

# Program

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2. Flows, stocks, and the production function
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4. The basic macroeconomic model
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## **Topic 2**

# **Flows, Stocks, and the Production Function**

**2.1. Commodities**

**2.2. Flows and Stocks**

**2.3. Inputs**

**2.4. Technology and Production Function**

**2.5. Properties of the Production Function**

**2.6. Neoclassic Production Function**

# Commodities

A commodity is a good or a service. Its defining features include the time, place and state of nature at which it is available.

For example, an umbrella in Getafe, today, if it rains, is a different commodity wrt an umbrella in Madrid, tomorrow, if it is sunny.

# Flows and stocks

## Flows

Economic variables representing a process which require time to be completed

Example: monthly wage

## Funds or Stocks

Economic variables determined at a specific point in time

Example: wealth today

# Inputs

## Labor (L)

Hours of work. The remuneration of labor is the wage ( $w$ ).

## Capital (K)

Machines. Intermediate goods versus capital goods.

## Human Capital (H)

Knowledge and skills.

## Natural Resources (N)

Land, rivers, natural deposits.

# Technology and the production function

## Technology

Technical procedure to transform inputs into final goods (output)

## Production function

Analytical abstraction representing the technology of a firm

$$Y = A * f(K,L,H,N)$$

## Properties of the production function

- No inputs, no output
- Increasing in inputs
- Marginal returns to each input
- Returns to scale

# Returns to inputs

Average returns

$$Y/L$$

$$Y/K$$

Marginal returns

$$\Delta Y / \Delta L$$

$$\Delta Y / \Delta K$$

**Result:** Average returns increase (decrease) if and only if the marginal returns are higher (lower) than the average returns

## Returns to scale

The change in output induced by an equal change in **all** inputs. RTS are constant, increasing or decreasing if output doubles, more-than-doubles or less-than-doubles respectively, when the amount of all inputs is doubled.

# Neoclassical Production Function

- It goes through the origin
- Increasing in inputs
- Marginal returns decreasing for all inputs
- Constant returns to scale
- Example:  $Y = A K^a L^{1-a}$