Econ 522

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Classical Model

- Expanded circular flow diagram
  - 3 Groups: Households, Government, Firms
  - 3 Markets: Factors of Production, Financial, Goods and Services
- Closed-economy, market clearing model
- Focus on “real” variables
- Long-run

Production / Output

- What determines how much the economy produces?
  - (1) Factors of production (inputs into the production process)
  - (2) Available technology (ability to turn inputs into outputs)
- Represent firm's production technology with a production function. Focus on two factors of production: Labor and Capital.
  - Production function = indicates how many units of output can be produced by combining different amounts of inputs
  - Capital = the set of tools, machines, and structures used by workers in production; use *K* to denote the amount of capital
  - Labor = the physical and mental efforts of workers / the time people spend working; use *L* to denote the amount of labor (typically think of in terms of a number of hours)

Production – Available Technology

- Described by the production function: Y = F(K, L)
  - Shows how many units of output (*Y*) can be produced using *K* units of capital and employing *L* units of labor.
    - If technology changes, the production function changes. Better technology will allow more to be produced using the same level of inputs.
  - F is used to describe some general relationship
  - Common specific example: Cobb Douglas production function

$$Y = \mathrm{F}(K, L) = AK^{a}L^{1-a}$$

$$Y = \mathrm{F}(K, L) = AK^{1/3}L^{2/3}$$

  - Production function properties: returns to scale
    - Constant returns to scale = doubling the amount of each input *will double* the amount of output produced
    - Increasing returns to scale = doubling the amount of each input *will more than double* the amount of output produced
    - Decreasing returns to scale = doubling the amount of each input *will less than double* the amount of output produced

Returns to Scale

- Typically assume that the production function exhibits constant returns to scale. Implies increasing each factor of production by a fixed percent will increase output by the same percentage.
- Checking returns to scale: multiply both inputs by some number z and compare output.
  - Y1 = F(K1, L1)
  - K2 = z K1, L2 = z L1
  - Y2 = F(K2, L2)
  - If
    - Y2 = z Y1 => constant returns to scale
    - Y2 > z Y1 => increasing returns to scale
    - Y2 < z Y1 = > decreasing returns to scale
- Examples …

Factors of Production

- Factor Prices = the prices per unit that firms pay for the factors of production
  - Wage (W) = the price per unit of Labor
  - Rental rate (R) = the price per unit of capital
- Notation:
  - W = nominal wage
  - R = nominal rental rate
  - W / P = real wage (measured in units of output)
  - R / P = real rental rate

Firms

- Assumptions:
  - Economy is made up of perfectly competitive firms (price takers)
  - Can describe as one representative firm
- Firms decide how much output to produce and how much of each factor to use in production. Goal is to maximize profit.
- More assumptions:
  - Technology is fixed (exogenously determined)
  - Supply of capital and labor are fixed
  - Full resource utilization