Price Mechanism

Price as core in the market mechanism

Price mechanism is the core of market mechanism.

Price mechanism: Prices determined by the forces of supply and demand in competitive markets.

- In competitive market, at equilibrium positions, **the buying and selling choices of all buyers and sellers are satisfied and are in balance.**
- Market mechanism working through **prices** without any central authority, is also known as the ***invisible hand of the market.***

Adam Smith and the Invisible Hand

Adam Smith

Every individual . . . neither intends to promote the public interest, nor knows how much he is promoting it. . . . He intends only his own gain, and he is in this, as in many other cases, led by **an invisible hand** to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it

The role of the price

① The signaling function of price

- Price communicate Information to decision makers.
- When the price increase,
  - it gives signal **to supplier** that there is a product shortage（high demand）, the product is more profitable.
  - It gives signal **to consumers** that the product is more expensive, vice versa.

② The incentive function of price

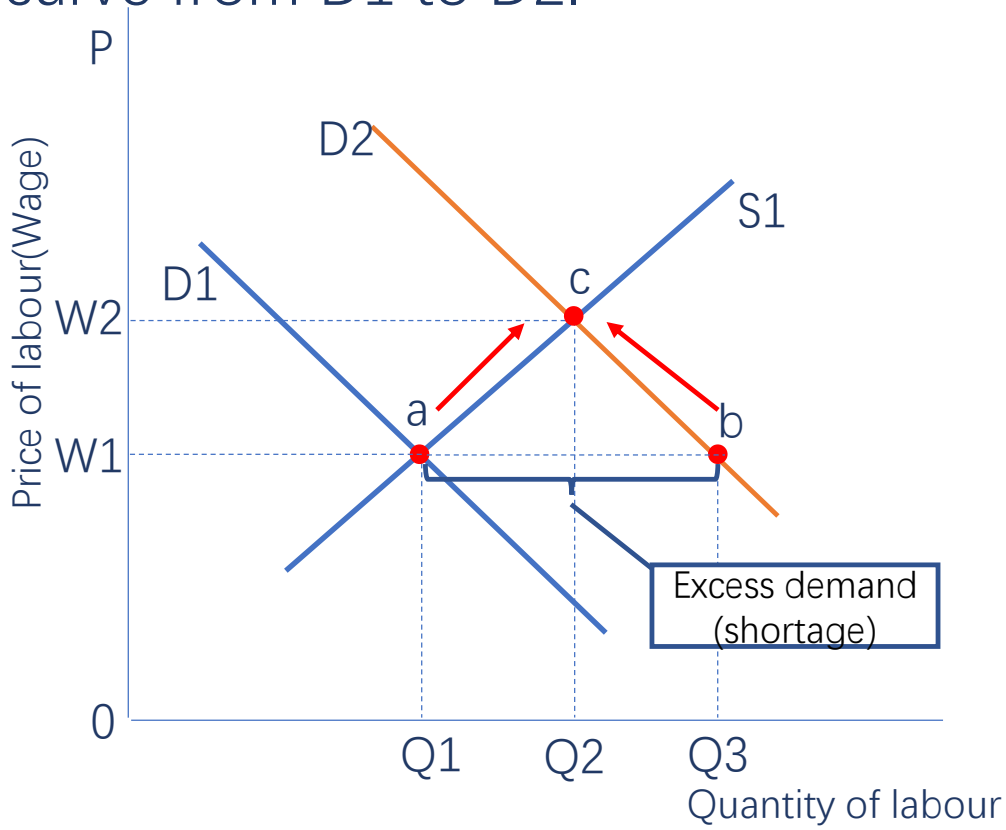
- Price motivate decision makers to respond to the information and make the best decisions for themselves.
- When the price goes up,
  - It's an incentive for existing **suppliers** to produce more and potential suppliers to enter the market,
  - And it's also an incentives for **buyers** to buy less, vice versa.

③ The rationing function of price

- Rationing is a method of apportioning or parceling out goods and services among consumers or households.
- Whether or not a consumer will get a good is determined by the price of that good only.

Example of IT labour market

- Originally in IT labour market, the demand and supply curve D1 and S1 was in equilibrium in point a with W1 and Q1.
- Through the significant development of IT industry in recent years, there was a big increase in IT labour demand, shift the demand curve from D1 to D2.
- With the old wage W1, there is a shortage of labour of Q3-Q1.
- The shortage cause the wage to start rising until the shortage has disappeared. The new equilibrium is at point c with W2 and Q2.

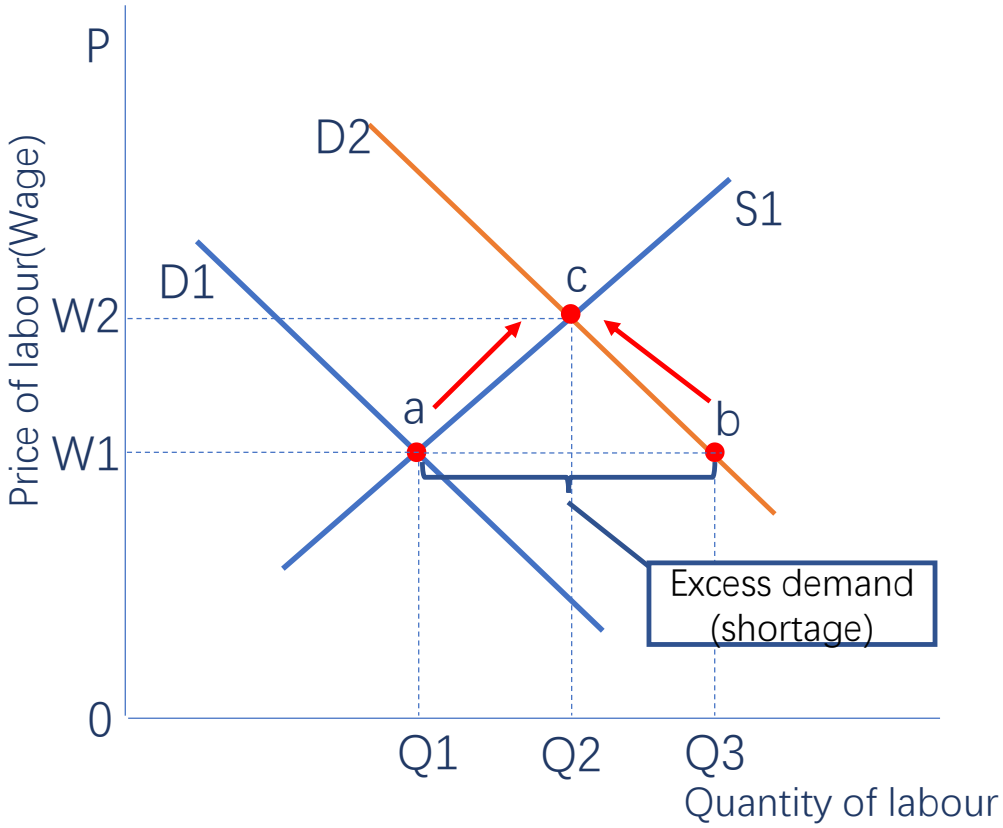


Example of IT labour market

The **rising wage** has acting as a signal and incentive.

- **In supply side:** The higher wage ① **signalled** to the labours about the shortage, it's also an ② **incentives** for them to increase the quantity supplied (part-time worker switch to full-time, more capable people join the industry).

➡ Move along supply curve from a to c, increase the quantity from Q1 to Q2



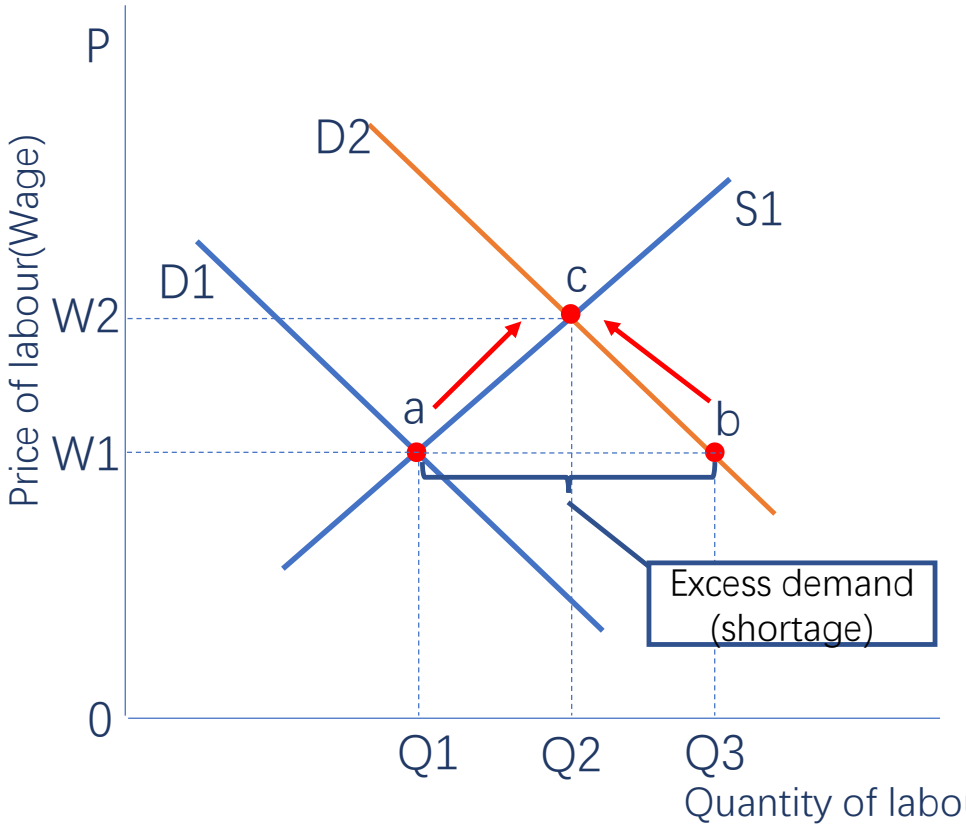
Example of IT labour market

The **rising wage** has acting as a signal and incentive.

- **In demand side:** The new higher wage ① **signalled** to the employer that the labour is now more expensive, it's also an ② **incentive** for them to hire less.

➡ Move along the demand curve from b to c, hiring less employee than at the original wage of W1.

The increase in the price of IT labour resulted in a ③ reallocation of resources （rationing） . More labour resources are now allocated to IT industry.



Price and rationing (reallocation of resources)

- **Price helps to ration resources**. We have limited resources, so in order to have an effective and productive economy, we need to make the best possible use of the resources.
- By the signalling and incentive function of price, people can determine where best to put their resources based on how prices are changing in the economy.

→ **While consumes/suppliers are making the best decision for themselves, they are also making the best decisions for the economy.**

Price mechanism answers the 3 key questions:

Answers to what to produce:

- Firms produce only those goods consumers are willing and able to buy, While consumers buy only those goods producers are willing and able to supply. – solely determined by price

Answer to How to produce?

- Firms use those resources and technologies in their production process That they are willing and able to pay for. Produce things in a way that minimize their cost. (cost will affect price)

- Answer to For whom to produce?
  - Whoever can afford the products.

Consumer Surplus & Producer Surplus

How much would you pay for a movie?

Willingness to pay

Willingness to pay is the maximum price a consumer would pay.

In RMB

Name	Highest price willing to pay for movie	Market price
Alex	30	40
Jennice	40	40
Allen	50	40
Elsie	60	40
Joseph	70	40
Grace	80	40

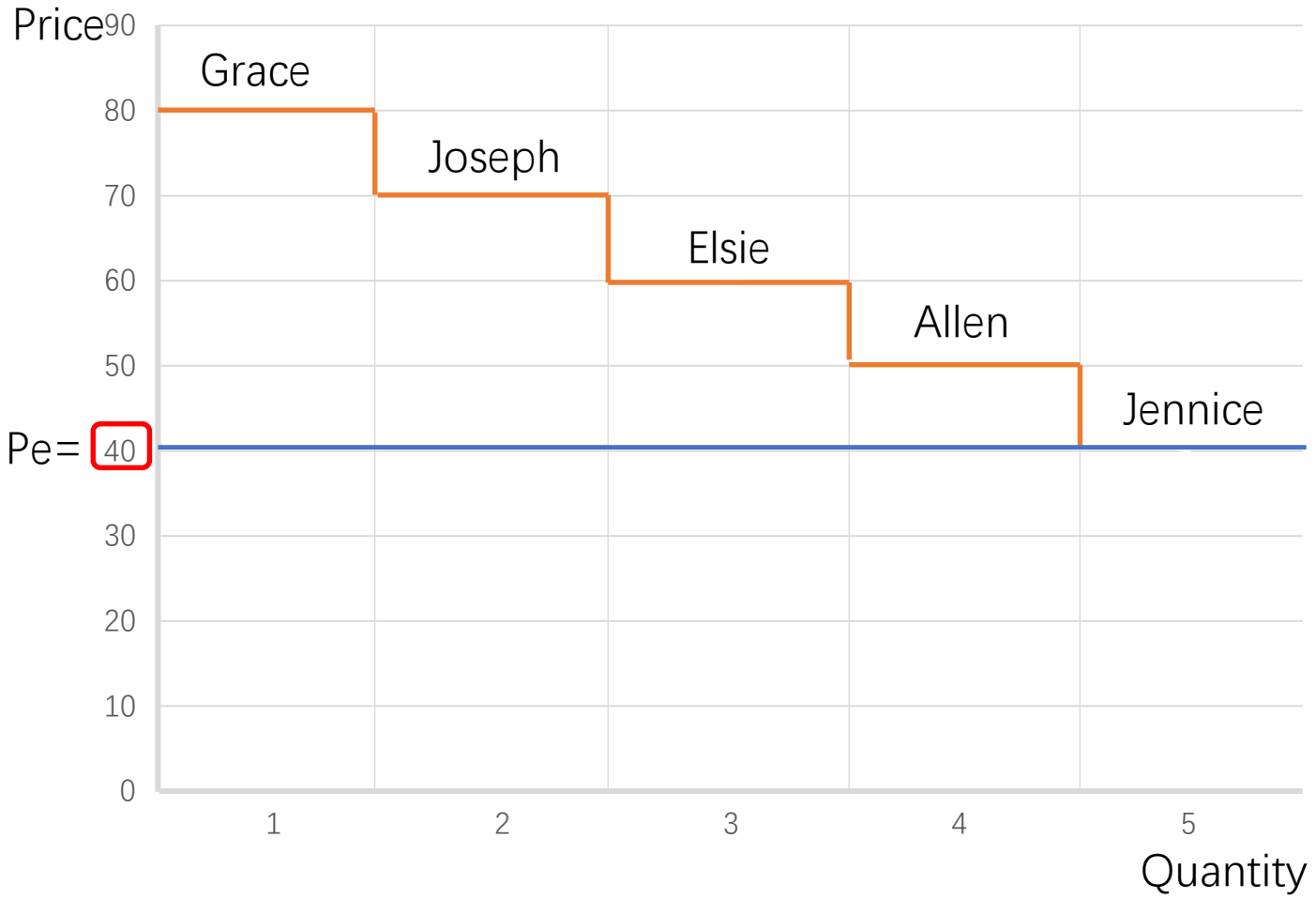
The highest price they are willing to pay is given by the demand curve. (each individual's willingness)

The price actually paid is determined at the market equilibrium by supply and demand.

Illustration in graph

In RMB

Name	Highest price willing to pay for movie	Market price
Alex	Not buying, out of market	40
Jennice	40	40
Allen	50	40
Elsie	60	40
Joseph	70	40
Grace	80	40

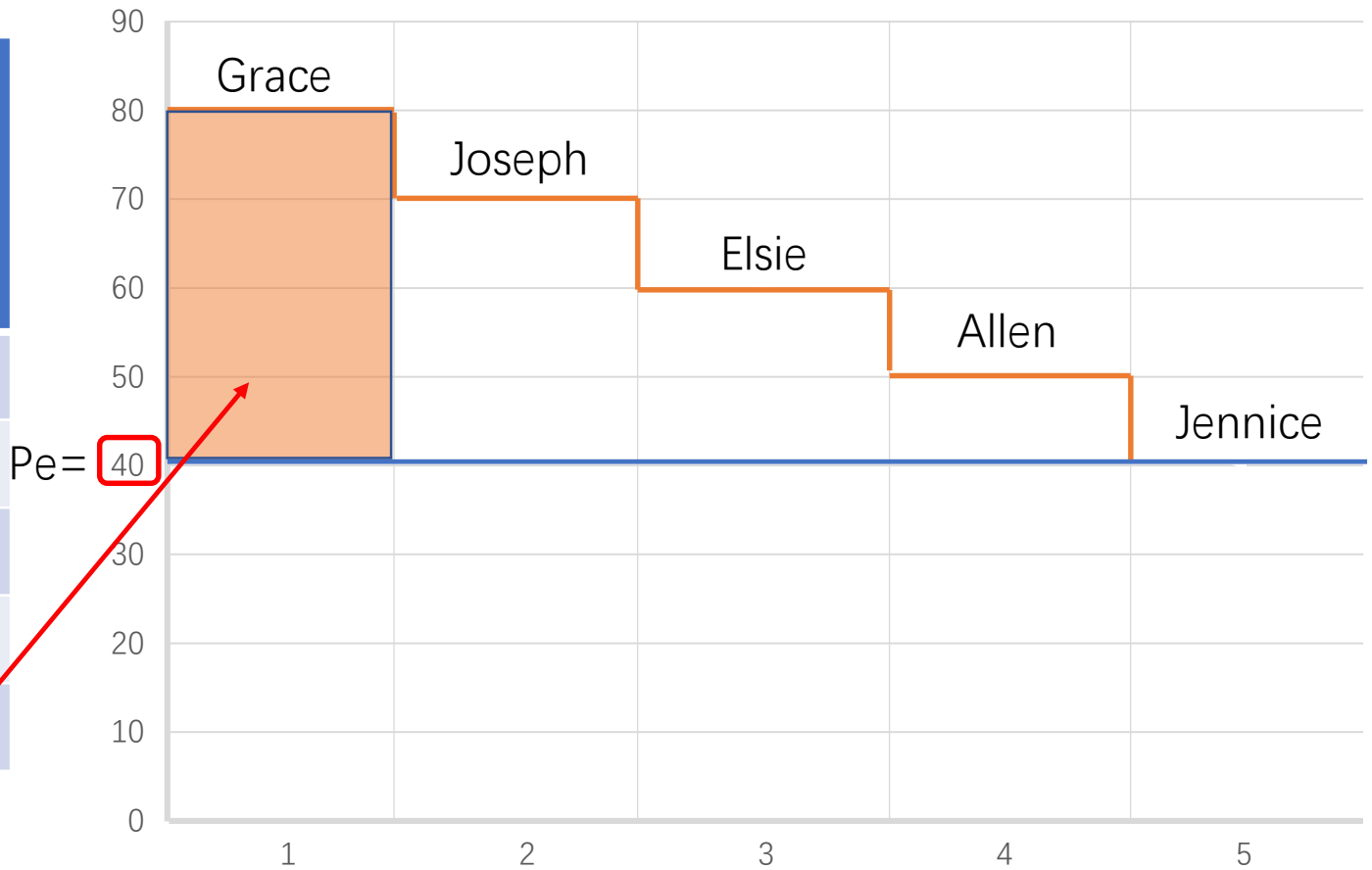


Consumer surplus

Consumer surplus is defined as the highest price consumers are willing to pay for a good minus the price actually paid.

No. of people	Price willing to pay for movie	Market price	Consumer Surplus
Jennice	40	40	0
Allen	50	40	10
Elsie	60	40	20
Joseph	70	40	30
Grace	80	40	40

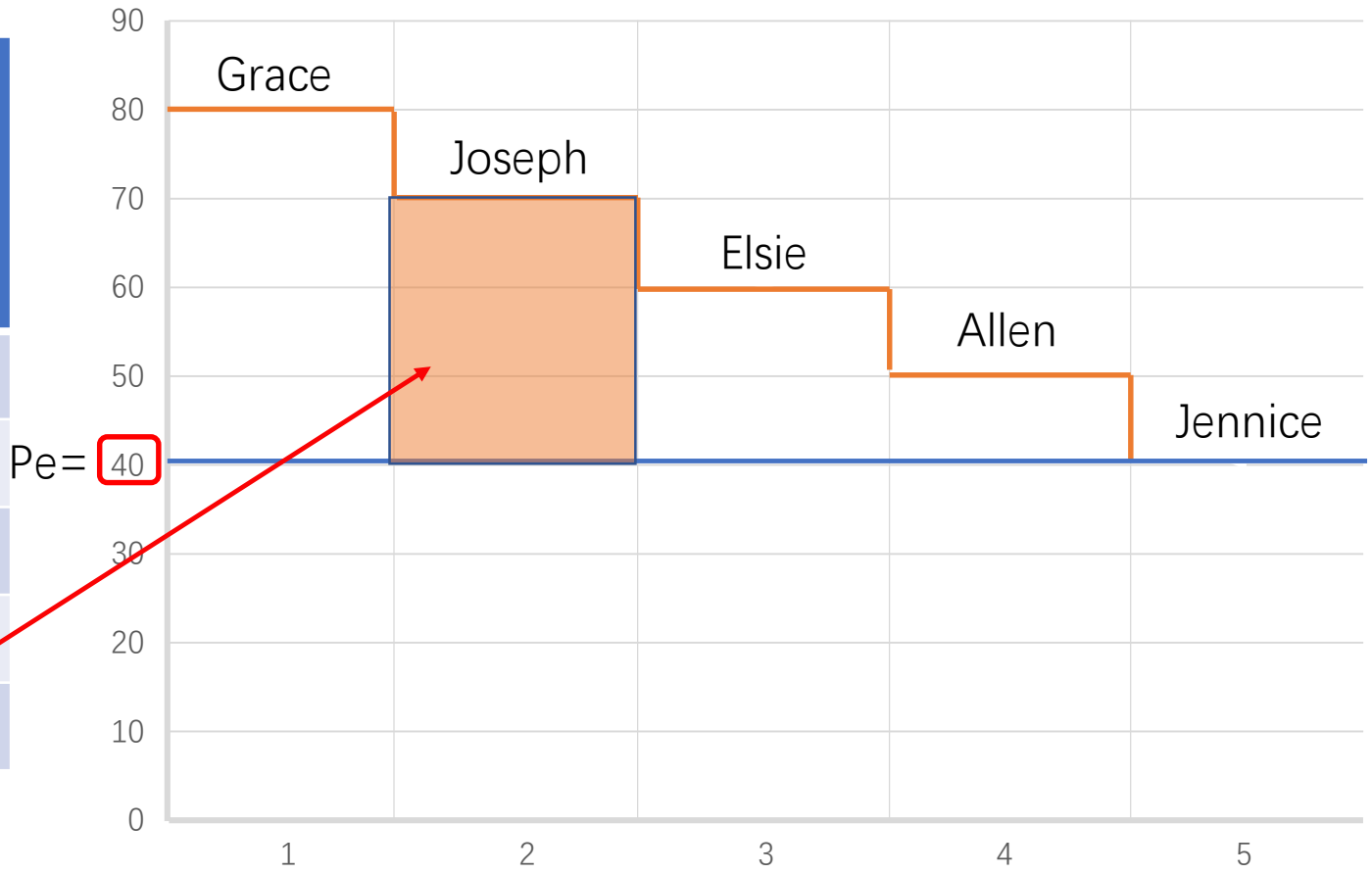
In RMB



Consumer surplus

In RMB

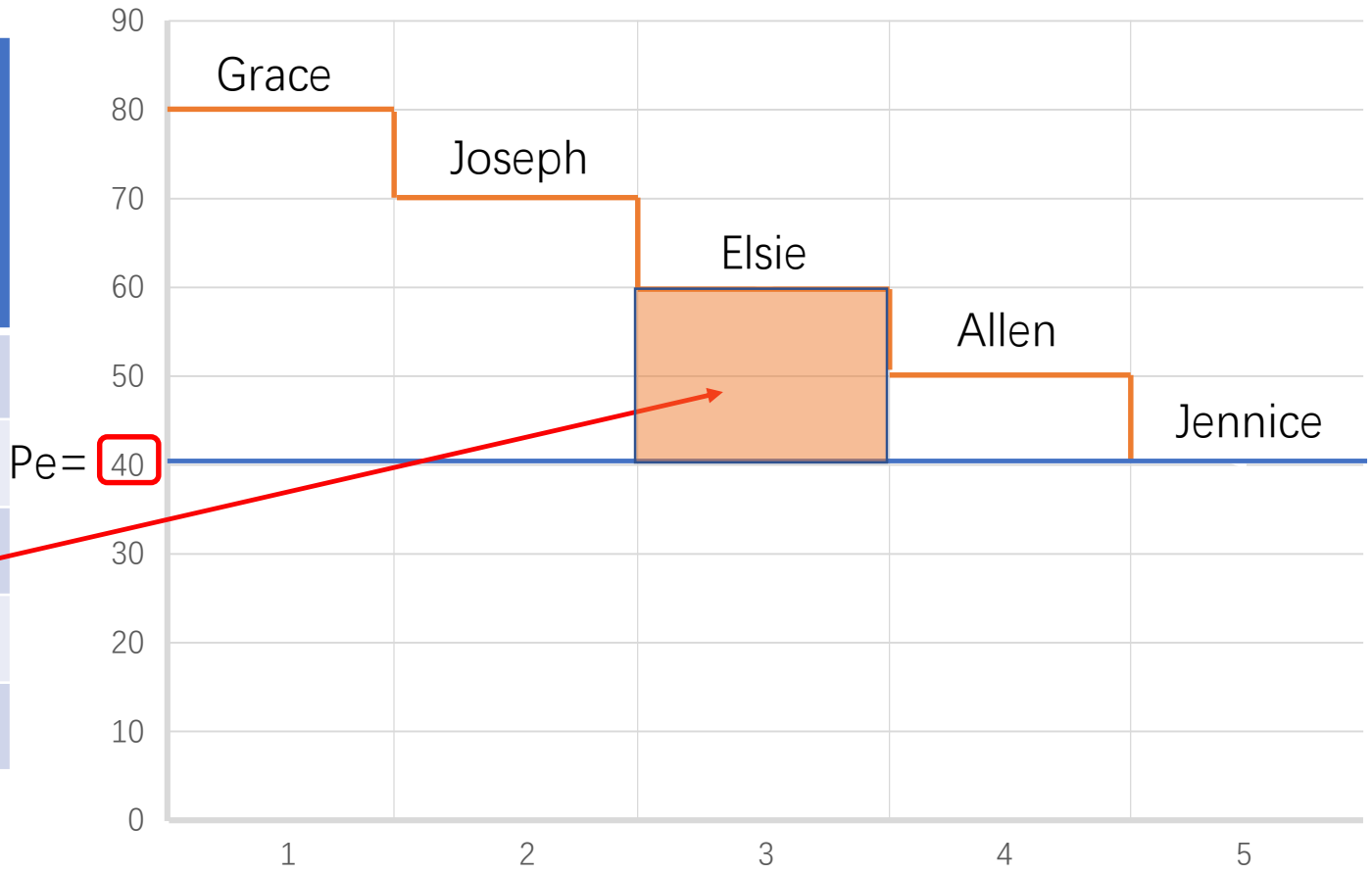
No. of people	Price willing to pay for movie	Market price	Consumer Surplus
Jennice	40	40	0
Allen	50	40	10
Elsie	60	40	20
Joseph	70	40	30
Grace	80	40	40



Consumer surplus

In RMB

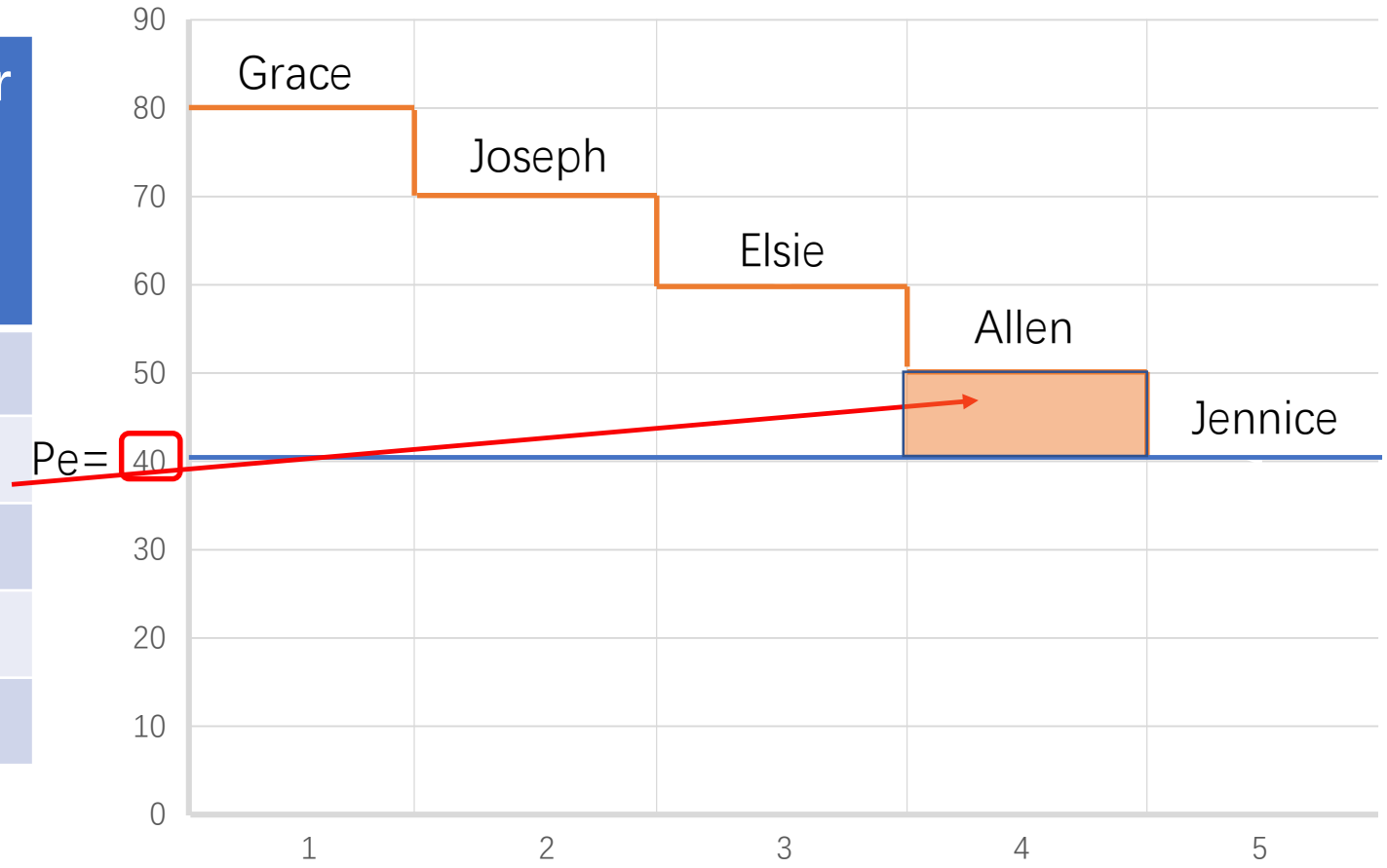
No. of people	Price willing to pay for movie	Market price	Consumer Surplus
Jennice	40	40	0
Allen	50	40	10
Elsie	60	40	20
Joseph	70	40	30
Grace	80	40	40



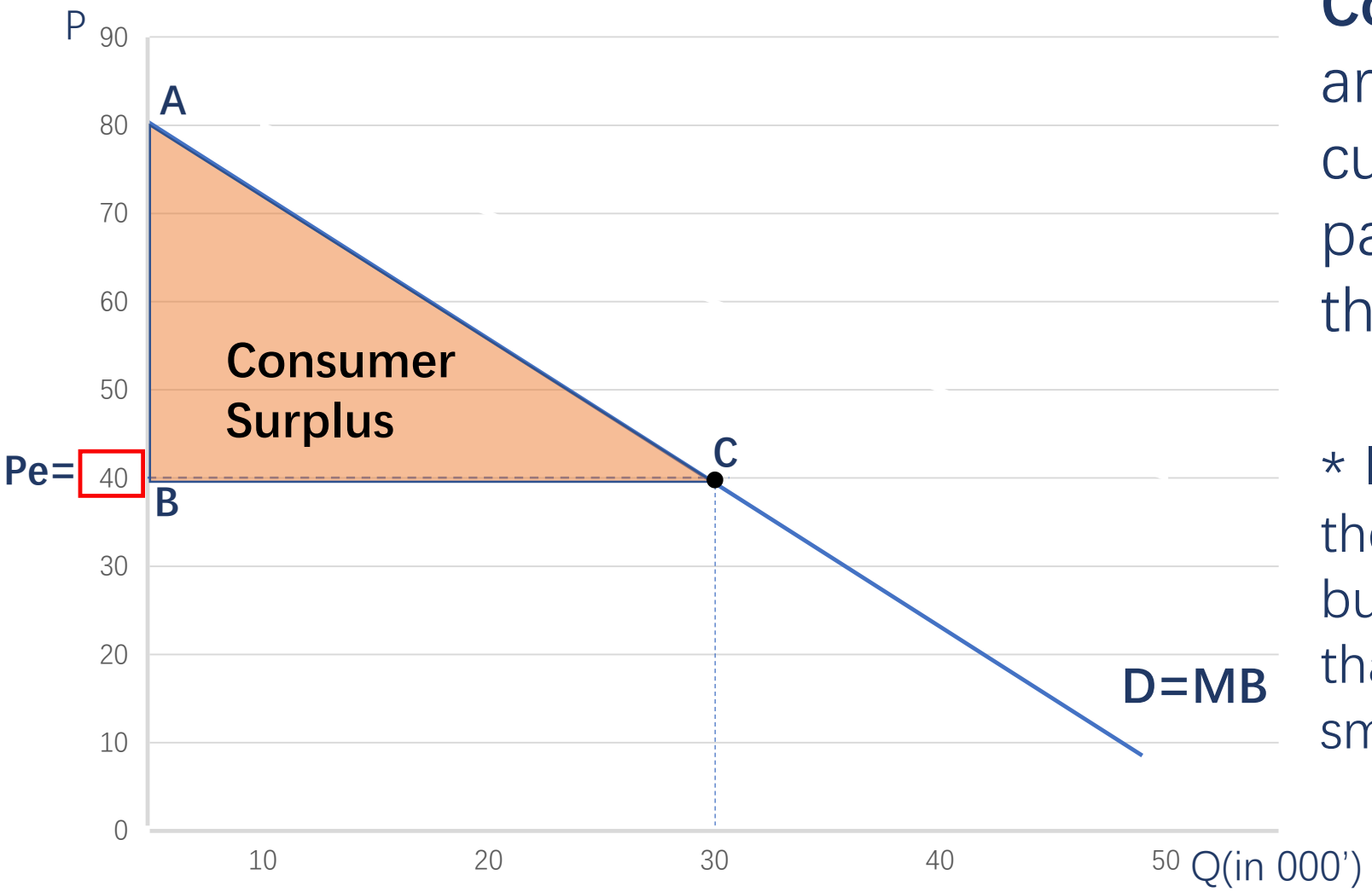
Consumer surplus

In RMB

No. of people	Price willing to pay for movie	Market price	Consumer Surplus
Jennice	40	40	0
Allen	50	40	10
Elsie	60	40	20
Joseph	70	40	30
Grace	80	40	40



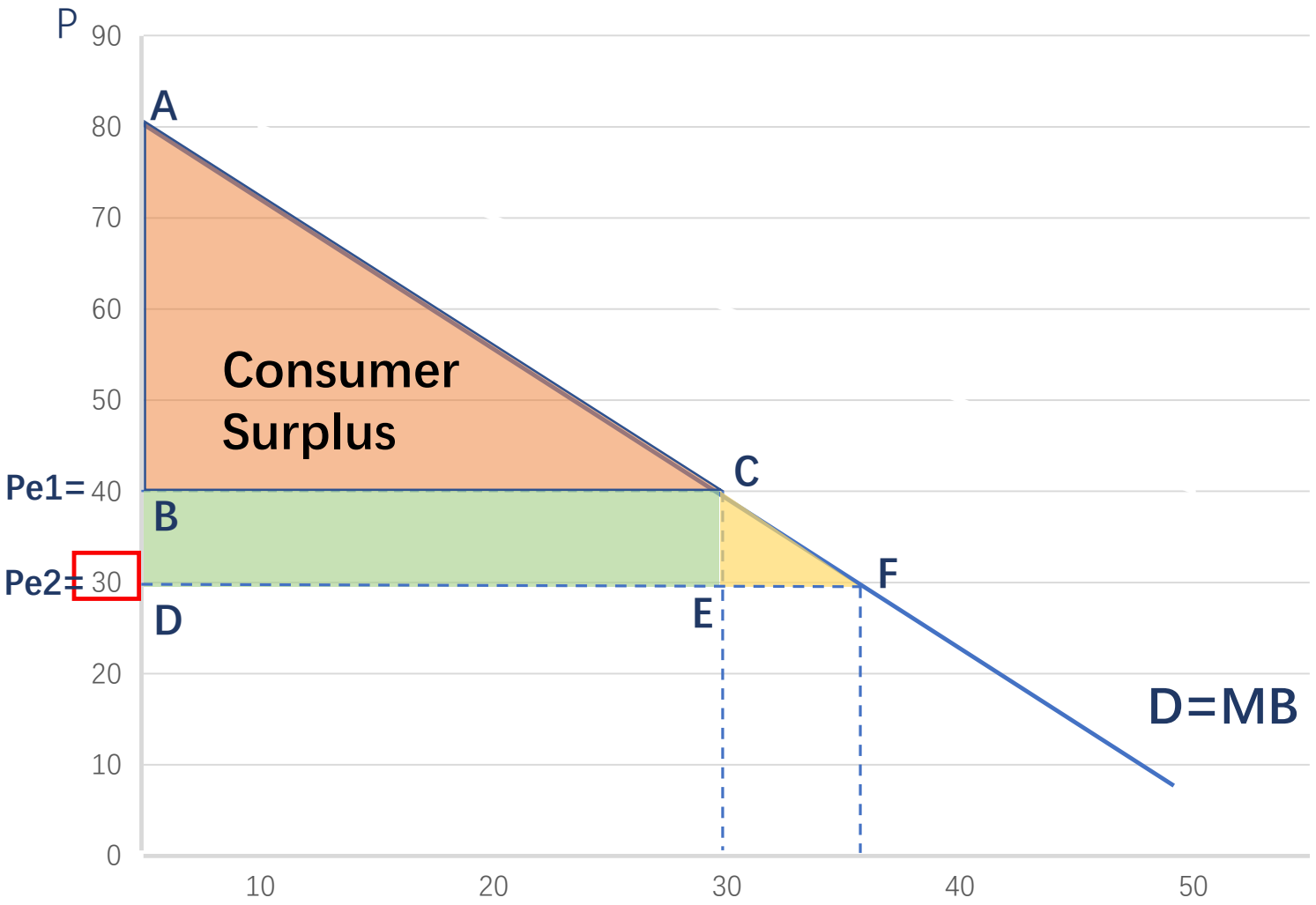
Add up all consumers in the movie market



Consumer surplus is the area under the demand curve and below the price paid by the consumer, up to the quantity purchased. (ABC)

* In a market with many buyers, the resulting steps from each buyer dropping out are so small that they form, in essence, a smooth curve

How a price reduction raise consumer surplus?



- If the market price falls from 40 to 30, the new consumer surplus is ADF area, BCDF is the new adding part after the price reduction.
- It composed by two parts:
  1. BCDE area: consumer surplus increase for existing buyers.
  2. CEF area: consumer surplus for new buyers, they are willing to buy the good at the lower price

What Does Consumer surplus Measure?

In economic world, we assumed that buyers are rational when they make decisions, so the consumer surplus is a **good measure of economic well-being**. It measures the benefit that buyers receive from a good as the buyers themselves perceive it.

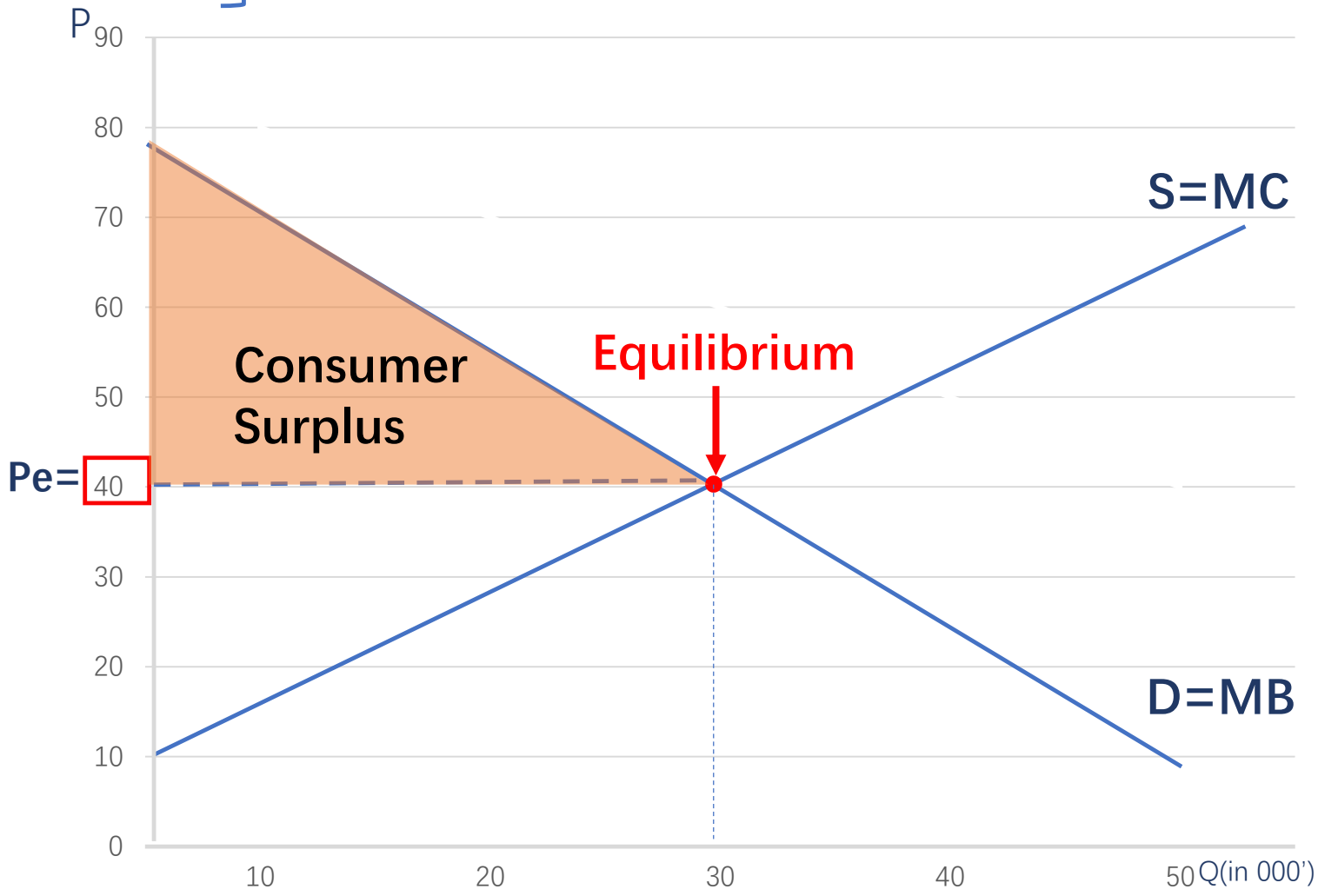
In some extreme cases, like harmful goods or dangerous good, consumer surplus is not a good measure of economic-well being.

Calculate the consumer surplus (triangle shape)

Consumer Surplus = [**P intercept of D curve** - **Actual price of consumption**] * **Quantity purchased** /2

= (80 – 40) * 30,000 / 2

= 600,000 RMB



Cost and The Willingness to Sell

Cost: the value of everything a seller must give up to produce a good.
Producer's willingness to sell:

- When price > cost, eager to sell
- When price = cost, indifferent about selling or not selling
- When price < cost, refuse to sell the product

Movie Theatre	Cost	Market price	Willingness to sell
A	50	40	✗
B	40	40	✗ ✓
C	30	40	✓
D	20	40	✓
E	15	40	✓

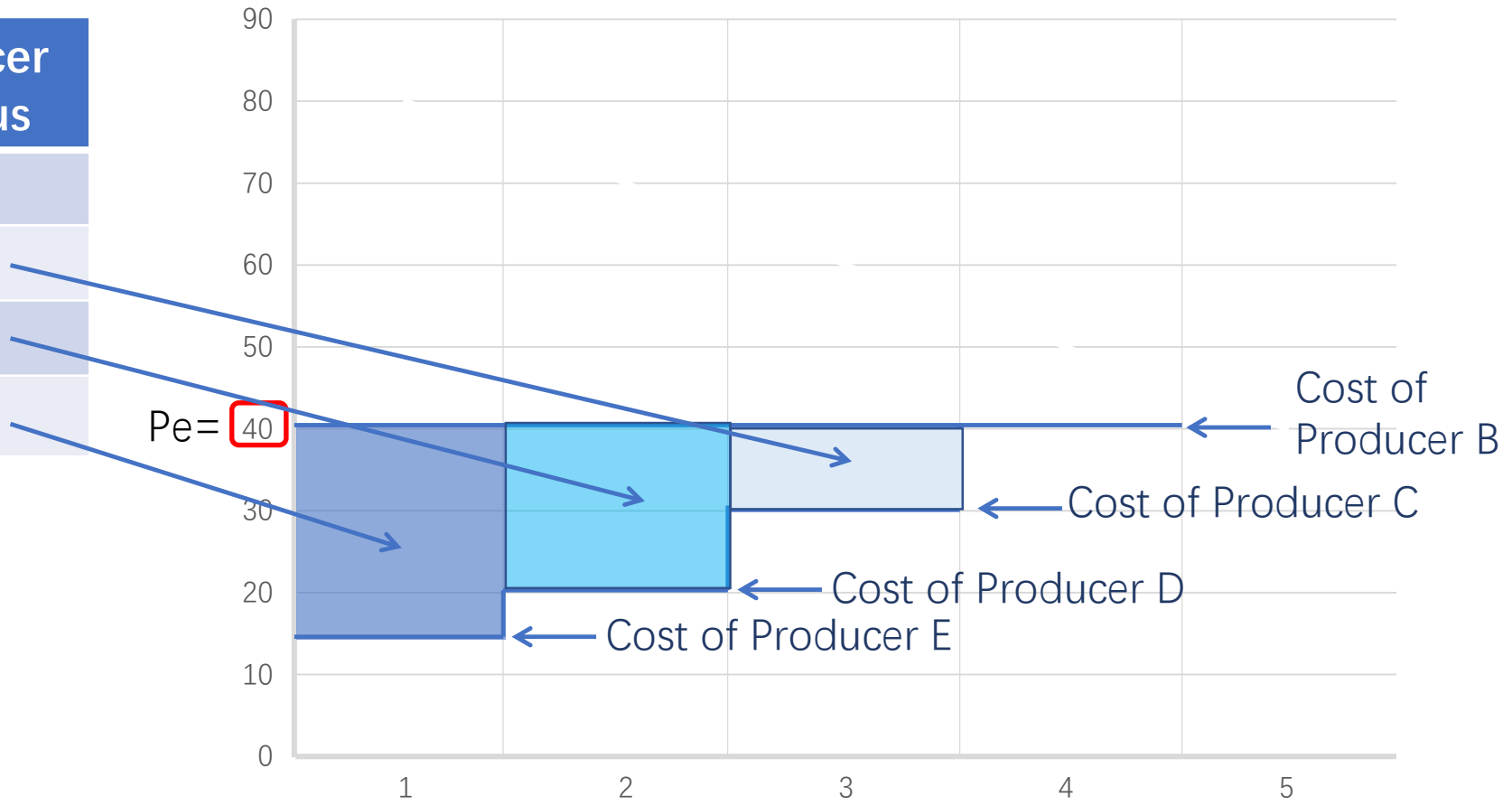
In RMB

Producer surplus

the price received by firms for selling their good minus the lowest price that they are willing to accept to produce the good.

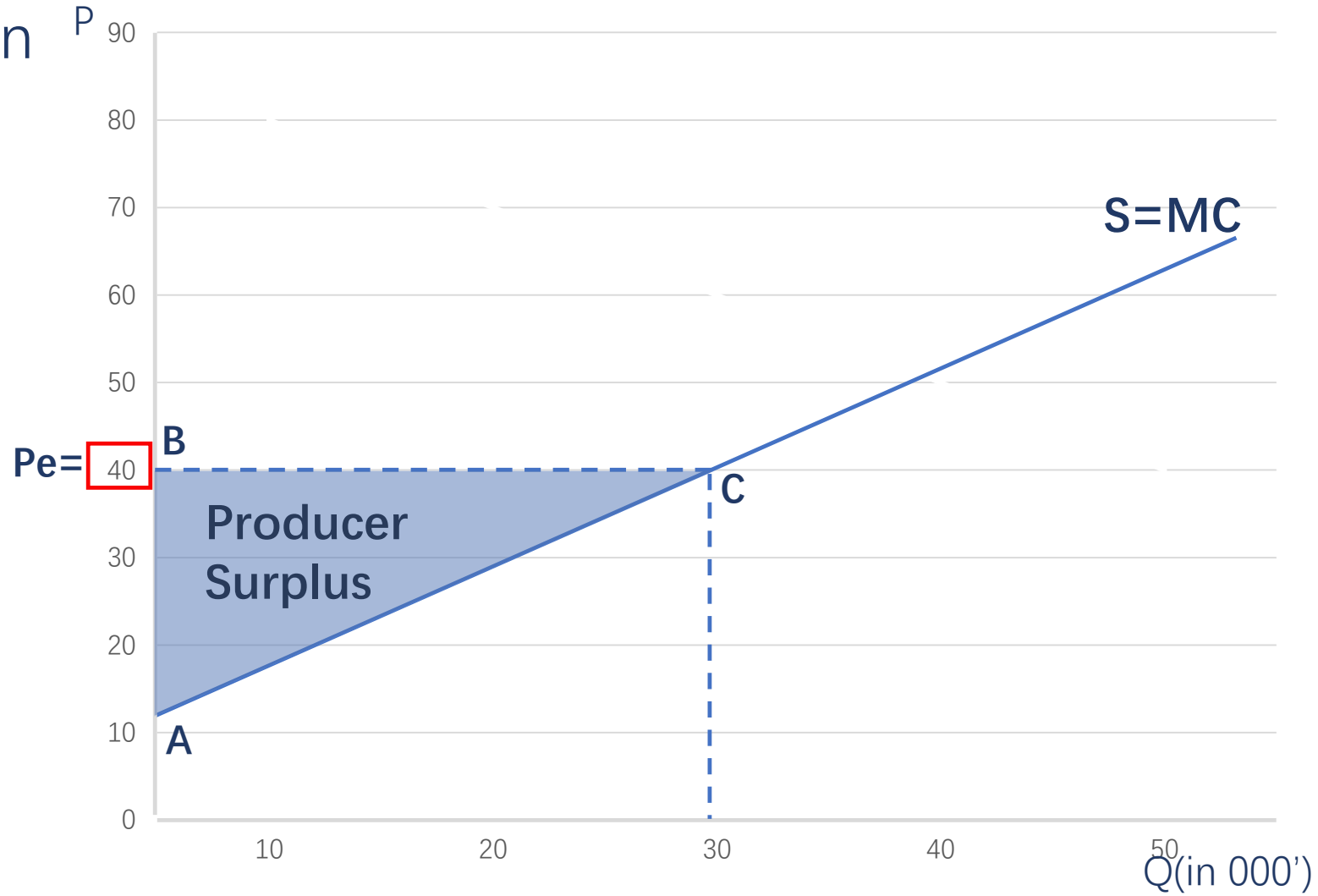
In RMB

Movie Theatre	Cost	Market price	Producer Surplus
B	40	40	0
C	30	40	10
D	20	40	20
E	15	40	25

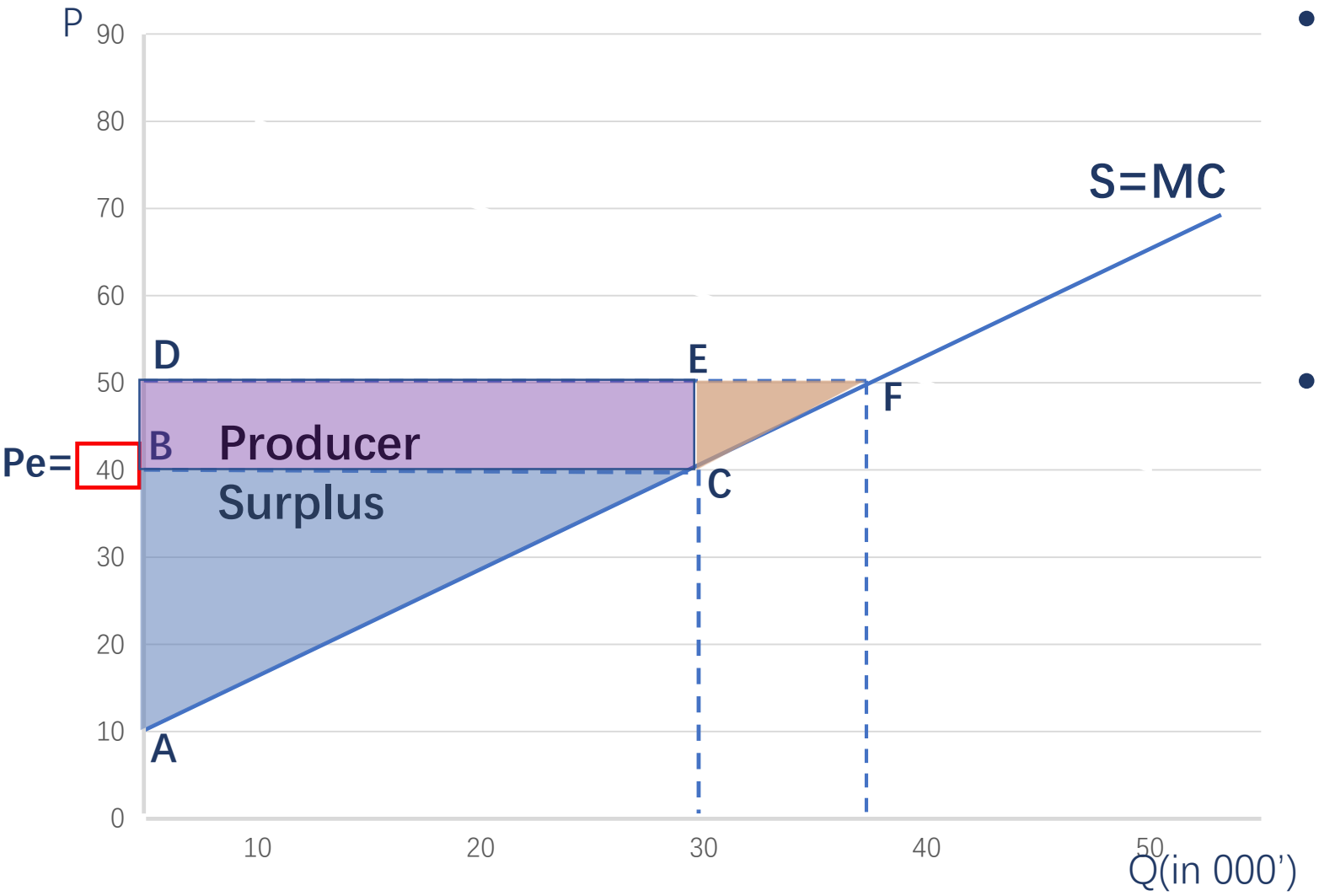


Add up all suppliers in the movie market

- Producer surplus is shown as the area above the firms supply curve and below the price received by the firm, up to the quantity produced.



How a price influence producer surplus?



- If the market price rise from 40 to 50, the new producer surplus is ADF area, BCDF is the new adding part after the price increase.
- It composed by two parts:
  1. BCDE area: producer surplus increase for existing suppliers.
  2. CEF area: producer surplus for new suppliers, they are willing to sell the good at the higher price.

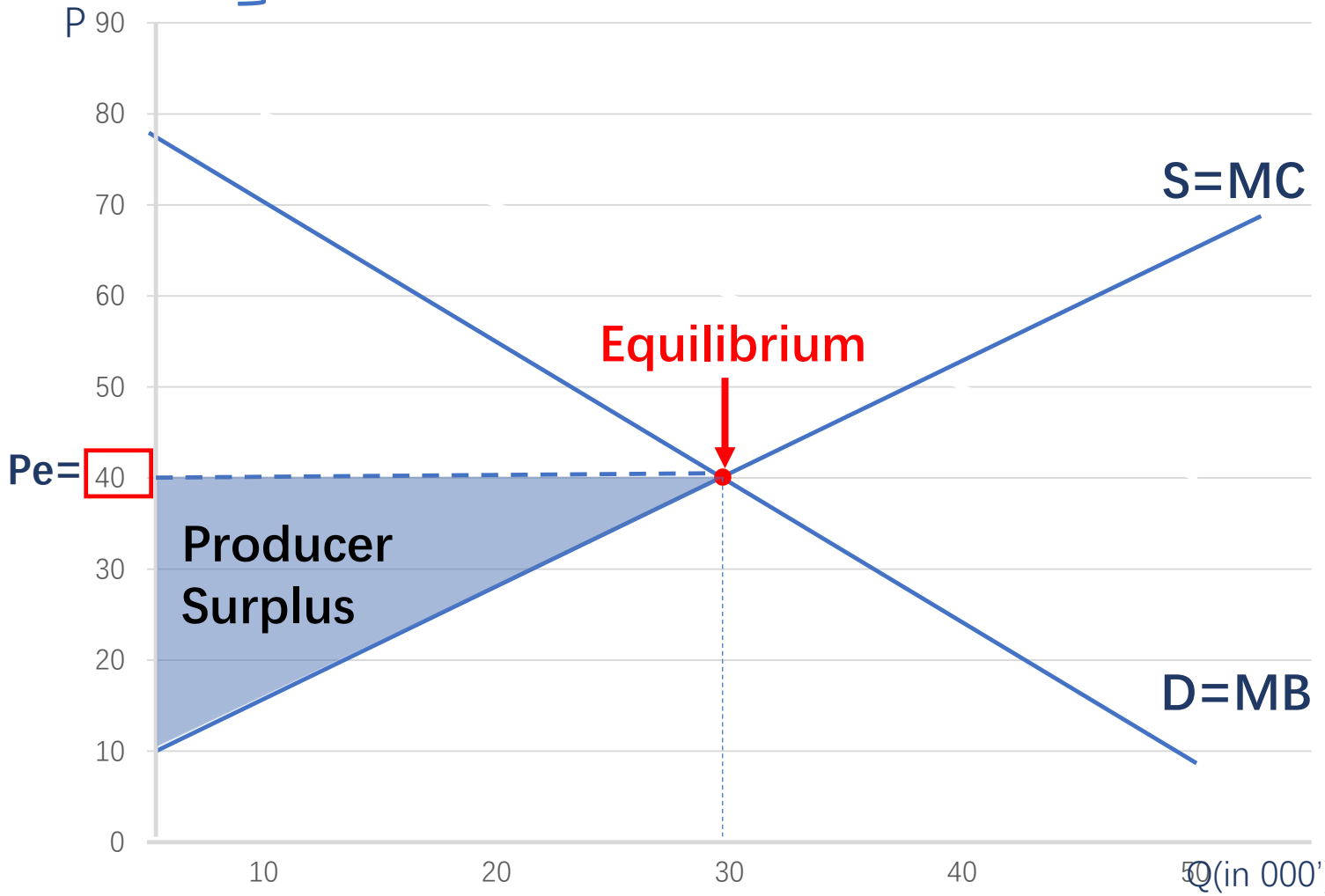
Calculate the producer surplus

When S intercept with P (triangle shape)

Producer Surplus = [**Actual price received by producer** - **P intercept of S curve**] * **Quantity sold** /2

= (40 – 10) * 30,000 /2

= 450,000 RMB

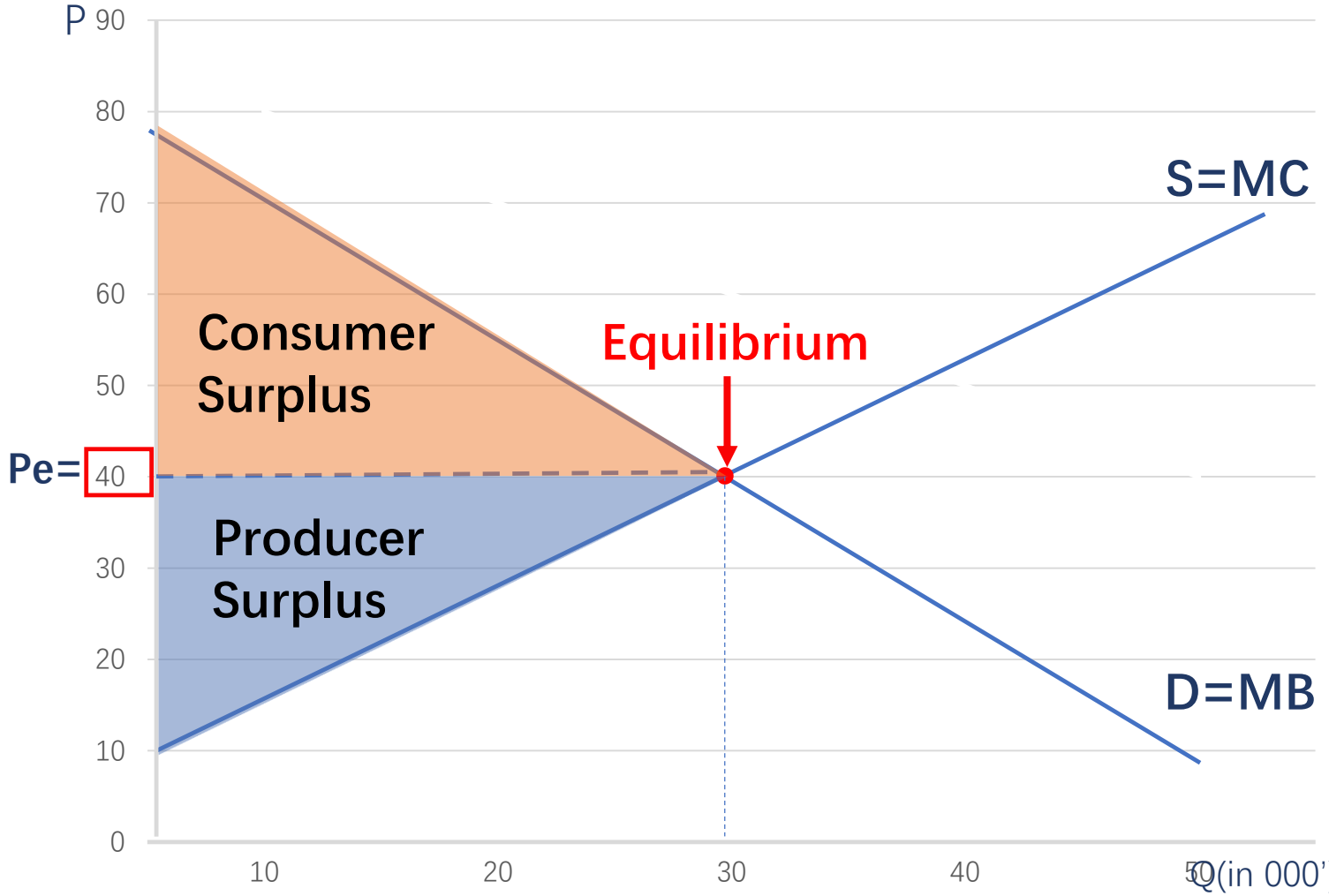


Calculate the Social Surplus

Social Surplus = **Consumer Surplus** + **Producer Surplus**

= 600,000 + 450,000
= 1,050,000 RMB

At the point of competitive market equilibrium, social surplus, defined as the sum of consumer surplus + producer surplus, is maximum.



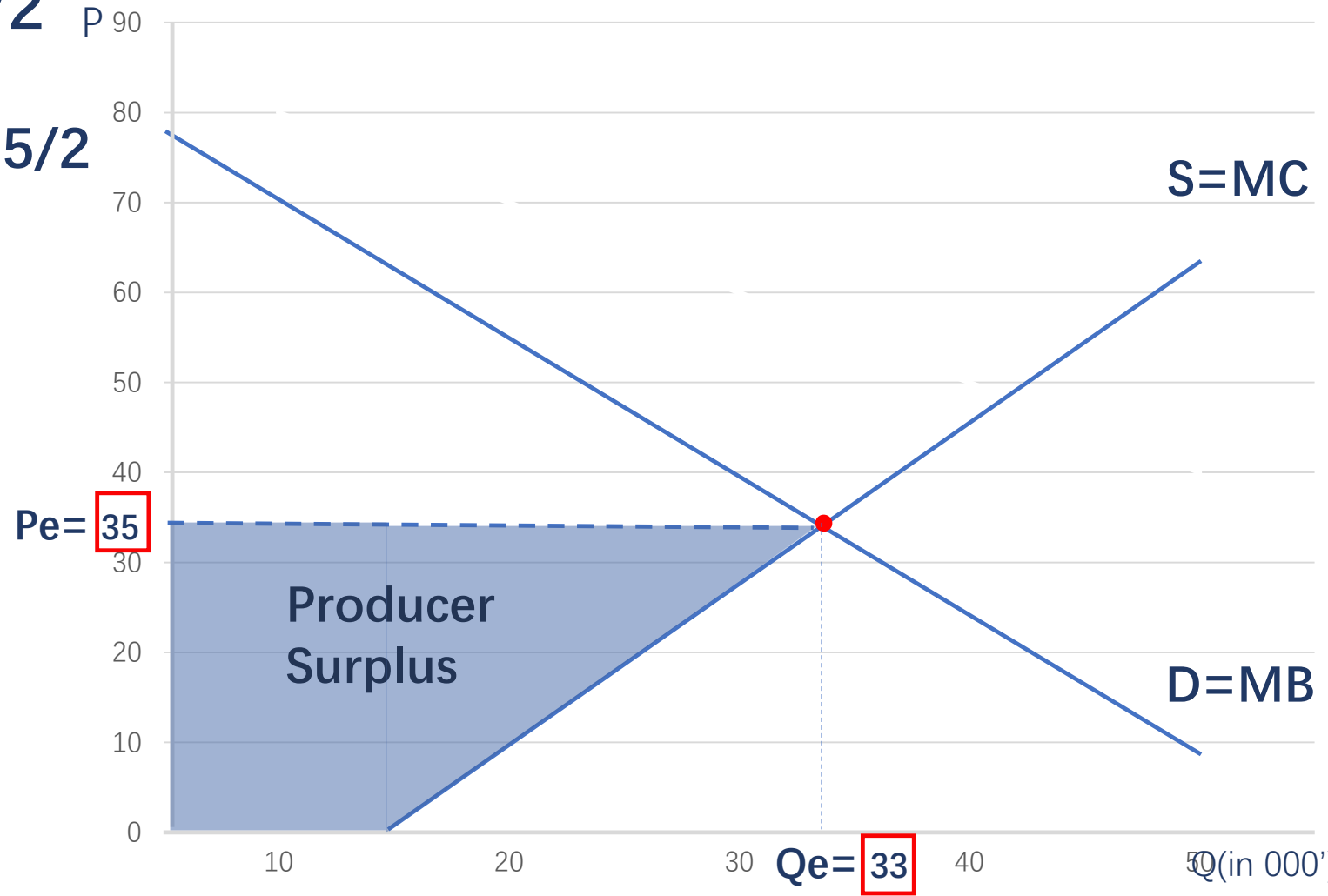
Calculate the producer surplus

When S intercept with Q (trapezium shape)

Area of trapezium= (a+b)*c/2

Producer Surplus trapezium shape = (15,000+33,000)*35/2

= 840,000 RMB



Allocative efficiency

Allocative efficiency

Allocative efficiency – an allocation of (scarce) resources that results in producing the combination and quantity of goods and services mostly preferred by consumers (society).

→ Achieved when the economy allocates its resources so that the society gets the most benefits from consumption.

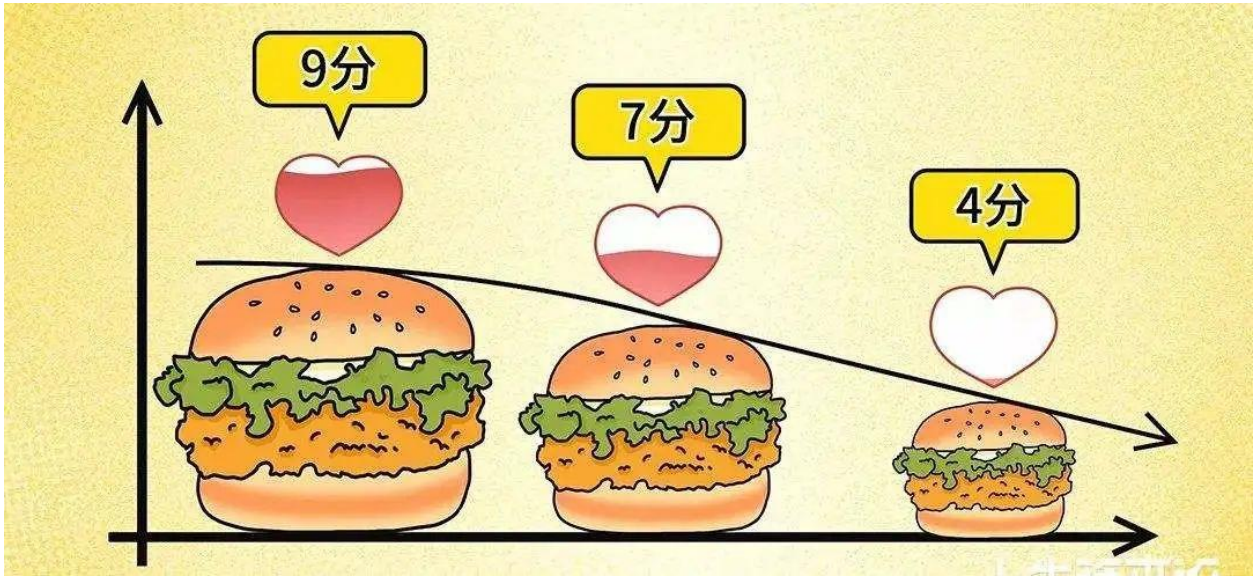
→ It answers the what/how much to produce question in the best possible way.

- **Allocative efficiency is achieved when**:
  1. **MB = MC**
  2. **Social welfare maximized.**

The law of diminishing marginal utility

The extra benefit provided by each additional unit increases by smaller and smaller amounts.

No. of burger eat per day	Total utility (utils)	Marginal utility (utils)
0	0	0
1	9	9
2	16	7
3	20	4
4	20	0
5	17	-3



Marginal benefit

Marginal benefit: the extra benefit that you get from each additional unit of something you buy.

- It can be thought of as showing the amount of money that the consumer is willing to pay.
- Compare marginal benefit and marginal utility.
  - Marginal benefit: Willingness to pay for the last or marginal unit bought. (measurable)
  - Marginal utility: extra satisfaction that consumers receive from consuming one more unit of a good.(not measurable)

Marginal benefit decreases as the quantity of a good consumed increases, consumers will be willing to buy an extra unit of the good only if its price falls. The demand curve can therefore be called a **marginal benefit (MB) curve.**

Total product & Marginal product

Total product: total quantity of output produced by the firm.

Marginal product: extra output produced by one additional unit of a variable input.

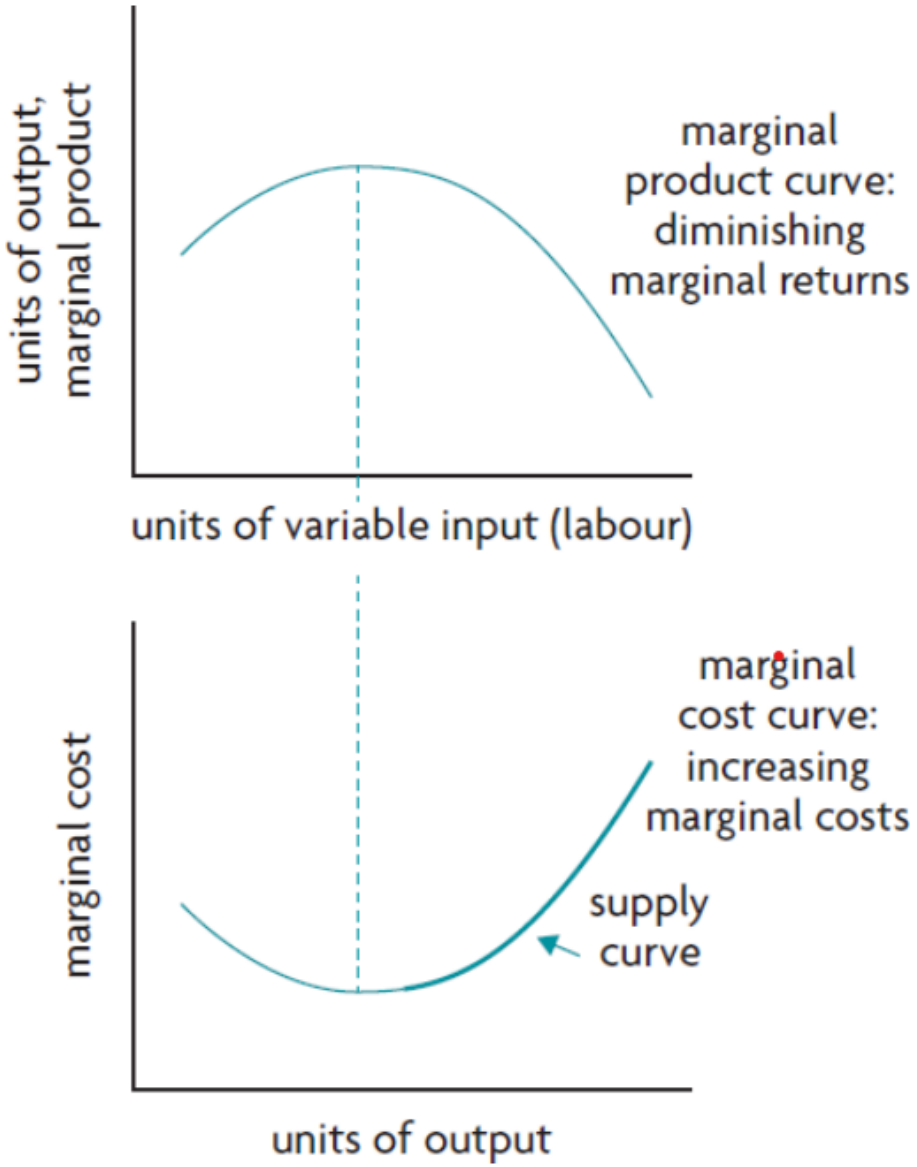
No. of workers (variable input)	Total product made per hour (burgers)	Marginal product (burgers made)
0	0	0
1	10	10
2	30	20
3	60	30
4	75	15
5	80	5
6	80	0

Diminishing marginal returns:

When inputs and technology are fixed, as more and more units of a variable inputs are added to the fixed inputs, the marginal product at first increases, and then comes a point when it begins to decrease.

Marginal product & Marginal cost

- When marginal product increases, marginal cost decreases;
- when marginal product is maximum, marginal cost is minimum.
- When marginal product falls, marginal cost increases.



Marginal cost

Marginal cost: the **extra** cost of producing **one more** unit of output. It increases as the units of output produced increased.

- It can be thought of as showing the cost that the supplier is willing to produce.
- The supplier will be willing to produce and sell an extra unit of the good only of its price increases.
- The supply curve also shows the price that the firm is willing to accept in order to produce one more unit of the good. Therefore, the supply curve can be called a **marginal cost (MC) curve**.

A simple example

Me

No. of burger buy	Marginal Benefit
1	20
2	15
3	12
4	10
5	8
6	5

Burger maker

No. of burger sell	Marginal Cost
1	6
2	7
3	9
4	10
5	12
6	15

Best Price setting：10 RMB

Price=MB=MC

No need to buy or sell additional unit

If you are going to set the price, what price level would you set?

Rule 1: Allocative efficiency: MB=MC

Market equilibrium occurs at the point of intersection of the demand and supply curves.

MB=MC → **the extra benefit to society of getting one more unit of the good** = **The extra cost to society of producing one more unit of the good**

→Society allocate 'right' amount of resources to the production of the good, and is producing the 'right' quantity of the good that is mostly wanted by society.

→Socially optimal level of output is where MB=MC

Illustrated by diagram

1. When MB>MC (at Q=20),

value to buyers > cost to sellers

➡ It is worth to produce more of the good, more resource should be allocated toward the product.

Finally reach the equilibrium.

2. When MB<MC (at Q=40),

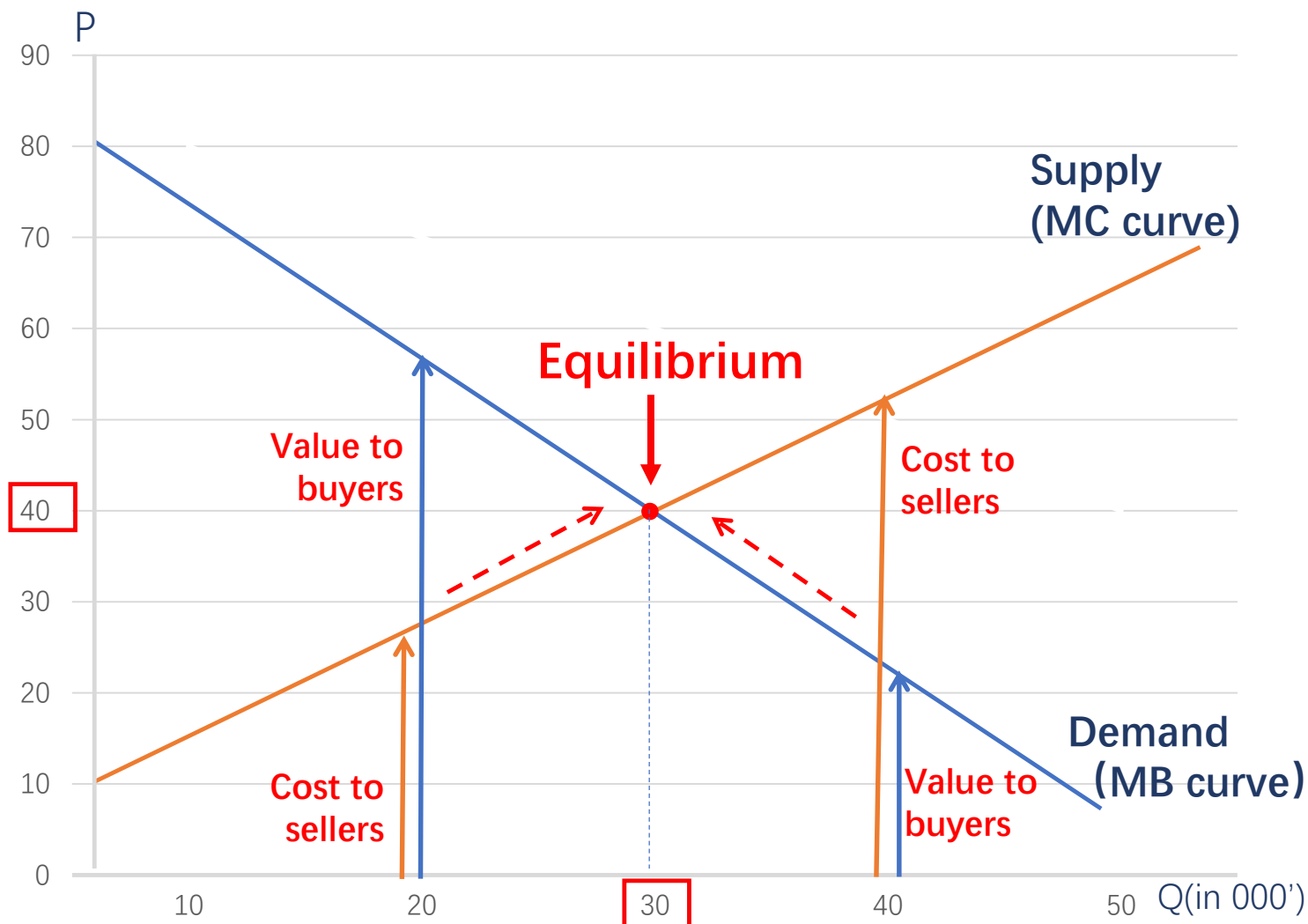
value to buyers < cost to sellers

➡ The society would be benefit from producing less as it is currently producing too much of the good, less resources should be allocated to produce the unit of product.

Finally reach the equilibrium.

3. When MB=MC (at Q=30),

This is the ideal output, the output yields allocative efficiency.

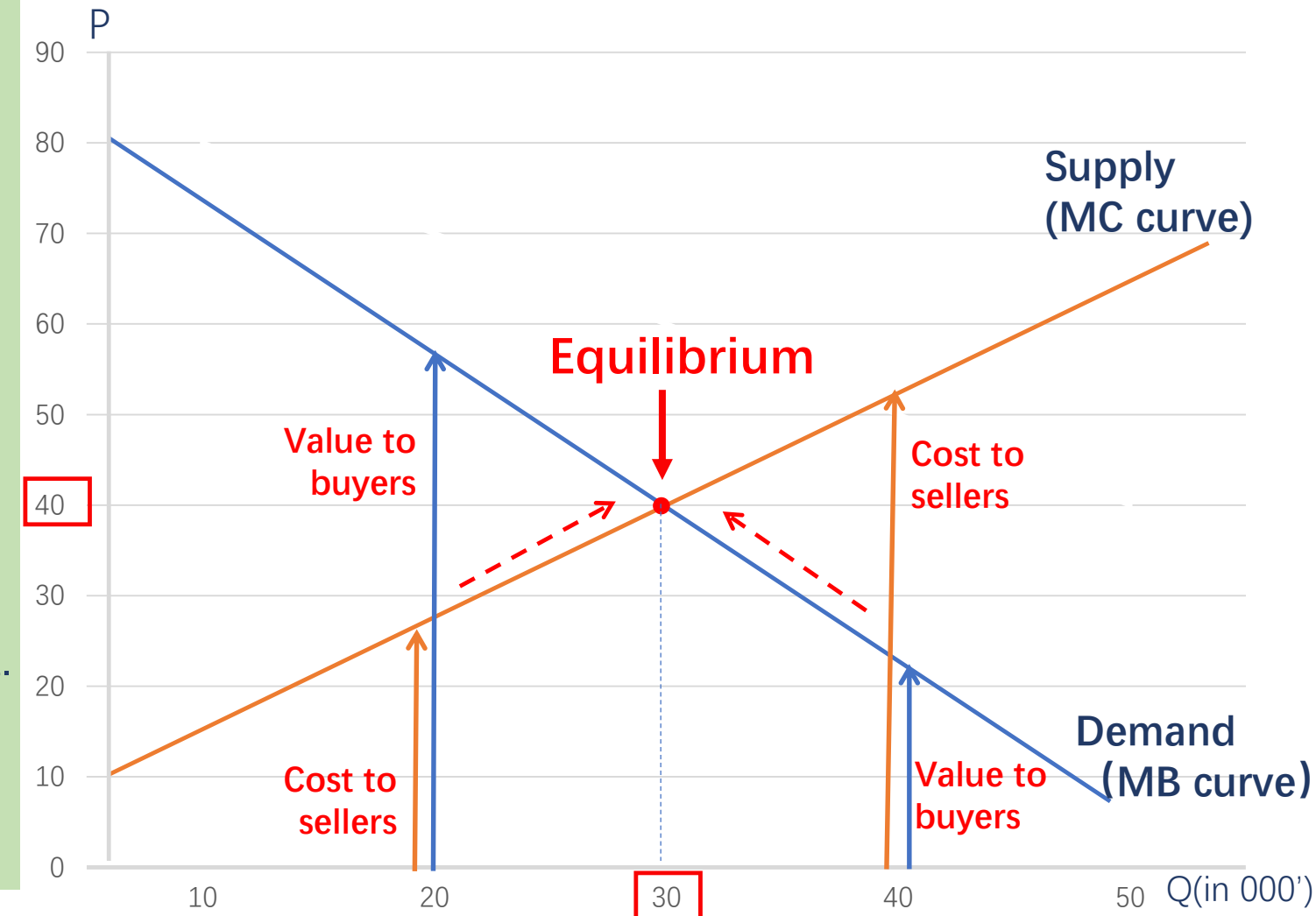


Illustrated by diagram

When MB>MC, the value that consumer put on the product is higher than the cost to society of producing it, therefore, it is worth to produce more of the good. → more resource should be allocated toward the product.

When MB<MC, the unit cost is higher than the value, the society would be benefit from producing less as it is currently producing too much of the good → less resources should be allocated to produce the unit of product.

When MB=MC, this is the ideal output, there is no reason for further production.



Rule 2: Social surplus maximized.

Economist use **total surplus (social surplus)** as a measure of society's economic well-being.

Consumer surplus = **Value to buyers** – **Amount paid by buyers.**

(the benefit that buyers receive from participating in a market)

Producer surplus = **Amount received by sellers** – **Cost to sellers**

(the benefit that sellers receive from participating in a market)

Total surplus = **Consumer surplus** + **Producer surplus**

= [**Value to buyers** – **Amount paid by buyers.**] + [**Amount received by sellers** – **Cost to sellers**]

= **Value to buyers** – **Cost to sellers**

Total surplus = (value to buyers) – (cost to sellers)

An allocation of resources is efficient if it **maximizes total surplus**.
Allocative Efficiency means:

- The goods are consumed by the buyers who **value them most highly.**
- The goods are produced by the producers with **the lowest costs.**

Raising or lowering the quantity of a good would not increase total surplus.

Evaluating the equilibrium

In demand side:

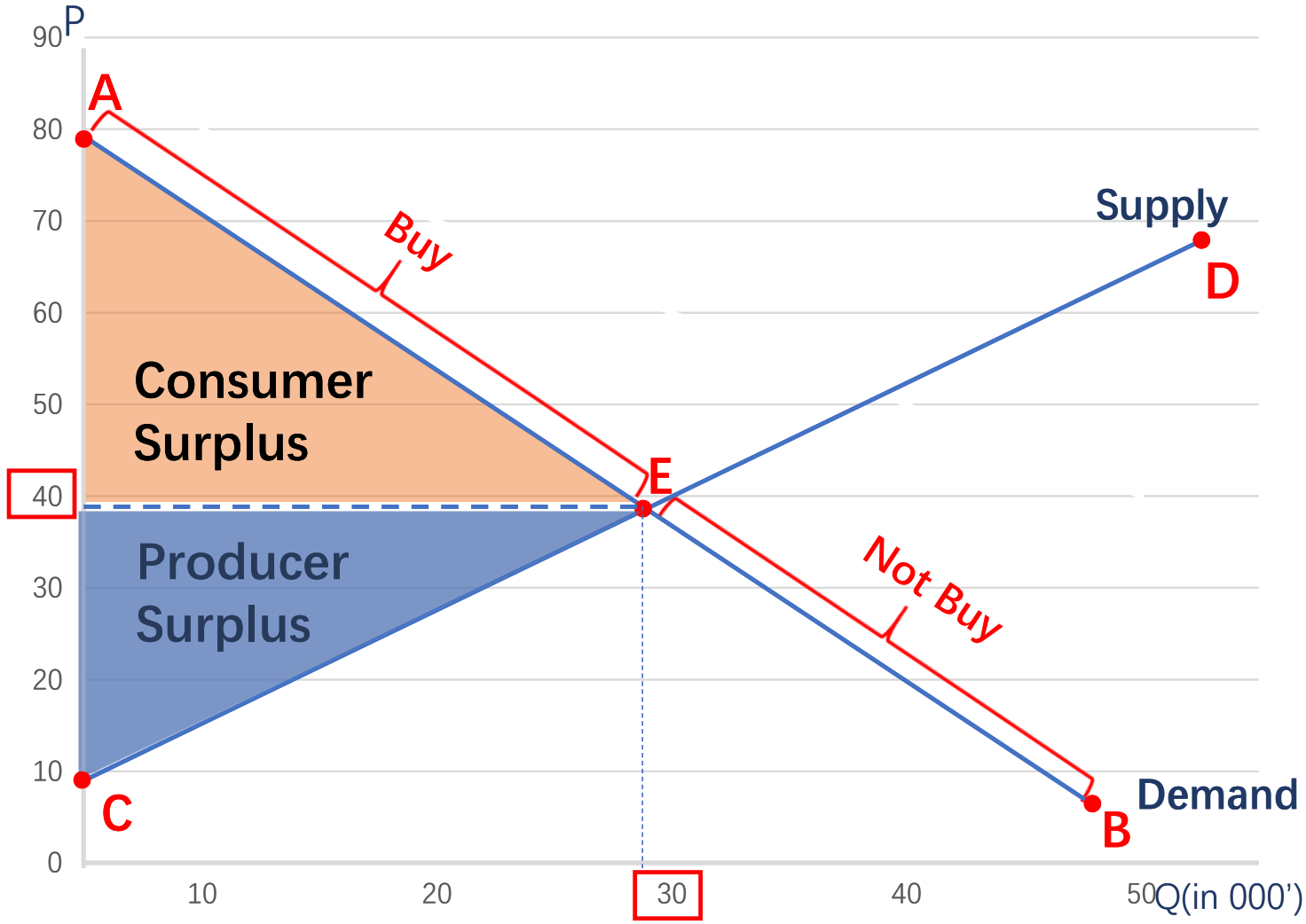
- The buyer who perceived
  Value of good ⩾40 RMB (AE)

➡ Will buy the movie ticket

- The buyer who perceived
  Value of good < 40 RMB (BE)

➡ Will not buy the movie ticket

the buyers who value the good most highly are the ones who consume it.



Evaluating the equilibrium

In supply side:

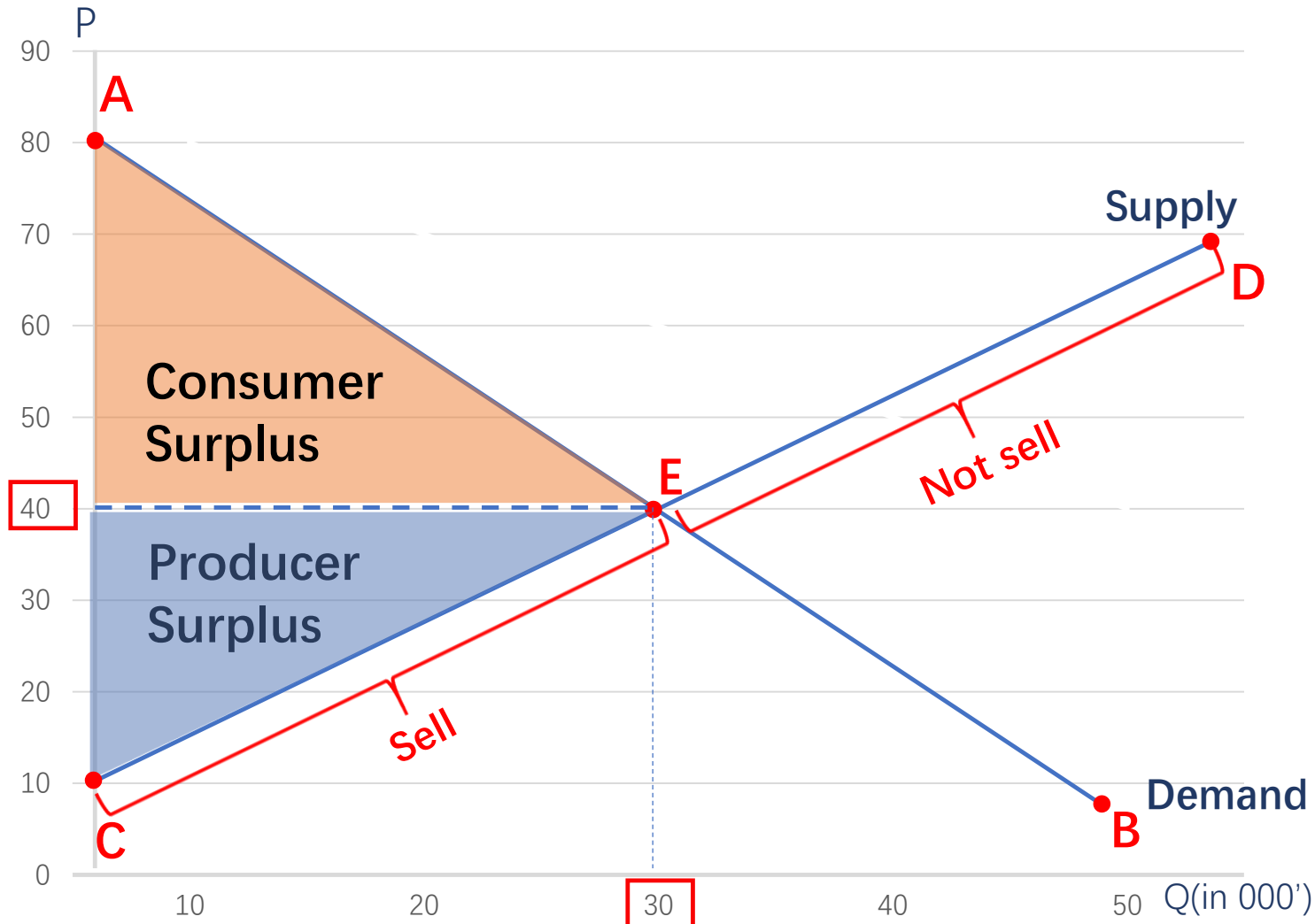
- The supplier who perceived cost of good ⩽ 40 RMB (CE)

➡ Will sell the movie ticket

- The buyer who perceived cost of good > 40 RMB (DE)

➡ Will not sell the movie ticket

the sellers with the lowest cost produce the good.



Free market resource allocation

1. Free markets allocate the **supply of goods** to the buyers who **value them most highly**, as measured by their willingness to pay.
2. Free markets allocate the **demand for goods** to the sellers who can produce them at the **lowest cost.**
3. Free markets produce the quantity of goods that maximizes the sum of consumer and producer surplus.

→ In this equilibrium, **the social warfare is maximized**. we cannot increase the economic well-beings by changing the allocation of buyer's consumption or seller's production.

Allocative efficiency achieved when Social Surplus is maximized.

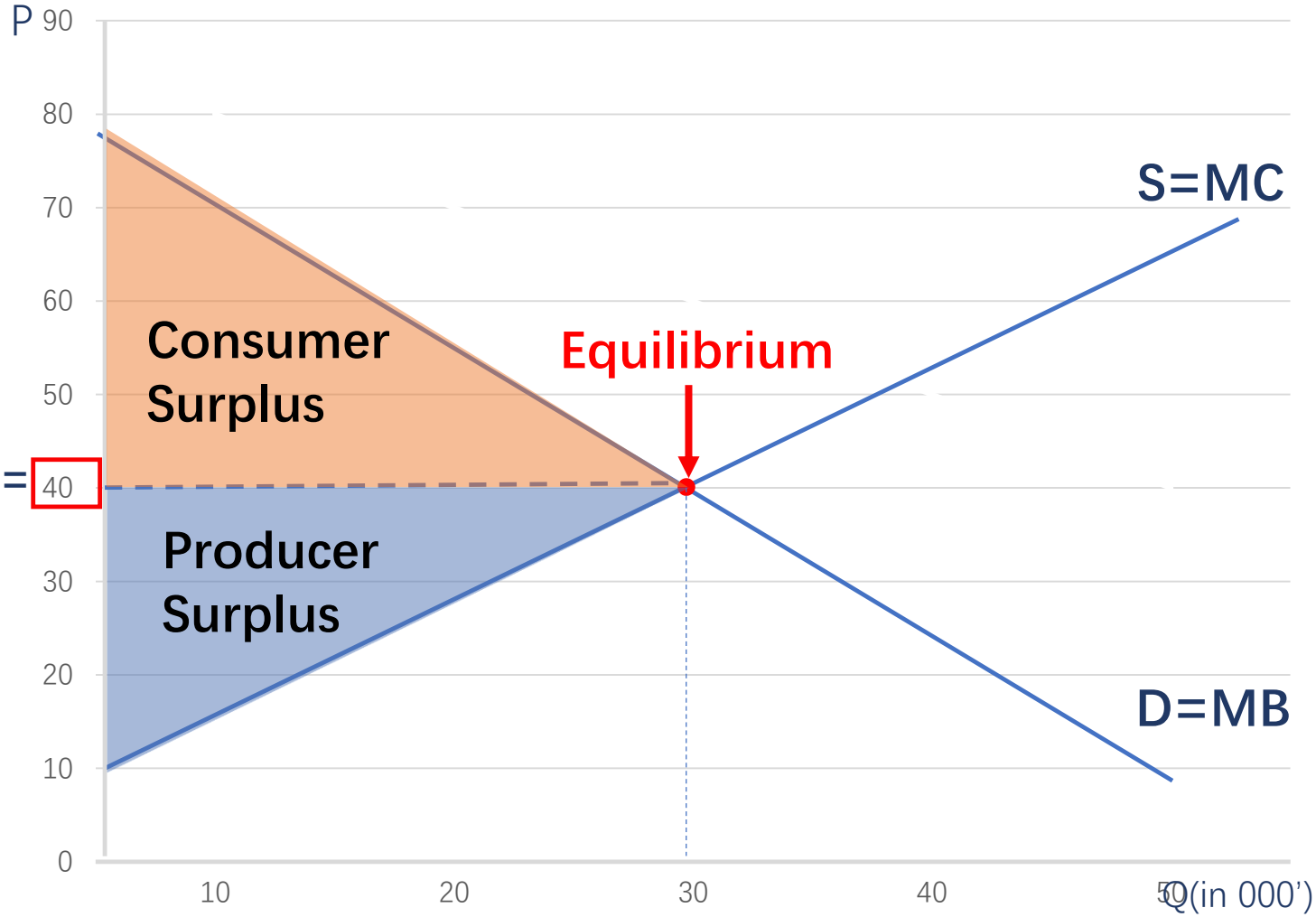
Social Surplus	=	Consumer Surplus	+	Producer Surplus

At the point of competitive market equilibrium, social surplus, defined as the sum of consumer surplus + producer surplus, is maximum.

→**Allocative efficiency**

→**Social welfare is maximum.**

Society is making the best possible use of its scarce resources.



Better understanding of the “invisible hand”

The market is able to coordinate the decisions of countless actions of individual economic decision-makers without any central authority, simply **through the working of demand and supply**, while at the same time promoting **efficiency** which encourages the **best allocation of scarce resources**.

Adam Smith and the Invisible Hand

Adam Smith

Every individual . . . neither intends to promote the public interest, nor knows how much he is promoting it. . . . He intends only his own gain, and he is in this, as in many other cases, led by **an invisible hand** to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it

Market efficiency & market failure

- In perfect competitive market, the social is maximum, allocative efficiency achieved.
- But in real world, the market fails to achieve allocative efficiency, the social surplus (welfare) is reduced. → welfare loss.
- The market failures are an important justification for government intervention.