

G11 Fall midterm Microeconomics Study Guide

Unit 1: Basic Economic Concepts

1.1 Scarcity

--Definition: People have **unlimited wants** but **limited resources**.

So, we must make choices on how to use our resources efficiently.

--Trade-off: **All the alternatives** that we give up when we make a choice.

--Opportunity Cost: The **most desirable alternative** given up when people make a choice. (second best choice forgone)

--Microeconomics VS Macroeconomics

· Microeconomics is the study of small economic units such as individuals, firms, and markets (except stock markets)

· Macroeconomics is the study of the large economy as a whole or economic aggregates.

--Economic Assumptions

· Scarcity (due to scarcity, choices must be made)

· Every choice has a trade-off

· Everyone is rational and acts in their own “self-interest”

· Compare marginal costs and marginal benefits

· Real-life situations can be explained and analyzed through simplified models and graphs.

--Four Factors of Production

1. **Land**: All natural resources that are used to produce goods and services.

2. **Labor**: Labor refers to the effort expended by an individual to bring a product or service to the market.

3. **Capital**: Man-made production resources

(1) Physical Capital: Any human-made resource that is used to create other goods and services. 一般为看得见摸得着的 (used as input to produce output, like machinery, equipment, and buildings)

(2) Human Capital: Any skills or knowledge gained by a worker through education and experience. (e.g., skills, knowledge, intellectual property)

4. **Entrepreneurship**: Ambitious leaders that combine the other factors of production to create goods and services. They use their creativity to make a profit.

Labor and Capital are all made by people.

--> labor 是人的劳动力, capital 是人创造出的结果

--Productivity 投入产出比

profit=revenue-costs

revenue= money paid by consumers

costs= money that the business spent

1.2 Revenue Allocation & Economic System

--The 3 Economic Questions

1. **What** goods and services should be produced?
 2. **How** should these goods and services be produced?
 3. **Who** consumes these goods and services?
- These three questions determine the type of economic systems.

--Economy Systems



临海地区有地理优势，发展海上贸易，更市场化（更偏 free market economy）

--The Circular Flow Model

The Production Market	The Resource(Factor) Market
Definition: The place where goods and services produced by business are sold to household	Definition: The place that businesses use to purchase, rent, or hire what they need in order to produce goods or services
Buyer: Households/ Individuals	Buyer: Businesses
Seller/ Producer: Businesses	Seller: Individuals



--The Circular Flow Model Terms

- Private Sector- Part of the economy that is run by individuals and businesses.
- Public Sector- Part of the economy that is controlled by the government.
- Factor Payments- Payment for the factors of production, namely rent, wages, interest, and profit.
- Transfer Payments- When the government redistributes income (ex: welfare, social security).
- Subsidies- Government payments to businesses.

1.3 Production Possibility Curve (PPC)

--Consumer goods VS. Capital goods

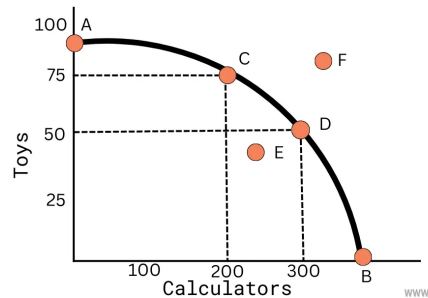
Consumer goods can be sold directly, while capital goods (like machines) are goods used in the production process.

--Production Possibility Curve Assumptions

- Only two goods can be produced.
- Full employment of resources
- Fixed resources (Ceteris Paribus)
- Fixed technology

--Definition of PPC: A PPC is a model that shows alternative ways in which an economy can use its scarce resources.

--PPC graphically demonstrated scarcity, trade-off, opportunity cost, and efficiency.



The diagram above shows a PPC for producing toys and calculators.

-The points on the PPC curve (points A, C, D, B) represented the efficient production ways.

-The points inside the curve (like point E) represented the inefficient producing solutions.

-The points outside the curve (like point F) represented the impossible or unattainable production solution with recently given resources.

--PPC Shifters

- Change in resource quantity or quality. When the resource quantity or quality increases, the PPC curve will move to the right.
- technology change. (e.g., the First and Second Industrial Revolutions) When the technology becomes more advanced, the costs will decrease, and as a result, the PPC

curve will move to the right. In this way, some impossible-producing ways can be attainable.

- [Change in trade.](#)

*More capital goods will lead to the future PPC curve moving to the right.

If the curve is concave, the opportunity cost is increasing.

--The shape of the PPC curve

- When the resources of producing 2 goods are perfectly substituted or adaptable, the shape of the PPC curve will be a straight line.
- If the raw materials used in the production of two products are not interchangeable, the PPC curve will be concave downward.
- *Notice that the PPC curve can never be concave inward. Also, there is no situation in which the opportunity cost is decreasing.

1.4 Comparative Advantage and Gains from Trade.

--Absolute Advantage VS Comparative Advantage

- Absolute advantage means that the company has the ability to produce a good using fewer inputs than another producer.
- Comparative advantage means that the company has the ability to produce a good at a lower opportunity cost than another.

--Terms of Trade: The agreed-upon conditions that would benefit both countries.

--Input Model VS Output Model

Input VS Output					
Output Model			Input Model		
	Bread	Corn		Bread	Corn
USA	4	2	USA	4	2
Brazil	4	6	Brazil	4	6

<p>USA:</p> <p>$1B = 1/2C$ ← Comparative Advantage</p> <p>$1C = 2B$</p> <p>Brazil:</p> <p>$1B = 3/2C$</p> <p>$1C = 2/3B$ ← Comparative Advantage</p>		<p>USA:</p> <p>$1B = 2C$</p> <p>$1C = 1/2B$ ← Comparative Advantage</p> <p>Brazil:</p> <p>$1B = 2/3C$ ← Comparative Advantage</p> <p>$1C = 3/2B$</p>
--	--	--

Input Model 中的数字表示需要多少投入来生产一单位产品

比如左图可表示需要用 4 单位 resource 生产一个单位的 bread, 2 单位 resource 生产一单位 corn

一般题目中出现 hours/ # of labor 就是 input model

Output Model 中的数字表示一单位投入可以生产几单位产品

*若一个市场中只有两种商品，它们互为对方的 Opportunity Cost，那么它们的 OC 互为相反数，乘积为 1

1.5 Cost-Benefit Analysis& 1.6 Marginal Analysis

--Explicit Costs VS Implicit Costs

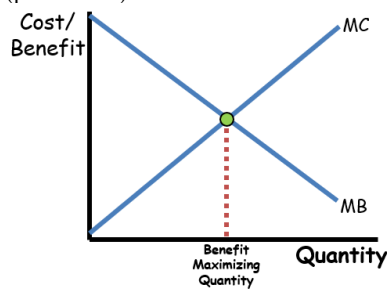
- Explicit Cost: input costs that require an outlay of money by the firm. 为了做一件事的实际支出
- Implicit Cost: input costs that do not require an outlay of money by the firm. 为了做一件事放弃了本该得到的

--Economic Cost=Explicit Cost+ Implicit Cost

--Total Net Benefits= Total Benefits- Total Costs

--The optimal quantity is achieved when marginal benefit(MB) is equal to marginal cost(MC) or where total benefit is maximized.

--Comparing marginal benefit (MB) with marginal cost (MC) helps individuals (firms) decide whether to increase, decrease, or maintain their consumption (production) levels.



如上图所示，MB 与 MC 交点决定了生产的数量 Q.因为在这点 net benefit 最大

Cost-Benefit Analysis	Marginal Analysis
用于进行非重复性动作的生产	用于重复性生产
-Compare <u>total benefit</u> and <u>total cost</u> . -When total benefit > total cost, the producer should produce.	-Compare <u>marginal benefit</u> and <u>marginal cost</u> . -When marginal benefit > marginal cost, the producer should produce.

--The Law of Diminishing Marginal Utility

- **Definition:** As people consume anything, the additional satisfaction that they will receive will eventually start to decrease.
- But people will **continue** to do something as long as the marginal benefit is greater than the marginal cost.

Marginal Utility=change in total utility/ change in consumption quantity

Marginal Utility = $\frac{\text{Change in Total Utility}}{\text{Change in Quantity}}$

生产者角度分析用 Benefit, 消费者角度分析用 Utility

--Utility Maximization (Rule)

Definition: Consumers allocate their limited income to purchase the combination of goods that maximize their utility by equating/comparing the marginal utility of the last dollar spent on each good.

$$\text{Utility-maximizing rule: } \frac{MU_x}{P_x} = \frac{MU_y}{P_y}$$

$$\text{If } \frac{MU_x}{P_x} > \frac{MU_y}{P_y} \Rightarrow \text{buy more X}$$

$$\text{If } \frac{MU_x}{P_x} < \frac{MU_y}{P_y} \Rightarrow \text{buy more Y}$$

Unit 2 Supply and Demand

2.1 Demand

--Definition:

· The different quantities of goods that consumers are willing and able to buy at different prices.

-- Law of Demand

· Definition: The inverse relationship between price and quantity demanded.

· Content: Other things being equal, as the price goes up, quantity demanded goes down; As the price goes down, quantity demanded goes up.

· Reasons to form the law of demand:

The Substitution Effect:

-The change in consumption that results when a price change moves the consumer along a given indifference curve to a point with a new marginal rate of substitution

-An Increase in price makes substitutes more attractive, so people will buy more amount of this kind of product.

The Income Effect:

-The change in consumption that results when a price change moves the consumer to a higher or lower indifference curve

-An increase in price decreases purchasing power, so people will buy less amount of this kind of product.

-- Substitute & Complement

Deleted: c

- Substitute: Two goods for which an increase in the price of one leads to an increase in demand for the other.
- Complement: Two goods for which an increase in the price of one leads to a decrease in the demand for the other.

--Normal Goods and Inferior Goods

· Normal Good:

When other things are equal,

When the incomes decrease, the demand for the good will decrease.

When the incomes increase, the demand for the good will increase.

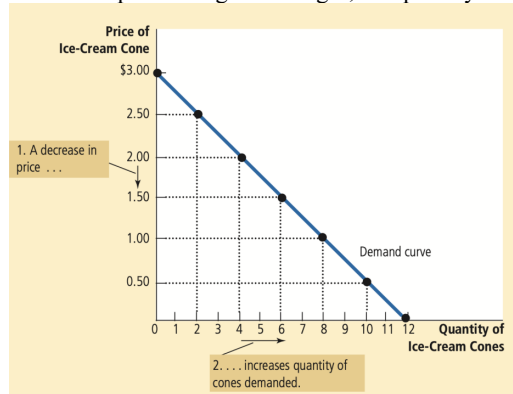
· Inferior Good:

If the demand for a good rises when income falls, the demand falls when income rises. The good is called an inferior good.

--Demand Curve

· A graph of the relationship between the price of a good and the quantity demanded.

· When the price of a good changes, the quantity demanded of that good also changes.



--Market Demand

- The sum of individual demands

Price of Ice-Cream Cone	Catherine		Nicholas		Market
\$0.00	12	+	7	=	19 cones
0.50	10		6		16
1.00	8		5		13
1.50	6		4		10
2.00	4		3		7
2.50	2		2		4
3.00	0		1		1

Demand Shifters:

--Tastes and Preferences

- If people like good A, they buy more of it, and then the demand curve will move to right.

--Market Size

- More people will cause the demand curve to move toward the right.

- Example:

Immigration: more people come into this country, which will cause the demand curve to move toward the right.

Emigration: fewer people live in this country, which will cause the demand curve to move toward the left.

--Price of Related Goods

- Substitute: If the price of good A's substitute increase, good A's demand curve will move to right.

- Complement: If the price of good A's complement increase, good A's demand curve will move to left.

--Income

- Normal goods:

Income increases will cause the demand curve to move toward the right.

- Inferior goods:

Income decreases will cause the demand curve to move toward the right.

--Future Expectation

- Customers buy now more of what they think will go up in price in the future.

2.2 Supply

--Definition:

- Supply is the different quantities of goods that producers are willing and able to produce at different prices.

--Law of Supply:

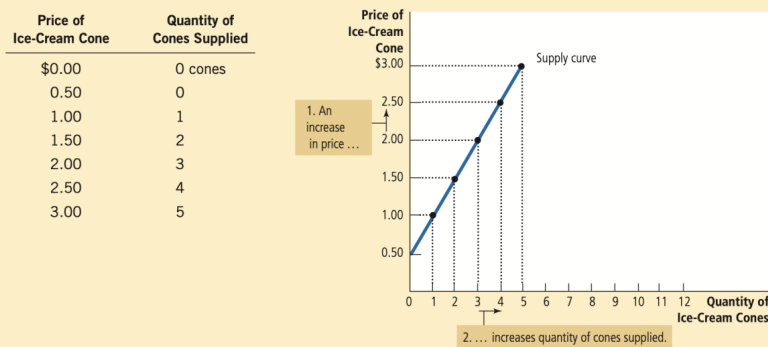
- The direct relationship between price and the quantity supplied.

(Other things being equal, when the price of a good rises, the quantity supplied of the good also rises; when the price falls, the quantity supplied falls as well.)

The supply schedule is a table that shows the quantity supplied at each price. This supply curve, which graphs the supply schedule, illustrates how the quantity supplied of the good changes as its price varies. Because a higher price increases the quantity supplied, the supply curve slopes upward.

FIGURE 5

Ben's Supply Schedule and Supply Curve



Supply Shifters:

--Input Price

- Input prices are the prices associated with the raw materials and resources used in the production of goods and services. (e.g. The costs of labor)
- When the input price increases, the supply curve will move to the left.

--Government Tools

- Ways: taxes, subsidies, regulations...
- Examples:

When the government sets taxes, the supply curve will move to the left.

When the government gives subsidies to companies(producers), the supply curve will move to the right.

When the government sets regulations or makes the regulations stricter, the supply curve will move to the left.

--Number of Sellers

- When there are more sellers in the market, more products can be produced, so the supply curve will move to the right.

--Technology

- Advances in science and technology can increase productivity. As a result, the supply curve will move to the right.

--Future Expectation

- If the companies (producers) think the price of this type of product will increase in the future, they are likely to store the products now and, therefore, decrease the amounts of products in the market, and the supply curve will move to the left.

--Price of Other Goods

- Producers always want to put their money into the field so they can earn more profit.

·Example:

If the companies originally produce good A, one day they find out that the price of the other good B increases, which means they can earn more profit if they produce good B. So the companies (producers) will produce less amount of good A and more amount of good B. Thus, the supply curve of good A will move to the left and the supply curve of good B will move to the right.

2.3 Price Elasticity of Demand

--Definition: PED measures the responsiveness (sensitivity) of quantity demanded given a price change.

--Calculation:

$$PED = \frac{\% \text{change in quantity demanded}}{\% \text{change in price}}$$

--Elasticity:

·Demand for goods is said to be elastic if the quantity demanded responds substantially to changes in the price. Demand is said to be inelastic if the quantity demanded responds only slightly to changes in the price.

--Categories:

·Demand is elastic:

It means that the demand for this good is sensitive to price changes.

It usually occurs when there are many choices for consumers to decide.

Description: The graph is shallow.

·Demand is inelastic:

It means that the demand for this good is not sensitive to price changes.

It usually occurs in necessities, such as medicine for cancer.

Description: the graph is steep.

·Demand is perfectly inelastic:

It means that the demand for this good is not sensitive to price changes at all, that no matter how the price changes, the demand remains the same amount.

It is for goods that cannot be replaced.

Description: the graph is a vertical line.

·Demand is perfectly elastic

Given the price, consumer will buy any quantity.

E.g. in gold, the price is specific every day.

Description: the graph is a horizontal line

·Unit-elastic

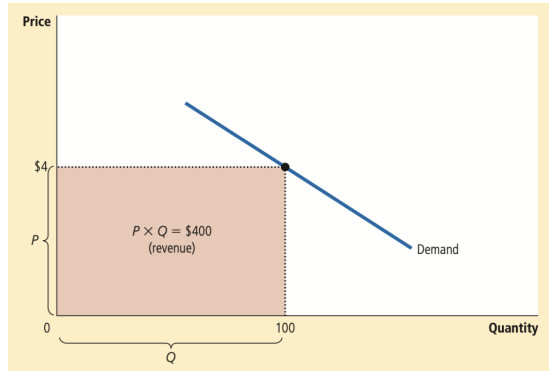
The change in demand is always equal to the change in price.

Demand and price offset each other.

--Total Revenue

·Definition: The total value of sales of a good or service. It is equal to the price multiplied by the quantity sold.

·Total Revenue= Price* Quantity Sold



--Total Revenue in Demand Elasticity Curve

Elasticity		Characteristic	Relationship with Total Revenue	Example	Graph
>1	Elastic	sensitive to price change	when price goes up, TR goes down. When price goes down, TR goes up.	Market with many choices.	
<1	Inelastic	not sensitive to price change	when price goes up, TR goes up. When price goes down, TR goes down.	Necessities.	
$=0$	Perfectly Inelastic	Any the price changes will not affect any change in demand.	when price goes up, TR goes up. When price goes down, TR goes down.	Irreplaceable items	
infinity	Perfectly Elastic	Given the price, consumer will buy any quantity.	price cannot change	Gold	
1	Unit Elastic	Demand and Price offset each	when price goes up, TR goes down.	---	

		other	When price goes down, TR goes down.		
--	--	-------	-------------------------------------	--	--

2.4 Price Elasticity of Supply

--Definition:

·Price Elasticity of Supply(PES) measures the sensitivity (responsiveness) of quantity supplied given a price change.


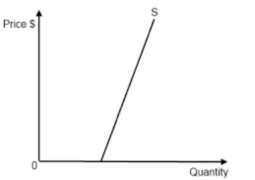
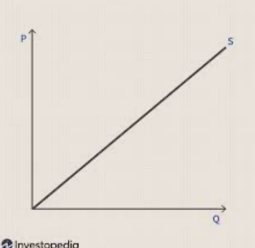
--Calculation:

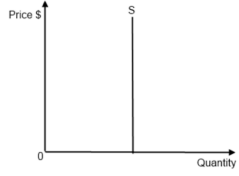
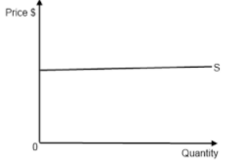
$$PED = \frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}}$$

--Time limit:

Factories and firms cannot change their manufacturing structure as soon as they find out the problem, so there is postponement.

--Categories:

Elasticity	Determination	Graph
>1	Supply is elastic	 A graph showing a red supply curve labeled 'S' on a coordinate system. The vertical axis is labeled 'Price' and the horizontal axis is labeled 'Quantity'. The curve is relatively flat, indicating that a large change in price leads to a small change in quantity supplied.
<1	Supply is inelastic	 A graph showing a steep supply curve labeled 'S' on a coordinate system. The vertical axis is labeled 'Price \$' and the horizontal axis is labeled 'Quantity'. The origin is marked '0'. The steepness of the curve indicates that a small change in price leads to a large change in quantity supplied.
=1	Supply is unit-elastic	 A graph showing a straight supply curve labeled 'S' on a coordinate system. The vertical axis is labeled 'P' and the horizontal axis is labeled 'Q'. The curve starts at the origin and is a straight line with a 45-degree slope, indicating that the percentage change in price equals the percentage change in quantity supplied. The source 'Investopedia' is noted at the bottom left.

$=0$	Supply is perfectly inelastic	
∞	Supply is perfectly elastic	

--Examples of Inelastic Supply:

- Hard to produce
- Raw materials are expensive
- Lack of factories
- no/ little substitute goods
- elasticity<1

2.5 Other Elasticity

--Cross-Price Elasticity of Demand (XED)

·Definition:

How the quantity demanded of one good responds to a change in the price of another good.

·Calculation:

$$\text{cross-price elasticity of demand} = \frac{\text{percentage change in quantity demanded of good 1}}{\text{percentage change in the price of good 2}}$$

It shows whether two goods are substitutes or complements

·Result:

Substitutes——cross-price elasticity is positive

Complements——cross-price elasticity is negative

--The income Elasticity of Demand (YED)

·Definition: measuring how the quantity demanded changes as consumer income changes.

·Calculation:

$$\text{income elasticity of demand} = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}}$$

It shows whether a good is a normal good or an inferior good

·Result:

Normal good——the income elasticity is positive

Inferior good——the income elasticity is negative

2.6 Market Equilibrium & Consumer and Producer Surplus

--Market Equilibrium: where supply curve and demand curve intersect.

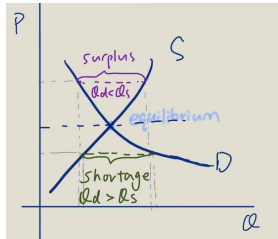
- Equilibrium price provides information to economic decision-makers to guide resource allocation.
- In a perfectly competitive market, equilibrium is achieved when the price of a good or service brings the quantity supplied and quantity demanded into balance, in the sense that buyers wish to purchase the same quantity that sellers wish to provide.

--Consumer Surplus: The difference between what you are willing to pay and what you pay.

--Producer Surplus: The difference between the price the seller received and how much they were willing to sell for it (cost).

Economists use consumer surplus and producer surplus to measure the benefits markets create for buyers and sellers and understand market efficiency.

从生产商赚钱角度考虑，生产商能获得大于他们 Opportunity Cost 的回报，他们就应该卖该产品。



Surplus is a signal to decrease the price. (market mechanism-- “invisible hand”)

Shortage 总比 Surplus 变化快

Total Surplus=Total Welfare=Producer Surplus+ Consumer Surplus

Deadweight Loss: a loss of economic efficiency that can occur when equilibrium for a good or service is not Pareto optimal. 市场无法满足所有人的期待

2.7 Double Shift Rule

--If two curves shift at the same time, either price or quantity will be indeterminate (or ambiguous)

--If price and quantity all have changed, either demand or supply will not change.

--Relationship between supply and demand curve shift and the change of price and quantity

· If the demand curve shifts, quantity and price will change in the same direction

· If the supply curve shifts, quantity and price change in the opposite direction

2.8 The Effects of Government Intervention in Markets

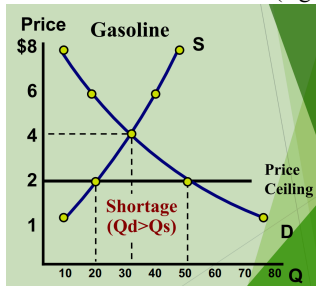
Price Ceiling and Price Floor are two ways to control the price.

--Price Ceiling(限最高价)

· Function: Maximum legal price a seller can charge for a product.

·Binding/ Effective: Put in under/ below the equilibrium price. Equilibrium price 以上的点本身就可以达到，若是设到上面就没有作用了

- 一般设在民生类必需品(e.g. water, oil, gas, electricity...)



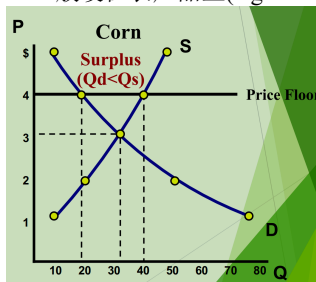
·Price ceiling leads to shortage--the government will give producers subsidies.

--Price Floor(限最低价)

·Function: Minimum legal price a seller can sell a product

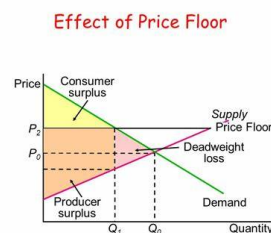
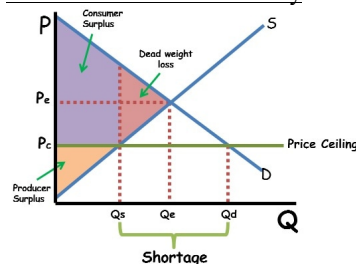
·Effective/ Binding: Above equilibrium price

- 一般设在农产品上(e.g. corn, wheat...)



·Price Floor leads to surplus--the government will buy or export some of the goods.

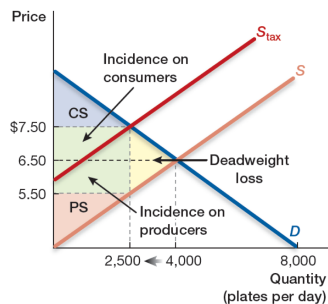
--Price Control and Efficiency



Price ceiling and price floor all cause deadweight loss.

--Tax

- Exercise Tax: A per unit tax on producers
- Lump Sum Tax: A fixed tax imposed on individuals or businesses that doesn't vary based on their income or wealth. (This means that all taxpayers are required to pay the same fixed amount, regardless of their financial status.) Only have income effect but no substitute effect.



An image about the influences of the tax

The green part on the image is the total tax revenue.

Tax Revenue 上半部分总是 consumer 负担的，下半部分总是 producer 负担的

*判断 consumer or producer 负担更多的税可通过 Supply curve & Demand curve 的倾斜程度 (elastic 程度) 越 inelastic 承担越多 tax.

*Inelastic 比 elastic 对 shortage or surplus 影响小 (因为 inelastic 竖直方向 price 变化慢)

2.9 International Trade

--Tariff

• Definition: Tax on imports that increases the world price (tariff directly adds to the world price)

• Government can get tax revenue

--Quota

• Definition: A limit on the number of imports

• Government cannot get revenue from quota, producers get benefit from the quota

--Purpose of Tariffs and Quota

• To protect domestic producers from a cheap world price

• To prevent domestic unemployment

*shortage: government's measures always cause deadweight loss.

