Resource Markets

The Once Over

The Demand and Supply of Resources

A Closer Look at Resource Demand

Resource Demand

- **MR of additional worker > MC**
  - **Hire additional worker**
- **The same is true for both capital or land**
- **If MR>MC**
  - **Demands an additional unit of a resource**

Resource Supply

- **Resource owners supply resources to the highest-paying alternative, other things equal**
- **Since other things are not always equal, resource owners must be paid more to supply resources**
- **The worker's utility depends on**
  - **monetary and nonmonetary aspects**
  - **Higher pay for dangerous, illegal, no future…jobs.**

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Demand and Supply of Resources

- **Firms demand resources →maximize profit**
- **households supply resources→ maximize utility**

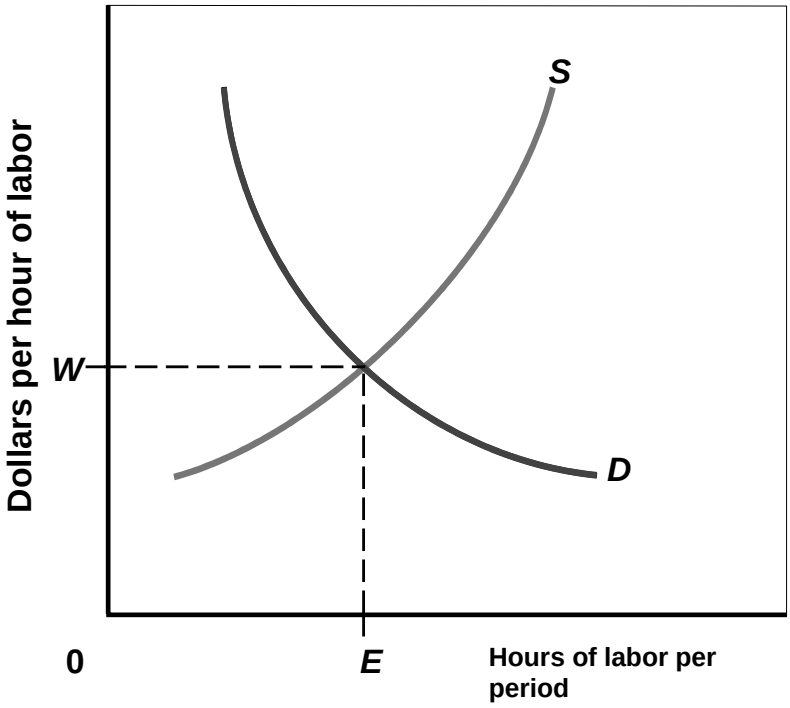
- **Goals maybe differences:**
  - **Largest market share …**
- **See next slide: market for a particular resource**

Resource Market for Carpenters

Demand curve slopes downward
Supply curve slopes upward.

Depend on the willingness and ability

Equilibrium price: wage rate for this type of labor.



Why do firms employ resources?

- Resources are used to produce goods and services
- A firm does not value the resource itself
- It value the resource's ability to produce products
- Demand depends on the value of it products
  - *Derived demand* → derived from the demand for the final product

Derive Market Demand for Resources

- The market demand for a resource = sum of demands for that resource in all its different uses
- The demand curve for a resource, slopes downward
  - As the price of a resource falls, producers are more willing and able to employ that resource

Derive Market Demand for Resources

- **Remark:**
  - **Assume the prices of other resources remain constant**
    - **The price of a resource falls,**
      - **Becomes relatively cheaper compared to other resources**
      - **More willing to hire this resource**
  - **Thus, we observe substitution in production**

Derive Market Supply for Resources

- **Market supply curve=**
  sums of all individual supply curves

- **Resource suppliers tend to be *more willing and more able* to supply the resource as its price (wage…) increases**
  - **Higher resource price, other things constant, means more goods/services can be purchased with the earnings from resource supplied**
  - **→ the market supply curve slopes upward**

Market Supply for Resources

- **Resource prices are signals**
  - **Rewards for supply resources to alternative activities**
  - **Higher prices will draw resources from lower-valued uses**

Temporary and Permanent Resource Price Differences

- **Resource owners want to sell resources where they are most valued**
  - ***Resources tend to flow to their highest-valued use***
- **Resource owners seek the highest pay,**
  - **Prices paid for identical resources tend toward equality**
- **Consider next slide**

Market for Carpenters in Alternative Uses

Initial market:
Build home: $25/hour
Make furniture: $20/hour

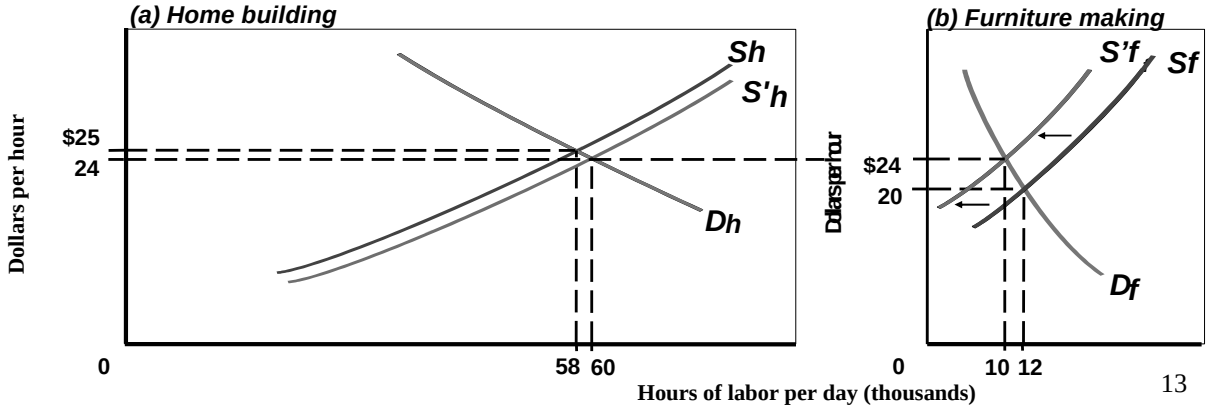
This encourage some carpenters to move furniture making→ home building

Wage in home building decreases
Wage in furniture building increases.

This shift will continue until the shifts in supply yield the same wage in both markets

Remark:
Let:
Nonmonetary benefit are identical
Resources are freely mobile,

→Resources will adjust across uses until they are paid the same rate



Temporary Differences in Resource Prices

- **Resource prices sometimes differ temporarily**
  - **adjustment takes time**
- **Price differences trigger the reallocation of resources, which equalizes payments for similar resources**

Permanent Differences in Resource Prices

- **Not all price differences cause a reallocation of resources**
  - **Land is relatively immobile**
    - **Permanent differences in land prices**
  - **Wage differentials:**
    - **Different costs of the education and training**
    - **Nonmonetary aspects**

Summary

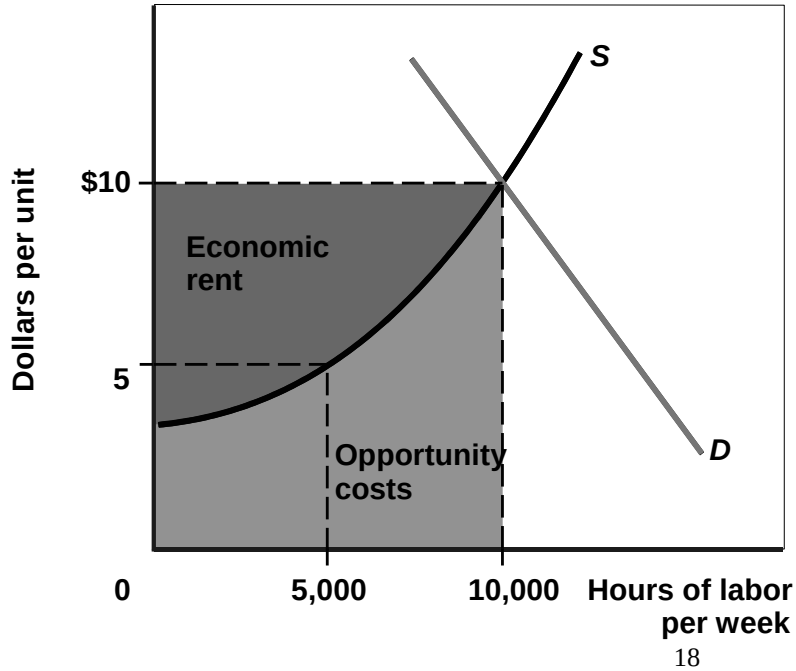
- **Temporary price differences**
  - **Resources move from lower-paid uses →higher-paid uses**
- **Permanent price differences cause no such reallocations**
  - **Lack of resource mobility**
  - **Differences in the quality of the resource**
  - **Differences in the time and money involved in developing the necessary skills**
  - **Differences in nonmonetary aspects of job**

Opportunity Cost and Economic Rent

- **Opportunity cost :**
  - **resources could earn in its best alternative use**
- ***Economic rent:***
  - **Portion of a resource earnings that is not necessary to keep the resource in its present use**
  - **Producer surplus earned by resource suppliers**
- **See next slide**

Opportunity Cost and Economic Rent

Remark:
Both demand and supply determine equilibrium price and quantity.



Opportunity Cost and Economic Rent

- **The division between**
  - **Opportunity cost**
  - **Economic rent**

  depends on the resource owner's *elasticity of supply*
- **The less elastic the supply,**
  - **The greater the economic rent as a portion of total earnings**
- **The more elastic**
  - **The lower the economic rent as a portion of total earnings**

All Earnings are Economic Rent

- **If the supply of a resource is perfectly inelastic,**
  - **Resource has no alternative use**
  - **No opportunity cost**
  - **All earnings are economic rent**
- **See next slide**

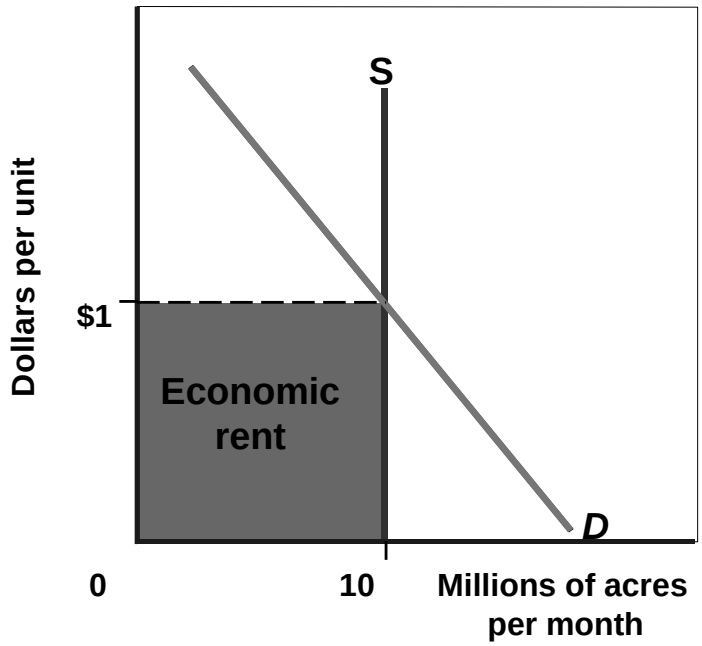
All Earnings are Economic Rent

The supply of grazing land (牧場) is shown by the perfectly inelastic vertical supply curve,
→No alternative use.

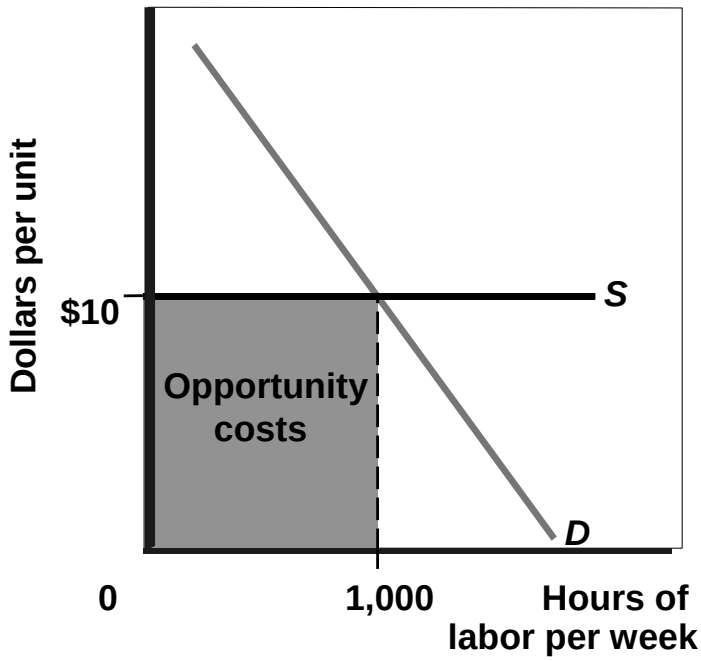
The land's opportunity cost=0
All earnings are economic rent

Fixed supply determines the equilibrium quantity of the resource

Demand determines the equilibrium price.



All Earnings are Opportunity Cost



Resource can earn as much in its best alternative use
The supply curve is perfectly elastic
- **→ horizontal**
- **→ all resource returns are opportunity costs**

Supply curve determines the equilibrium wage,

Demand determines the equilibrium quantity

Summary

- **Specialized resources tend to earn a higher proportion of economic rent**
- **Given a resource demand curve that slopes downward**
  - **Supply is perfectly inelastic,**
    - **All earnings are economic rent**
  - **Supply is perfectly elastic,**
    - **All earnings are opportunity cost**
  - **Supply curve slopes upward,**
    - **Earnings divide economic rent and opportunity cost**

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An Numerical Example

Remark:

All but one of the firm's inputs remain constant

Marginal product reflects the law of diminishing returns.

Workers per day (1)	Total Product (2)	Marginal Product (3)	Product Price (4)	Total Revenue (5)	Marginal Revenue Product (6)
0	0	-	$20	$0	-
1	10	10	20	200	$200
2	19	9	20	380	180
3	27	8	20	540	160
4	34	7	20	680	140
5	40	6	20	800	120
6	45	5	20	900	100
7	49	4	20	980	80
8	52	3	20	1040	60
9	54	2	20	1080	40
10	55	1	20	1100	20
11	55	0	20	1100	0
12	53	-2	20	1060	-40

Marginal Revenue Product (MRP)

- What happens to the firm's revenue when additional workers are hired?
- Marginal revenue product (MRP) of a resource:
  - Change in total revenue resulting from employing an additional unit of the resource, other things constant
  - **Marginal benefit from hiring one more unit of the resource**
- **A resource's MRP depends on**
  - **How much additional output the resource produces**
  - **The price at which output is sold**

Calculate MRP in Perfectly Competitive Market

- **An individual firm in perfect competition sells as much as it wants at the market price ($20)**
- **MRP = MP*20**

Workers per day (1)	Total Product (2)	Marginal Product (3)	Product Price (4)	Total Revenue (5)	Marginal Revenue Product (6)
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Selling Output as a Price Maker

- **If the firm is price maker**
  - **Demand curve slopes downward**
  - **Sell more → must lower price**
  - **Search for the price that maximizes profit**
- **See next slide for analyzing the resource hiring decision for the price maker**

MRP for Price Maker

- **MRP declines**
  - **The law of diminishing returns**
  - **Additional output can be sold only if the price is lower**
- Profit-maximizing firm
  - is willing and able to pay MRP for an additional unit of the resource
  - MRP can be thought of as the firm's demand curve for that resource

Workers per day (1)	Total Product (2)	Product Price (3)	Total Revenue (4) = (2) × (3)	Marginal Revenue Product (5)
1	10	$40.00	400.00	$400.00
2	19	35.20	668.80	268.80
3	27	31.40	847.80	179.00
4	34	27.80	945.20	97.40
5	40	25.00	1000.00	54.80
6	45	22.50	1012.50	12.50
7	49	20.50	1004.50	-8.00
8	52	19.00	988.00	-16.50
9	54	18.00	972.00	-16.00
10	55	17.50	962.50	-9.50
11	55	17.50	962.50	0.00

Marginal Resource Cost (MRC)

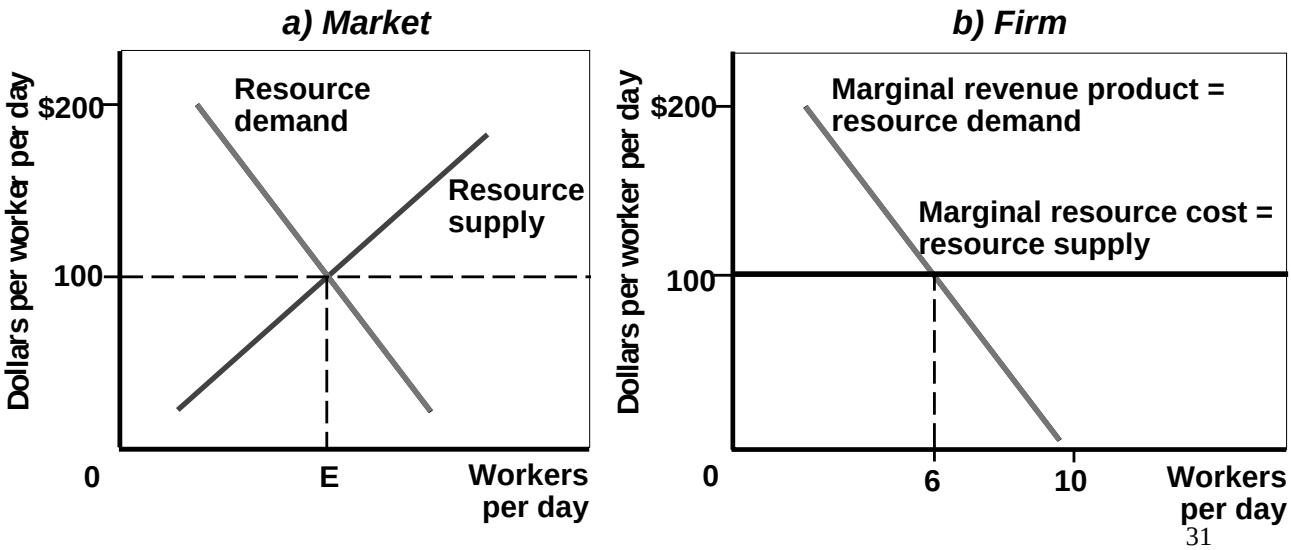
- **Marginal resource cost (MRC)**
  - **Additional cost to employ one more unit of labor**
- **A typical firm hires such a tiny fraction of the available resources,**
  - **Price taker!**
  - **Faces a given market price for the resource and decides on how much to hire to maximize profit**
- **See next slide**

Market Equilibrium For a Resource and the Firm's Employment Decision

Wage=$100 per day= MRC of labor

MRC is a horizontal curve.

MRP, or (resource demand curve) and MRC determines the firm will hire 6 workers per day.



Summary

- **Maximum profit (or minimum loss) occurs as**
  - **MR=MC**
  - **MRP=MRC**
- **First rule focuses on output while the second on input,**
- **Two approaches are equivalent ways**

Shifts in the Demand for Resources

- **MRP consists of two components**
  - **Resource's marginal product.**
    - **Two factors can cause this to change**
      - **A change in the amount of other resources employed**
      - **A change in technology**
  - **The price at which the product is sold.**
    - **One factor can cause this to change**
      - **A change in the demand for the product**
  - **Described in the following slides**

Change in the Price of Other Resources

- **MR of one resource depends on the quantity and quality of other resources used**
- **Resources can be substitutes or complements**
- **Substitutes**
  - **An increase in the price of one increases the demand for the other and vice versa**

Change in the Price of Other Resources

- **Complements**
  - **A decrease in the price of one resource leads to an increase in the demand for the other and vice versa**
  - **Generally, any increase in the quantity and quality of a complementary resource boosts the marginal productivity of the resource in question**

Changes in Technology

- **Technological improvements**
  - **can boost the productivity of some resources**
  - **also can make others obsolete**
- **Examples**
  - **Computer-controlled machines**
    - **increased the demand for computer-trained machinists**
    - **decreased the demand for machinists without computer skills**

Change in the Demand for the Final Product

- **The demand of resource is derived from the demand for the final output,**
  - **Change in the demand for output will affect resource demand**
- **For example,**
  - **Increasing demand for automobiles**
  - **→Increase market price**
  - **➔ Increase the MRP of autoworkers**
  - **→ Demand for autoworkers increase**

課堂報告

- 請解釋何謂 derived demand
- 請舉例說明造成Permanent resource price difference 的原因
- 請說明elasticity of resource supply和 Opportunity cost以及economic rent的關係
- 請說明爲何在MRC=MRP時,廠商的profit 極大化
- 請說明使用MRC=MRP和 MR=MC來分析profit極大化之相異處,其分析結果是否因此不同?
- 請描述 P253 Case study: The derived demand for architects 的大意

Homework

- 8. Figure out opportunity cost and economic rent
- 9. Analyze the demand for a resources
- 11. Analyze the shifts in demand curves