

# Introduction to Economics

## **Topic 7 (Macroeconomics):**

An aggregate supply-aggregate demand model

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# Overview



1. Aggregate demand
2. Aggregate supply
3. The determination of equilibrium: income and price level

**Goal:** [1] How the **AS-AD model** is used to analyze economic fluctuations. [2] The importance of the **multiplier**, which determines the total change in aggregate output arising from a shift of the aggregate demand curve.

1. Aggregate demand: consumption, investment, public expenditure and net exports

# The aggregate demand curve

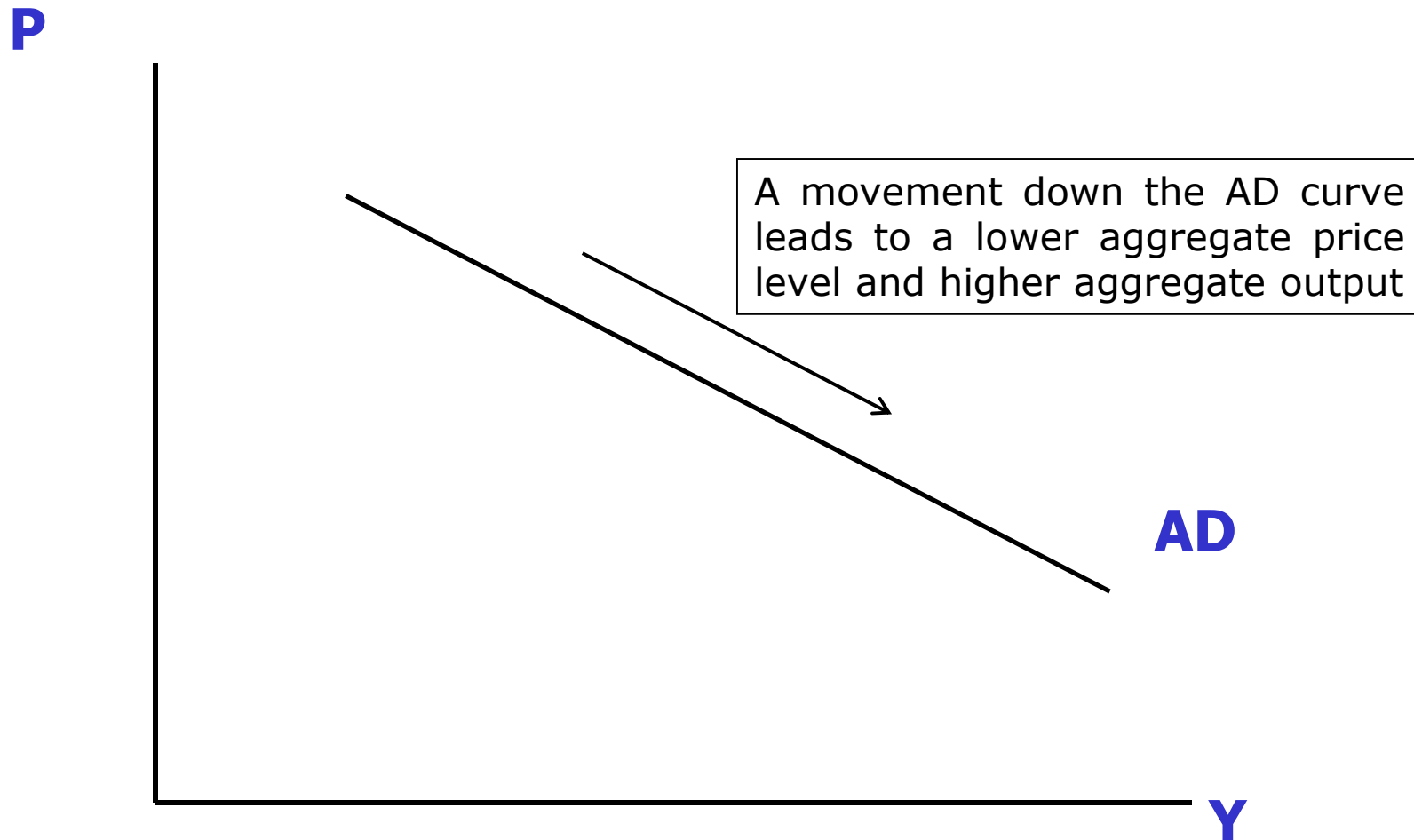


The aggregate demand curve shows the relationship between the aggregate price level and the quantity of aggregate output demanded by households, business, the government and the rest of the world.

$$AD \equiv C + I + G + (X - IM)$$

The aggregate demand curve is downward-sloping

# The aggregate demand curve



# Consumption

The planned aggregate spending in consumption is a function of disposable income, among others,...

$$C = f(Y_d)$$

The households' saving is the part of disposable income not spend on consumption...

$$S = Y_d - C$$

$$S = f(Y_d)$$

## Some definitions...

The marginal propensity to consume, or MPC, is the increase in consumer spending when disposable income rises by €1.

The marginal propensity to save, or MPS, is the increase in household savings when disposable income rises by €1.

$$MPC = \frac{\Delta C}{\Delta Y_d} > 0$$

$$MPS = \frac{\Delta S}{\Delta Y_d} > 0$$

The average propensity to consume, or APC, is the proportion of income spent.

The average propensity to save, or APS, is the proportion of disposable income which is saved.

$$APC = \frac{C}{Y_d}$$

$$APS = \frac{S}{Y_d}$$

## Some definitions...

MPC is lower than 1 ( $0 < MPC < 1$ )

MPS is lower than 1 ( $0 < MPS < 1$ )

Please, note that...

$$Y_d = C + S \quad \Rightarrow \quad \Delta Y_d = \Delta C + \Delta S$$

$$1 = \frac{\Delta C}{\Delta Y_d} + \frac{\Delta S}{\Delta Y_d} \quad 1 = MPC + MPS$$

# The keynesian function of consumption

$$C = C_0 + MPC \cdot Y_d$$

$$0 < MPC < 1$$

**Autonomous consumption** (also exogenous consumption) is a term used to describe consumption expenditure that occurs when income levels are zero.

$$C_0 > 0$$

An example:

$$C = 700 + 0.8Y_d$$

$$S = -700 + 0.2Y_d$$

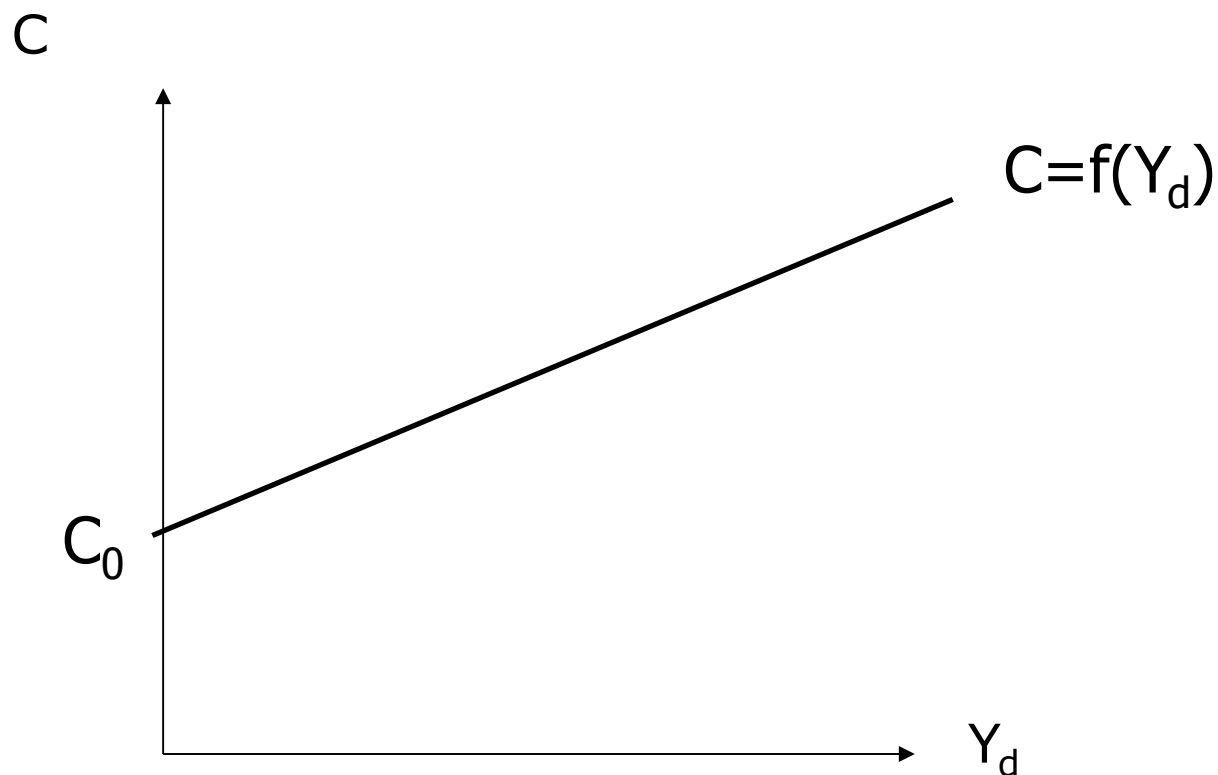
In general terms...

$$S = -C_0 + (1 - MPC) \cdot Y_d$$

$$S = -C_0 + MPS \cdot Y_d$$

# The keynesian function of consumption

$$C = C_0 + MPC \cdot Y_d$$



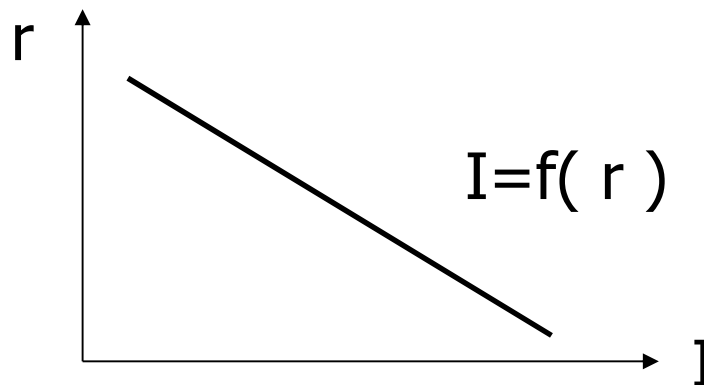
# Investment spending

It is the planned aggregate purchase of capital goods (IK) and the planned aggregate purchase of variable inputs (IE).  
*But we are going to focus only on the planned aggregate purchase of capital goods (capital investment spending).*

It depends on...

- Business expectations
- The cost of investment spending, so the interest rate ( $r$ )
- Others... (aggregate output level, price of capital goods, subventions, tax exemptions,...)

**Quizz** - *What about expectations?*



# Government spending



**Government spending** or **government expenditure** is classified into four main types:

- Government acquisition of goods and services for current use (government final consumption expenditure).
- Government acquisition of goods and services intended to create future benefits (government investment - gross fixed capital formation).
- Government expenditures that are not acquisition of goods and services (transfer payments).
- Public borrowing interests.

# Net exportations

It is the difference between exportations and importations:

$$\text{Net exports} = X - IM$$

It depends on...

- Aggregate production and income of the rest of the world
- The ratio between national good prices and foreign good prices
- Exchange rate

# The aggregate demand curve



The aggregate demand curve shows the relationship between the aggregate price level and the quantity of aggregate output demanded by the economic agents (households, business, the government and the rest of the world).

$$AD \equiv C + I + G + (X - IM)$$

The aggregate demand curve is downward-sloping

**Quizz - Why?**

# The aggregate demand curve



If "price" decreases...

- The interest rate (the price of money) decreases, so investment spending increases (and consumption spending too). Then AD rises.
- National goods are cheaper, so exports increases. Then AD rises.

## 2. Aggregate supply: determinants

# The aggregate supply curve



The aggregate demand curve shows the relationship between the aggregate price level and the quantity of aggregate output supplied.

# The aggregate supply curve

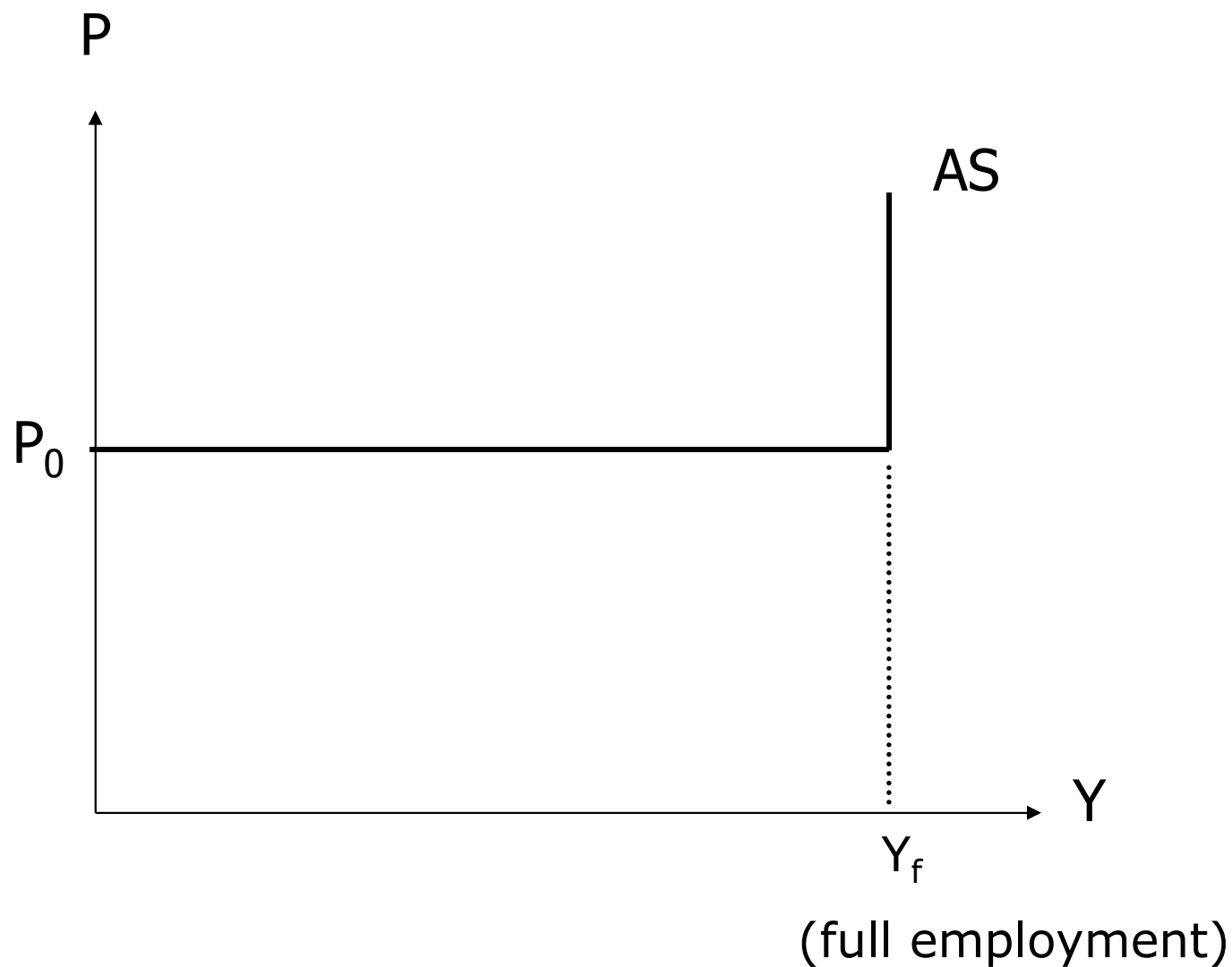


Simplifier hypothesis...

- Short-run aggregate supply curve
- Both prices and wages are fixed
- There is a high unemployment rate (so, the output level may be increased without changes costs of productions – prices)

The aggregate supply curve is then perfectly elastic until the full employment aggregate output level. Then it is perfectly inelastic.

# The aggregate supply curve



### 3. The determination of equilibrium: income and price level

# The AS-AD model

The economy is in short-run macroeconomic equilibrium when the quantity of aggregate output supplied is equal to the quantity demanded.

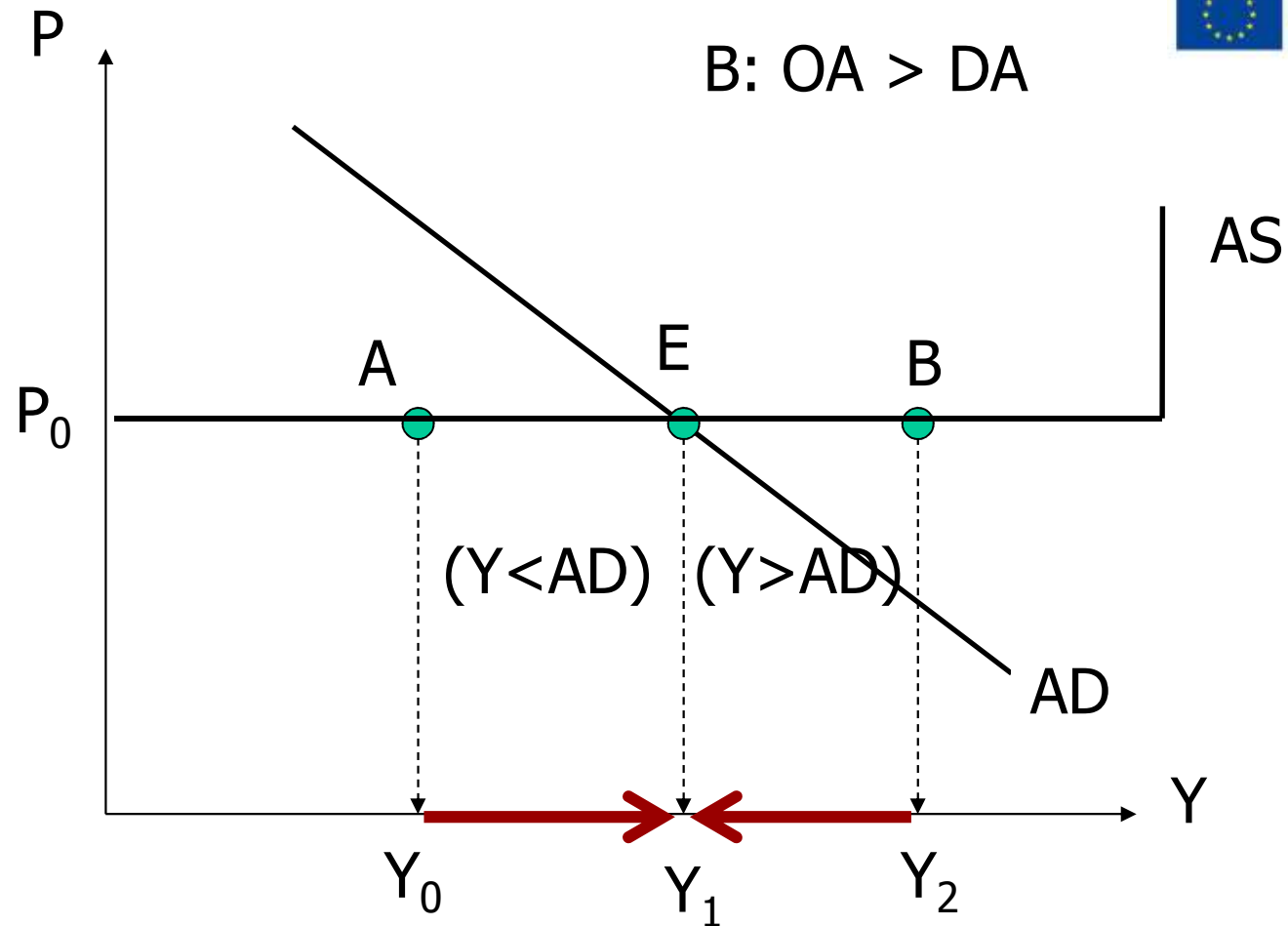
$$\begin{array}{c} AS = AD \\ \swarrow \quad \downarrow \\ \underbrace{Y}_{\text{AS}} = \underbrace{C + I + G + (X - IM)}_{\text{AD}} \end{array}$$

# The AS-AD model

E:  $OA = DA$

A:  $OA < DA$

B:  $OA > DA$

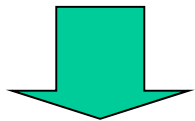


When aggregate production ( $Y$ )  $<$  ( $AD$ )  $\Rightarrow \uparrow$  aggregate output (viceversa)

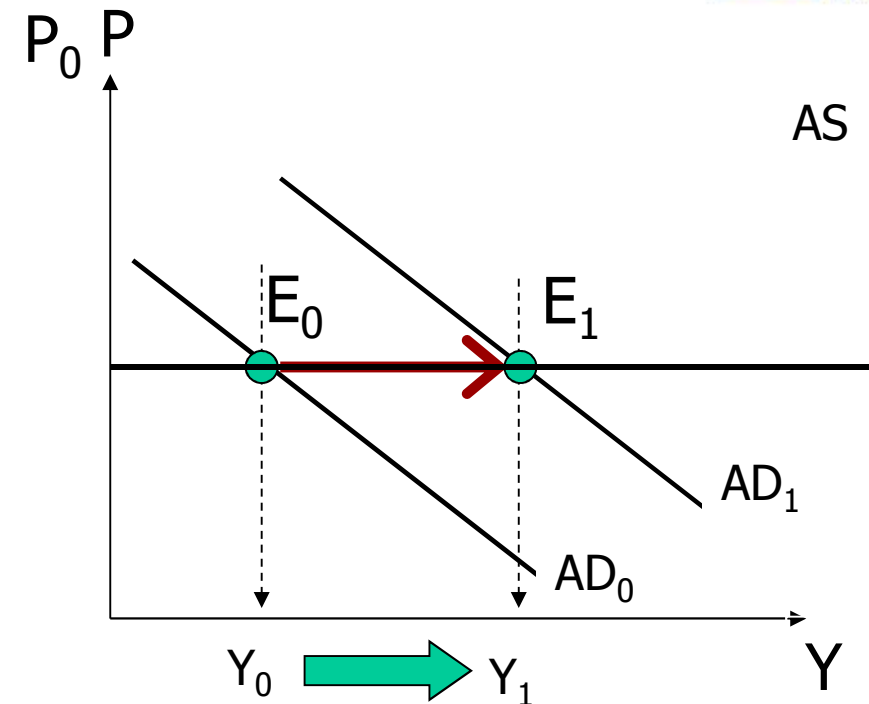
# The AS-AD model

## Changes in equilibrium

$\uparrow C$  ( $\uparrow C_0$ ;  $\uparrow PMC$ ;  $\downarrow T$ ;  $\uparrow TR$ )\*  
 $\uparrow I$   
 $\uparrow G$  (we will see this in Topic 10)  
 $\uparrow X, \downarrow IM$



–AD  
(vice versa)



(\*)Note that:

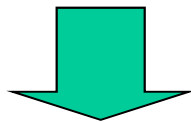
$C = f(Y_d)$  where

$Y_d = NI - T_d + TR$

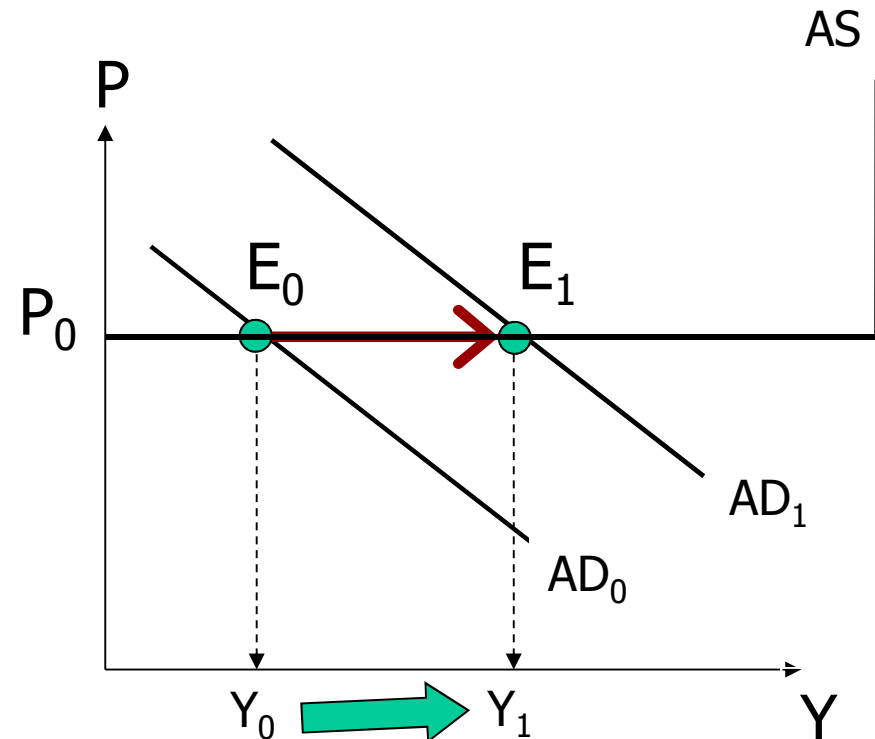
# The AS-AD model

## Changes in equilibrium: An example

$$\uparrow X \Rightarrow \uparrow (X-M)$$



-AD



# The multiplier



The multiplier is the ratio of the total change in Y (real GDP) caused by an autonomous change in aggregate spending to the size of that autonomous change...

$$\text{Multiplier} = 1 / (1 - \text{MPC}) = k$$

$$\text{Change in Y} = k \times \text{Autonomous change in agg. spending}$$

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