THE ECONOMY AT FULL EMPLOYMENT

CHAPTER 7

- MC Quiz
- Summary
- Key Figures
- Lecture Slides

2 lectures

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• Explain how employment and wage rates are determined by demand and supply in the labor market.
Tasks:

- What determines the demand curve for labor?
- What determines the supply curve for labor?
- How do we reach equilibrium?
Learning objectives

- the production function
  - total product
  - average product
  - marginal product

- shifts in the production function
  - changes in total product
  - changes in marginal product

- what determines the real wage?

  \[
  \text{Marginal physical product of labor} = \frac{w}{p}
  \]

- what determines changes in real wages?

- hypothesis of behavior of real wages (interpersonal comparison)
Explaining Employment and Wage Rates

- Demand and Supply in the Labor Market
  - The labor demand curve shows the quantity of labor that firms plan to hire at each possible real wage rate.
  - Firms attempt to maximize profits

\[ \frac{\Delta TR}{\Delta L} = \frac{w}{P} \]
Production Function

Real GDP (trillions of 1992 dollars per year)

Labor (billions of hours per year)

An increase in labor hours brings an increase in real GDP at a decreasing rate.

RGDP = f (K, N, T)

"Law" of diminishing returns

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\[ \Pi = \tilde{P} \times \phi(K, N) - \tilde{w} \times N \]

"the profit function"

\[ \frac{d\Pi}{dN} = 0 \]

Test:

"profit"

Find the amount of labor that maximizes profit.
Micro 101

theory of the firm


competitive

$$\Pi = TR - TC$$

$$\Pi = \bar{\rho} \cdot \phi(\bar{K}, \bar{N}) - \bar{W} \cdot \bar{N}$$

max $$\Pi$$  \hspace{1cm} \text{key assumption}

$$\frac{d\Pi}{dN} = 0 = \bar{\rho} \cdot \frac{\partial \phi}{\partial N} - \bar{W}$$

Solve

$$\frac{\partial \phi}{\partial N} = \frac{\bar{W}}{\bar{\rho}} = \text{real wage}$$

recall $$\phi = f(\bar{K}, \bar{N})$$

$$\frac{\partial \phi}{\partial N} = \text{Marginal Physical Product of Labor}$$
Note:

\[
\frac{3}{2}w > \frac{3}{1}w
\]

\[\text{AP}_n > \text{MPP}_n\]

Given \(\tilde{w}/\tilde{p}\), the profit maximizing firm will hire \(OA\) to \(OB\).
at point a

\[ \text{RGDP} = ? \]

\[ \frac{\text{RGDP}}{N} = ? \]

\[ \frac{\Delta \text{RGDP}}{\Delta N} = ? \]

\[ \frac{w}{\rho} = ? \]

Econ 101:1

\[ \frac{w}{\rho} = \frac{\Delta \text{RGDP}}{\Delta N} \]

- verbalize
- illustrate
- derive
The production function

\[ \phi = f(\bar{c}, n, \bar{y}) \]

\[ \frac{\partial \phi}{\partial n} = MPL_n \]

The demand curve for labor
ODCA: total output = GDP
OACB: real labor income
DBC: real "capital" income

\[
\frac{DBC}{OACB} = \frac{0.33}{0.66} = 0.50 \text{ for U.S. economy}
\]
\[ \frac{\Delta Q^D}{Q^D} = e \frac{\Delta (w/l)}{(w/l)} \]

\( e \): demand elasticity for labor at point a \( e = -1.0 \)

**Keynotes:** 
\( e > -1.0 \); e.g. -0.05 (inelastic)

**Classical:** 
\( e \leq -1.0 \); e.g. -2.0 (elastic)