ECONOMIC POLICY

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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

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ELTE Faculty of Social Sciences, Department of Economics

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Author: Péter Pete

Supervised by Péter Pete

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Week 12

Fiscal policy II

Dynamics and forward looking expectations

Péter Pete

Forward looking expectations

- In case of forward looking expectations timing of fiscal policy measures can be very important.
- Previously announced or unannounced fiscal policy measures can have quite different adjustment paths.
- Effects of the measure and effects of the information about it are to be separated.

Dynamics and forward looking

- Time paths for taxes and spending
- In a dynamic setting T and G are related to each other through the intertemporal budget constraint of the government. T and G cannot be both exogenous.
- If we consider G as exogenous, then it determines the present value of taxes. Moreover: timing of taxes would not matter. (Ricardian equivalence)

Representaive consumer

- The simplest case:
- If we substitute the government budget constraint into the one of the consumer, we can eliminate the tax variable

$$c + \frac{c'}{(1+r)} = y + \frac{y'}{(1+r)} - t - \frac{t'}{(1+r)}$$

$$G + \frac{G'}{1+r} = T + \frac{T'}{1+r}$$

Ricardian equivalence

- Assumptions
- G is exogenous
- Forward looking expectations
- Perfect capital markets
- Representative agent
- There is no income redistribution.
- No distortive taxes and other market imperfections exist.

Ricardian equivalence

- Conclusions:
- With given time path of G reductions of taxes would not be expansive.
- It is not easy to determine practically, however, whether the public expects G or T to be exogenous.

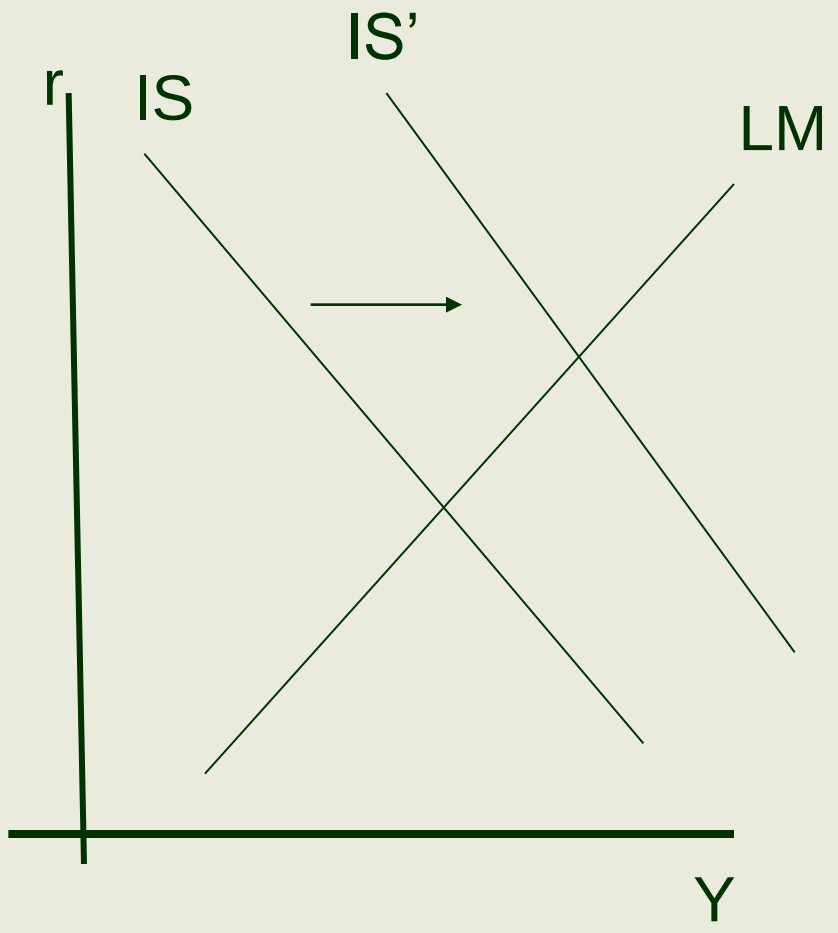
Ricardian equivalence

- If RE holds then the level of national debt does not matter.
- However, it holds only if we assume perfect capital markets. In reality they are not perfect.
- In practical modeling both Ricardian and non-Ricardian consumers are built into the model.
- There is also risk premium on debt usually made dependent on its size.

A dynamic IS-LM model

- A traditional keynesian structure
- Price level is exogenous
- Lacks micro foundation
- Demand oriented, production is fully determined by the level of demand.
- We model expansive fiscal policy, an increase in G.

Static IS–LM



What is the time path to reach the new equilibrium?

Goods market dynamics

- Linearized system. In equilibrium:
- $Y = aY – br + G$
- Assumption: supply adjusts to changes in demand, but it requires time to pass, adjustment is slow. In the meantime the market exhibits disequilibrium.
- Excess demand → Y increases
- Excess supply → Y decreases

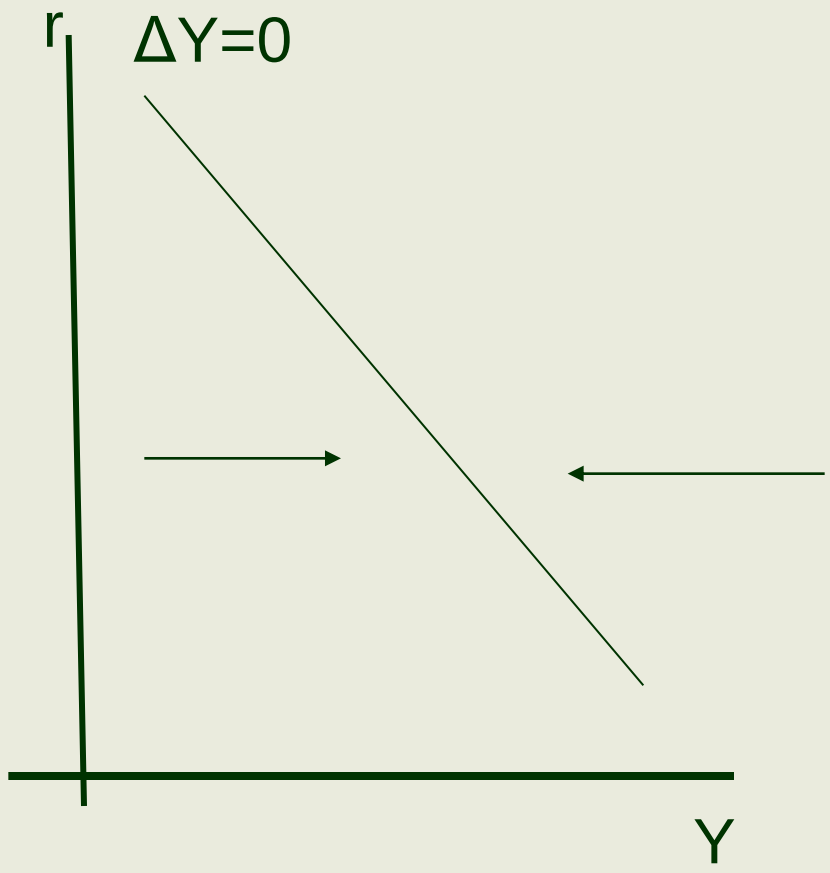
Goods market dynamics

$$Y^d = aY - br + G$$

$$\frac{\partial Y}{\partial t} = \lambda(Y^d - Y)$$

- The speed of supply adjustment depends on λ.

Goods market dynamics



Money market dynamics

- Goods market: movement towards the equilibrium is slow.
- Money market: money is liquid. The money market adjusts immediately. The money market is always in the state of equilibrium.
- There are two different types of equilibrium though. In the steady state, r is constant in time. This is long run equilibrium. In the short run, r is changing in equilibrium.
- What makes r to change?

Digression

- Why does demand for money depend on r?
- M/P = L(Y, r) LM curve
- Transaction demand makes it to depend on Y.
- Why holding money in excess of the transaction demand?
- Models with micro base
- MIU, or Finance constraint

An alternative

- Holding money reduces uncertainty and risk.
- What risk?
- Nominal prices of non-money assets can change. This can cause capital gains or losses for holders.
- The price of money cannot change by definition. Money can be used for hedging risk stemming form price changes of other assets.

Keynes

- Speculative demand for money
- What is speculation?
- An adjustment in the portfolio holdings according to the expected changes in their prices in the future.
- Simplified portfolio structure: money and non-money (bond) assets.
- Interest is return on non-money assets held.

Keynes

- We hold money for speculative purposes, if we expect a decrease in the prices of non-money assets.
- Hold less or none if we expect the prices of other assets to increase.
- Why is that so?

Price of an interest bearing asset

- Price of an asset is the present value of its expected future stream of returns.

$$PV = \sum_{i=1}^{k} \left(\frac{1}{1+r} \right)^{i} C$$

- A change in the rate of interest changes the discount factor we use when calculate the present value. The price of the asset changes resulting in a capital gain or loss.

Keynes

- Expecting an increase in the price of the interest bearing assets is the same thing as expecting a drop of the interest rate.
- Expecting a drop in the interest → small level of speculative demand for money. We hold other assets instead because we expect their prices to increase.
- Expecting an increase in the interest → high level of speculative demand for money.

Forward looking

- What should we preserve from the old keynesian thoughts?
- The fact that the future interest rate is connected to the present interest rate
- But not like Keynes thought (the present determines the future rate).
- Rather, expectation of the future is to determine the current rate.

Equilibrium in the money market

- Original money market
- $M/P = L(Y, r)$ LM curve
- Linearized: $M/P = \beta Y - \gamma r$
- If duration of bonds lasts only for one period, then return would not include expected price changes.
- Assume perpetual (never maturing) bonds for the sake of simplicity.

Price of the bond

- Let P_k stand for the price of the bond. It is determined by the actual rate of interest.

$$P_K = \sum_{i=1}^{\infty} \left(\frac{1}{1+\bar{r}} \right)^i = \frac{1}{r}$$

- Change in the price of the bond is:

$$\frac{\frac{\partial P_K}{\partial t}}{P_K} = \frac{-\frac{\partial r}{\partial t} \Big/ r^2}{1/r} = -\frac{\frac{\partial r}{\partial t}}{r}$$

- Return on bonds is the sum of the interest income and the expected change of the price of the bond.

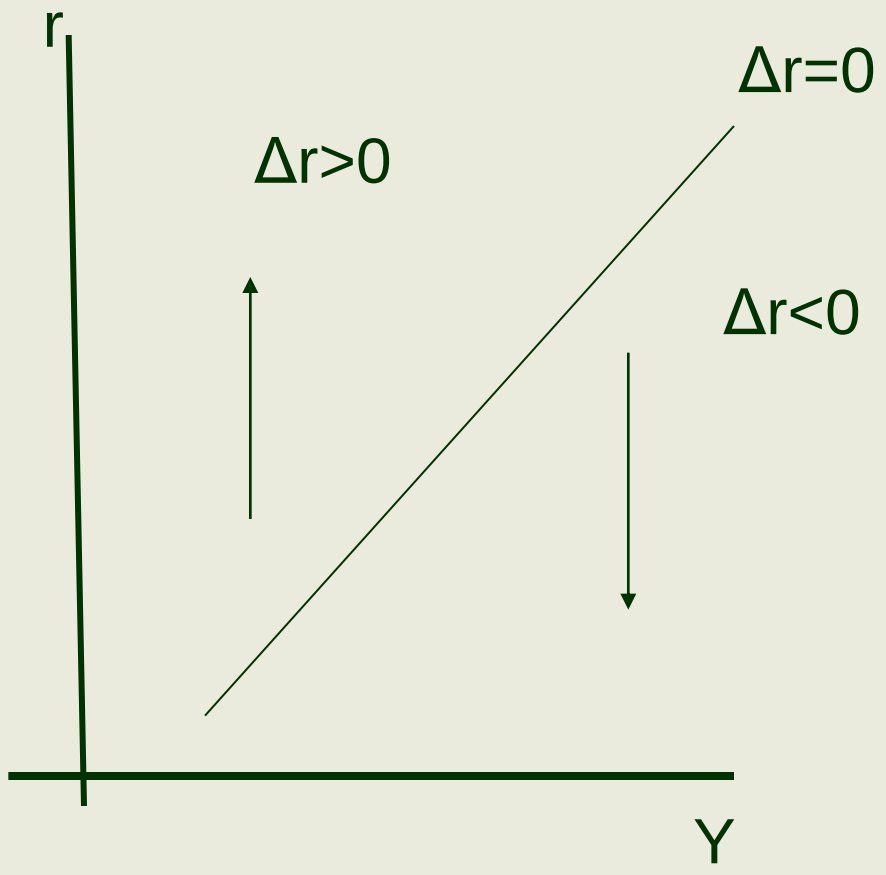
Money market equilibrium

- The new money demand function is as follows:

$$\frac{M}{P} = \beta Y - \gamma\left(r - \frac{\frac{\partial r}{\partial t}}{r}\right)$$

- The money market is always in equilibrium. In the short run the interest rate changes, in the long run it is a constant.

Equilibrium in the money market



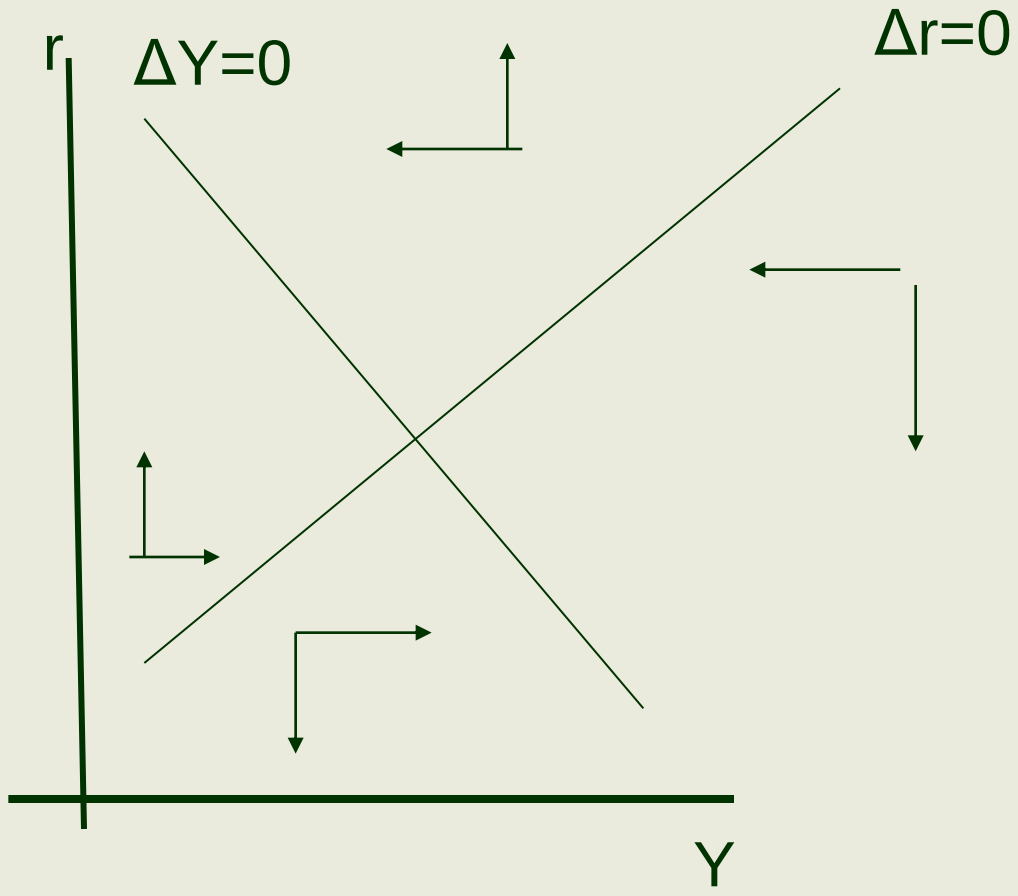
The complete model

$$Y^d = aY - br + G$$

$$\frac{\partial Y}{\partial t} = \lambda(Y^d - Y)$$

$$\frac{M}{P} = \beta Y - \gamma\left(r - \frac{\frac{\partial r}{\partial t}}{r}\right)$$

The complete model



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