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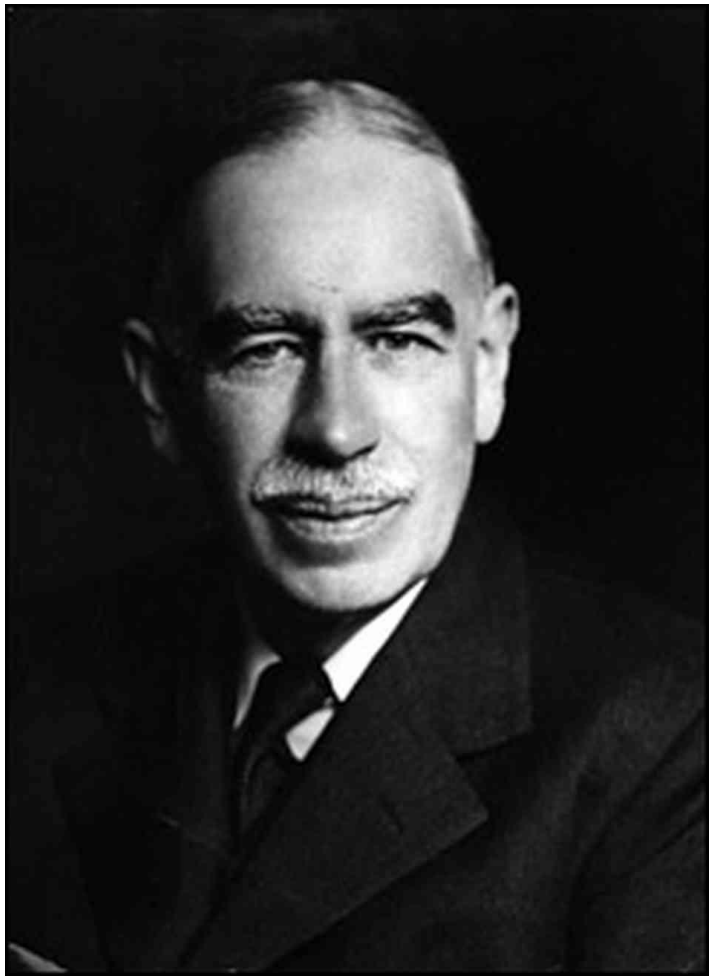
Economy in the short-run: two factor income-expenditure model

Lecture objectives

- What is the essence of the Keynesian doctrine?
- How can economic crises be explained by the aggregate demand fluctuations?
- What are the key factors determining consumption and investment?
- What is the meaning of so called „multiplier" in the vulnerability of the economy to crises?

John Maynard Keynes (1883-1946)



- Model explaining causes of crises and suggesting methods of counteracting them.
- *„**The General Theory** of Employment, Interest and Money"*

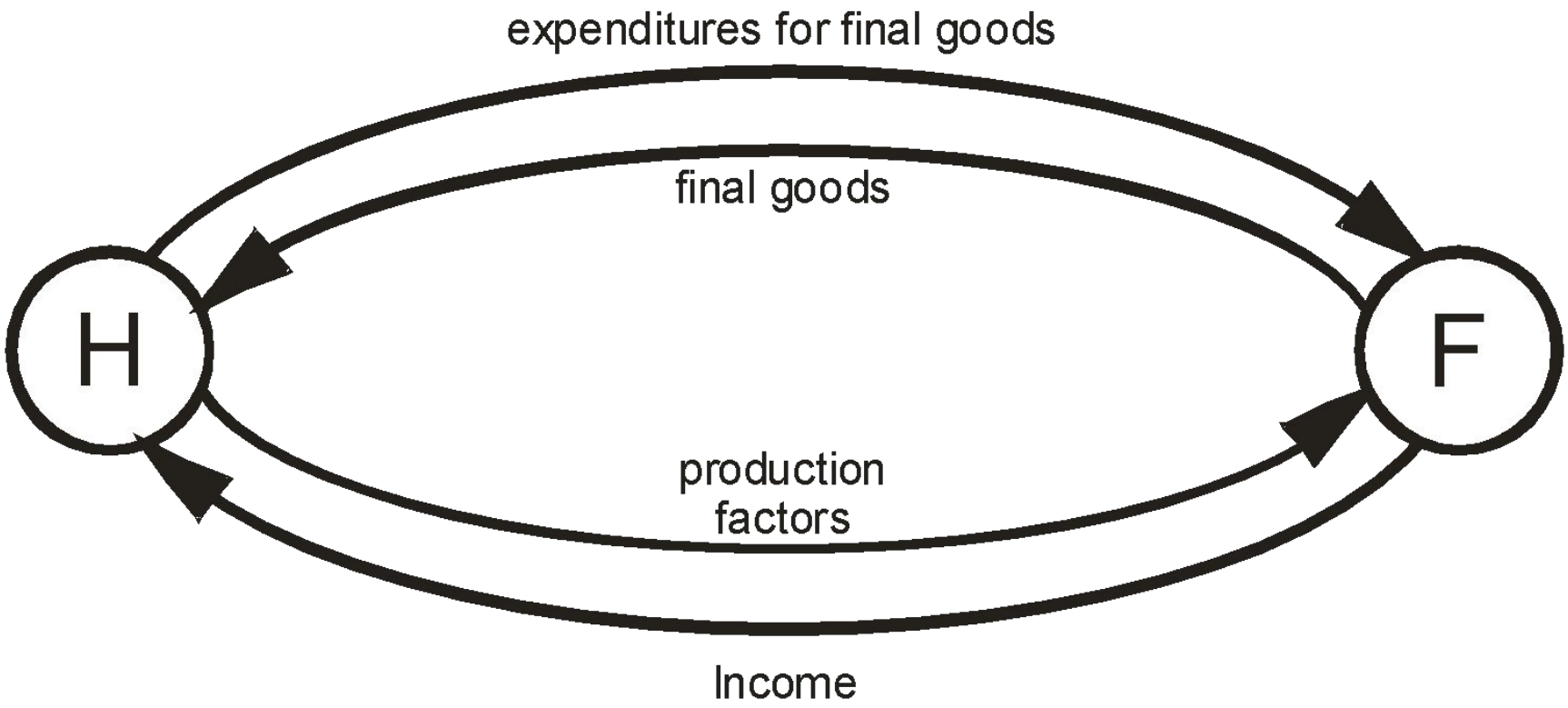
The Keynesian perspective

- Aggregate demand as the cause of crises
- Government intervention as the remedy for crises
- Equilibrium with unemployment

Model assumptions

- Two factor analysis: the only types of economic subjects are domestic households and firms (H and F)
- Crisis circumstances: there are production factors that are not used (actual production is smaller than potential production)
- Price stability: short-run approach (short enough to assume that prices don't change)
- One dimension: the subject of the analyses is the market for goods and services

Circular flow in the model



The essence of aggregate demand

- **Aggregate demand** (**AD**): sum of expenditures for various goods and services that are **planned** at various levels of current income (Y).
- **Consumption (C)**: expenditures for consumption goods planned by households.
- **Investment (I)**: expenditures for investment goods (including inventory) planned by firms.
- AD = C + I

Consumption component of AD

- Two things concerning „C" must be noted:
  - it is directly dependent on households' income
  - it can be financed not only by current income but also by past or future income
- The relationship between „C" and current income can be presented as **marginal propensity to consume** (MPC).
- The part of „C" which is independent of current income is known as **autonomous consumption** (C_A).

Marginal propensity to consume

- **Marginal propensity to consume (MPC)**: the fraction of the additional current income which households are going to spend on additional consumption.

- **MPC = ΔC/ΔY**

Autonomous consumption

- **Autonomous consumption (C_A)**: the part of consumption that is not financed by current income (consumption that does not depend on current income).

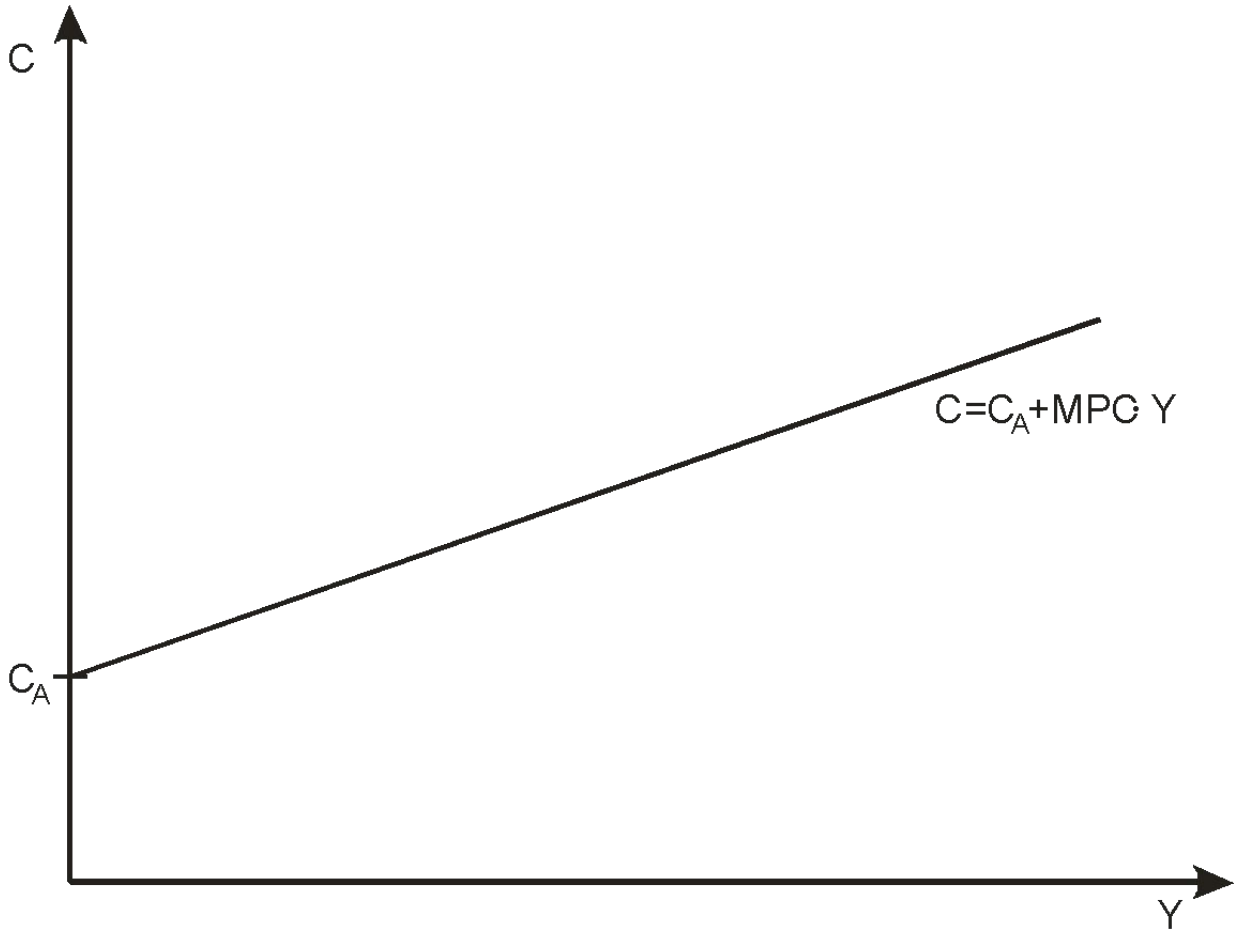
- Yet, it can be covered by past income (i.e. saving) or future income (i.e. borrowing).

Consumption function

Notice that MPC and C_A are key variables in consumption function formula:

1) MPC is responsible for the **slope**

2) C_A is responsible for the **intercept** point (and the parallel shifts of the line).



Technical note

- Changes in nouseholds' current income result in **shifts along** the consumpion line.
- Changes in the autonomous consumption result in **parallel movements** of the consumption line.
- Changes in MPC result in the **different angle** of the consumption line.

Saving

- Saving means unconsumed income.

- $Y = C + S$
- $C = MPC \times Y + C_A$

- $S = MPS \times Y - C_A$

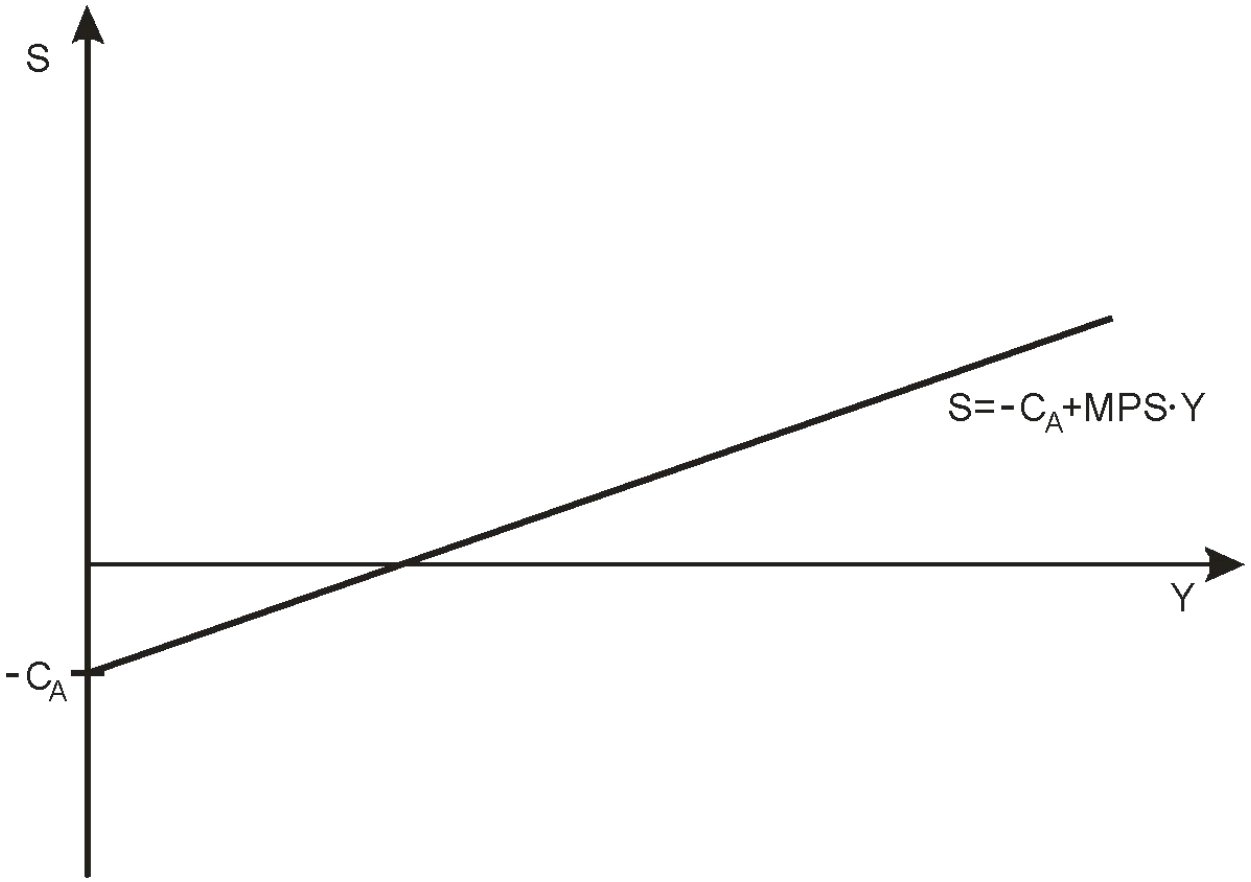
- **Marginal propensity to save (MPS)**: the fraction of the additional current income which households are going to save.

Saving function

Notice that saving function is the mirror reflection of the consumption function formula:

1) MPS is responsible for the **slope**

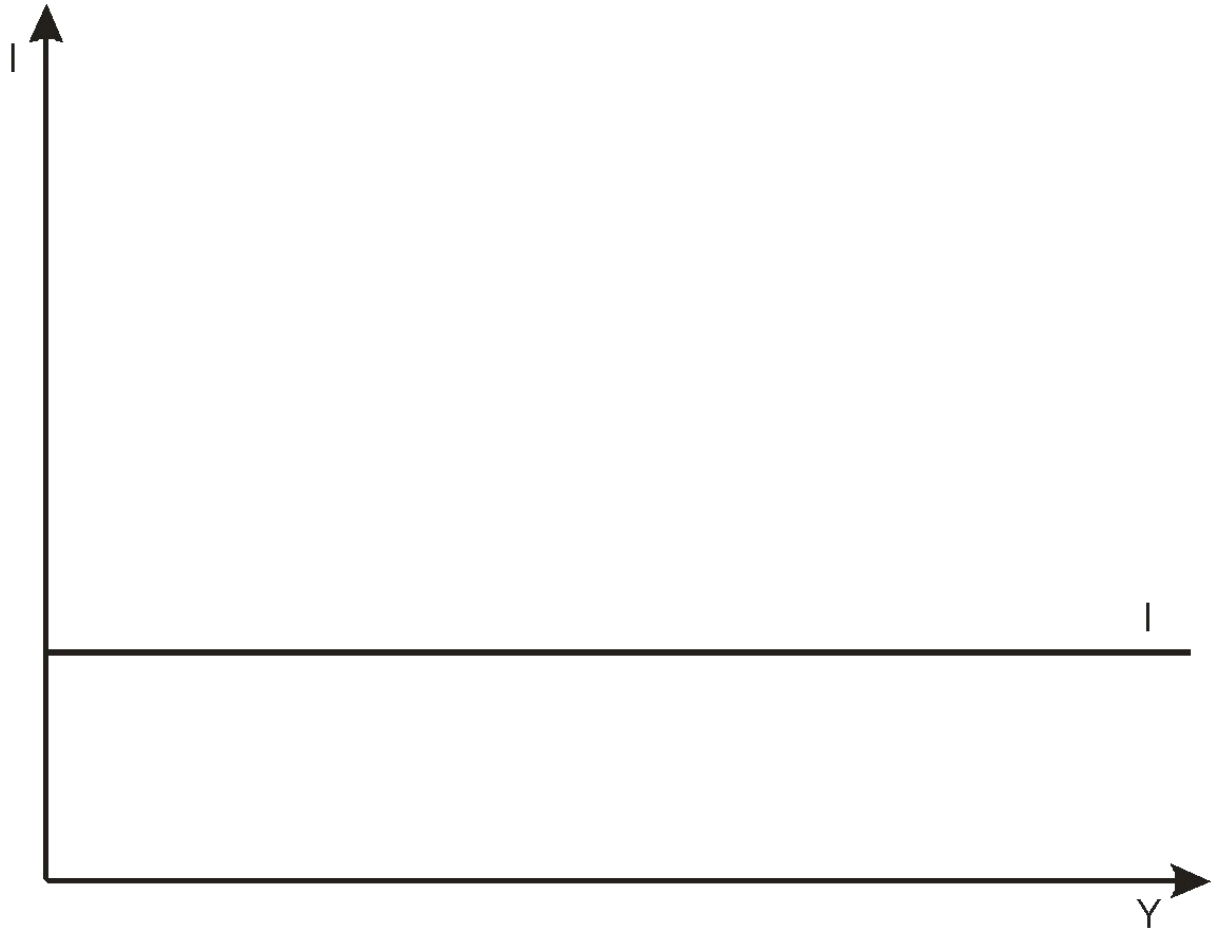
2) C_A is responsible for the **intercept** point.



Investment component of AD

- Special status in the Keynesian doctrine
- Outstanding variability
- Independent of the current state of the economy (including current income); in that sense they're fully autonomous
- Dependent on factors such as:
  - expectations concerning future terms of business
  - interest rates

Investment function

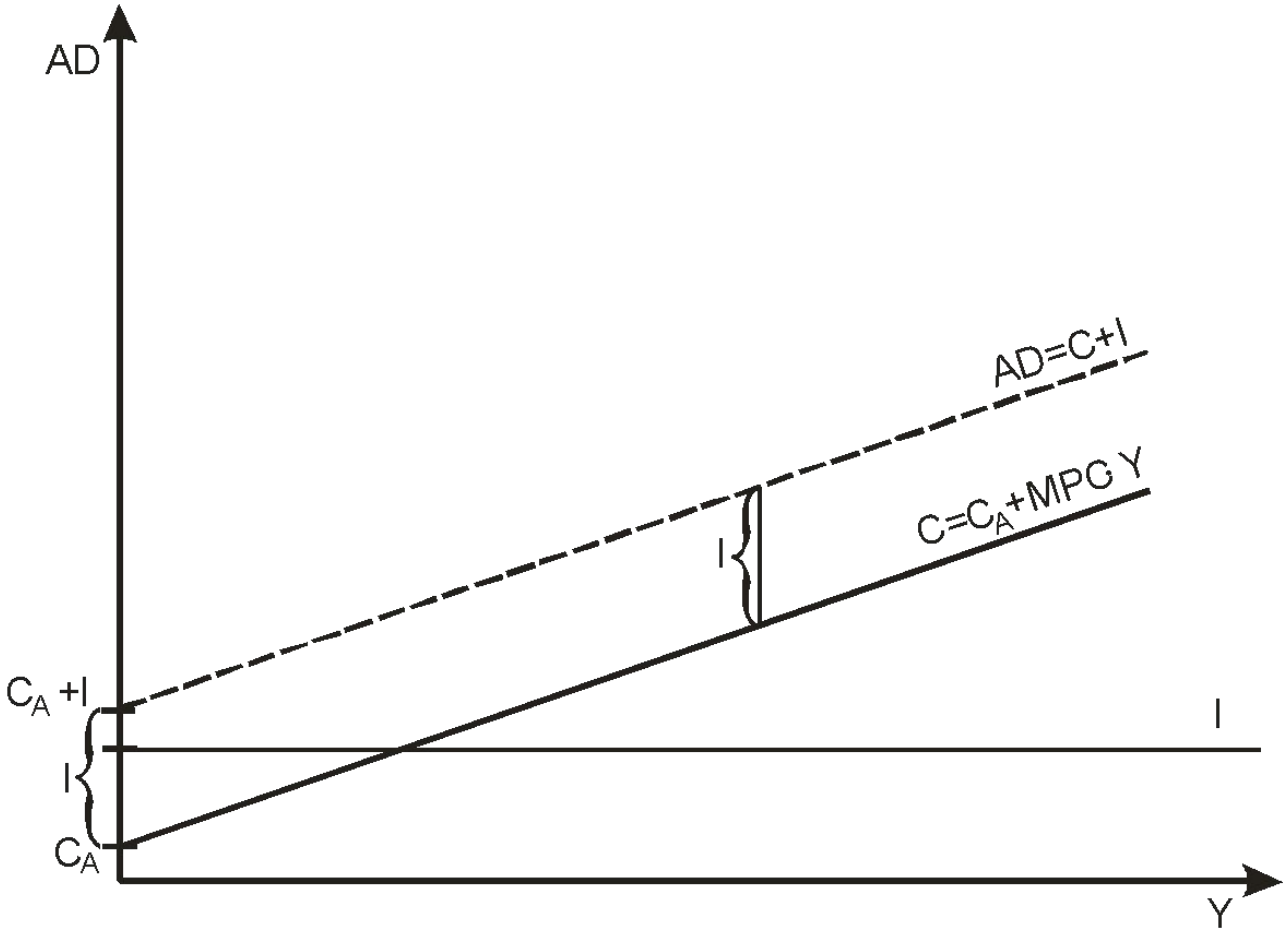


Aggregate demand: recollection

- **Aggregate demand**: the sum of households' and firms' expenditures (for consumption and investments, respectively) **planned** at various levels of current income.

- AD = C + I

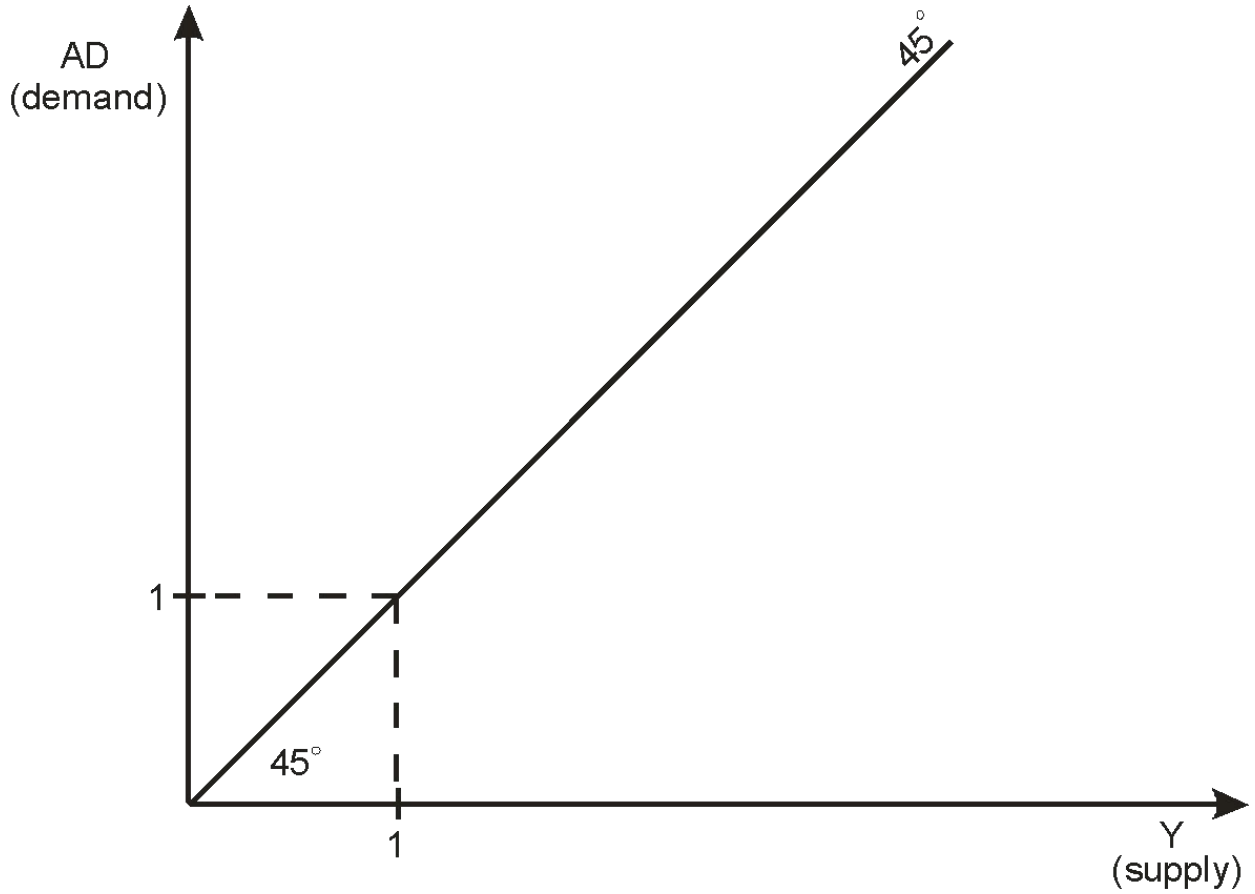
Aggregate demand function



45 degrees line

At any point on the 45° line the distance to the horizontal axis is the same as the distance to the vertical axis.

The 45° line joins points at which AD (demand) equals Y (supply).

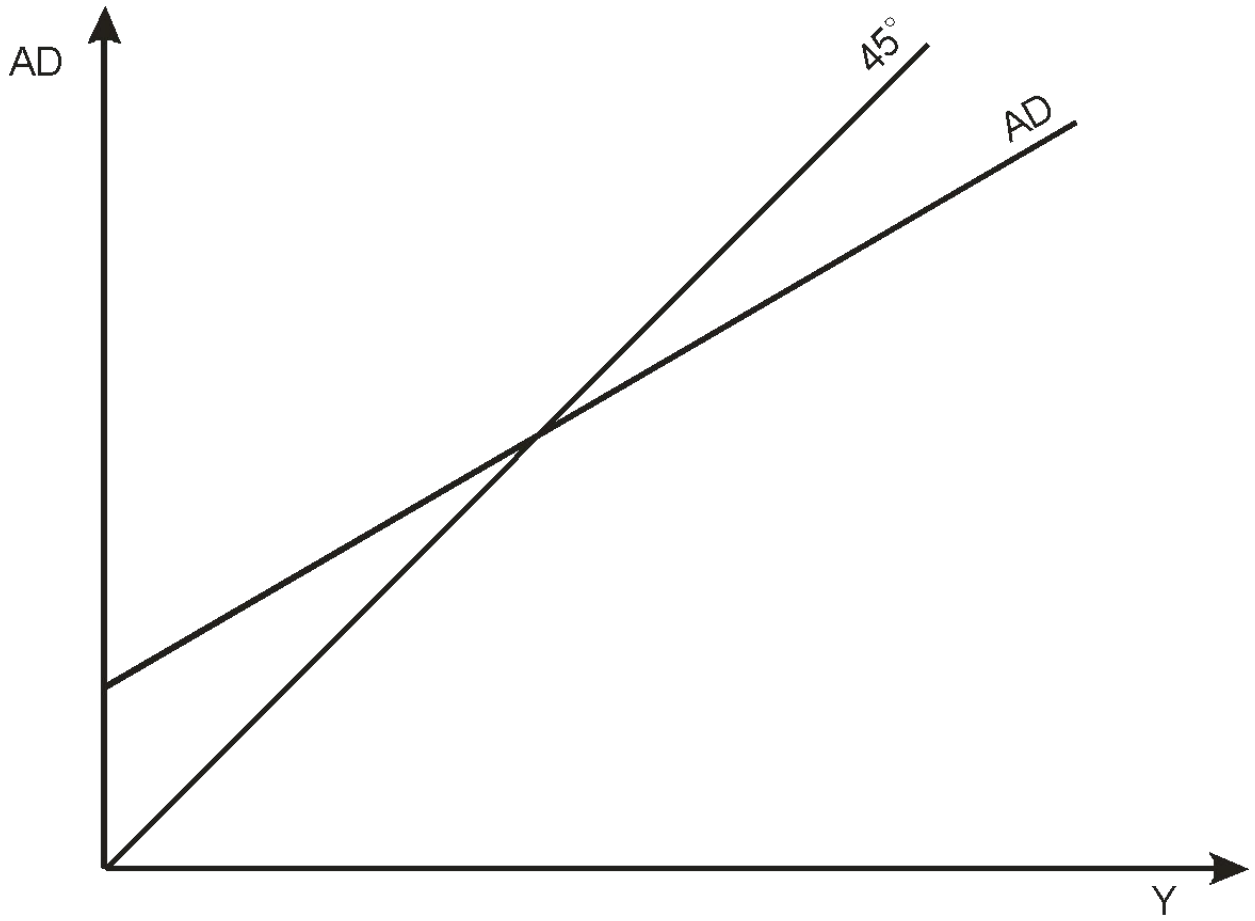


Check point: the meaning of „Y”

- So far the letter „Y” was using to denote „income”.
- From now on it will be used to denote not only „income” but also „production”.
- How can we justify such decision?

Keynesian cross

Plotting AD and 45 degrees lines on the same chart allows you to study equilibium and disequilibrium terms in the market for goods and services.

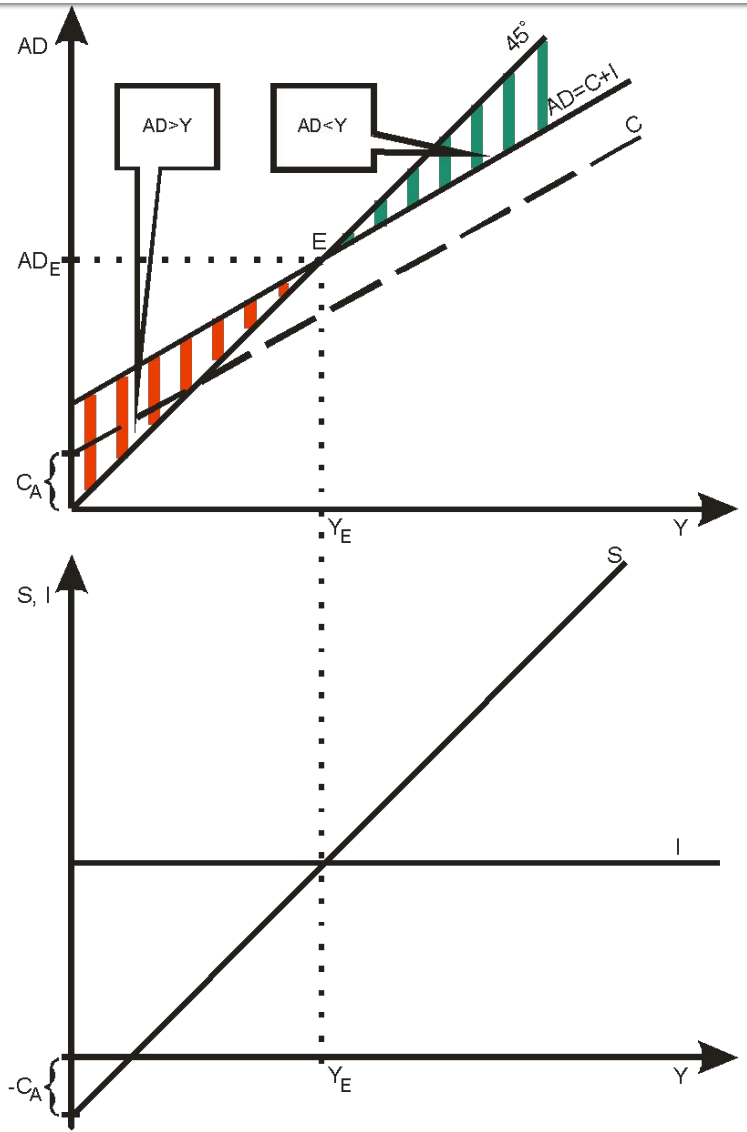


Equilibrium & equilibrium output

- **Equilibrium output (Y_E)**: the level of GDP at which the aggregate demand for output equals the amount that is produced.

- DEMAND = SUPPLY

Short-run equilibrium in the market for goods and services



Equilibrium: numerical example (static analysis)

- $C = 50 + 0{,}7 \times Y$
- $S = -50 + 0{,}3 \times Y$
- $I = 400$

- **$AD = C + I = 450 + 0{,}7 \times Y$**

Equilibrium: two approaches

- **First approach**:
  - AD = Y
  - 450 + 0,7×Y = Y
  - Y_E = 1500
- **Second approach**:
  - S = – 50 + 0,3×1500 = 400 = I
  - S = I

Disequilibrium: shortage (insufficient production)

STATUS

- Assume that
  Y = 1200
- Then AD = 450 + 840 = 1290
- **AD>Y**
- S = – 50 + 360 = 310
- **S<I**

ADAPTATION TO THE STATUS

- Planned investment: 400
- Unplanned investment: -90
- Actual investment (planned + unplanned): 310

Disequilibrium: surplus (excess production)

STATUS	ADAPTATION TO THE STATUS
Assume that Y = 1800	Planned investment: 400
Then AD = 450 + 1260 = 1710	Unplanned investment: 90
AD<Y	Actual investment (planned + unplanned): 490
S = – 50 + 540 = 490	
S>I	

Beware of the misunderstanding!

- At the short-run disequilibrium:
  - $S_{planned} \neq I_{planned}$
  - $S_{actual} = I_{actual}$

Equilibrium: numerical example (dynamic analysis)

- Assume that:
  - $C = 50 + 0{,}7 \times Y$
  - $I = 400 \longrightarrow I' = 550$ ($\Delta I = 150$)

- $AD' = 600 + 0{,}7 \times Y$
- $Y_E' = 2000$
- $Y_E' = 2.000$

- $\Delta Y_E / \Delta I = 500/150 = 3{,}33$

Investment multiplier

- **Investment multiplier**: a measure that informs how many times the change in the equilibrium output (that is reaction to the change in investment) will be greater than the change in invesment.

- $M = \Delta Y_E / \Delta I = 1/(1 - MPC)$

Investment multiplier and economic cycles

- Higher multiplier >>> more volatile GDP
- Lower multiplier >>> less volatile GDP

Check point: true / false test

- The Keynesian model assumes that the production is basically determined by the demand.
- Sum of marginal propensity to consume and marginal propensity to save equals 1.
- Planned saving is always the same as planned investment.
- The slope of the consumption function depends solely on the autonomous consumption.
- Consumption is zero when the income at households' disposal is also zero

Check point: true / false test (cont.)

- The relation of consumption planned by households to their income at disposal is named marginal propensity to consume.
- The higher marginal propensity to consume, the more steep aggregate demand line.
- Investment is inversely dependent on the interest rate.
- Change in investment always causes shifts of AD line down.
- Investment multiplier equals 1/marginal propensity to save

Test your understanding: matching

Description	Term
(1) The situation in which planned investment in the same as planned saving	(A) Investment multiplier
(2) The economic variable that takes responsibility for crises in the Keynesian model	(B) Autonomous consumption
(3) The variable that is always the same as saving	(C) Marginal propensity to save
(4) The variable that reflects the sensitivity of economy to changes in autonomous demand	(D) Aggregate demand
(5) The graphic illustration that matches AD and 45 degrees line	(E) Equilibrium in the Keynesian model
(6) The variable responsible for the parallel shifts in consumption function	(F) Planned government expenditures for goods
(7) The fraction of the additional dollar of income that remains unconsumed	(G) Equilibrium output
(8) The part of AD formula having no impact on the slope of AD line	(H) Actual investment
(9) The level of income at which there is no pressure on firms to change their inventories in an unplanned way	(I) Saving
(10) The unconsumed part of households' income	(J) Keynesian cross

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Textbooks

- O'Sullivan & Sheffrin: chapter 11, „The Income-Expenditure Model"
- Krugman & Wells: chapter 27, „Dochody i wydatki"