

2. Welfare economics and the rationale for public intervention

(Stiglitz ch.3, 4, 5; Gruber ch.2,5,6,7; Rosen ch. 4,5,6)

- 2.1. The two fundamental theorems of Welfare Economics
- 2.2. Social efficiency: perfect competition and Pareto Efficiency; measuring social efficiency
- 2.3. Equity: From Social Efficiency to Social Welfare

2.1. The benchmark: perfect competition and Pareto Efficiency (Optimal allocation of resources) (Stiglitz ch.3; Gruber ch.2; Rosen Ch. 4)

- **Welfare economics** considers the rationale for public intervention in terms of **efficiency and equity**.
- ❖ According to this theory **perfect competition** in all markets automatically allocates resources **efficiently** and fully employs all the available resources (**first best**).
- ❖ At the basis of this result is the **classical approach** which states that the **invisible hand** of the market is the best way to maximise social welfare through the maximization of individual interests.
- ❖ **Only** when the **market does not work** (due to **market failures**), the government intervention is justified to support a more efficient and equitable use of resources.
- ❖ In order to avoid the risk of introducing distortions (due to **government failures**), government intervention is justified only when:
 - It is **limited to clearly identified market failures**
 - It is **directly targeted at market failures**

The First Theorem of Welfare Economics: The Competitive Equilibrium maximizes Social Efficiency

- **The competitive equilibrium maximizes social efficiency and is Pareto efficient.**
- **Pareto efficiency** is reached when:
it is not possible to improve the welfare of one agent without reducing that of another agent, i.e. there is an optimal allocation of resources.
- **Every competitive economy is Pareto efficient because** the perfectly competitive market mechanism allocates scarce resources efficiently.

The second Theorem of Welfare Economics: from social efficiency to social welfare (*Equity*)

- Pareto Efficiency is associated with economic efficiency, but not necessarily with equity or fairness. **A Pareto Optimum may not be socially desirable** (for example an economy based on slavery may reach a Pareto optimum, but it is undesirable). **However:**
 - **Society may achieve any Pareto efficient resource allocation by an appropriate initial redistribution of resources and free trade (2nd theorem of Welfare Economics).**
 - The implication is that, under certain assumptions, the goals of **equity** and **efficiency** can be separated:
 - Society may achieve a whole series of Pareto efficient allocations of resources from which it can choose, according to social preferences in relation to equity and efficiency issues.
 - The socially preferred distribution of wealth/consumption may be reached **by redistributing initial endowments via lump sum taxes/subsidies (which do not change the agents' behaviour).**
 - This is the **only** thing the government needs to do: to ensure efficiency, policy makers **should not interfere** with the competitive market mechanism.

2.2. EFFICIENCY: perfect competition and Pareto efficiency/1

- With perfect competition firms and workers do not affect prices and wages and all of them face the same prices.
 - **Prices and wages are flexible and free to adjust according to market conditions until demand equals supply and there is full employment of resources. This is the equilibrium condition.**
 - **If all market are perfectly competitive, the **Pareto Efficiency Condition is satisfied**, i.e. there is an optimal allocation of resources (characterized by efficiency in production and efficiency in exchange): it is not possible to improve the welfare of one agent without reducing that of another agent.**
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Perfect competition and Pareto efficiency /2

- **Pareto efficiency** requires:
 - **Production efficiency**: production is maximized **given the resources and technology available**. This means that given the resources available, the production of one good cannot be increased without reducing the production of another.
 - **Exchange efficiency**: social welfare is maximized given the available resources. This means that ***whatever the goods produced, they go to the individuals who value them most (are willing to pay more for them)***.
 - **Product mix efficiency (or total efficiency)**: the goods and services produced correspond to those desired by individuals.

Perfect competition and Pareto efficiency/3 - Intuition

- In perfectly competitive markets:
- **FIRMS**: have to be competitive in buying all their inputs (production factors) at the lowest possible price, they use these inputs to maximize production, and sell outputs at the lowest possible price to remain in business. **Competition minimizes costs and maximizes production (production efficiency)**
- **CONSUMERS**: acquire goods and services at the lowest possible prices and are thus able to **maximize their utility and consumption** given their preferences and budget constraints (**exchange efficiency**)
- **Hence both Production and Consumption are maximized, within the constraints imposed by the available resources.**
- If perfect competition exists everywhere, then economy-wide production and consumption will be maximized and will not be possible to increase either one by reallocating resources (**General equilibrium**).
- **Since all producers and consumers face the same set of prices** no rearrangement of production and consumption is possible that will increase economic welfare, for a *given set of production conditions and consumers' preferences*.

Competitive Equilibrium – The Supply curve/1

- **The *SUPPLY CURVE* shows the quantity of a good firms are willing to supply at given prices.**
- **Firms maximize profits**, i.e. the difference between revenues and costs, given the technology available. To **maximize profits** firms produce until the revenue from an additional unit of output (marginal revenue) is equal the cost of that additional unit of output (marginal cost). In perfect competition **MR=P**, hence a firm producing good A will produce until **MC_a=MR_a=P_a**.
- With two goods (A and B), the production efficiency condition is that **MC_a/MC_b = P_a/P_b**.

Competitive Equilibrium – The Supply curve/2

- **To minimize costs** for each level of production, employers choose the combination of factors of productions (Capital, K, and Labour, L) where $MP_K/MP_L = P_K/P_L$, on the assumption that the marginal productivity of each factor of production declines the more is used of that factor in production, given the other (***diminishing marginal productivity***).
- **The supply curve (S) is the marginal cost curve for firms and shows the quantity of a good/service that firms are willing to supply at each price.**
- **The Elasticity of supply** measures the percentage change in quantity supplied for each percentage change in price: $(\Delta Q_s/Q_s) / (\Delta P/P)$

Competitive Equilibrium – The Demand curve

- **The DEMAND CURVE** shows the quantity of a good consumers are willing to buy at each price.
- **Consumers maximize their utility** (which represents their set of preferences), given their budget constraint (representing the combination of goods the individual can afford to buy if she spends her entire income).
- The marginal utility derived from the consumption of each additional unit of a good declines the more is consumed of that good, given the others (**diminishing marginal utility**).
- The consumer will consume a given good **A** up to the point where the additional utility she derives from the consumption of that good equals its price: **$MU_a = P_a$** .
- With two goods (A and B) the efficiency condition is: **$MU_a/MU_b = P_a/P_b$** .
- With two consumers (Jane and Sam) the Pareto efficiency condition is that: **$(MU_a/MU_b)_{\text{Sam}} = (MU_a/MU_b)_{\text{Jane}} = P_a/P_b$**
- **The Elasticity of demand** measures the percentage change in quantity demanded for each percentage change in price:

$$(\Delta Q_D/Q_D) / (\Delta P/P)$$

The equilibrium in perfect competition

S_a shows the quantity of good A firms are willing to supply at each price P_a .

D_a shows the quantity of good A the consumers are willing to purchase at each price P_a .

At the competitive equilibrium:

- i) the **marginal costs** of producing good A for producers equals the price (on the Supply curve)
- ii) the **marginal Utility** of acquiring good A for consumers equals the price (on the Demand curve),

Hence: **$MU_a = MC_a = P_a$**

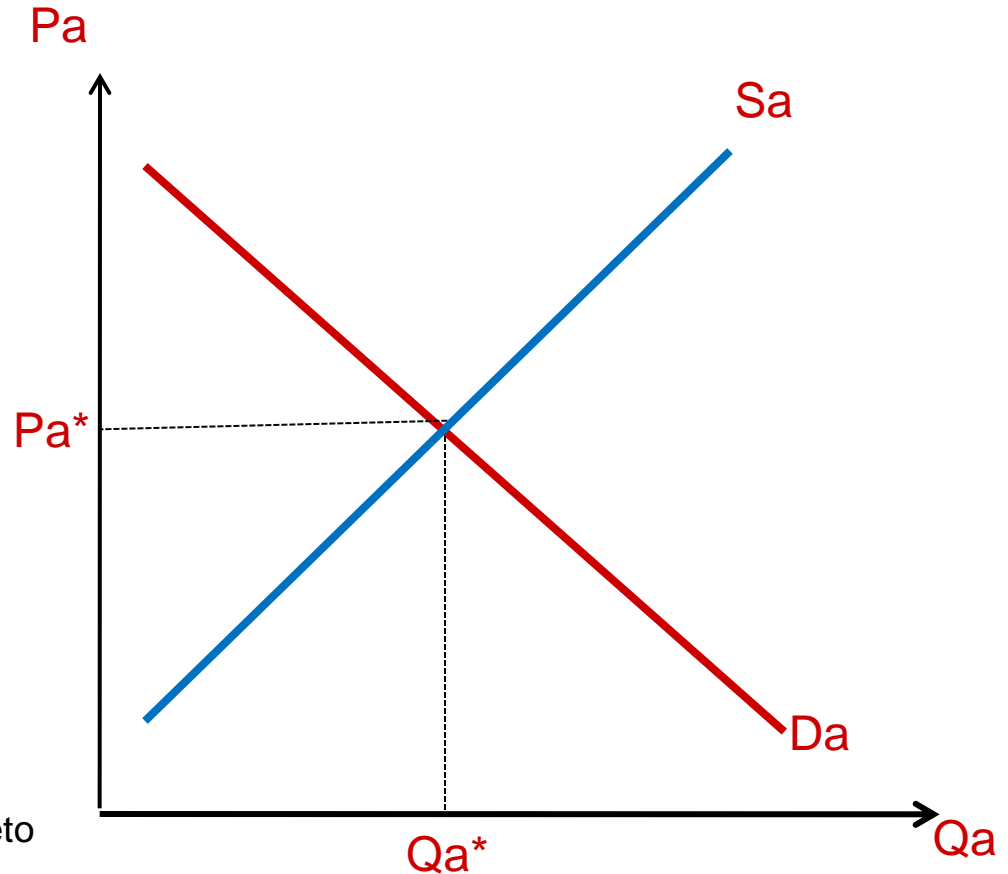
which is the **condition required for economic efficiency**. This partial equilibrium condition is generalised (general equilibrium) by the profit maximising behaviour of firms and the utility maximising behaviour of consumers in competitive markets.

With two goods and two consumers the Pareto Efficiency conditions is:

$MRS_{ab} = MRT_{ab} = P_a/P_b$ where

$MRS_{ab} = MU_a/MU_b$ and **$MRT_{ab} = MC_a/MC_b$**

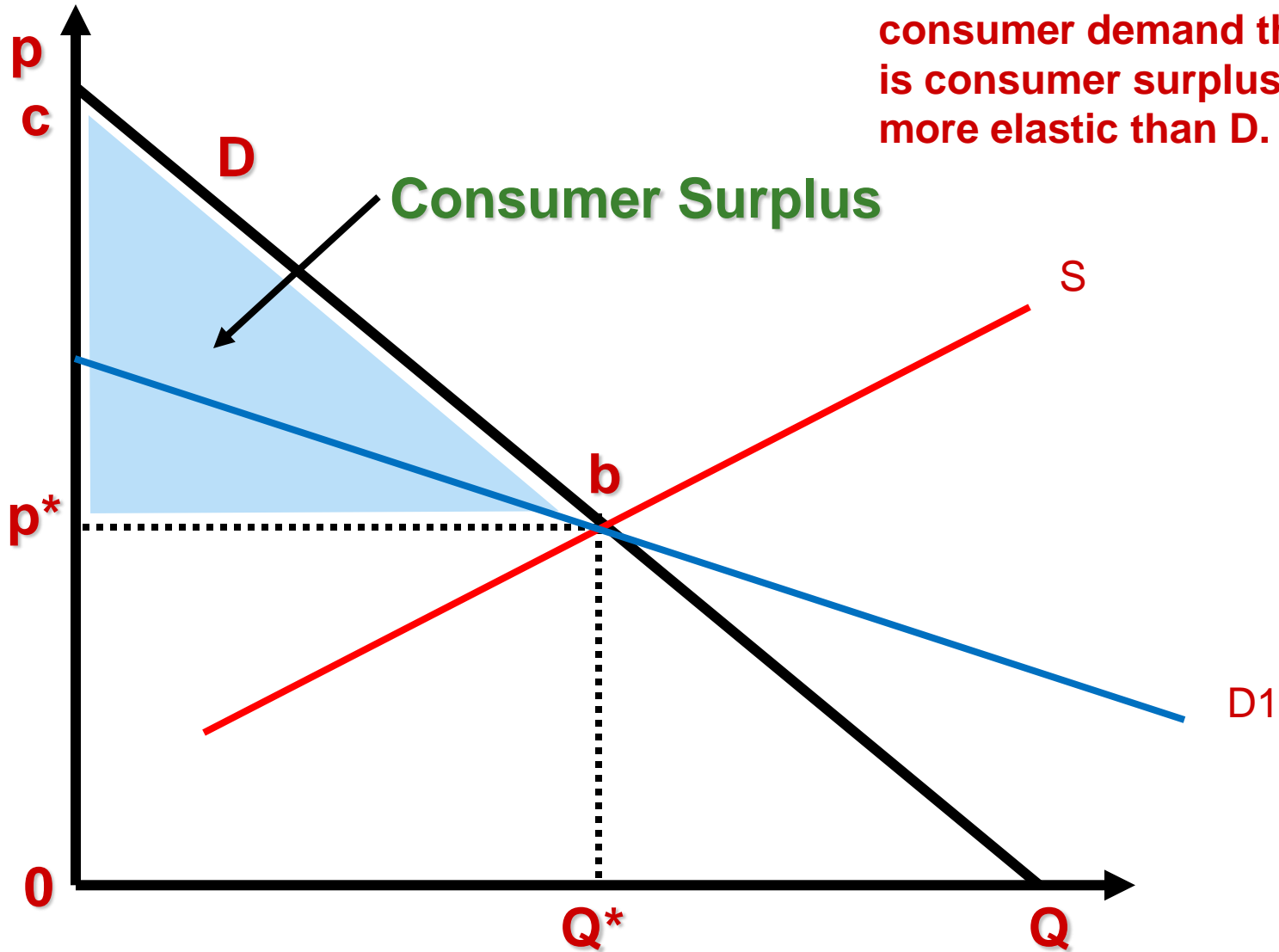
and the two consumers have the same MRS_{ab}



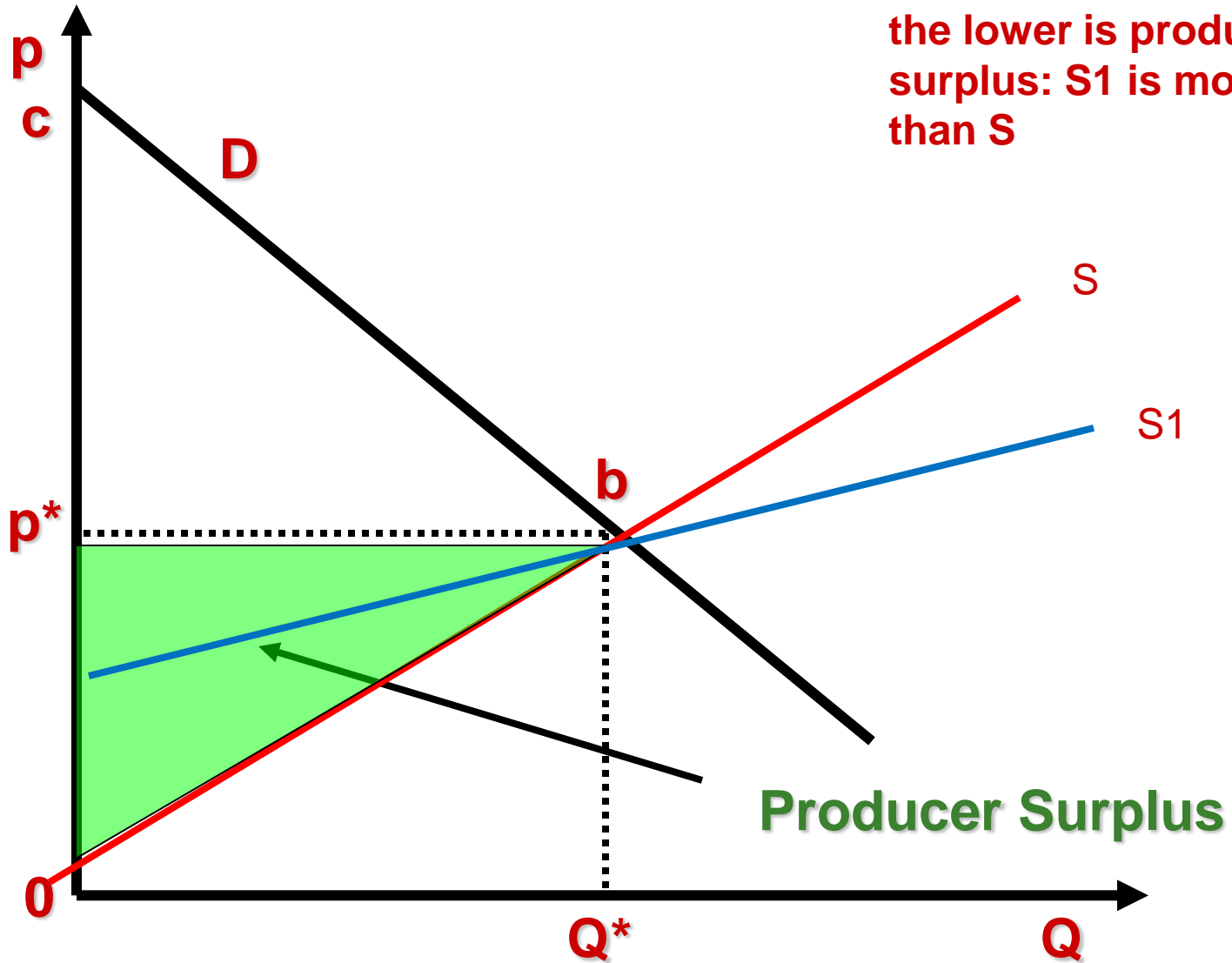
Measuring social efficiency/1

- **CONSUMER SURPLUS (CS):** is the area below the demand curve and above the equilibrium market price, i.e. the difference between what consumers are willing to pay and what they have actually to pay. It measures the benefit consumers derive from consuming a good above and beyond the price they pay for that good.
- **WILLINGNESS TO PAY:** how much a person is willing to pay in order to get additional units of a commodity. It measures the additional unit of utility the individual gets out of each additional unit of a commodity.
- **PRODUCER SURPLUS (PS):** is the area below the equilibrium market price and above the supply curve. It measures the benefit (profits) the producers derive from selling a good, above and beyond the costs of producing that good.
- **SOCIAL SURPLUS OR SOCIAL EFFICIENCY:**
PS+CS
- **The size of PS and CS depend on the elasticity of supply and demand**

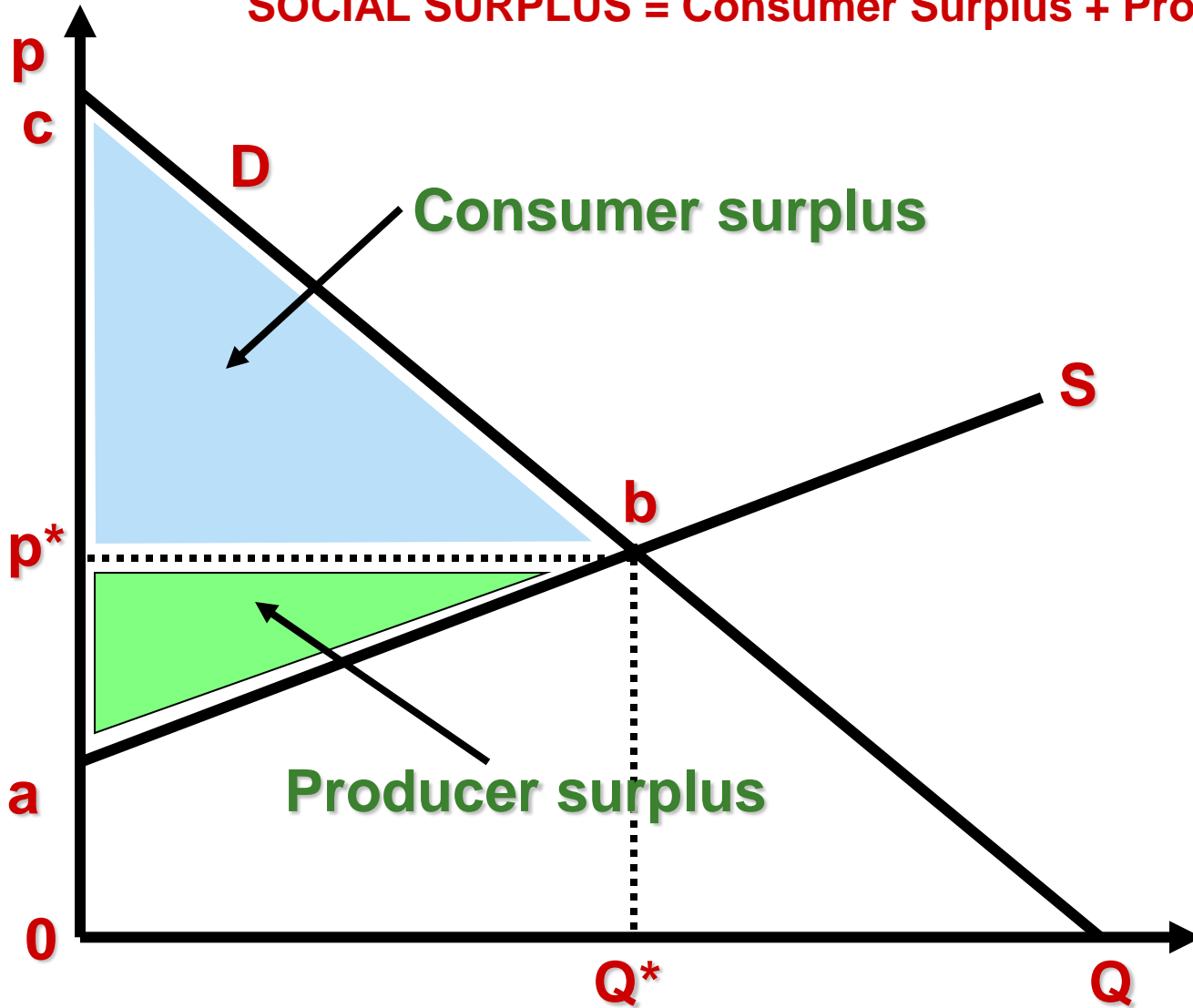
The more elastic is consumer demand the lower is consumer surplus: D1 is more elastic than D.



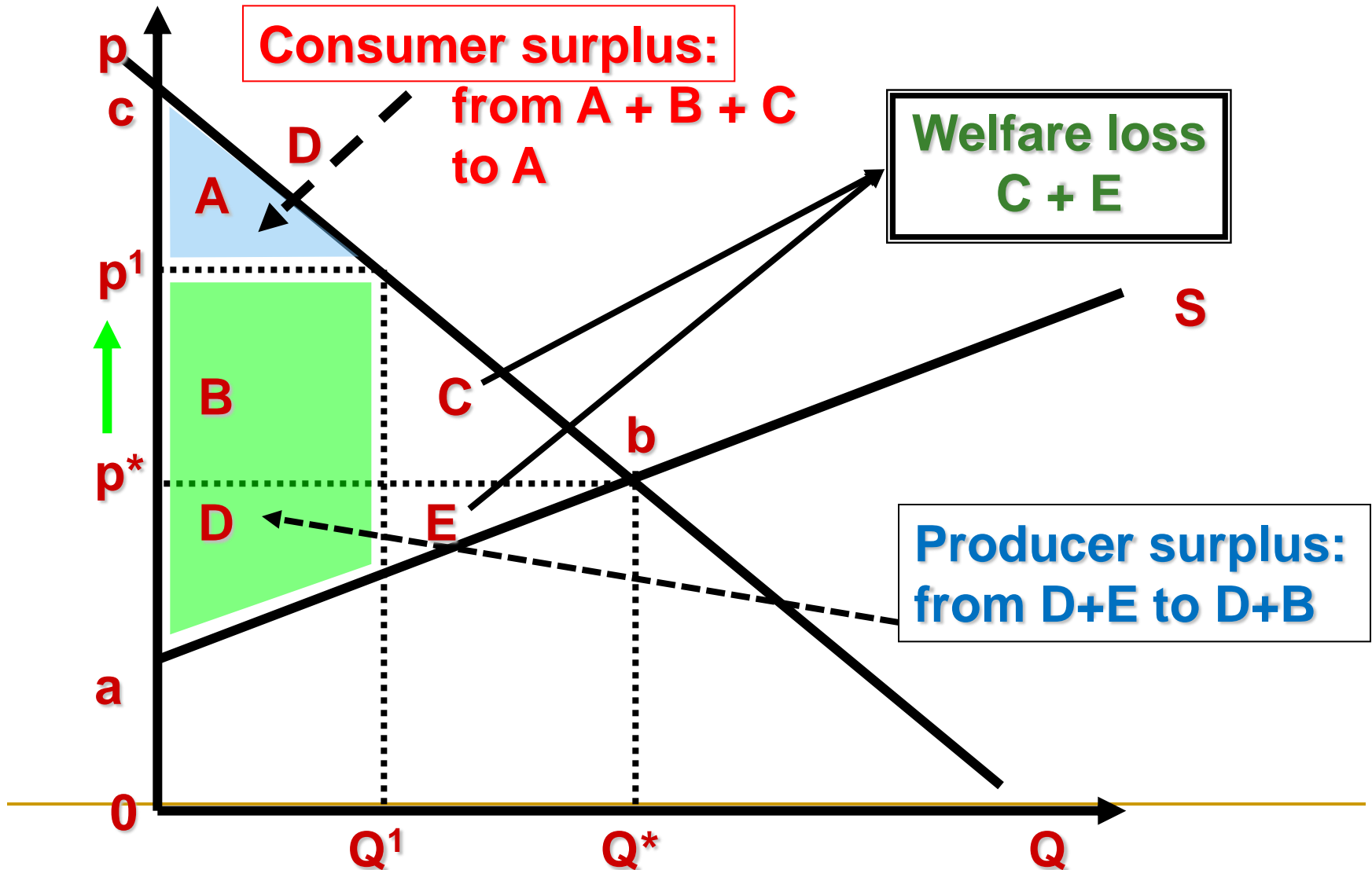
The more elastic is supply
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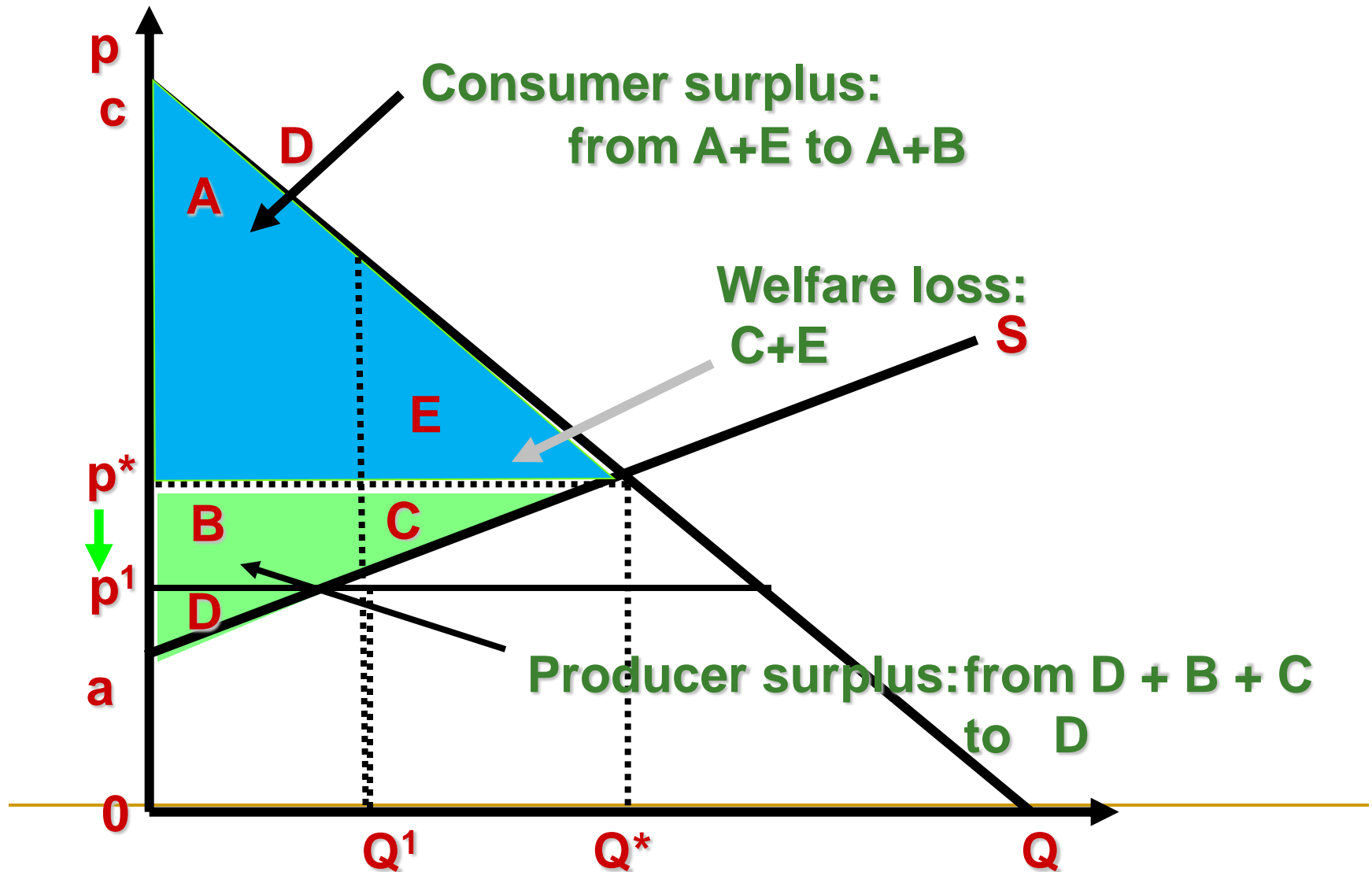
SOCIAL SURPLUS = Consumer Surplus + Producer Surplus



Welfare loss (deadweight loss): reduction in social efficiency when markets are not competitive: i.e. when the price p^1 is higher than the perfectly competitive price p^*



Welfare loss when the price p^1 is lower than the equilibrium one p^* (due to restrictions on price)



Pareto efficiency and distribution of income: assumptions and limits

- Behind the Pareto efficiency conditions there are a number of assumptions:
- **The welfare of society is the sum of the welfares of all individuals in it;**
- **Welfare is a private phenomenon:** each individual is the best judge of his/her own welfare and of the choice of activities to reach it
- **Individuals are rational** in pursuing the maximization of their welfare

Given these assumptions, **voluntary exchange** is the only way to pursue social welfare and allocate resources and there must be unanimity in agreeing any socio-economic change.

Note that the PE condition accepts whatever distribution of income arises out of the free market system and derives the first best efficiency situation from it. There are infinite configurations which satisfy PE, which depend on the initial endowments of individuals.

Limits of PO:

- Equity issues are disregarded by efficiency prescriptions.
- there may be social values and interests which are not simply the sum of individual ones
- individuals are not always able to act in their interests
- Lump sum transfers among individuals (as required by the 2^o theorem) are not always feasible.