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生产要素市场

**The Market for the Factors of Production**

# 生产要素市场

## The Markets for the Factors of Production

- 2007 年美国居民的总收入是 14 万亿美元，人均 4.6 万美元（中国： 26 万亿人民币，人均 1.9 万元）。  
In 2007, the total income of all U.S. residents was about \$14 trillion, or \$46,000 per capita.
- 工人以工资和附加福利的形式赚到的收入占其四分之三（中国：二分之一）。其余以地租、利润和利息的形式归土地所有者与资本所有者。

Workers earned about three-fourths of it in the form of wages and fringe benefits. The rest went to landowners and to the owners of capital in the form of rent, profit and interest.

# 生产要素市场

## The Markets for the Factors of Production

- 为什么有的人的收入比别人高？

Why do some people have higher incomes than others?

- 是什么决定了多少归工人，多少归土地所有者，多少归资本所有者？

What determines how much goes to workers? To landowners? To the owners of capital?

- 为什么一些工人（或土地所有者、资本所有者）比另一些挣得更高的工资（或租金收入、利润）？

Why do some workers earn higher wages than others, some landowners higher

**答案取决于供给与需求。**

**The answers hinge on supply and demand.**



# 生产要素

## Factors of Production

**生产要素**是用来生产商品和服务的投入。

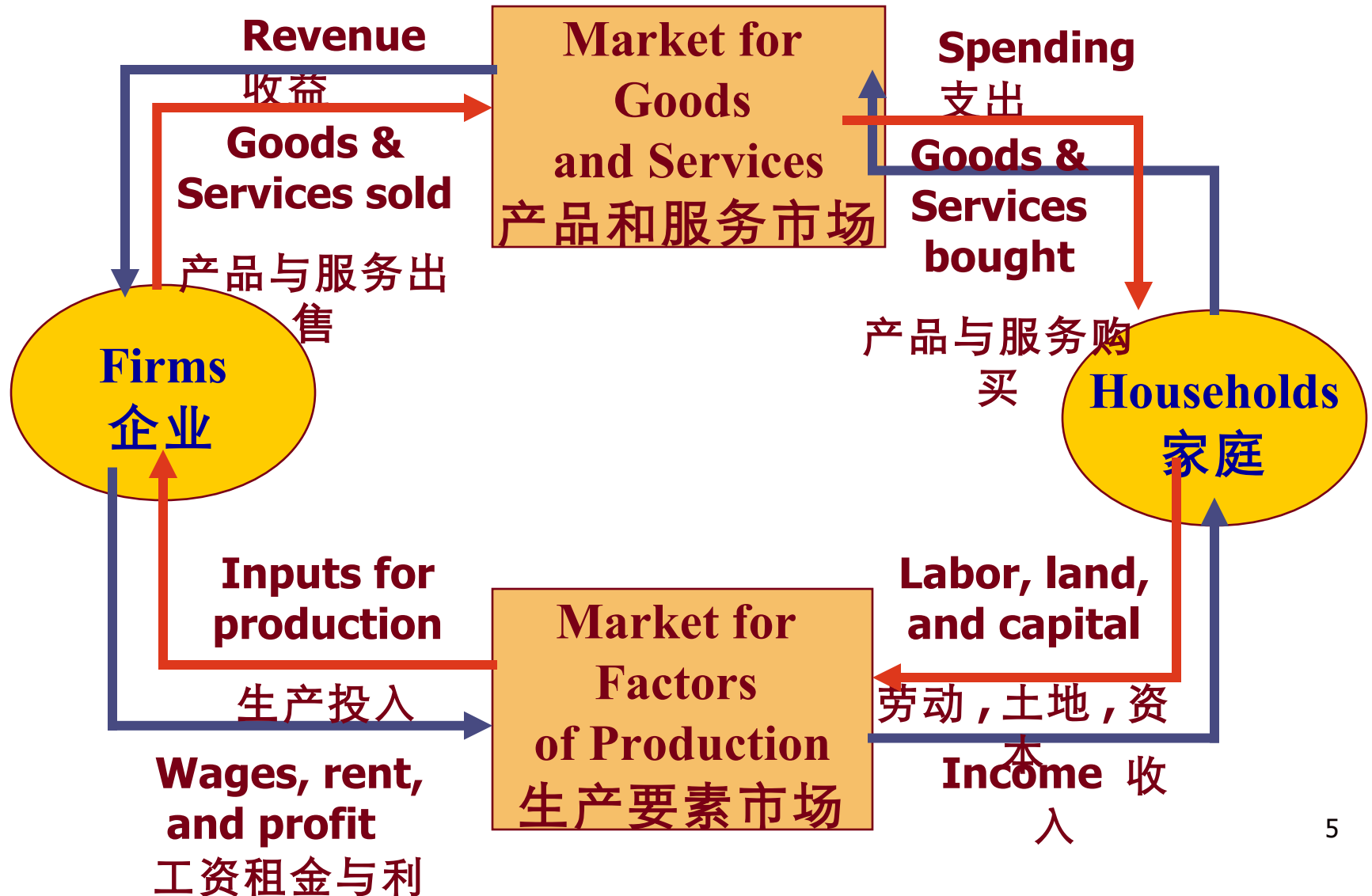
**Factors of production** are the inputs used to produce goods and services.

劳动、土地和资本是三种最重要的生产要素。

Labor, land and capital are the three most important factors of production.

# 生产要素市场

## The Markets for the Factors of Production





# 生产要素市场

## The Market for the Factors of Production

生产要素需求是**派生需求**。

The demand for a factor of production is **a derived demand**.

- 企业对于生产要素的需求，是从它在其他市场上供给商品的决策中**派生**出来的。

A firm's demand for a factor of production is **derived** from its decision to supply a good in another market.





# 劳动市场

## The Markets for Labor

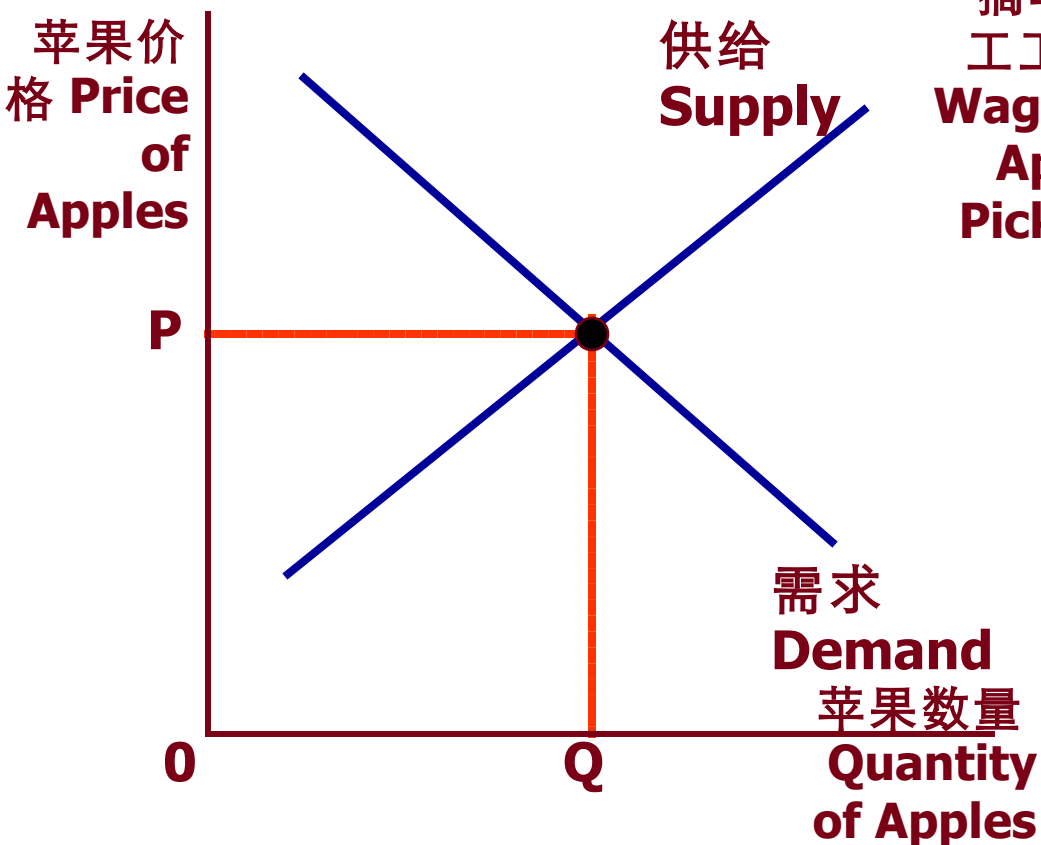
**劳动市场，跟经济中的其他市场一样，是由供给和需求的力量支配的。 Labor markets, like other markets in the economy, are governed by the forces of supply and demand.**



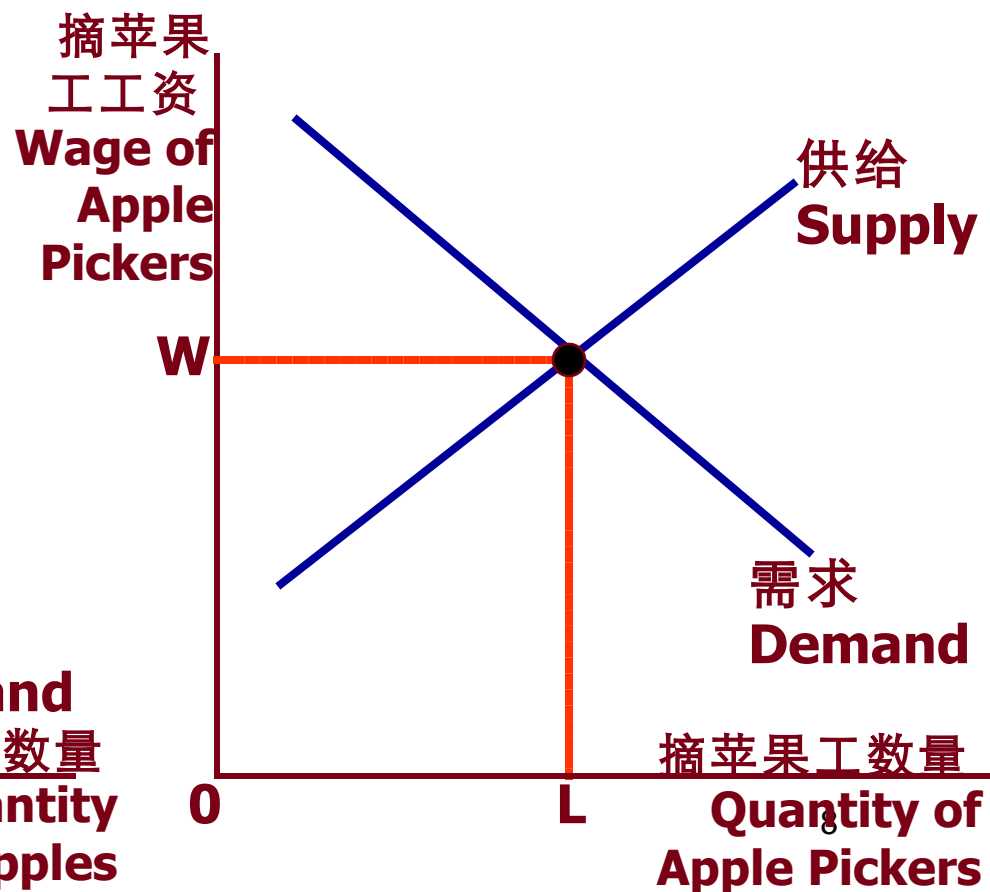
# “万能的” 供给与需求

## The Versatility of Supply and Demand...

(a) 苹果市场  
The Market for Apples



(b) 摘苹果工市场  
The Market for Apple Pickers







# **劳动需求**

## **The Demand For Labor**

**大多数劳动的使用，不是作为最终产品供消费者享受，而是投入其他物品的生产中。**

**Most labor services, rather than being final goods ready to be enjoyed by consumers, are inputs into the production of other goods.**



# 生产函数和劳动的边际产量

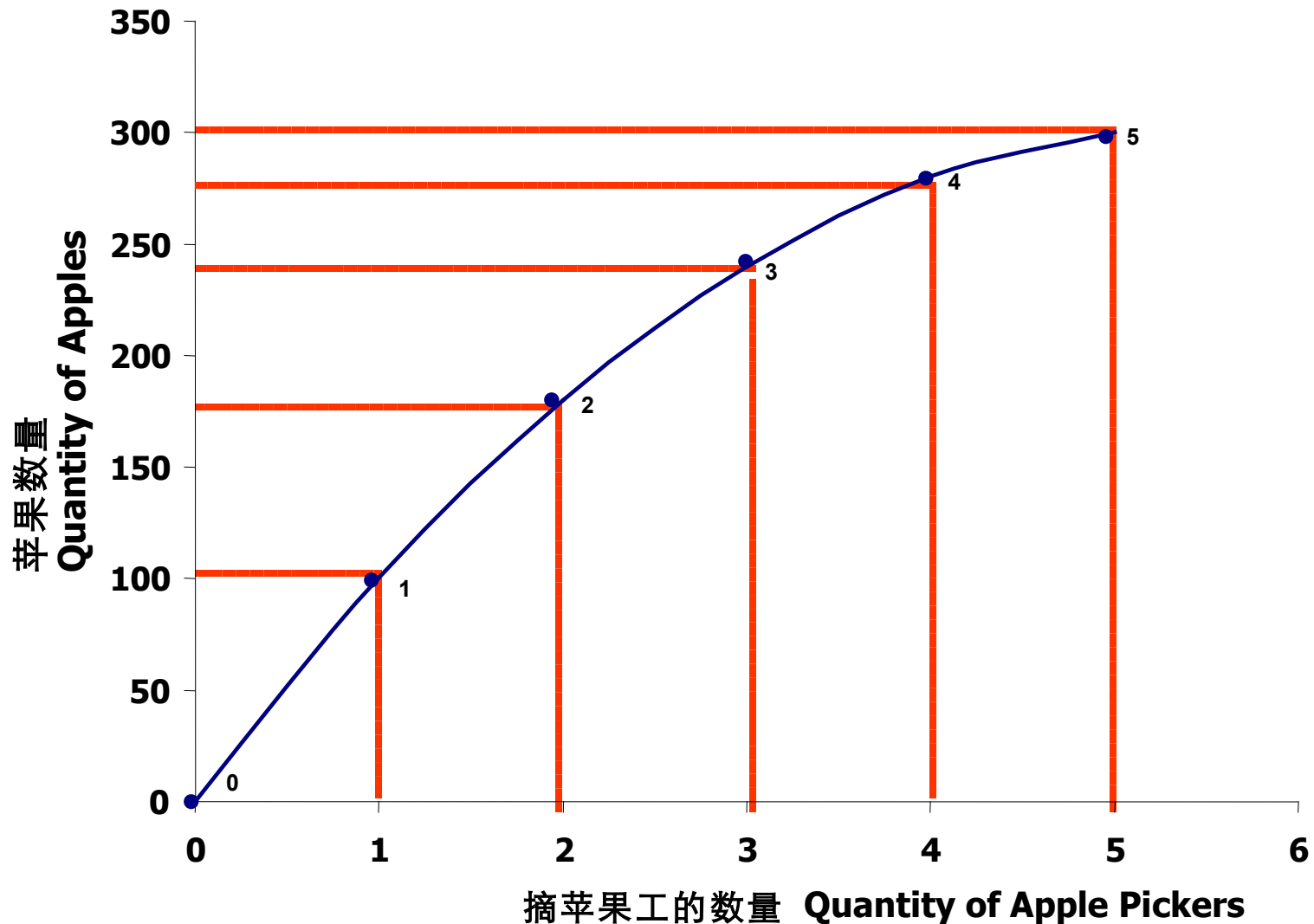
## The Production Function and The Marginal Product of Labor

生产函数描述使用的投入量与产品的产出量之间的关系。

The **production function** illustrates the relationship between the quantity of inputs used and the quantity of output of a good.

# 生产函数

## *The Production Function...*





# 生产函数和劳动的边际产量

## The Production Function and The Marginal Product of Labor

劳动的边际产量是增加 1 单位劳动所得到的产出量的增加。

The marginal product of labor is the increase in the amount of output from an additional unit of labor.

$$\text{MPL} = \Delta Q / \Delta L$$

$$\text{MPL} = (Q2 - Q1) / (L2 - L1)$$



# 劳动的边际产量递减

## Diminishing Marginal Product of Labor

- 随着工人数量增加，劳动的边际产量递减。  
As the number of workers increases, the marginal product of labor declines.
  - 随着工人数量愈来愈多，每个增加的工人对苹果产量的贡献小于前一个工人。  
As more and more workers are hired, each additional worker contributes less to production than the prior one.
  - 生产函数随着工人数量的增加变得越来越平坦。  
The production function becomes flatter as the number of workers rises.
- 这一性质称为**边际产量递减**。  
This property is called **diminishing marginal product**.



# 劳动的边际产值

## The Value of the Marginal Product of Labor

- **边际产值**是投入的边际产量乘以产出的市场价格。

The **value of the marginal product** is the marginal product of the input multiplied by the market price of the output.

$$VMPL = MPL \times P$$

# 劳动的边际产值

## The Value of the Marginal Product of Labor

- 劳动的边际产值以美元（或其他货币单位）来衡量。

The value of the marginal product is measured in dollars.

- 它随着工人数量的增加而减少，因为产品的市场价格是恒定的。

It diminishes as the number of workers rises because the market price of the good is constant.

边际产量递减  $\Rightarrow$  边际产值递减  
Diminishing MPL  $\Rightarrow$  Diminishing VMPL





# 边际产值和劳动需求

## The Value of the Marginal Product and the Demand for Labor

- 给定工人的市场工资，竞争性的、利润最大化的企业雇佣工人的数量要在劳动的边际产值等于工资这一点上。

Given the market wage for labors, the competitive, profit-maximizing firm hires workers up to the point where the value of marginal product of labor equals the wage.

$$VMPL = Wage$$

# 竞争性企业如何决定雇佣工人的数量

## How the Competitive Firm Decides How Much Labor to Hire

劳动  Labor L	产出  Output Q	劳动的 边际产量  Marginal Product of Labor MPL $MPL = \Delta Q / \Delta L$	劳动的 边际产值  Value of the Marginal Product of Labor VMPL = $P \times MPL$	工资  Wage W	边际利润  Marginal Profit $\Delta Profit = VMPL - W$
0	0				
1	100	100	\$1,000	\$500	\$500
2	180	80	\$800	\$500	\$300
3	240	60	\$600	\$500	\$100
4	280	40	\$400	\$500	-\$100
5	300	20	\$200	\$500	-\$300



## 边际产值和劳动需求

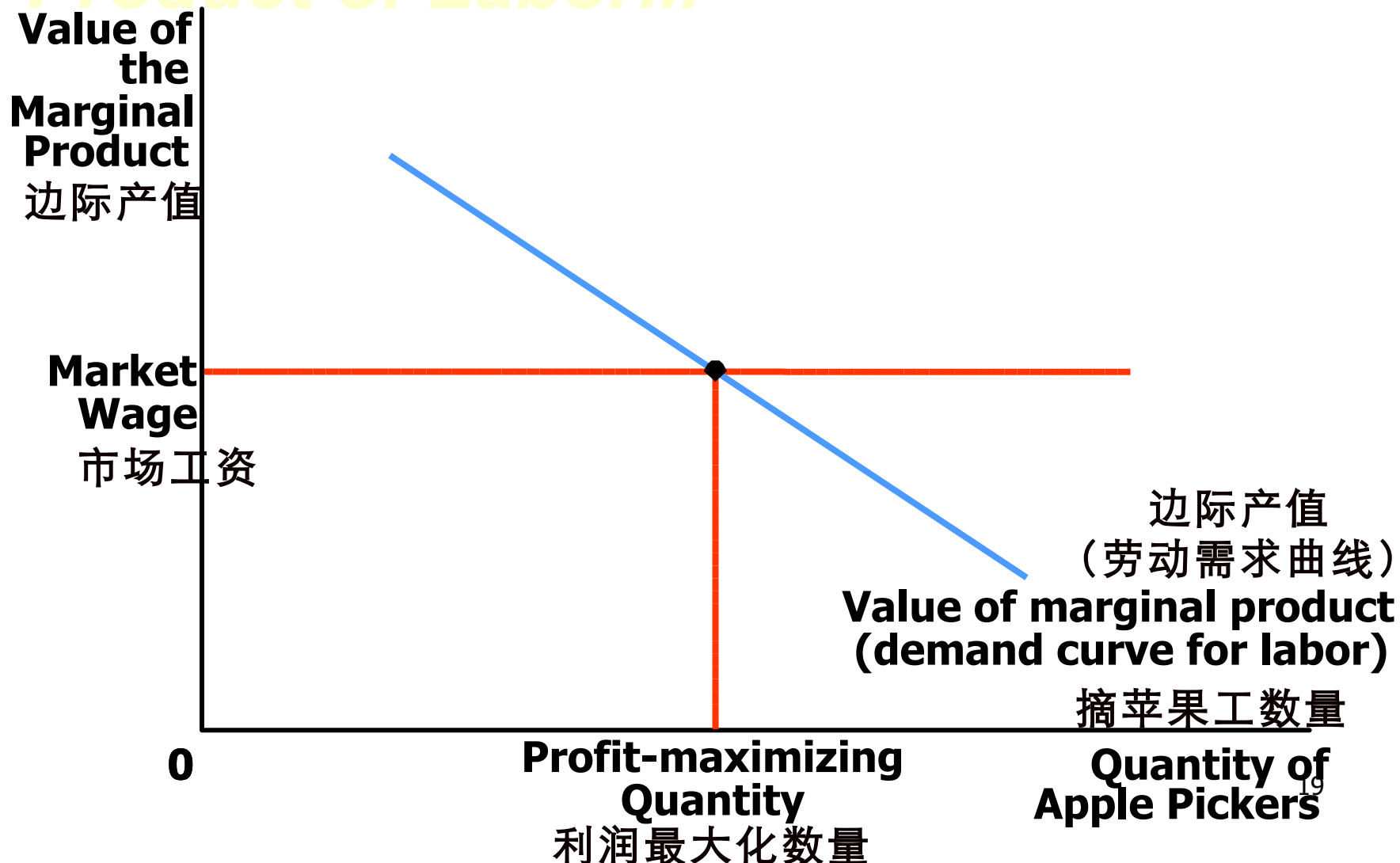
# The Value of the Marginal Product and the Demand for Labor

对于一个竞争性的、利润最大化的企业来说，边际产值曲线就是**劳动需求曲线**。

The value-of-marginal-product curve is the **labor demand curve** for a competitive, profit-maximizing firm.

# 劳动的边际产值

## The Value of the Marginal Product of Labor...



# 投入需求和产出供给：同一硬币的两面

## Input Demand and Output Supply: Two Sides of the Same Coin

一个竞争性企业雇佣越来越多的劳动，一直到边际产值等于工资那一点。此时，它的产量也就达到了价格等于边际成本的一点。

When a competitive firm hires labor up to the point at which the value of the marginal product equals the wage, it also produces up to the point at which the price equals the marginal cost.

$$\text{VMPL} \equiv P * \text{MPL} = W \Leftrightarrow P = W / \text{MPL} \equiv MC$$

# 什么引起劳动需求曲线的移动

## What Causes the Labor Demand Curve to Shift?

- 产出价格 Output Price
- 技术变革 Technological Change
- 其他要素的供给 Supply of Other factors

# 技术变革如何影响劳动需求？

## How Technological Changes Affect Labor Demand?

- 就某一个具体的行业而言，技术变革可能增加或者减少对这一行业的劳动需求。

In any particular industry, technological advance can raise or reduce the demand for labor for that industry.

- 不过，技术进步总体上趋向于**增加劳动（提高边际产值）**而不是**节约劳动（降低边际产值）**的。

However, that technological progress as a whole tends to be **labor-augmenting** instead of **labor-saving**.





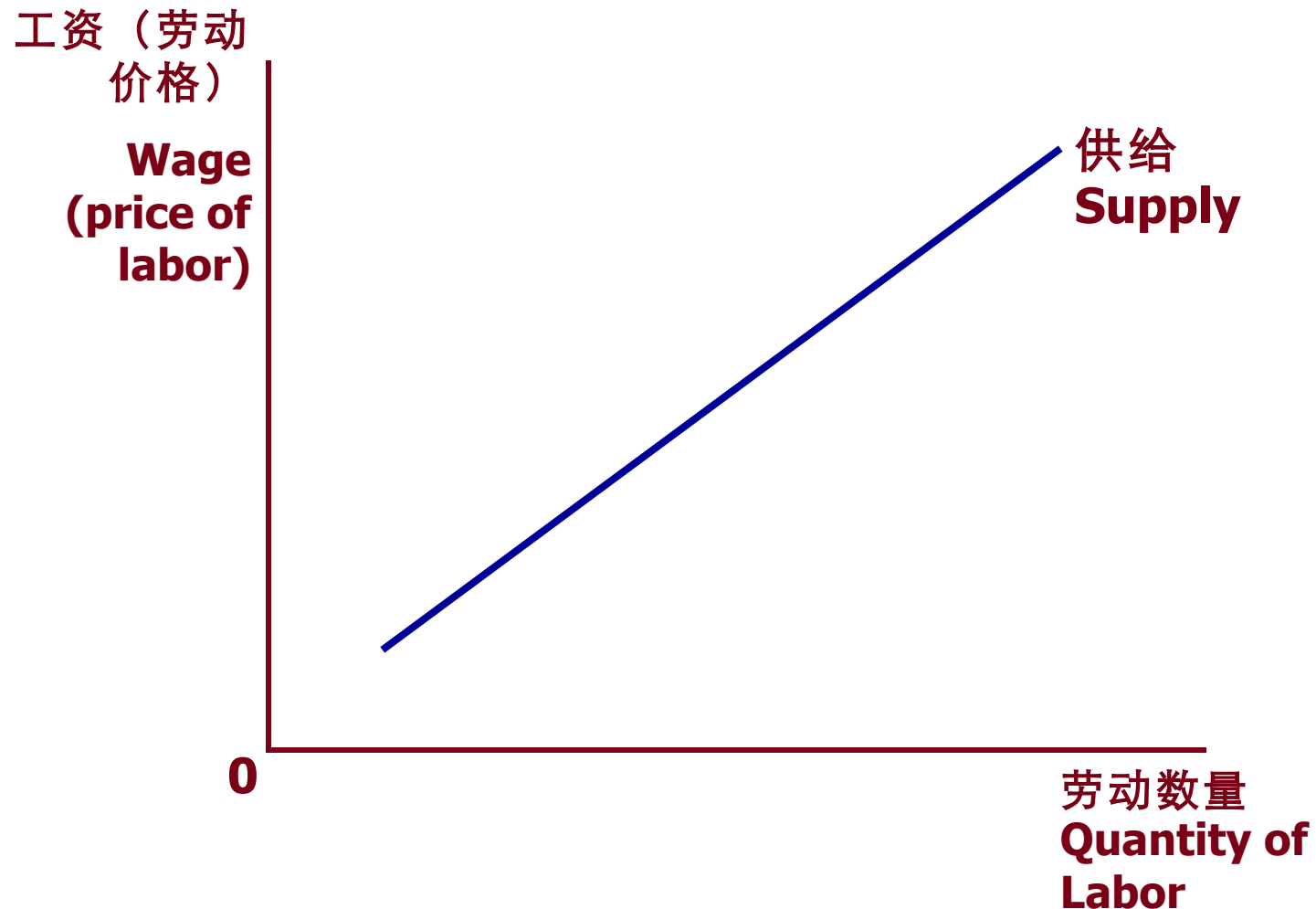
# 劳动供给曲线

## The Labor Supply Curve

- 劳动供给曲线反映工人如何根据机会成本的变动，作出劳动－闲暇的得失交换的决策。  
The labor supply curve reflects how workers' decisions about the labor-leisure tradeoff respond to changes in opportunity cost.
- 向上倾斜的劳动供给曲线意味着，工资上升使工人增加他们供给的劳动量。  
An upward-sloping labor supply curve means that an increase in the wages induces workers to increase the quantity of labor they supply.

# 劳动供给曲线

## The Labor Supply Curve



# 什么引起劳动供给曲线移动

## What Causes the Labor Supply Curve to Shift?

- 嗜好变动 Changes in Tastes
- 可供选择的机会改变 Changes in Alternative Opportunities
- 移民 Immigration



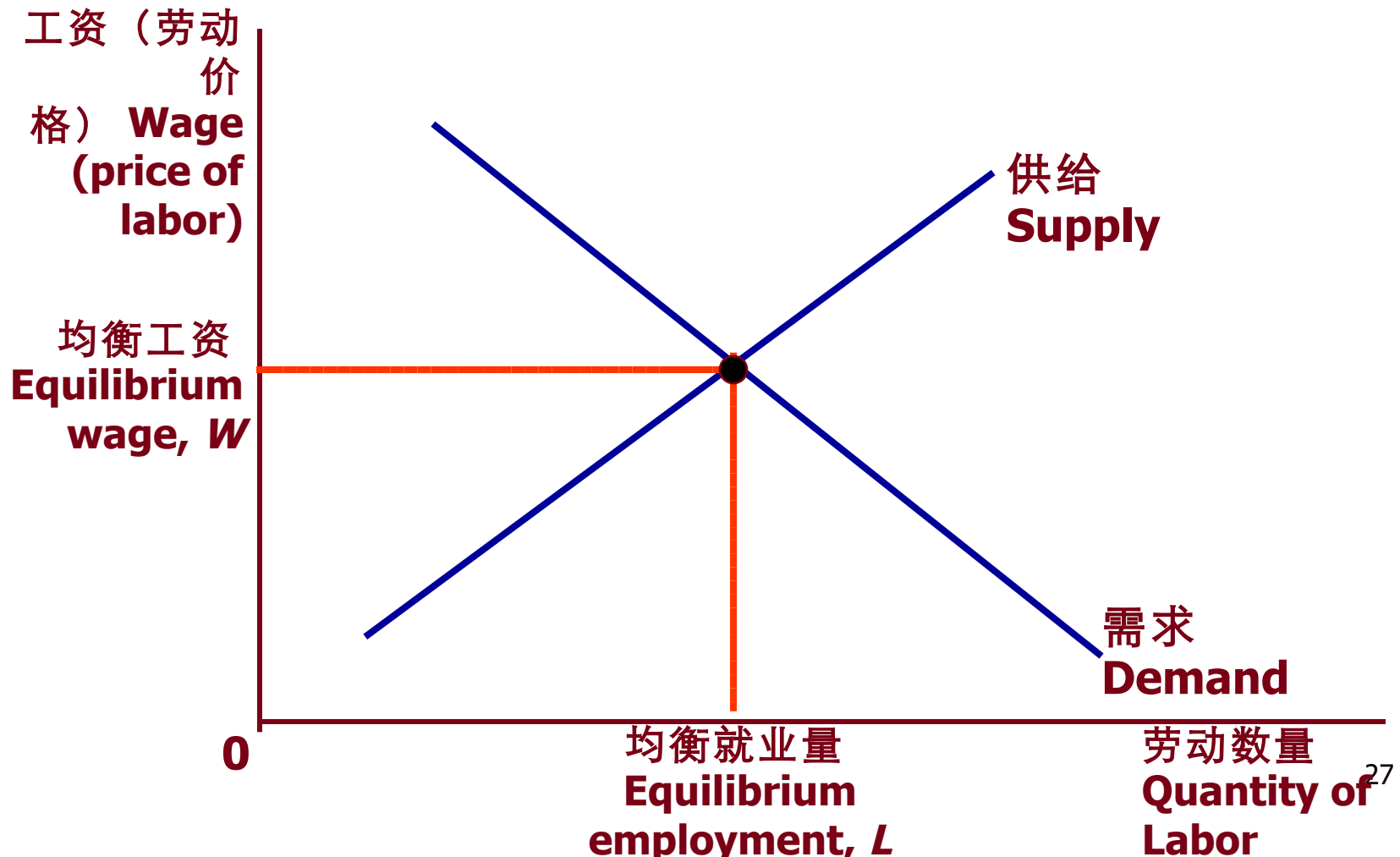
# 劳动市场的均衡

## Equilibrium in the Labor Market

- **工资调整使劳动的供求平衡。**  
**The wage adjusts to balance the supply and demand for labor.**
- **工资等于劳动的边际产值。**  
**The wage equals the value of the marginal product of labor.**

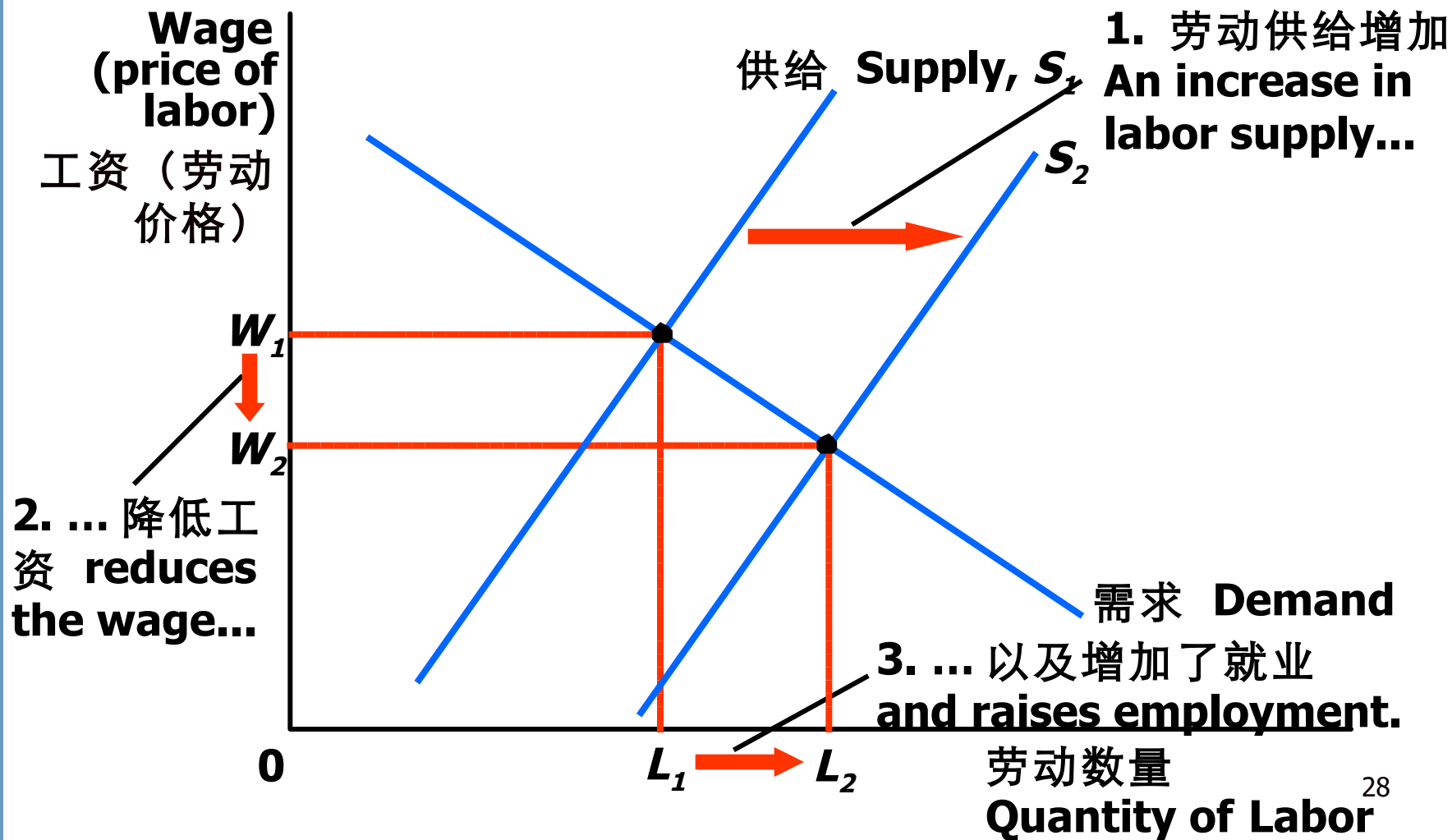
# 劳动市场的均衡

## *Equilibrium in the Labor Market...*



# 劳动供给的移动

## A Shift in Labor Supply...



# 劳动供给的移动

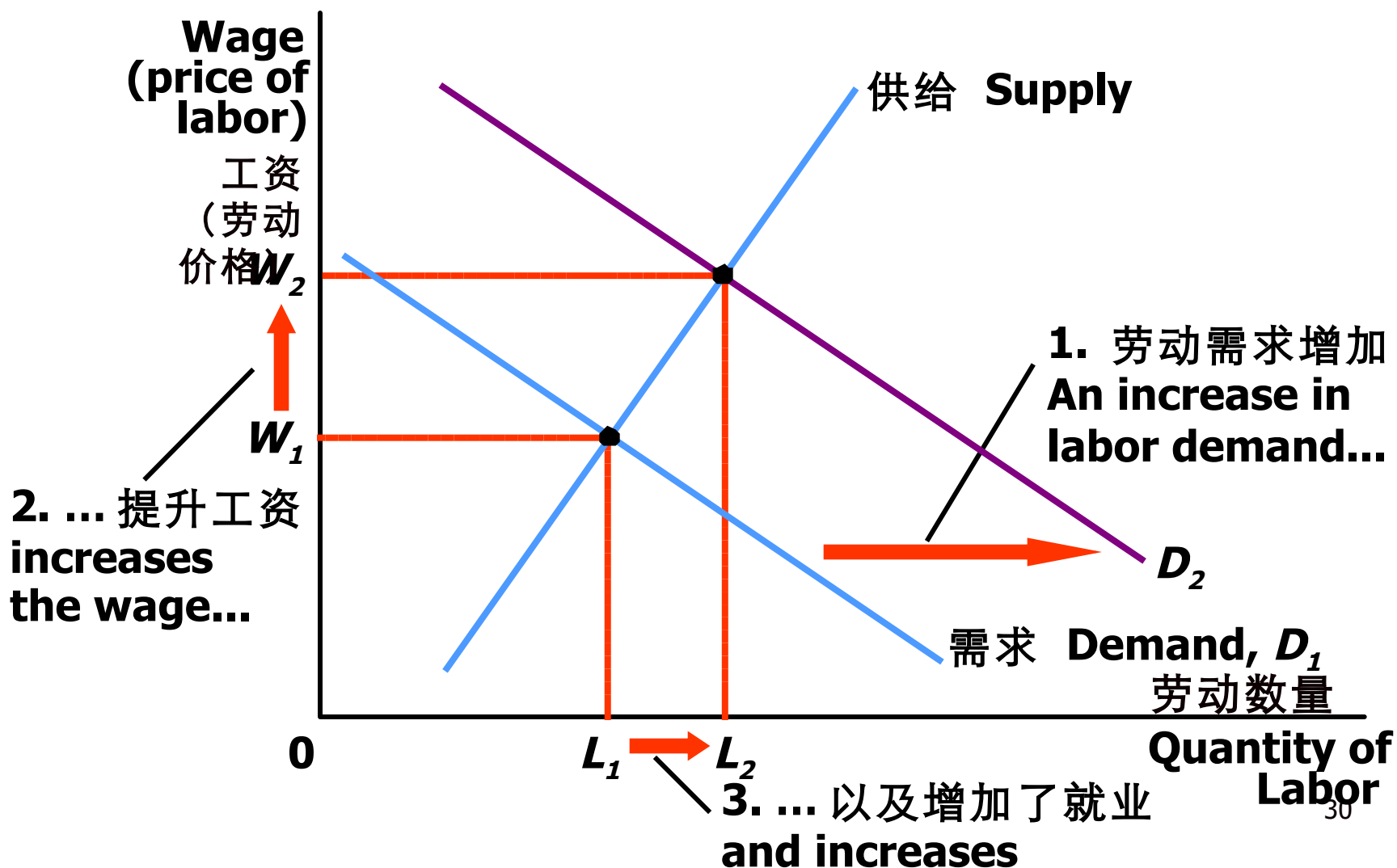
## A Shift in Labor Supply

- **劳动供给的增加** An increase in the supply of labor :
  - **导致劳动过剩** Results in a surplus of labor.
  - **对工资施加向下的压力** Puts downward pressure on wages.
  - **使得企业多雇佣工人变得有利可图** Makes it profitable for firms to hire more workers.
  - **导致劳动的边际产量下降** Results in diminishing marginal product.
  - **降低了劳动的边际产值** Lowers the value of the marginal product.
  - **产生了新的均衡** Gives a new equilibrium.



# 劳动需求的移动

## A Shift in Labor Demand...



# 劳动需求的移动

## Shifts in Labor Demand

- **劳动需求的增加**

**An increase in the demand for labor :**

- **使得企业多雇佣工人变得有利可图。**  
**Makes it profitable for firms to hire more workers.**
- **对工资产生向上的压力。**  
**Puts upward pressure on wages.**
- **提高了边际产值。**  
**Raises the value of the marginal product.**
- **产生了新的均衡**



# 生产率与工资

## Productivity and Wages

- 工资等于劳动的边际产值，后者可以用生产率来（粗略地）衡量。

Wages equal the value of the marginal product of labor as measured (roughly) by *productivity*.

- 生产率高的工人，得到的工资也高。  
Highly productive workers are highly paid.

# 美国的生产率与工资的增长

## Productivity and Wage Growth in the United States

time period	growth rate of produc- tivity	growth rate of real wages
1959-2006	2.1%	2.0%
1959-1973	2.8	2.8
1973-1995	1.4	1.2
1995-2006	2.6	2.5

# 世界各国与地区的生产率与工资增长 Productivity and Wage Growth around the World

Country	Growth Rate of Productivity (1980-91)	Growth Rate of Real Wages (1980-92)
South Korea	8.5	7.9
Hong Kong	5.5	4.9
Singapore	5.3	5.0
Indonesia	4.0	4.4
Japan	3.6	2.0
India	3.1	3.4
United Kingdom	2.4	2.4
United States	1.7	0.5
Brazil	0.4	-2.4
Mexico	-0.2	-3.0
Argentina	-0.9	-1.3
Iran	-1.4	-7.9



# 其他生产要素：土地和资本

## Other Factors of Production: Land and Capital

- **资本**指生产中所用的设备与建筑物存量。 **Capital** refers to the stock of equipment and structures used for production.
- 经济中的资本代表现在正用于生产新物品和服务的、过去生产的物品的积累。

The economy's capital represents the accumulation of goods produced in the past that are being used in the present to produce new goods and services.

# 土地和资本的价格

## Prices of Land and Capital

- **购买价格**是一个人为为了无限期地拥有那些生产要素而支付的价格。

The **purchase price** is what a person pays to own a factor of production indefinitely.

- **租赁价格**是一个人为为了在一个有限时期内使用那些生产要素而支付的价格。

The **rental price** is what a person pays to use a factor of production for a limited period of time.

- 购买价格与租赁价格是相关的：它取决于当前以及预期未来的租赁价格。

The purchase price is related to the rental prices: It depends on the current rental price and the rental price expected to prevail in the



# 土地和资本市场的均衡

## Equilibrium in Markets for Land and Capital

- 土地和资本的租赁价格是由供给和需求决定的。

The rental price of land and the rental price of capital are determined by supply and demand.

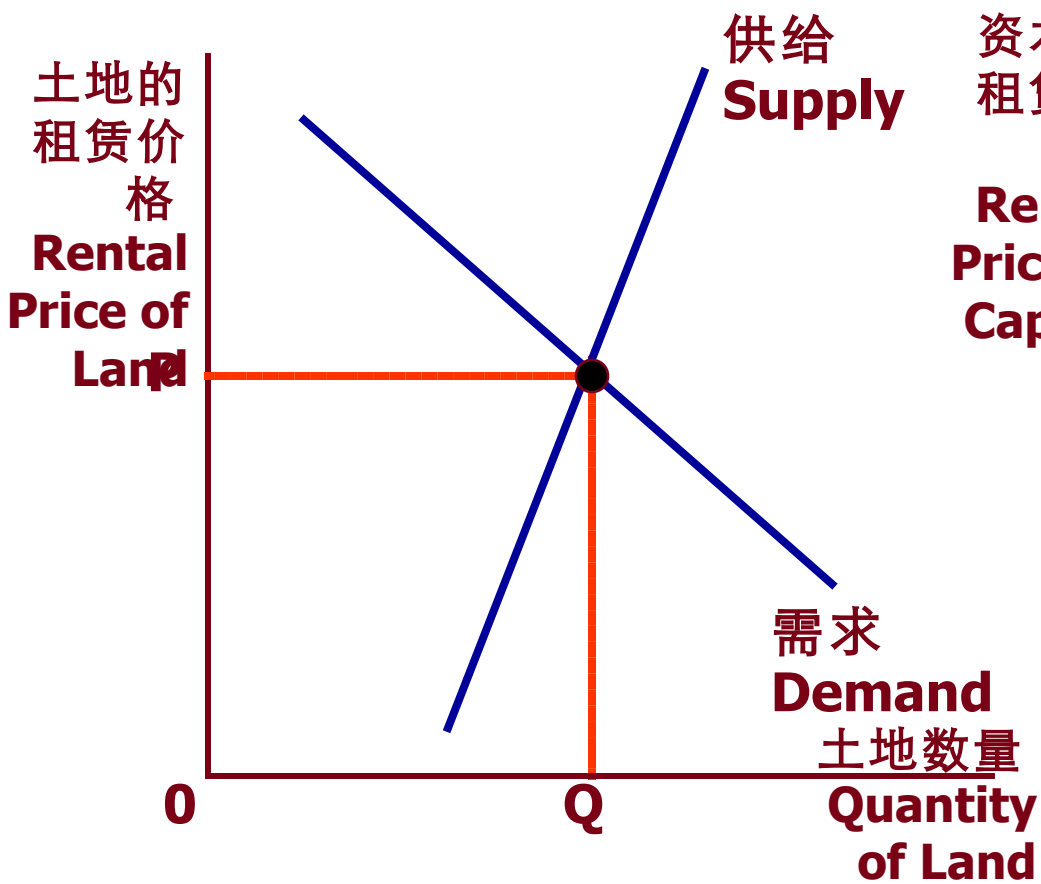
- 企业增加要素使用量，直到要素的边际产值等于要素价格。

The firm increases the quantity hired until the value of the factor's marginal product equals the factor's price.

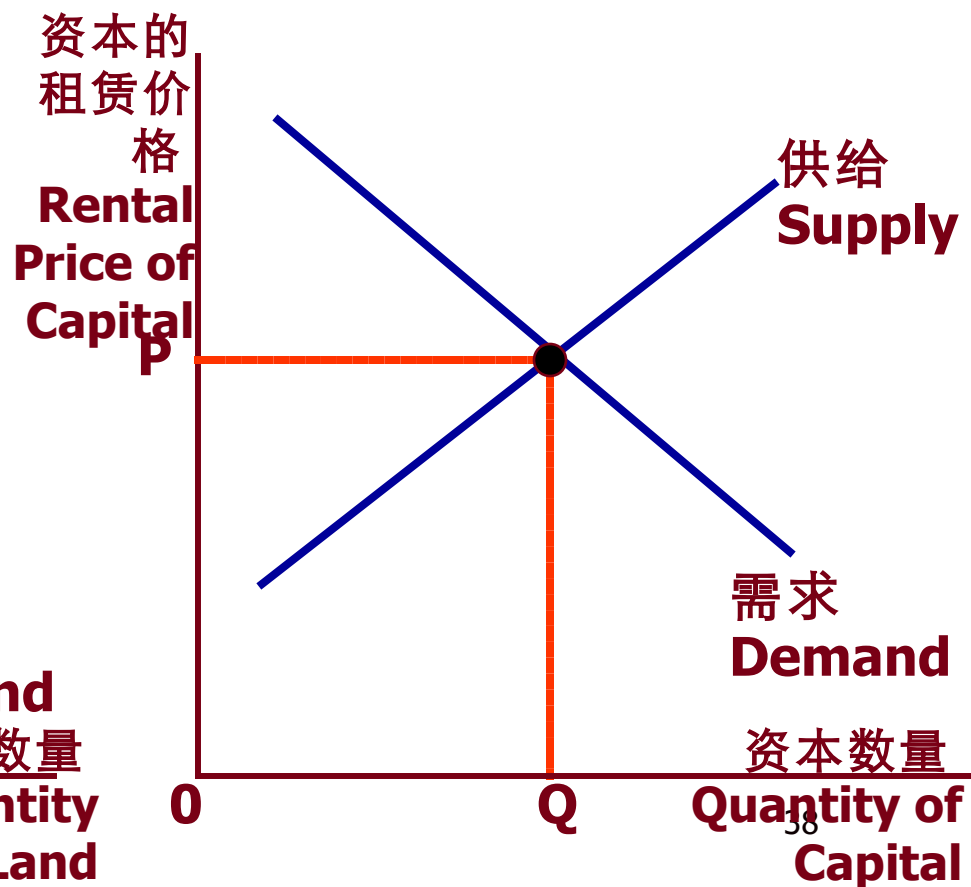
# 土地和资本市场

## *The Markets for Land and Capital...*

(a) 土地市场  
The Market for Land



(b) 资本市场  
The Market for Capital



# 土地和资本市场的均衡

## Equilibrium in Markets for Land and Capital

- 每个要素的租赁价格必须等于他们的边际产值。

Each factor's rental price must equal the value of their marginal product.

- 劳动、土地和资本各自赚到了他们对生产过程边际贡献的价值。

*Labor, land, and capital each earn the value of their marginal contribution to the production process.*

- 此谓新古典分配理论。

The theory developed here is called the **neoclassical theory of**



# **生产要素之间的联系**

## **Linkages Among the Factors of Production**

- **生产要素是一起使用的。**  
**Factors of production are used together.**
- **任何一种要素的边际产量取决于可以得到的所有要素的数量。**  
**The marginal product of any one factor depends on the quantities of all factors that are available.**
- **一种生产要素供给的变化会改变所有要素的收入。**

**A change in the supply of one factor alters the earnings of all**



# **生产要素之间的联系**

## **Linkages Among the Factors of Production**

**任何一种要素收入的变化，都可以通过分析某一事件对其边际产值的影响来发现。**

**A change in earnings of any factor can be found by analyzing the impact of the event on the value of the marginal product of that factor.**

# 黑死病的经济学

## The Economics of the Black Death

- 14 世纪的欧洲，鼠疫的流行在短短几年内夺去了大约三分之一人口的生命。

In fourteenth-century Europe, the bubonic plague wiped out about one-third of the population within a few years.

- 这一被称为黑死病的事件，为检验我们刚刚提出的要素市场理论提供了一个可怕的自然实验。

This event, called the Black Death, provide a grisly natural experiment to test the theory of factor markets that we have just



# 黑死病的经济学

## The Economics of the Black Death



- 劳动供给的下降导致劳动的边际产量增加，这导致工资的上升。

**With a smaller supply of workers, the marginal product of labor rose, which raised wages.**

- 由于可用于耕种土地的工人少了，土地的边际产量下降，这导致地租的下降。

**With fewer workers available to farm the land, the marginal product of land fell, which lowered rents.**

- 黑死病给农民阶级带来了经济繁荣，而减少了地主阶级的收入。

**The Black Death led to**



# 总结 Summary

- 经济的收入是在生产要素市场上分配的。三种最重要的生产要素是劳动、土地和资本。

The economy's income is distributed in the markets for the factors of production. The three most important factors of production are labor, land, and capital.

- 要素需求，例如劳动需求，是一种派生需求，它产生于用这些要素生产物品与服务的企业。

The demand for factors, such as labor, is a derived demand that comes from firms that use the factors to produce goods and services.

- 竞争的、利润最大化的企业使用每一种要素，都要达到该要素的边际产值等于其价格这一点。

Competitive, profit-maximizing firms hire each factor up to the point at which the value of the marginal product of the factor equals its price.





# 总结 Summary

- 劳动的供给产生于个人工作和闲暇的权衡 The supply of labor arises from individuals' tradeoff between work and leisure.
- 向上倾斜的劳动供给曲线意味着，人们对工资上升的反应是享受更少闲暇和工作更长时间。

An upward-sloping labor supply curve means that people respond to an increase in the wage by enjoying less leisure and working more hours.



# 总结 Summary

- 支付给每种生产要素的价格调节使得该要素的供求平衡。

**The price paid to each factor adjusts to balance the supply and demand for that factor.**

- 由于要素需求反映了那种要素的边际产值，在均衡时每种要素根据其对物品生产的边际贡献得到报酬。

**Because factor demand reflects the value of the marginal product of that factor, in equilibrium each factor is compensated according to its marginal contribution to the production of goods and services.**



## 总结 Summary

- 由于生产要素是同时使用的，所以任何一种生产要素的边际产量都取决于可以得到的所有要素量 Because factors of production are used together, the marginal product of any one factor depends on the quantities of all factors that are available.
- 结果，一种要素供给的变动将改变所有要素的均衡收入。

As a result, a change in the supply of one factor alters the equilibrium earnings of all the factors.