

Firms' Behaviors and Input Markets

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Lesson 1: Labor Market

Input markets

- Before, we saw that the number and price of car washes depends on how much drivers liked getting their cars washed.
- Now, think about the demand for a welder. The firm demands a welder is not because he/she is desirable, but because he or she is needed to produce a car and that car has value.
- *Inputs are demanded by a firm if and only if households demand the good or service provided by that firm.*
- Input demand is a **derived demand**: the demand for inputs that dependent on the demands for outputs.



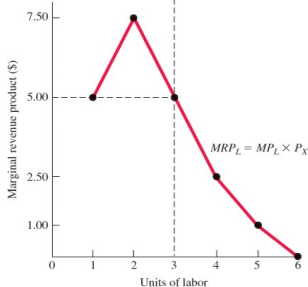
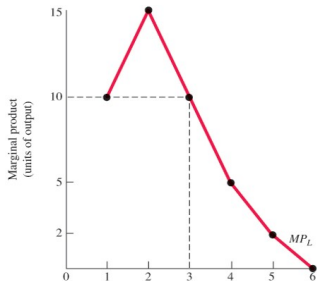
Input markets: Labor Market

- Firms care about: How many workers should be hired to maximize profits?
- The firm's decision on hiring workers depends on **how much value that worker can produce for the firm**. The value depends on **how many outputs the worker can produce**, his or her productivity; and **how much those outputs can be sold for**.
- **Marginal product of labor (MP_L)**: The additional output produced by one additional unit of labor.
- **Marginal revenue product (MRP) of labor**: The additional revenue a firm earns by employing 1 additional unit of an labor, ceteris paribus.

$$MRP_L = MP_L \times \underbrace{P_X}_{\text{Price of output X}}$$

Input markets: Labor Demand

- Example: A sandwich shop tries to hire workers.
- **Notice:** P_X is the output's price. The sandwich shop only provide sandwich-cooking and assembly services, but does not produce vegetables, breads, meat by itself.
- Given that, we assume that each finished sandwich in our shop sells for \$0.5 over and above the costs of its ingredients.
- Suppose the wage for sandwich makers is \$4 per hour, how many workers should be hired?



Input markets: Labor supply

- Labor supply (Households) curve: reflects the quantity of labor supplied at different wages.
- For a person, he or she faces potential choices in the labor market:
 - **Work:** earn wages → consume other goods
 - **Not work:**
 - **Relax or leisure:** Watch TV, play games, swim.
 - Do unpaid work: Take care of house and children
- The opportunity cost of not working is the wage.
- **Price of leisure = Wage** : For any one hour of leisure that you consume, you are giving up 1 hour's wage.
- When price changes, if we observe how many goods that the person purchased, then we could use Income effect and Substitution effect to explain this behavior. Same for the labor market.

Input markets: Labor supply

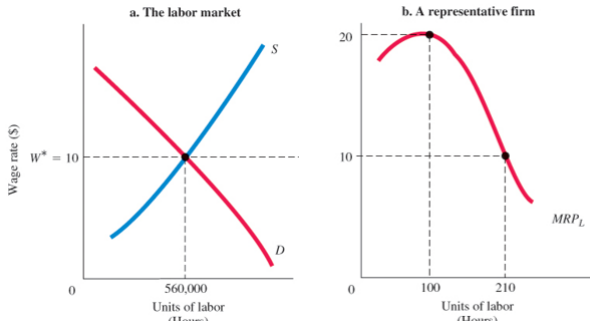
- **Income effect:** As wage rate increases \Rightarrow
 - If leisure is a normal good, the HH will buy more leisure, so the leisure time $l \uparrow$ and the working hour $h \downarrow$
 - Consumption on other goods also increase
- **Substitution effect:** As wage rate increases \Rightarrow Price of leisure increases \Rightarrow Since the price of other goods does not change, the price of leisure is higher \Rightarrow Consume less leisure time $l \downarrow \Rightarrow$ Working more hours $h \uparrow$
- If $IE > SE$, then the labor supply curve has a downward slope.
- If $SE > IE$, then the labor supply curve has an upward slope.
- One person's labor supply satisfied:
$$\frac{MU_{leisure}}{wage} = \frac{MU_{othergoods}}{P_{others}}$$
- The market aggregate labor supply is the sum of individual's labor supply at each given wage rate.

Input markets: Labor Market

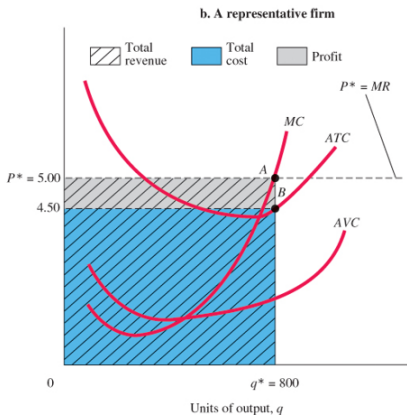
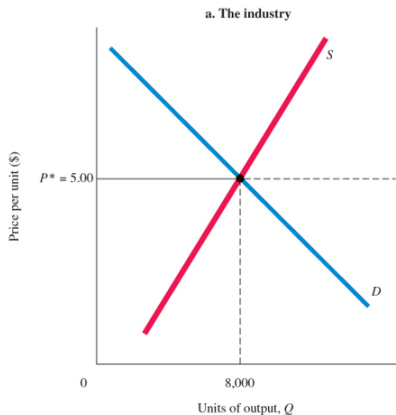
- In general, if the wage is W^* , how many workers should be hired to maximize profits?

$$W^* = MRP_L$$

- If MRP_L remains above wage rate W , the firm will earn positive value from each worker hired.
- Example: Assume the wage rate is $W = \$10$, the firm hires labor up to a point that $MRP_L = W = 10$, so the firm hires 210 units of labor.



Appendix: Graphic presentation of short-run profit



Click

Lesson 2: Land Market

Trade-off between Marginal cost and Marginal revenues

- Output market:
 - Decide how many outputs to produce:
 - The optimal amount of outputs:

$$\underbrace{P_{output}}_{MR} = MC_{\text{producing 1 additional output}}$$

- Input market:
 - Decide how many labor forces to hire:
 - The optimal amount of labor demand:

$$\underbrace{MRP_{Labor}}_{MR} = \underbrace{wage}_{MC}$$

- Decide how many lands to rent:
 - The optimal amount of land:

$$\underbrace{MRP_{Land}}_{MR} = \underbrace{P_{land}}_{MC}$$

Land Market

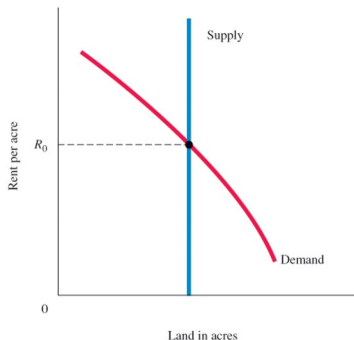
- Some land is more valuable than the other lands, what determine the price of land?



Land Market

Land Market

- Different from other goods, land is in strictly fixed supply in total. (*perfectly inelastic*)
- **Demand-determined price:** The price of a good that is in fixed supply; it is determined exclusively by what households and firms are willing to pay for the good.
- **Pure rent:** The return to any factor of production that is in fixed supply.



Land Market

- Why we say “land’s price is demand determined”?
- Example: Consider the potential uses of a corner lot in a suburb of Kansas city.
 - Alan wants to build a clothing store and he anticipates that he can earn economic profit of \$10,000.
 - Bella wants to build a pharmacy, and she expects to earn \$35,000.
 - Because of the highest profit that Bella expects to earn, she might outbid Alan.
 - The landowner will sell to the highest bidder.
 - The land’s price is determined by the highest bid.

Land Market

- However, because location is often the key to profits, landowners are frequently able to **squeeze** their renters.
- Example: Harvard Square at Boston.



Land Market

- How many lands should a profit-maximizing firm purchase in a perfect competition market?
- Rent depends on what the potential users of the land are willing to pay for it.
 - *Example: Alan and Bella's willingness to pay for the same land depends on how their expected profits.*
- A firm will pay for the land as long as the revenue earned from selling the product produced on that land is sufficient to cover the per period price of the land.
- The firm will use land up to the point at which:

$$MRP_{land} = P_{land}$$

- **Notice:** We care about the decision on the margin, instead of on the aggregation.

Profit-Maximizing in the Input Market

- The profit-maximizing condition for the perfectly competitive firm is

$$\underbrace{P_{Labor}}_{\text{wage}} = MRP_{Labor} = MP_{Labor} \times P_{output}$$

$$\underbrace{P_{Land}}_{\text{rent}} = MRP_{Land} = MP_{Land} \times P_{output}$$

- When all of these conditions are met, the firm will be using the optimal or least costly combination of inputs. The optimal condition could be rewritten as:

$$\frac{MP_{labor}}{P_{labor}} = \frac{MP_{land}}{P_{land}} = \frac{1}{P_{output}}$$

- Intuitively, why is it true? How about $\frac{MP_{labor}}{P_{labor}} > \frac{MP_{land}}{P_{land}}$?

Lesson 3: Capital Market

Capital

- To enter new industries or produce new products, capital is required.
- **Capital:** Those goods produced by the economic system that are used as inputs to produce other goods and services in the future.
- Several types of capital:
 - **Tangible Capital:** Materials used as inputs in the production of future goods or services.
 - Non-residential structures, durable equipment, residential structures, and inventories.
 - **Infrastructure:** Capital that provide services to the public.
 - Roads, bridges, police and fire protection.
 - **Intangible capital:** Nonmaterial things that contribute to the output of future goods and services.
 - Human capital: includes the skills and other knowledge that workers have or acquire through education and training and that yields valuable services to a firm over time.

Capital

- Labor is measured in hours, and land is measured in square feet or acres. Capital comes in many forms, how to measure the capital?
- **Current market value:** The indirect way to measure the capital.
- The measure of a firm's **capital stock** is the **current market value** of its plant, equipment, inventories, and intangible assets.
- Capital is a **stock** value.

Capital Market: Example

- In the summer of 2010, Tesla Motors turned to the public to seek capital. How did Tesla do?



Capital Market

- Tesla decided to become a public company, with shares offered to the public on a stock exchange. This process is call *Initial Public Offering (IPO)*
- Tesla initially offered the public 13.3 million shares (q), each for a price of \$17.
- Tesla got a total increase in capital: $13.3m \times \$17 = \$226m$
- These \$226m is the capital that Tesla had.
- Investment banks usually help firms figure our the right price and manage the sales.

Capital Market

- How does the investment bank get the correct price $P = \$17$?
- Gordon Growth Model

$$P = \frac{D_1}{r - g}$$

- P : the stock's price
- r : Required rate of return
- g : expected dividend growth rate
- D_1 : Stock's expected dividends over the next year

Capital Market

- How many capitals should a firm purchase to maximize its profit?
- A trade-off between MR and MC.

$$MRP_K = MC_K$$

- where $MRP_K = MP_L \times P_X$. Marginal cost of one capital is the interest rate r . (Explain)
- Hence, the equilibrium amount of capitals that a firm should buy must satisfy:

$$MRP_K = r$$

- **Interest:** is a payment made for the use of money.

WHAT IS AN IPO?

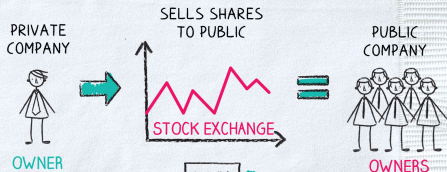
WHAT

INITIAL PUBLIC OFFERING

GOOD TO KNOW

GOING PUBLIC WITH SPACS

- ◆ LESS TIME TO COMPLETE
- ◆ FASTER EXECUTION
- ◆ SHORTER OR NO LOCKOUTS



WHY

RAISE MONEY



ALLOW INSIDERS TO ACCESS FUNDS



GAIN CREDIBILITY



INCREASE AWARENESS



ATTRACT TOP TALENT



In-Class Quiz

1. Use your electronic devices to search this website: www.kahoot.it
2. Pin code
3. Create a nickname for yourself
4. Answer the question

