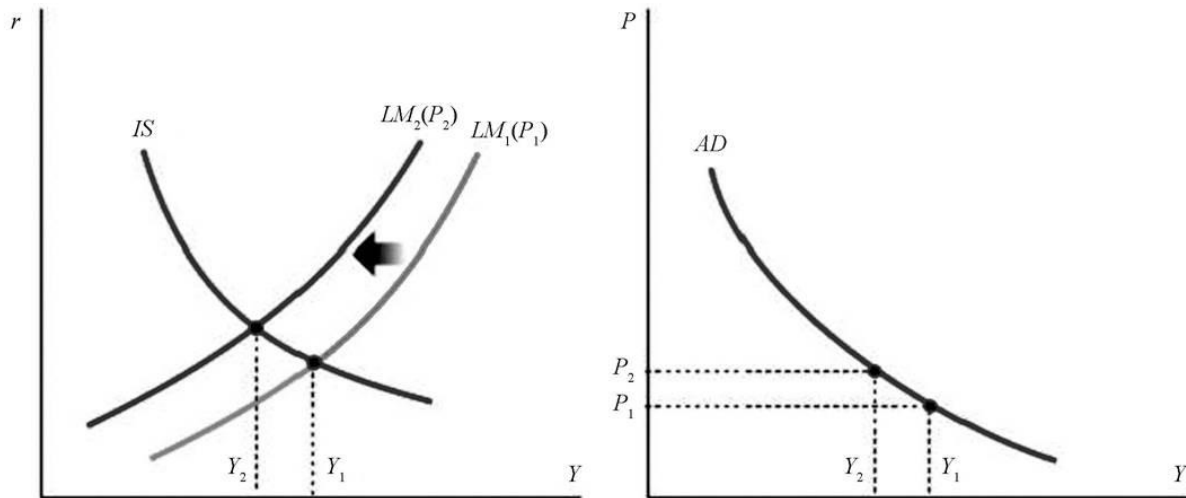


## Self correcting mechanism

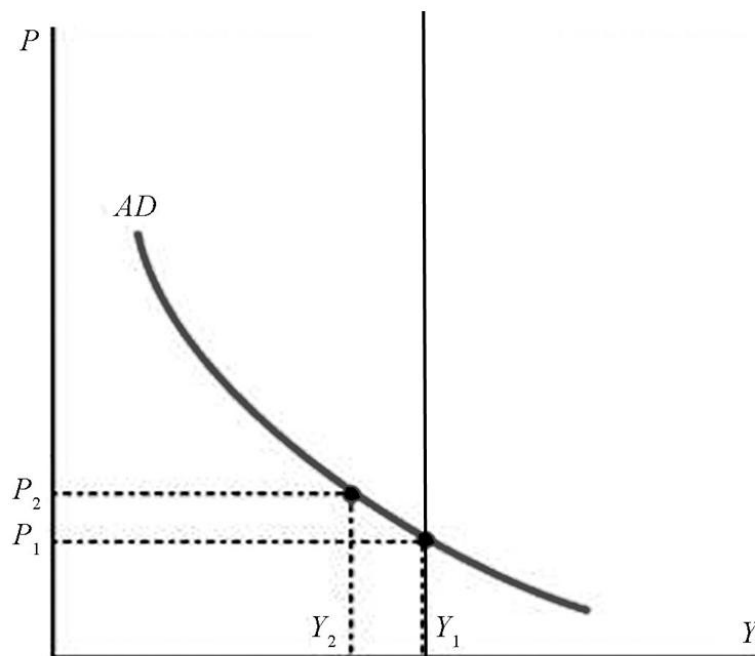
- In the long run adjustments in the price level drive back the economy to full capacity utilization equilibrium
- However, it may take a time too long. Price adjustment is staggering, prices may be rigid downwards
- Economic policy can fasten this adjustments
- Stabilization policy

# Aggregate demand

- Impact of changing  $P$  on IS-LM equilibrium. Notice that unlike in RBC, the aggregate demand is a function of the price level



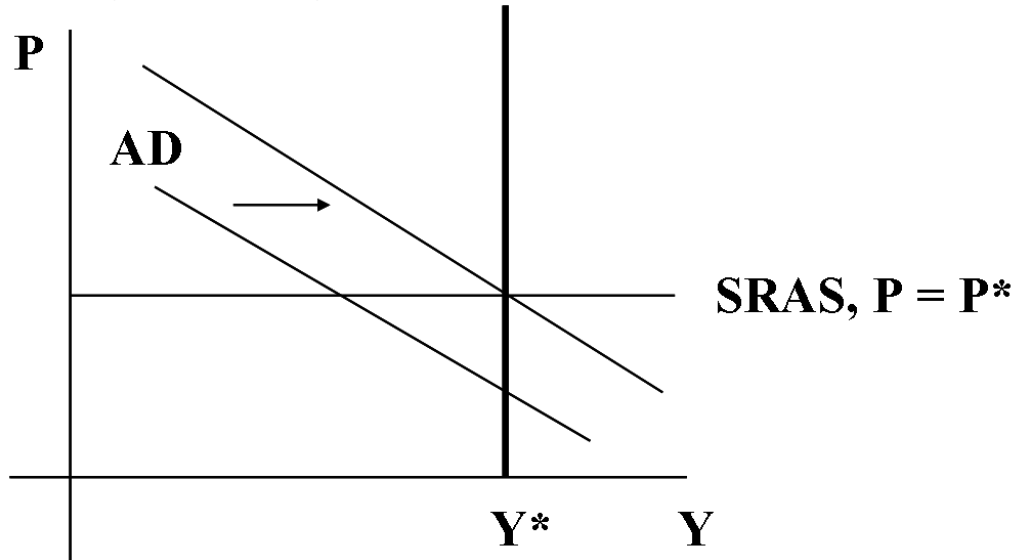
## AS-AD long run



$Y^*$

## Economic policy

- Generating demand to fight recessions



## Monetary policy

- Money is not neutral in the short run
- By changing money supply, demand changes and due to rigid prices the quantity of output adjusts
- In the long run prices adjust so, that demand goes back to the capacity level. No effect in the long run
- Monetary policy can be applied for short run output stabilization, but not for long run manipulation of output