

Chapter 17: Labor Markets

Econ 102: Introduction to Microeconomics

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1.1 Goals of this class

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- Learn how employment and wages are determined in equilibrium.
- Learn what can shift labor supply and labor demand, causing changes in wages and employment.
- Learn what determines the responsiveness of labor demand to changes in wages.
- Learn what determines the responsiveness of labor supply to changes in wages.

2 Labor Demand

2.1 Profit Maximization

Marginal Revenue Product

- **Marginal Revenue (MR):** the additional revenue from producing one additional unit of a good.
- **Marginal Revenue Product (MRP):** the additional revenue from hiring one additional unit of labor.
- $MRP = MP \times MR$.
- Law of diminishing marginal product assures that MRP decreases as labor increases.
- Will the MRP be upward or downward sloping?

Profit Maximization

- Suppose you producing a good and hiring at a point where $MRP > \text{wage}$. Should you...
 - hire more people and produce more?
 - hire fewer people and produce less?
 - not make any changes?
- What impact will this move have on $MRP - \text{wage}$?
- Profit maximizing labor demand: $MRP = \text{wage}$.
- *MRP curve is the labor demand curve.*

2.2 Shifts in Labor Demand

Shifts in Labor Demand

- When *something besides the wage* influences labor demand, this shifts the labor demand curve.
- The following effects MRP and therefore the labor demand curve:
 - Demand for a firm's output.
 - Prices of other factors of production.
 - Level of capital.
 - Technology.

Derived Demand

- Derived demand: demand for labor depends on demand for final product.
- Increase in demand for a good.
 - What happens to equilibrium price and quantity of the good?
 - What impact does the change in price have on MR ?
 - Increase in demand for a good shifts labor demand to the
 - Decrease in demand for a good shifts labor demand to the

Technology and Capital

- Changes in the price of other factors of production (capital, land, etc) have only *long-run* effects on demand for labor.
 - What is the long-run impact on labor demand if capital is a substitute for labor?
 - What is the long-run impact on labor demand if capital is a complement for labor?
- Increase in technology and/or capital.
 - Many believe improvements in technology reduces labor demand.
 - Some technology also increases labor demand.
- Example: Electronic telephone exchange system.
 - Reduces labor demand for telephone operators.
 - Increases labor demand for systems managers, programmers, electronic engineers.
 - Increases productivity of office workers.

2.3 Elasticity of Labor Demand

Elasticity of Labor Demand

- **Elasticity of labor demand:** measures the percentage change in the quantity of labor demanded when wage increases by one percent.

$$e_L = \frac{\% \Delta L_d}{\% \Delta w}$$

- The following influences elasticity of labor demand:
 - Labor intensity.
 - Elasticity of demand for the good being produced.
 - Sustainability of capital for labor.
 - Labor supply skill differentiation.
 - Time.

Labor Intensity

- Suppose project is very labor intensive and wages increase.
- The increase in wages have a big impact on total costs.
- Big increase in total cost shifts supply curve left by a large amount.
- Big decrease in quantity → big decrease in quantity of labor demanded.
- As labor intensity increases → elasticity of labor demand increases.

Price Elasticity of Demand

- Suppose good being produced has high elasticity of demand.
- Increase in wages shift supply curve leftward.
- Elastic demand implies large decrease in quantity.
- Big decrease in quantity → big decrease in quantity of labor demanded.
- As price elasticity of demand increases → elasticity of labor demand increases.

Other Influences on Elasticity of Labor Demand

- Substitutability of capital.
- Differentiation in labor skills.
 - The more differentiation there is in labor skills, the more difficult it is to search, interview, and hire.
 - More differentiation → less elastic labor demand.
- Time.
 - As time increases following an increase in wage, more substitutes can be found/developed.
 - Elasticity of labor demand increases with time.

3 Labor Supply

3.1 Labor vs. Leisure

Labor Supply

- Consumers choose labor supply in order to maximize utility.
- Think of labor supply as the residual of a decision to consume leisure.
- Think of leisure as a good you can buy.
 - What is the price of leisure? What is the opportunity cost of leisure.

3.2 Utility Maximization

Utility Maximization

- Notation: l =leisure, w =wage, c =consumption, P =price of consumption, T =total time one can spend working and leisure.
- Utility Maximization Rule:

$$\frac{MU_l}{w} = \frac{MU_c}{P}$$

- Budget constraint:

$$Pc + wl = w(T - l)$$

Income and Substitution Effects

$$\frac{MU_l}{w} = \frac{MU_c}{P}, \quad Pc + wl = w(T - l)$$

- Suppose there is increase in wage.
- Substitution effect: impact wage has on utility maximization rule.
 - Increase $MU_l \rightarrow$ decrease $l \rightarrow$ increase labor supply.
- Income effect: impact wage has on income in budget constraint.
 - Directly increases income \rightarrow increases $l \rightarrow$ decreases labor supply.
- Backward bending labor supply: at high wages, income effect begins to dominate.

3.3 Shifts in Labor Demand

Shifts in Labor Demand

- Increase in adult population.
- Changes in preferences:
 - Decisions to get an education, dedicate time to family.
 - **Discouraged workers:** those without work, that used to look for work but have given up.
- Change in home production technology.
 - Easier today to produce meals, do laundry, clean house, etc.
 - Able to outsource home production: day care, laundry service, cleaning services, etc.

3.4 Elasticity of Labor Supply

Elasticity of Labor Supply

- For whatever reason, labor supply is *very inelastic*.
- Tax on labor income - due April 15.
 - Who has larger tax burden, employers or workers?