ECON 208

1.

What is Economics

- Economics is the study of the use of scarce resources to satisfy unlimited human wants
- **Factors of Production**: land, labour, resource
    - Outputs: goods, or services

Scarcity and Choice

- Scarcity indicates having to make a choice
- For every choice made there is an opportunity cost (whatre you giving up to produce these resources)
- **Opportunity Cost** the value of the next best alternative that is forgone when one alternative is chosen
- Production Possibility Boundary (PPB)
    - Illustrates
        - Scarcity
        - Choice
        - Opportunity Cost
    - Items on boundary are most efficient, using all resources possible
- Opportunity cost for activity includes three things:
    1. The direct cost of activity, plus
    2. Whatever you give up in order to do the activity, minus
    3. Whatever savings the activity generates

Four Key Economic Problems

1. What is produces and how?
    - **Resource allocation** determines the quantities of various goods that are produced
2. What is consumed and by whom?
3. Idk
4. Is productive capacity growing?

Economics and Government

- Can tax
- Alter allocation of resources

- Improve distribution of consumption
- Can affect the overall output and income

The Complexity of Modern Economics

Nature of the Economy

- **Many transactions** leads to a **complex** system that is **self-organized**
- Self organizing: individual consumers and producers seek to maximize their own satisfaction which leads to the overall state of the economy
- Incentives and self-interest:
  - everyone is selfish
  - individuals respond to incentive
- Efficiency: will we produce the goods and services people want using the least possible resources

The Decision Makers and Their Choices

- Consumers: maximizes satisfaction/utility with budget constraint
- Producers: maximized profits
- Government

Production and Trade

- displays two characteristics
  - specialization of labour
  - division of labour
- specialization: allocation of jobs to different people
  - Advantageous because
    - individual abilities differ - comparative advantage
- Division of labour: the breaking up of a production process into a series of specific tasks
- **Market Economy** a society in which people specialize in productive activities and and meet most of their material wants through voluntary market transactions with other people.

Is There an Alternative to Market Economy

Types of Economic Systems

- Traditional: one where behavior is primarily based on tradition, custom, and habit
- Command Economies (Centrally planned Economy): the economic behavior is determined by a central authority, usually the government

- Free-Market Economies: decision about resource allocation are made without any central direction, they are a result of innumerable independent decisions made by producers and consumers.
- Mixed Economy: in general all economies are some mix of the the previous 3

2. Economic Theories, Data, and Graphs

Positive and Normative Statements

- **Normative Statement** depend on value judgements and opinions - cannot be settled by resource facts
- **Positive Statements** do not involve value judgements, they are statements about what is, was, or will be

Building and Testing Economic Theories

- **Correlation** is a measure of degree of relationship of two variables
- **Causal Relationship** between two events exists if the occurrence of one event causes the other
- **Endogenous** a variable that is explained within a theory
- **Exogenous** a variable that is determined outside a theory

Economic Data

Index Number

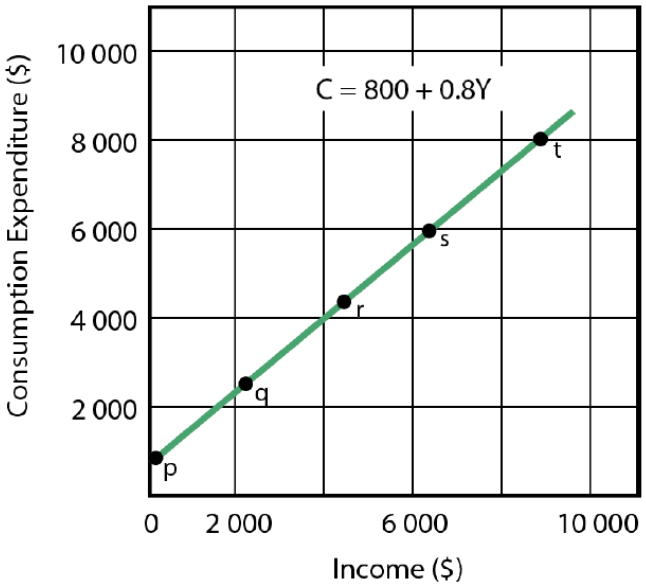
- Index Number: a measure of some variable, conventionally expressed relative to a base period, which is assigned a value of 100
- Value of index for any given period

$$\text{Value of index in any given period} = \frac{\text{Absolute value in given period}}{\text{Absolute value in base period}} \times 100$$

Consumer Price Index

- The price index of the average price paid by consumers for a typical basket of goods that they buyxf

Graphing Economic Theories

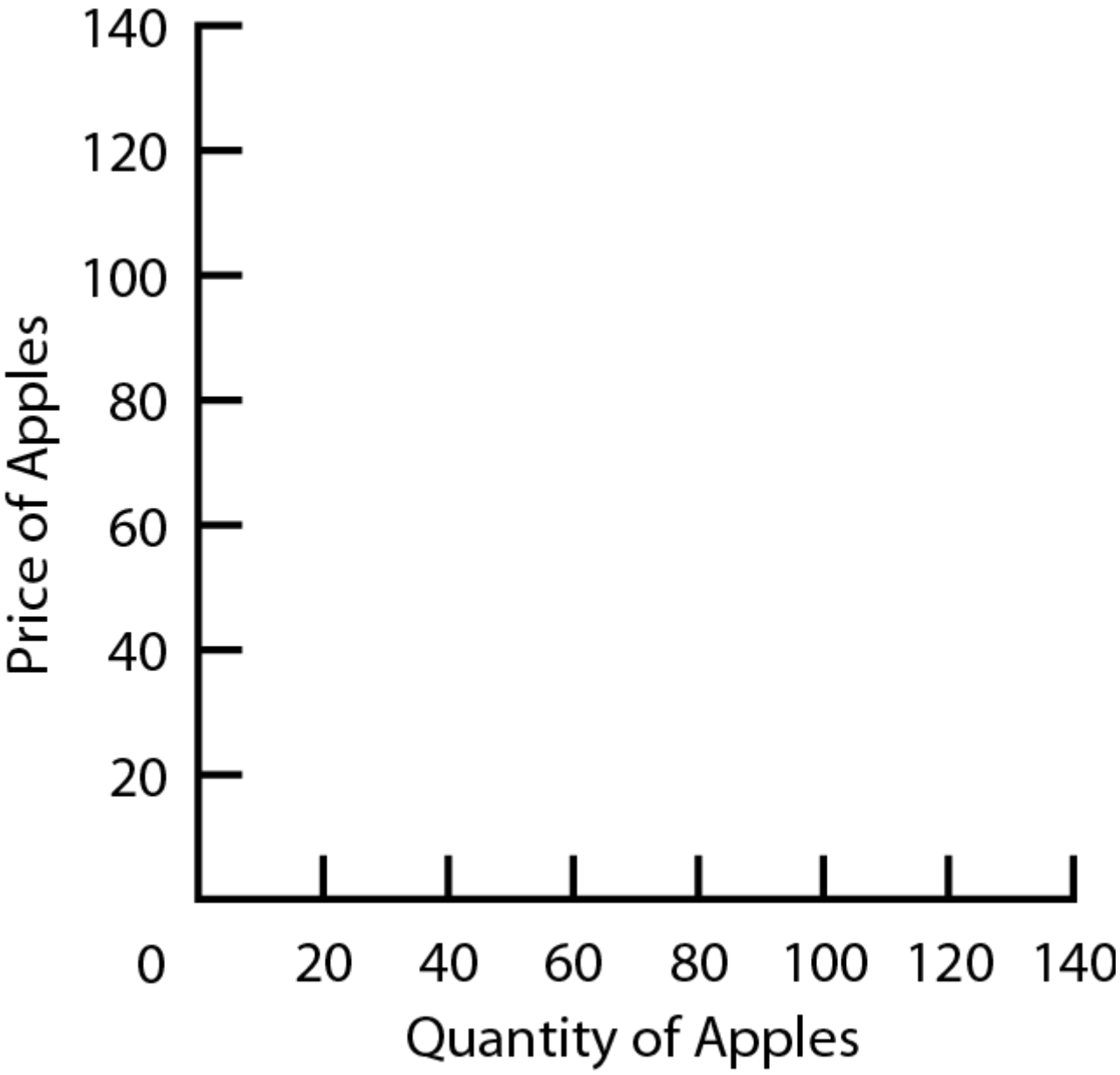


Annual Income	Consumption	Reference Letter
$ 0	$ 800	*p*
2 500	2 800	*q*
5 000	4 800	*r*
7 500	6 800	*s*
10 000	8 800	*t*

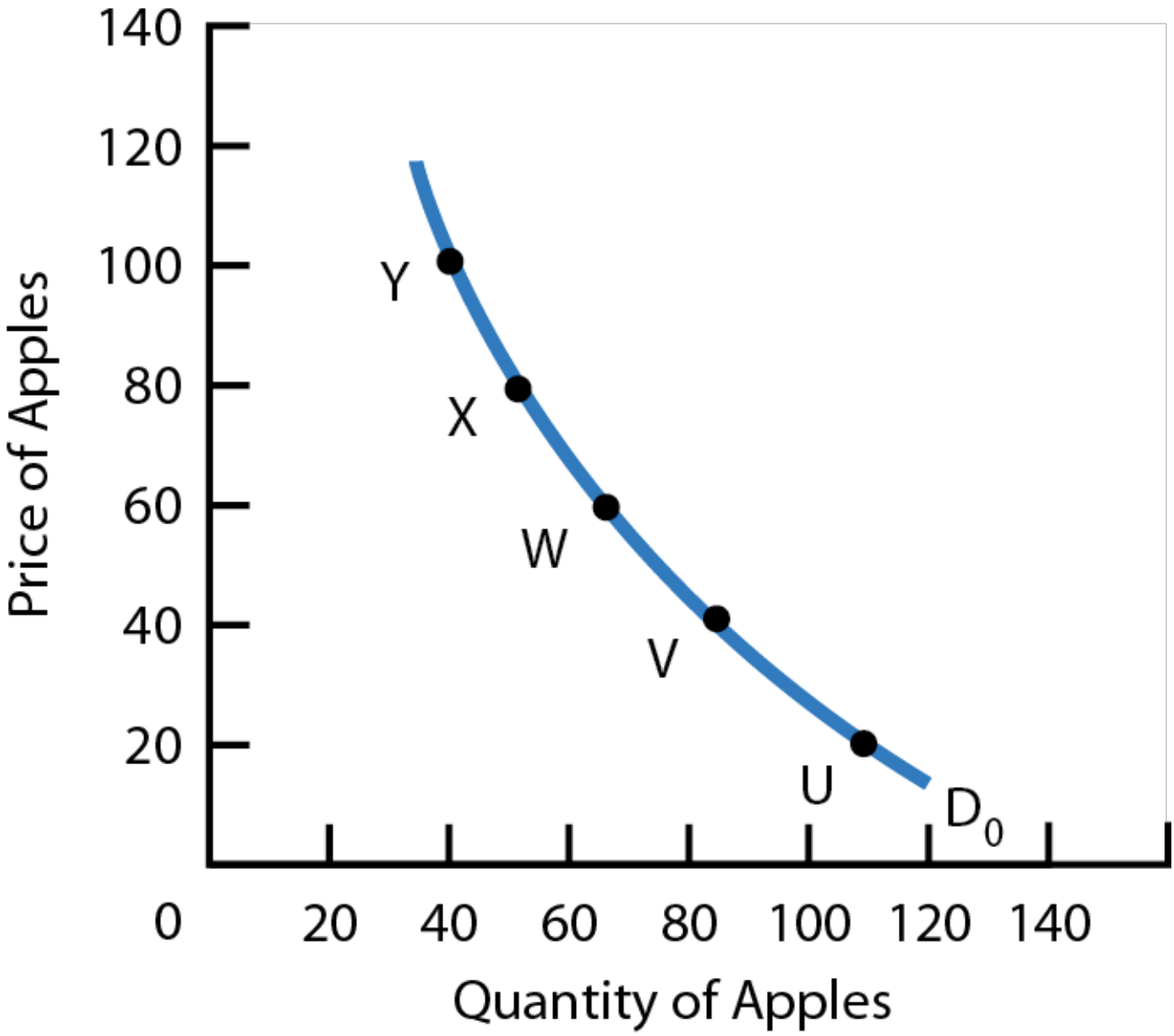
3. Demand Supply and Price

Demand

- Quantity demanded: the total amount consumers desire to purchase in some time period
- *ceteris paribus*: the price of a product and the quantity demanded are **negatively** related



- A change in variables other than price will shift the demand curve
  - average household income
  - prices of other products
  - Shifts in the Demand curve
  - rightward: increase in demand
  - leftward: decrease in demand
  - A **change in demand** is a change in the quantity demanded at every price shift the entire curve
  - A **change in quantity demanded** refers to a movement from one point on a demand curve to another point



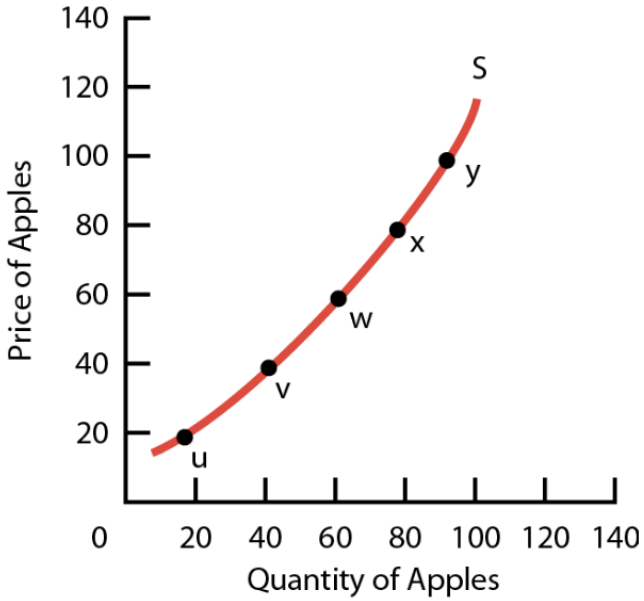
Supply

- Quantity supply: the amount of product that a firm desires to sell in some time period
- *ceteris paribus*: the price of a product and the quantity demanded are **positively** related
- Shifts in supply curve:
  - increase price of inputs
  - technology government taxes and subsidies
- Quantity supplied it the amount that firms are willing to offer for sale and not necessarily the quantity sold
  - A **change in supply** is a shift of the entire curve
  - A **change in quantity supplied**: refers to a movement from one point on a supply curve to another point

Supply Schedule

Reference Point	Price ($ per bushel)	Quantity Supplied
u	$ 20	20
v	40	45
w	60	65
x	80	80
y	100	95

Supply Curve



The Determination of Price

- **Market** a market may be defined as any situation in which buyers and sellers negotiate the transaction of some goods and services
- **Perfectly competitive market** buyers and sellers are price takers

Changes in Market Prices

- Four "laws" of supply and demand
  1. An increase in demand causes an increase in both equilibrium price and equilibrium quantity
  2. A decrease in demand demand causes a decrease in both equilibrium price and equilibrium quantity

Supply Schedule

Reference Point	Price ($ per bushel)	Quantity Supplied
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Supply Curve

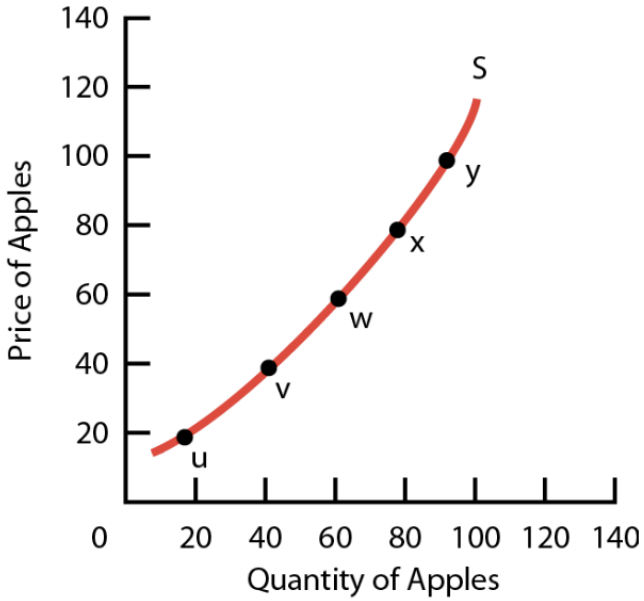


Figure 1. Shifts in the demand curve

1. An increase in supply causes a decrease in the equilibrium price and in increase in the equilibrium quantity
2. A decrease in supply causes an increase in the equilibrium price and a decrease in the equilibrium quantity

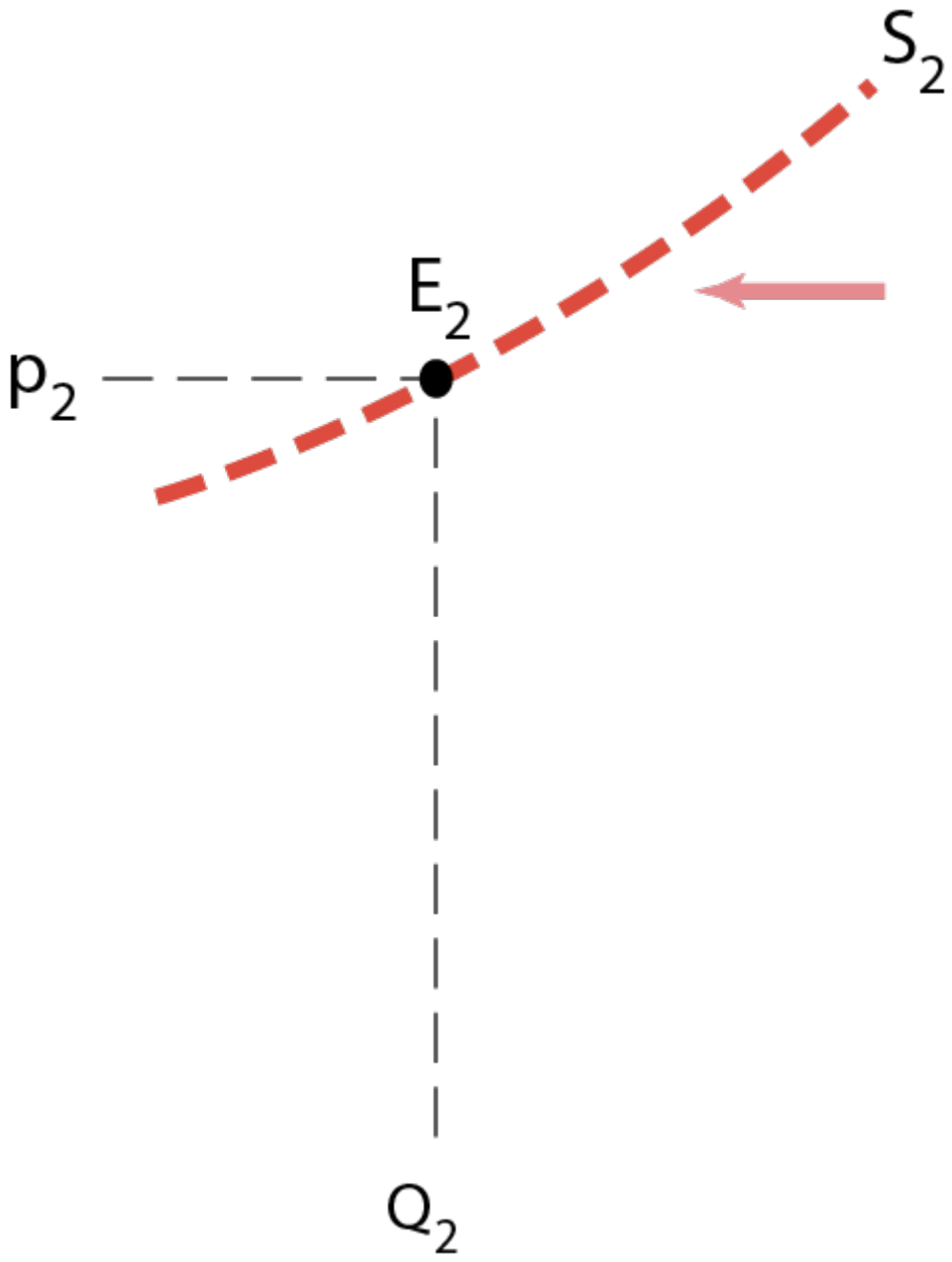


Figure 2. Shifts in the supply curve

Relative Prices and Inflation

- The **absolute price** of a product is the amount of money that must be spent to acquire one unit of that price
- A **relative price** is the price of one good in terms of another
- Demand and supply curves are drawn in terms of relative prices rather than absolute prices

4. Elasticity

Price Elasticity of Demand

- Demand is **elastic** when quantity demanded is very responsive to change in the products own price (**inelastic** is opposite)

- Related to the slope of the demand curve but not the same

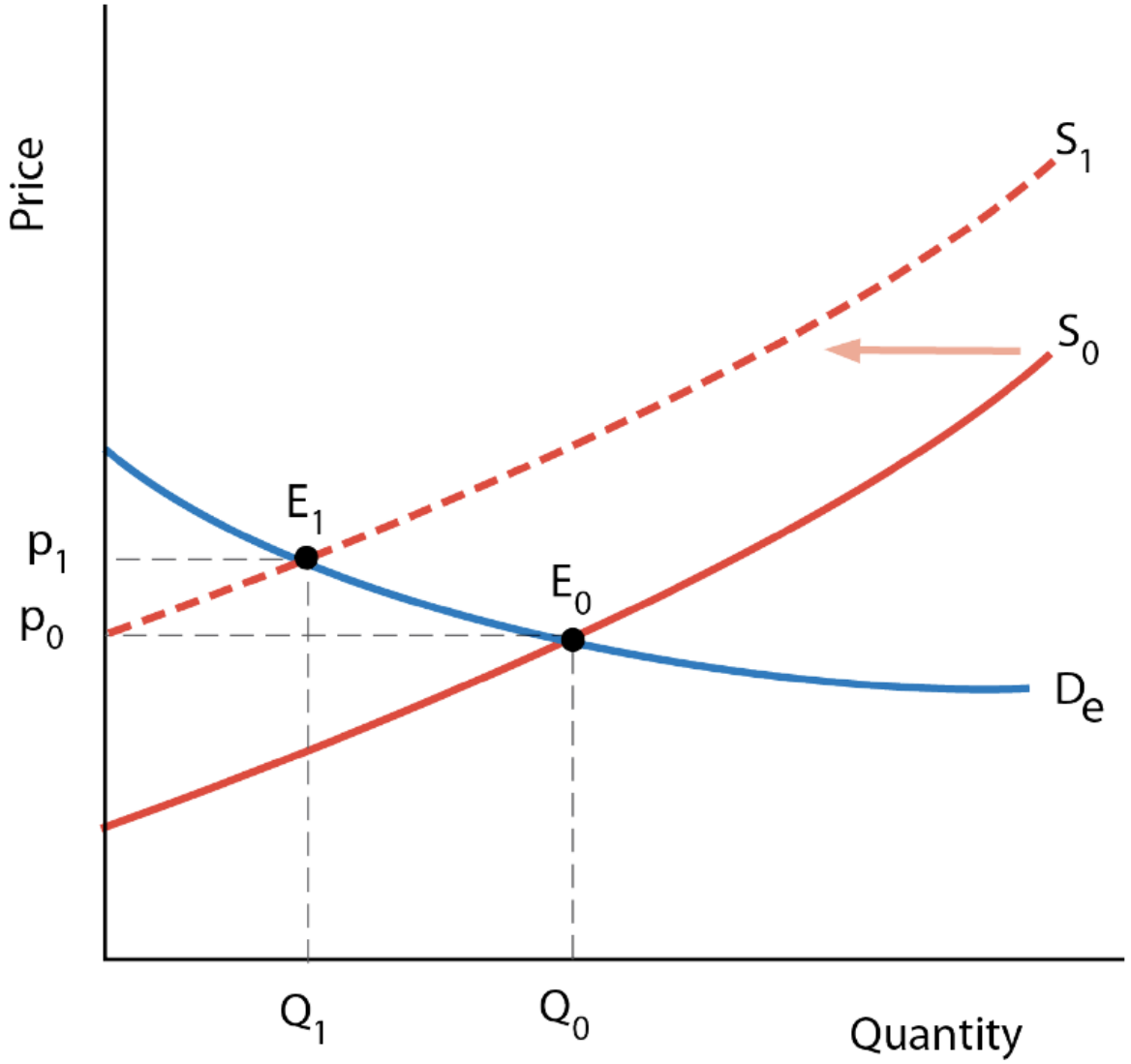


Figure 3. Elastic demand

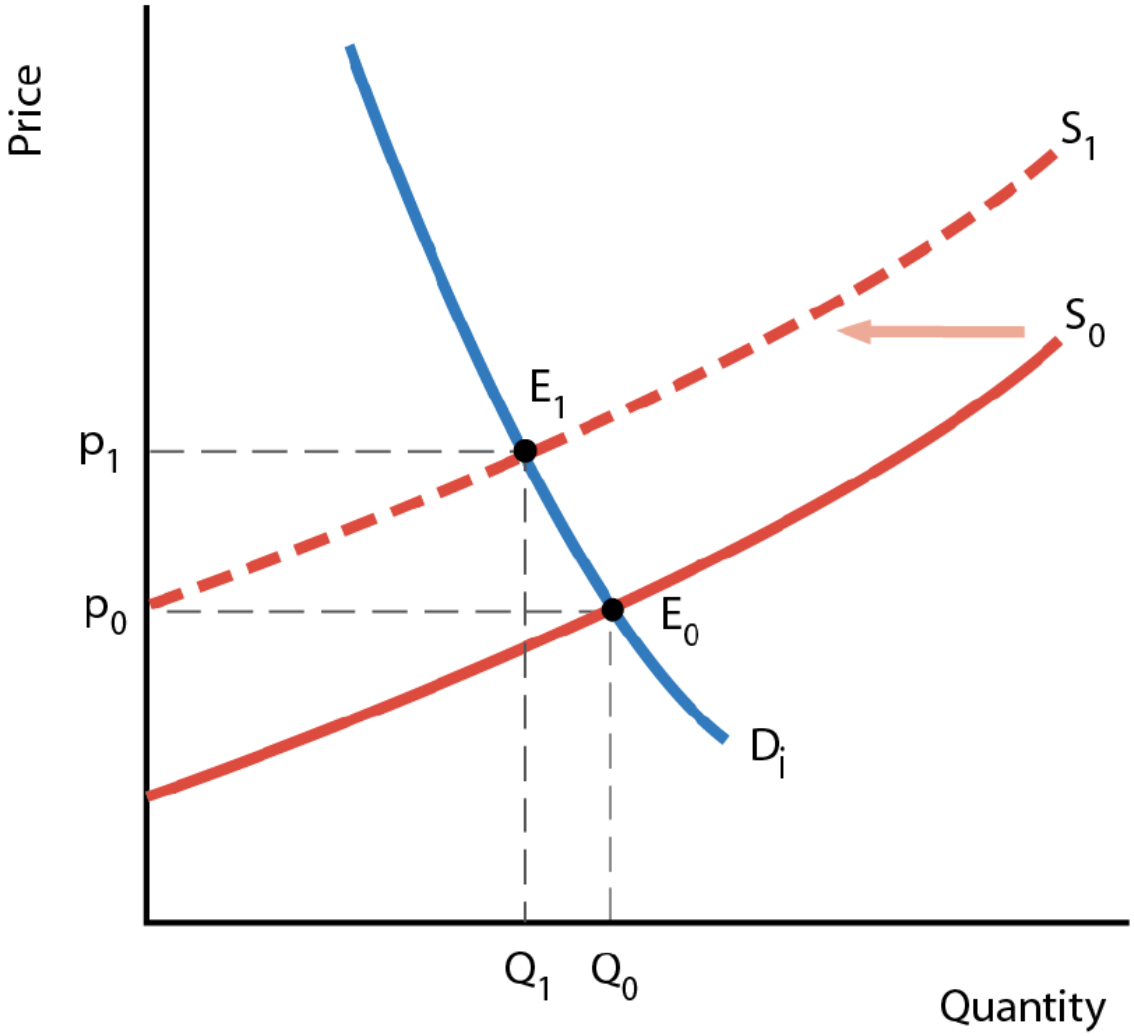


Figure 4. inelastic demand

- **Note** we can only do visual comparison if: both the curves are drawn on the same scale
- We start from the same price-quantity equilibrium

The Measurement of Price Elasticity

- Elasticity is defined as

$$\eta = \frac{\textit{percentage change in quantity demanded}}{\textit{percentage change in price}}$$

$$\eta = \frac{\Delta\ Q^D / \overline{Q}^D}{\Delta\ p / \overline{p}}$$

- Demand elasticity is **negative**, but economists usually use the **absolute value**
- Elasticity measures the change in p and Q relative to some base values of p and Q

$$\eta = \frac{(Q_1 - Q_0)/(Q_1 + Q_0)}{(p_1 - p_0)/(p_1 + p_0)}$$

Figure 5. Example: from point 0 to 1

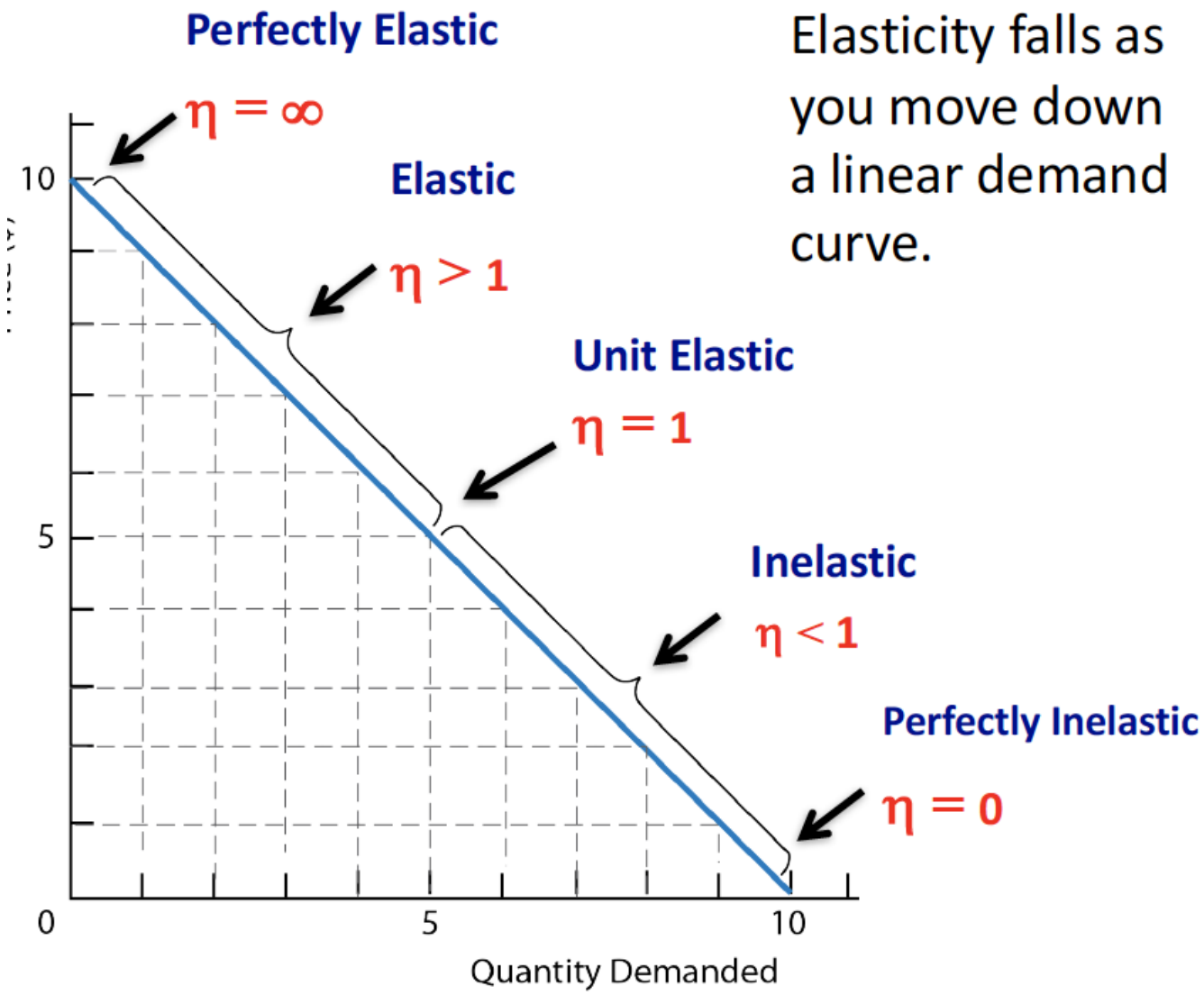


Figure 6. Elasticity along a linear demand curve

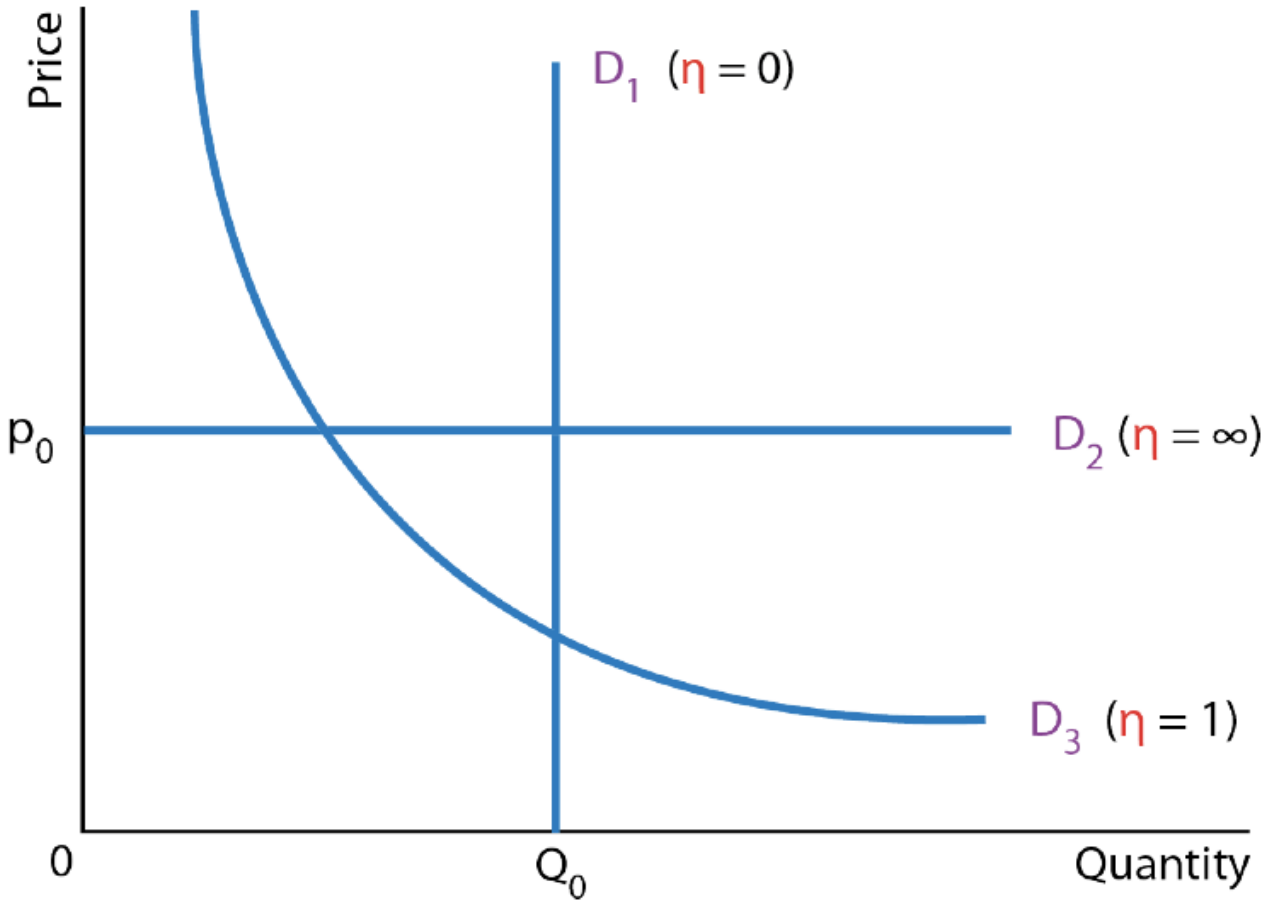


Figure 7. Demand Curves with constant elasticity

- D_1 is perfectly inelastic
- D_2 is perfectly elastic at p_0
- D_3 is unit elastic: a given % increase in p induces an equal % decrease in q at all points on the curve

What Determines Elasticity of Demand

- Demand elasticity tends to be high when there are many **close substitutes**
- The availability of substitutes is determined by:
  - the length of the time interval considered
  - whether the good is a necessity or a luxury
  - how specifically the product is defined

Total Expenditure

- The change in total expenditure depends on the relative changes in price and quantity: *Total Expenditure = Price X Quantity*
- Elasticity > 1: Changes in price cause TE to change in opposite direction
- Elasticity < 1: Changes in price cause TE to change in the same direction

- TE reaches maximum when demand is **unit elastic**

Price Elasticity of Supply

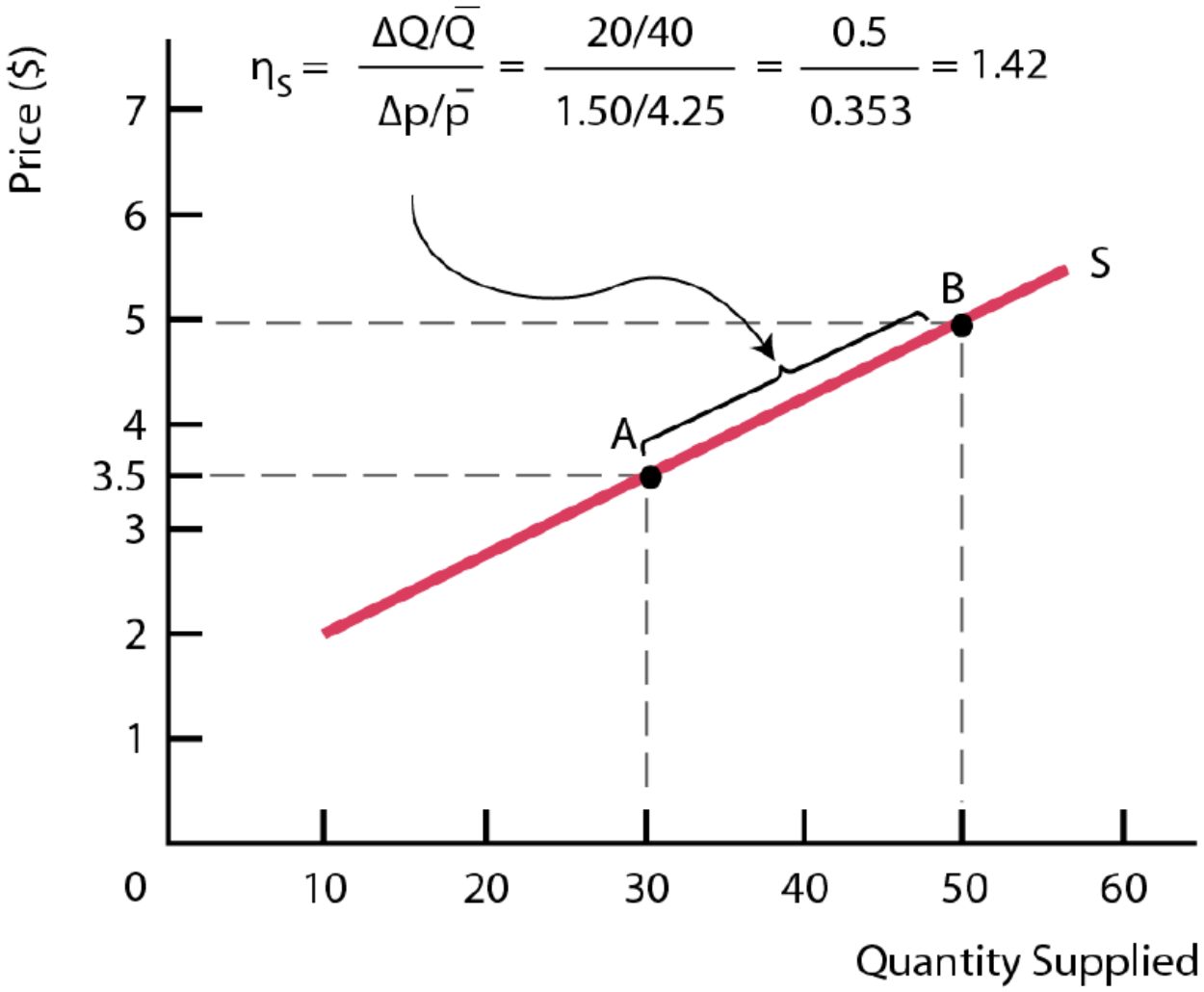
- Price elasticity of supply measures the responsiveness of the quantity supplied to a change in the products own price
- it is denoted as n_s and is defined as:

$$\eta_S = \frac{\text{percentage change in quantity supplied}}{\text{percentage change in price}}$$

$$\eta_S = \frac{\Delta\ Q^S / \overline{Q^S}}{\Delta\ p / \overline{p}}$$

Determinants of Supply Elasticity

- The elasticity of supply depends on how easily firms can increase output in response to an increase in the product's price
- Depends on:
  - The technical ease of substitution
  - The nature of production costs
  - The time span under consideration
- Are resource inputs really available
- Are factors mobile, ie can workers move when needed
- Can finished products be easily stored
- etc...



Important Example of Where Elasticity Matters

- **Exice Tax**: A tax on the sale of a particular commodity
- **Tax Incidence** Who bears the burden of the tax?

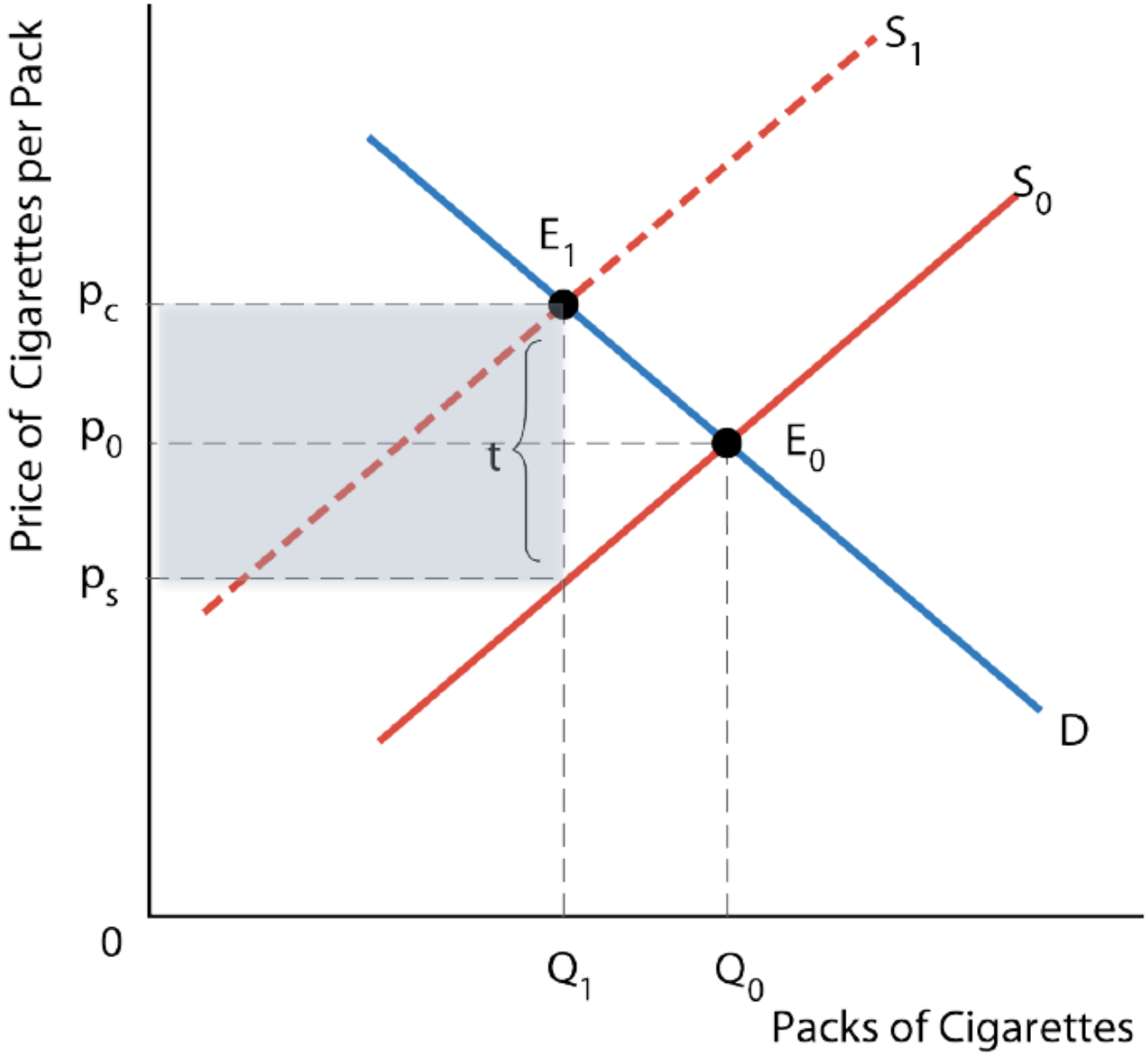


Figure 8. The effect of a cigarette exice tax

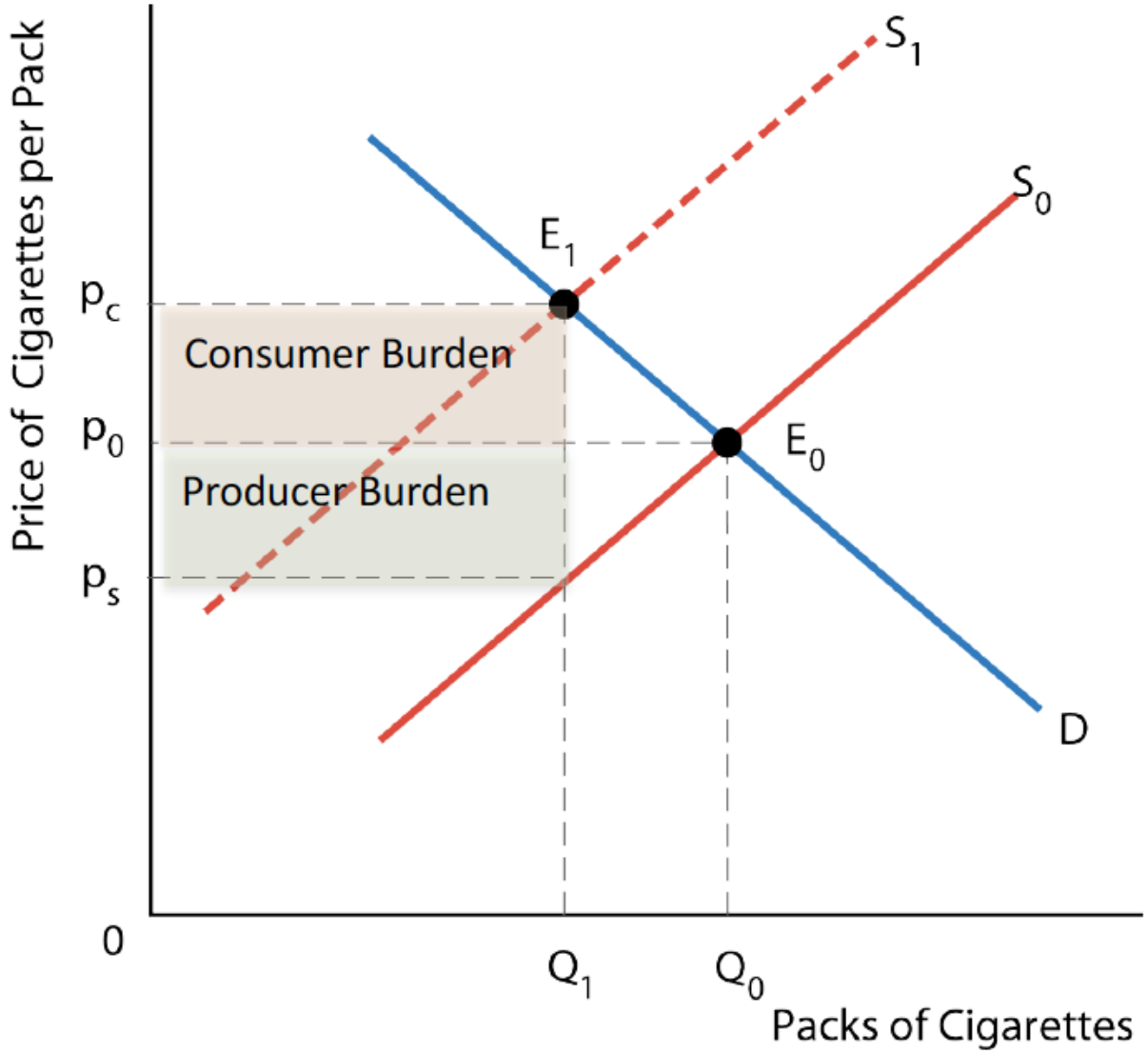


Figure 9. The effect of a cigarette on exice tax 2.0

- The burden of an exice tax is independent of who actually remits the tax to the government - it depends only on relative **elasticities** of demand and supply
- More inelastic is demand, more burden for consumers

Other Demand Elasticities

Income Elasticity of Demand

$$\eta_Y = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}}$$

If $\eta_Y > 0$, the good is said to be **normal**

If $\eta_Y < 0$, the good is said to be **inferior**

Luxuries Versus Necessities

- The more necessary an item is in the consumption pattern of consumers, the lower its income elasticity
- Income elasticities for any one product also vary with the level of a consumer's income
- The distinction between luxuries and necessities also helps to explain differences in income elasticities between countries

Cross Elasticity of Demand

$$\eta_{XY} = \frac{\text{percentage change in quantity demanded of good } \boldsymbol{X}}{\text{percentage change in price of good } \boldsymbol{Y}}$$

If $\eta_{XY} > 0$, then ***X*** and ***Y*** are **substitutes**

If $\eta_{XY} < 0$, then ***X*** and ***Y*** are **complements**

5. Price Controls and Market Efficiency

Government-Controlled Prices

Disequilibrium Prices

- At any disequilibrium price, quantity exchanged is determined by the lesser of quantity demanded or quantity supplied
- If price is set above equilibrium, some sellers will be unable to find buyers

- Conversely, if price is set below equilibrium, some buyers will be unable to find sellers
- With administered prices, the quantity is determined by the **lesser** of quantity demanded and supplied
- **Partial Equilibrium** is the analysis of a single market in which the feedback effects from the market are ignored

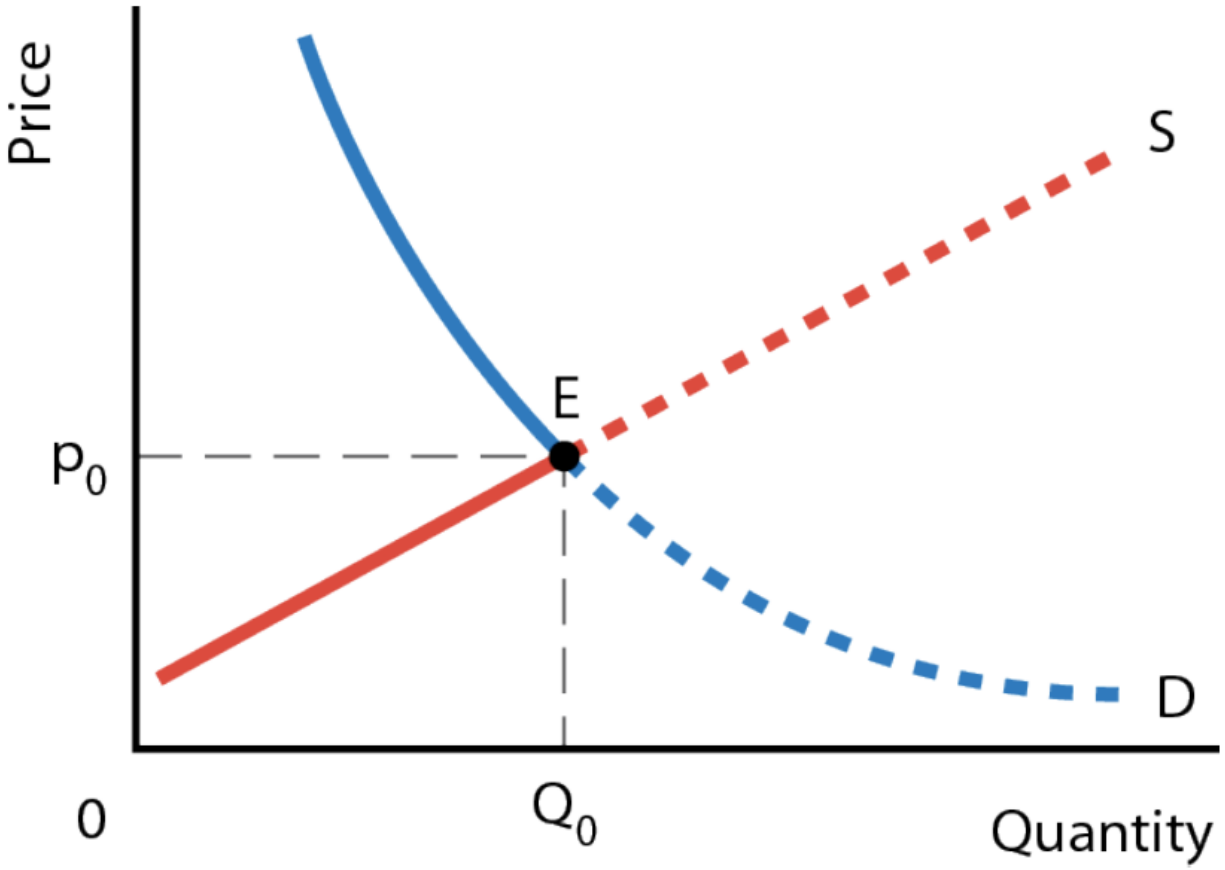


Figure 10. The determination of quantity exchanged in disequilibrium

Price Floors

- *Price floors lead to excess supply Either an unsold surplus will exist, or someone must enter the market and buy the surplus.

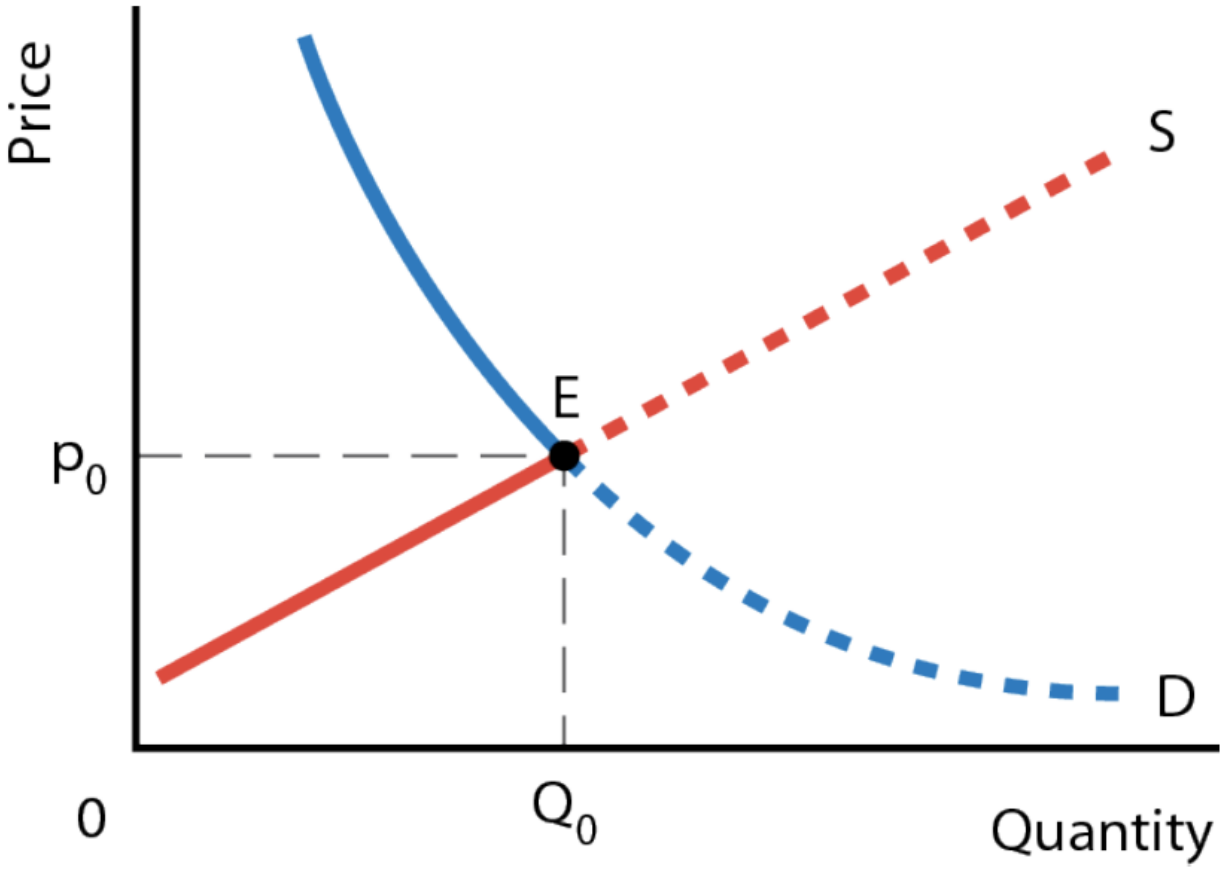


Figure 11. A binding price floor

- Price floors make it illegal to sell the product below the controlled price
- Price floors lead to excess
- **Deadweight loss** caused by the binding price floor and represents the overall loss of economic surplus on society

Price Ceilings

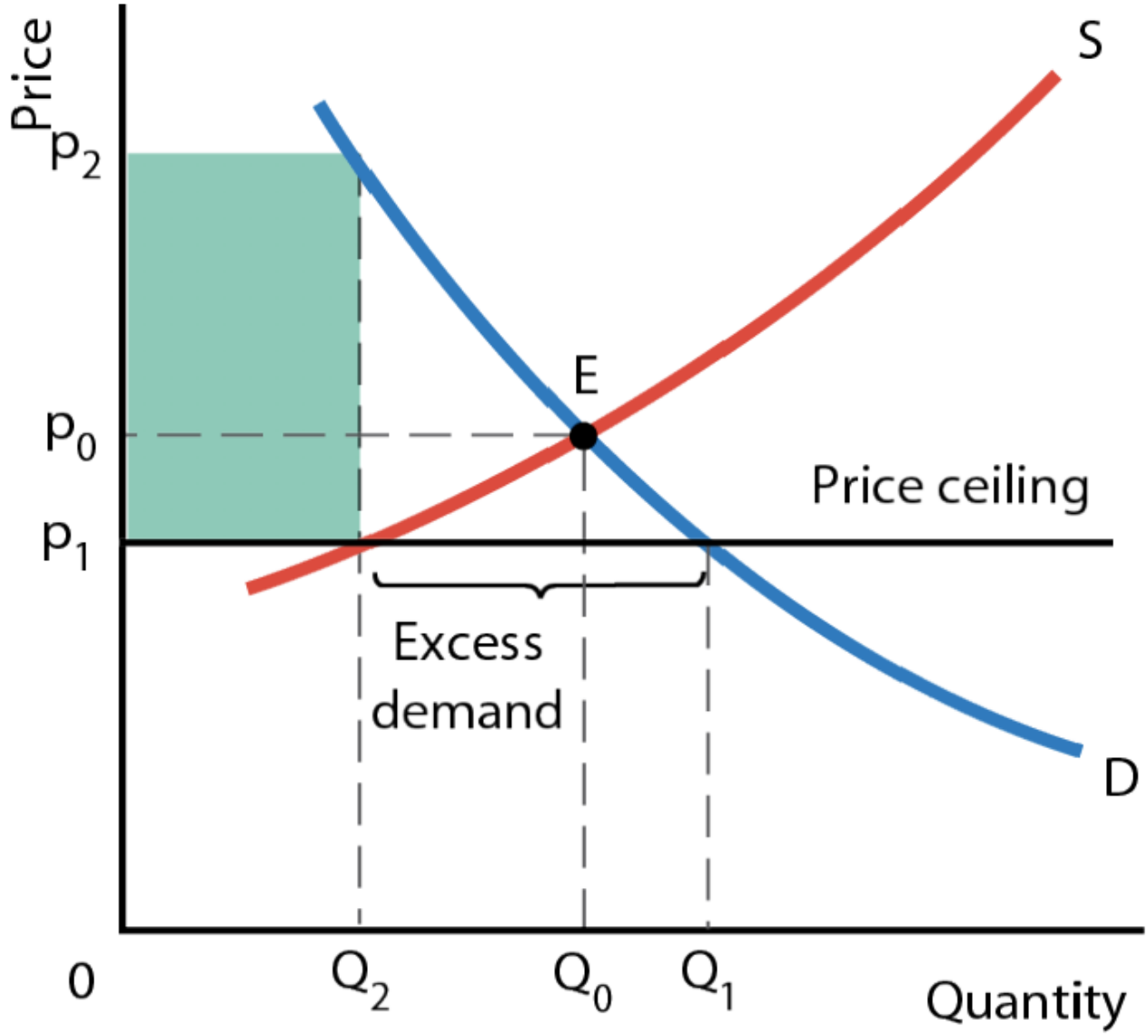


Figure 12. A price ceiling and Black-Market pricing

- A price ceiling is the maximum price at which a product may be exchanged
- **Price ceilings lead to excess demand**
- Reasons for excess demand:
  - Restrict production
  - Keep specific prices down
  - satisfy (normative) notions of quantity

Rent Controls: A case study of Price Ceilings

- The predicted effects of rent controls
  - Binding rent controls are a specific form of price ceiling

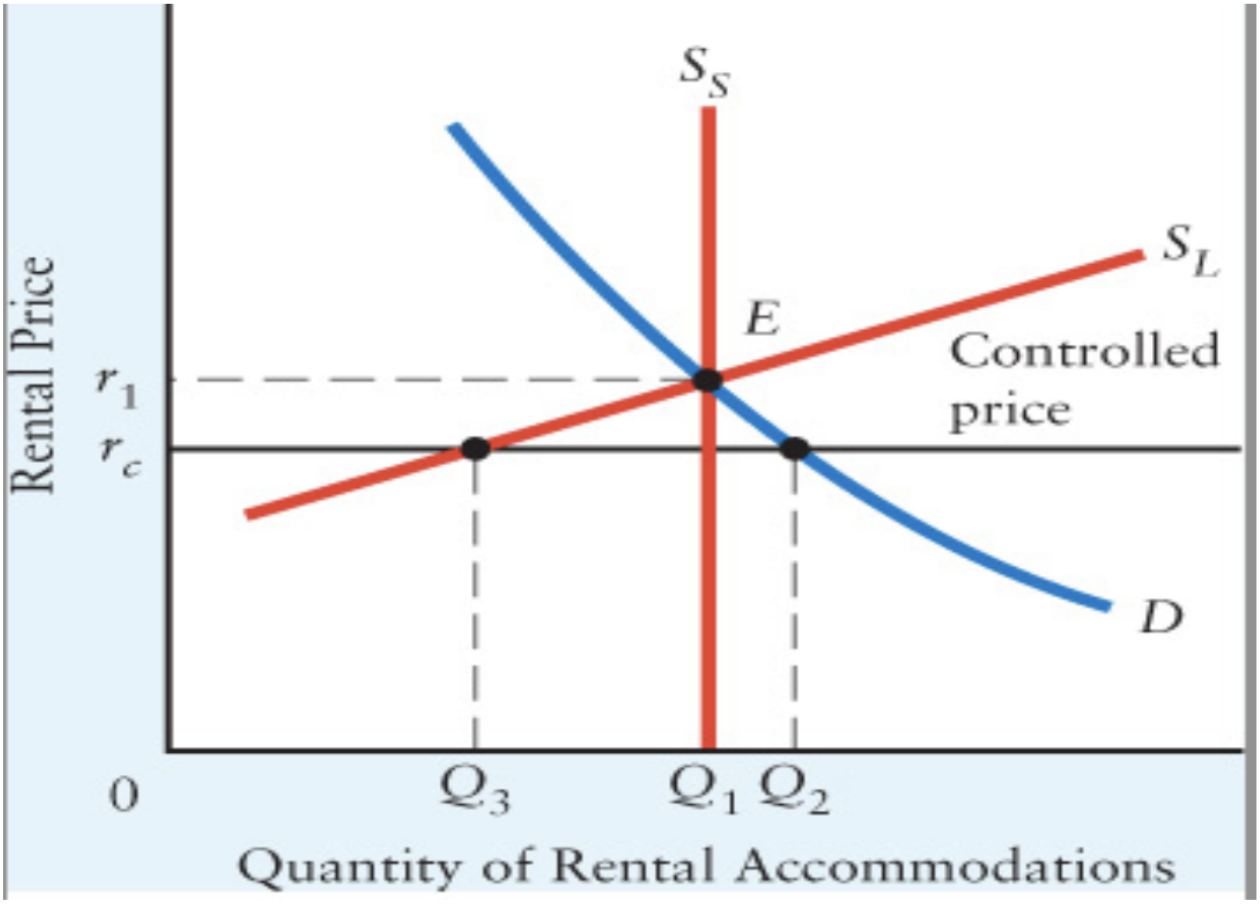


Figure 13. Short-run and long-run effects of rent controls

- Existing tenants in rent-controlled apartments win
- Landlords lose
- Potential future tenants also suffer

Policy Alternatives

- Housing shortages can be reduced if the government (at taxpayers' expense) either subsidizes housing production or produces public housing directly
- The government may also provide lower-income households with income assistance
- But no policy is "free" every policy involves resources cost

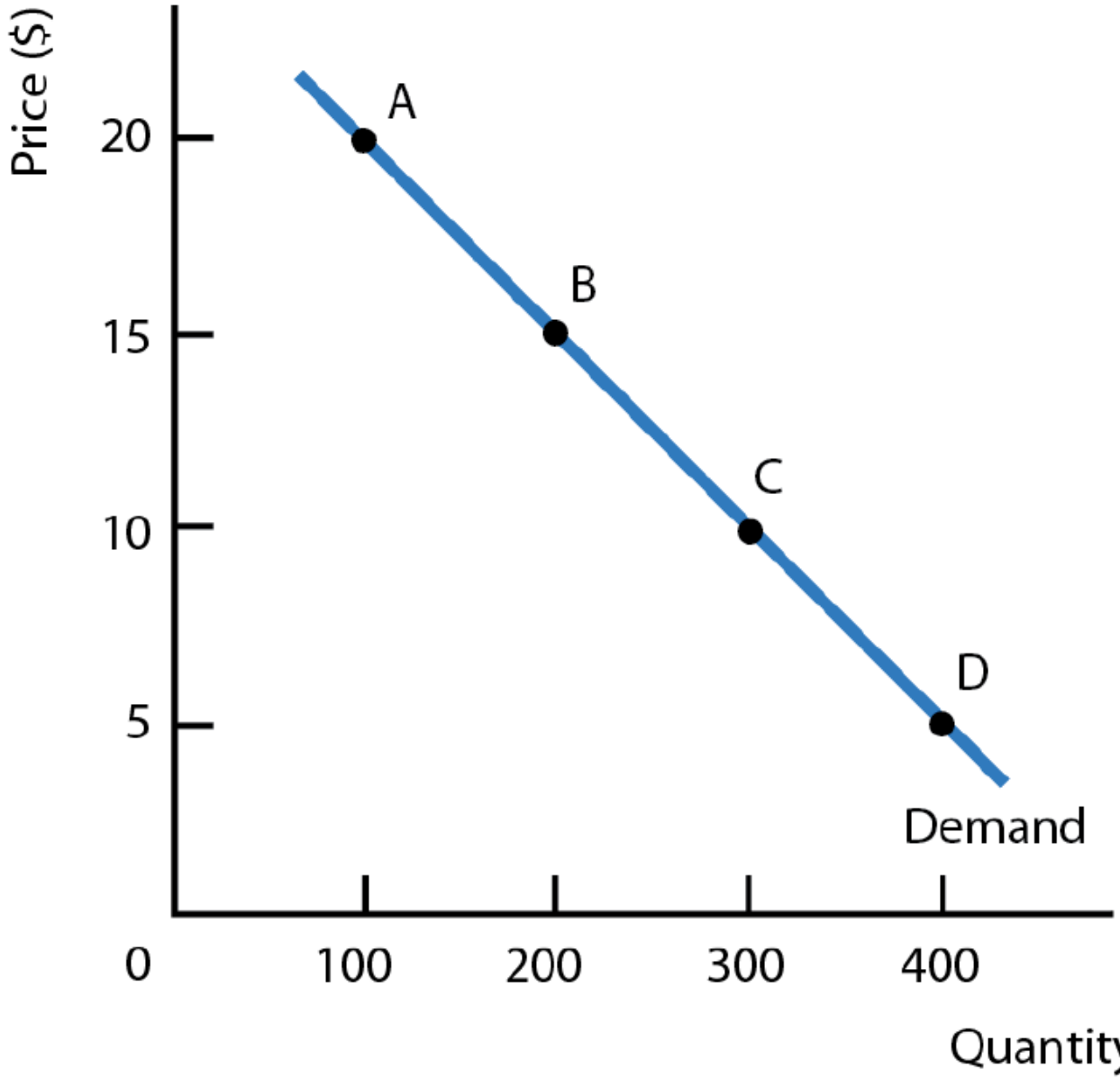
An Introduction to Market Efficiency

- Legislated minimum wages make firms and some workers worse off, but benefit those workers who retain their jobs
- Rent controls make some tenants better off at the expense of landlords
- **Market Efficiency** How does this effect society overall?

Demand as Value and Supply as Cost

- Price corresponding to a specific quantity demanded is the highest price consumers are willing to pay
  - As shown by the height of the demand curve
- Price corresponding to a specific quantity supplied is the lowest price producers are willing to accept
  - As show by the height of the supply curve

Reinterpreting the Demand Curve



- For each pizza the price on the demand curve shows the value consumers receive from consuming that pizza

Reinterpreting the Supply Curve

- For each pizza, the price on the supply curve shows the additional costs to firms of producing that pizza

Economic Surplus

- **Economic Surplus**: for any given quantity the area below the demand curve and above the supply curve shows the economic surplus associated with the prodution and consumption of that good
    - Represents the net value that society as a whole earns by producing and consuming that good

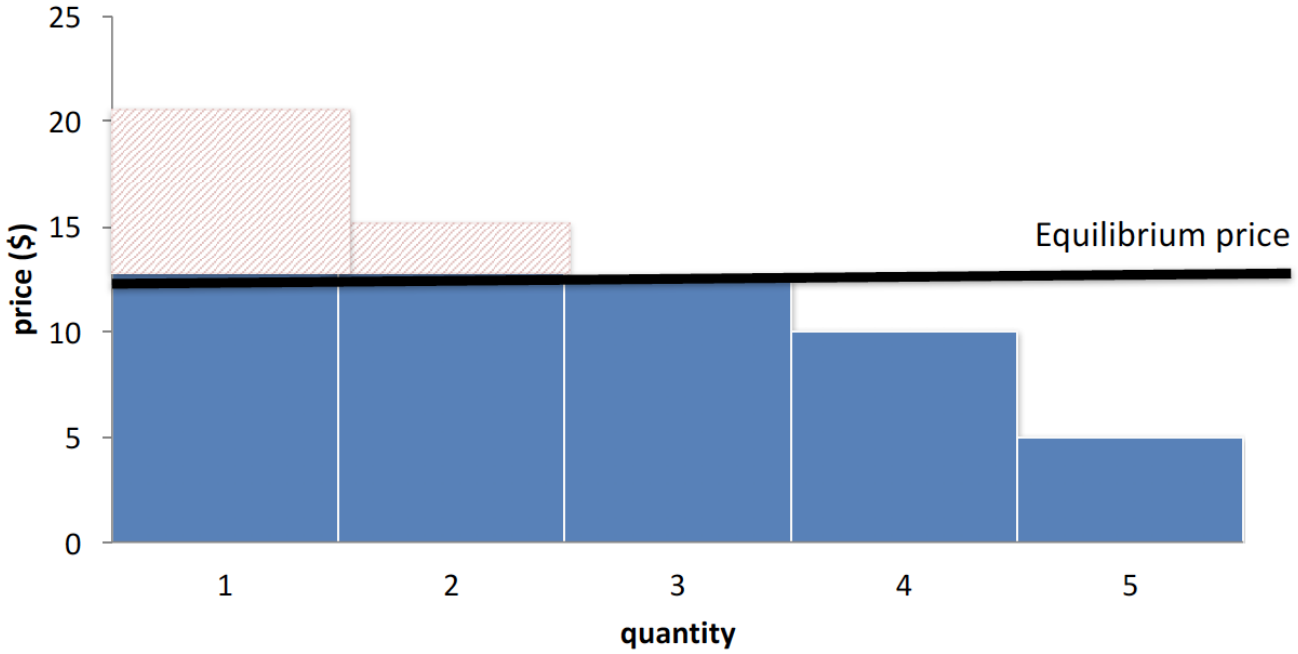


Figure 14. Economic surplus in the pizza market

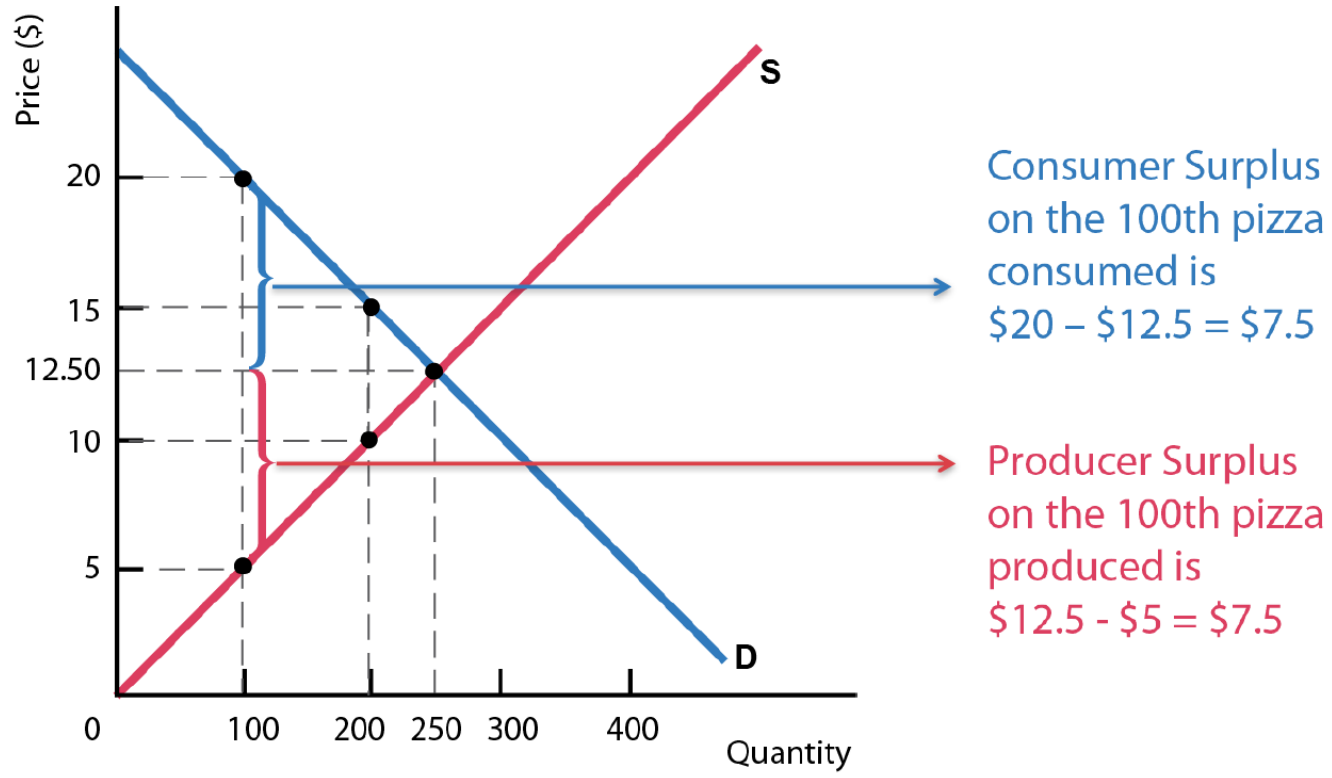
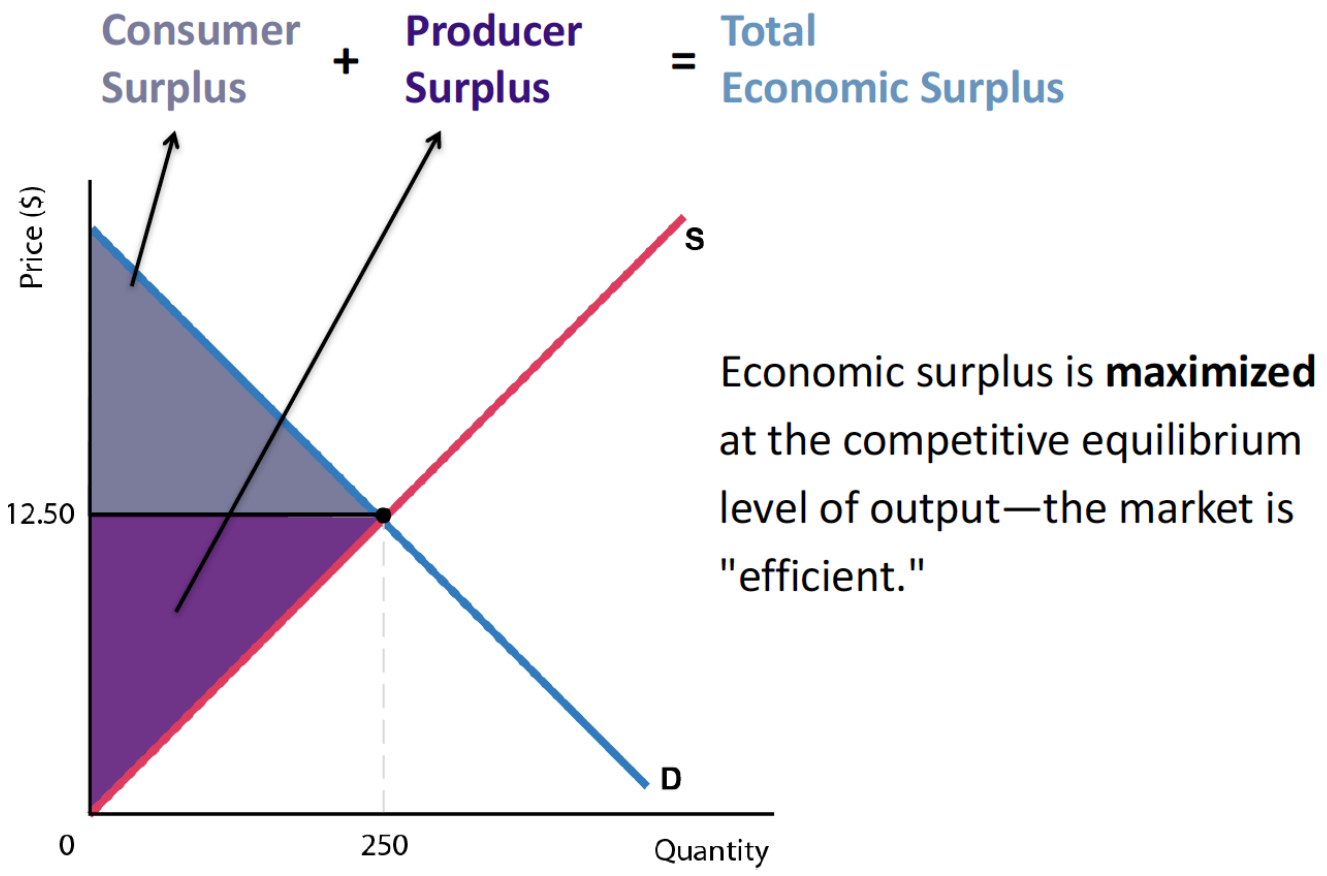


Figure 15. Economic surplus in the pizza market 2

Economic Surplus and Market Efficiency



Market Inefficiency with Price Controls

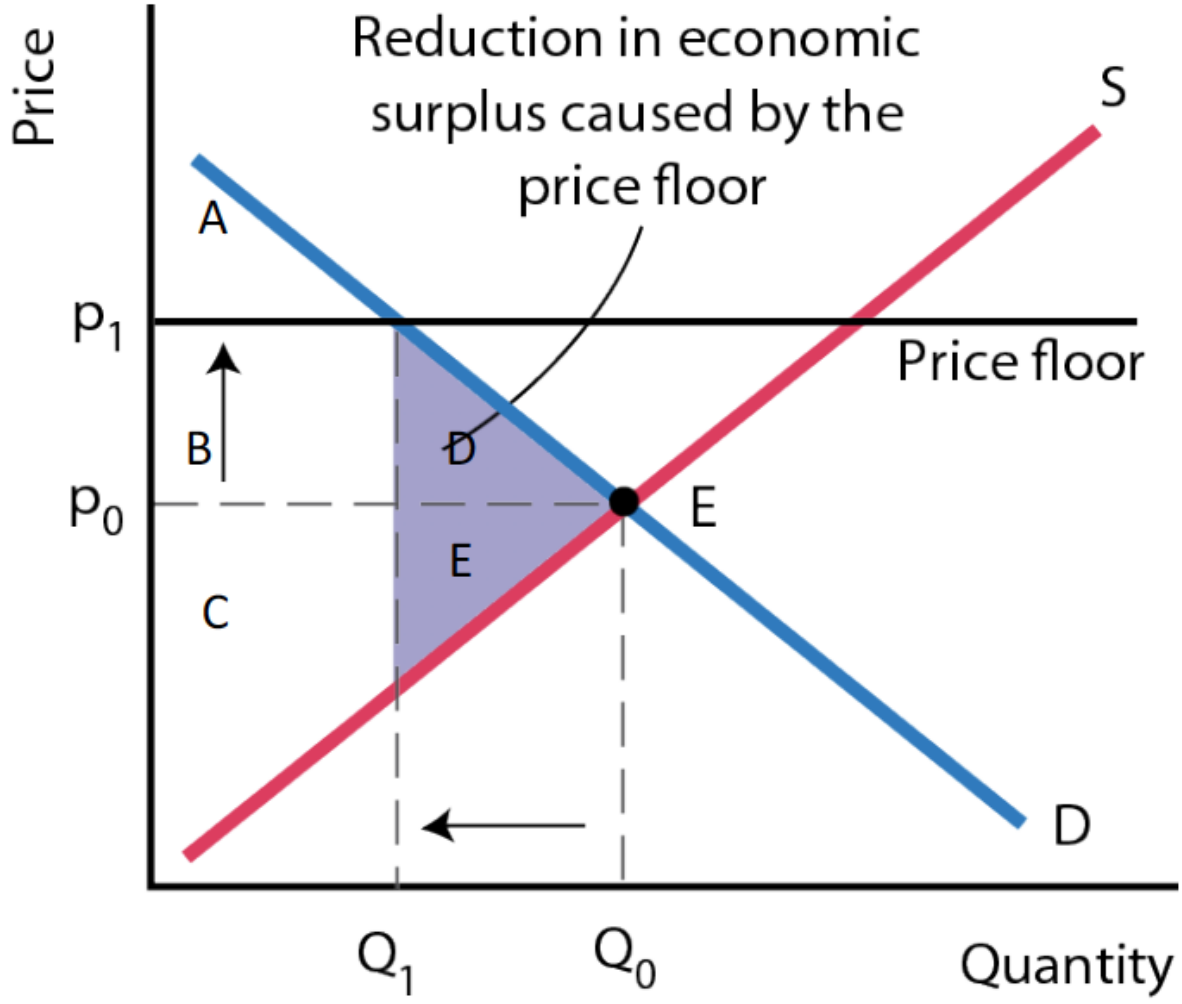


Figure 16. Price floor

- Change in CS=-(B + D)
- Change in PS=B-E
- Change in Total Surplus = -(D + E)

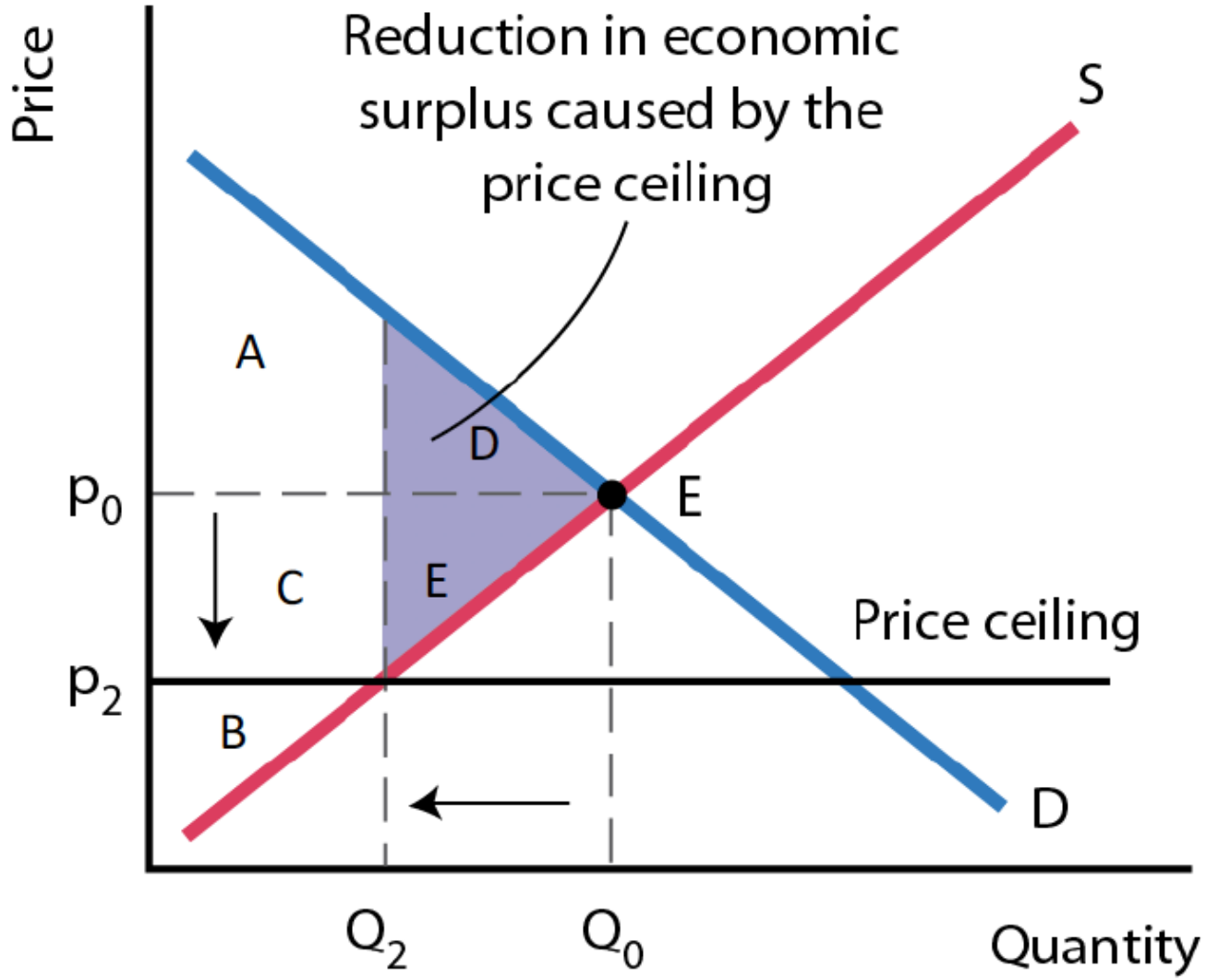


Figure 17. price ceiling

- Change in CS=C-D
- Change in PS=-(C-E)
- Change in Total surplus = - (D+E)

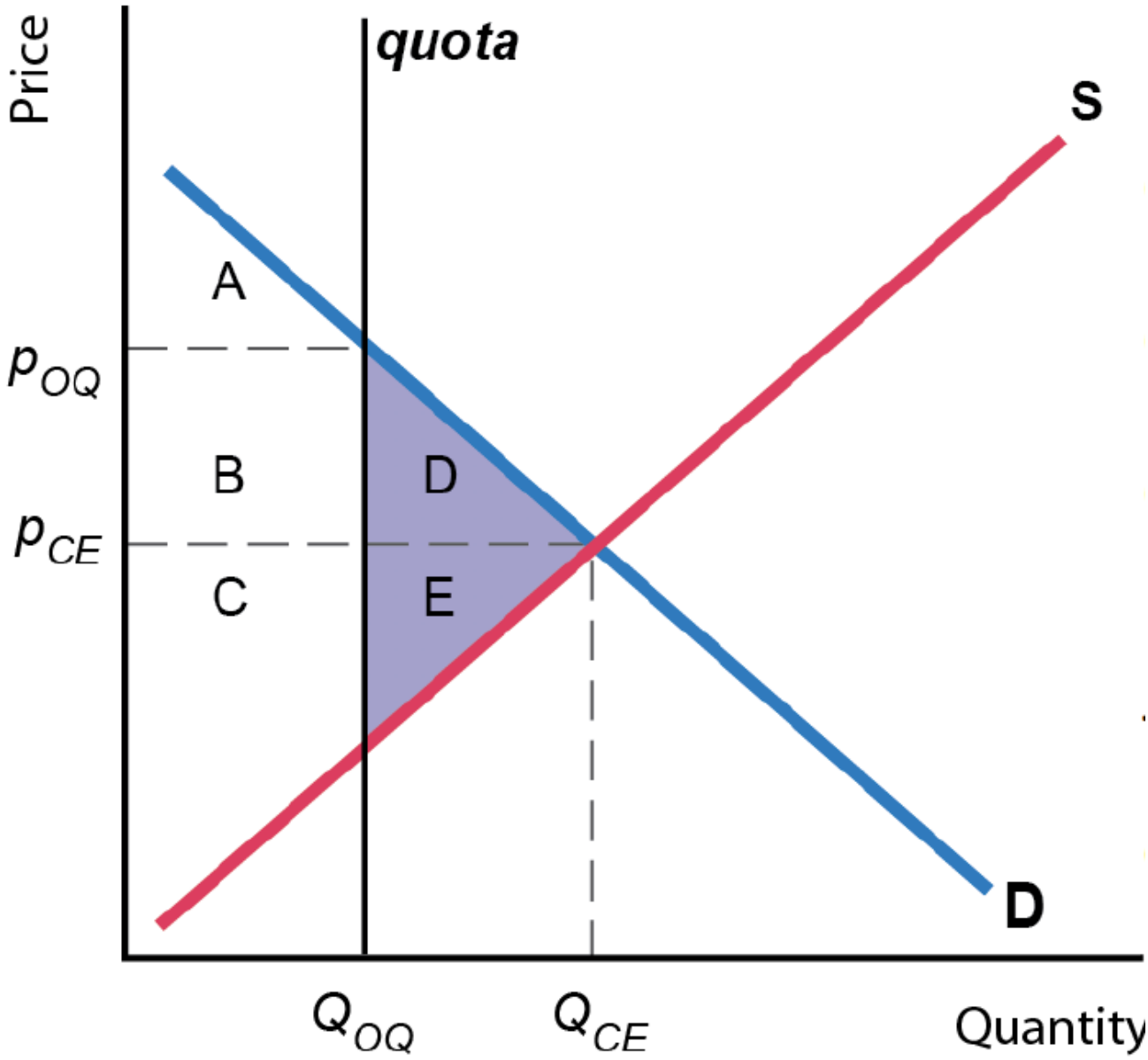


Figure 18. output quotas

- Change in CS = - (B+D)
- Change in PS = B - E
- Change in total surplus = - (D + E)

6. Consumer Behavior

Marginal Utility and Consumer Choice

- Consumers are motivated to maximize their utility
- **Utility**: the total satisfaction that they derive from the goods and services they consume
  - **Total Utility** the full satisfaction resulting from the consumption of some product by a consumer
  - **Marginal Utility** additional satisfaction resulting from consuming one more unit of some

product

Diminishing Marginal Utility

- All things being equal, the utility that any consumer derives from successive units of a particular product, is assumed to diminish as total consumption of the product increases
- Marginal utility falls as the level of consumption rises
- Important assumption to be able to compare total and marginal utility:
  - Individuals know the utility from different actions
  - Individuals can compare the utility from different actions

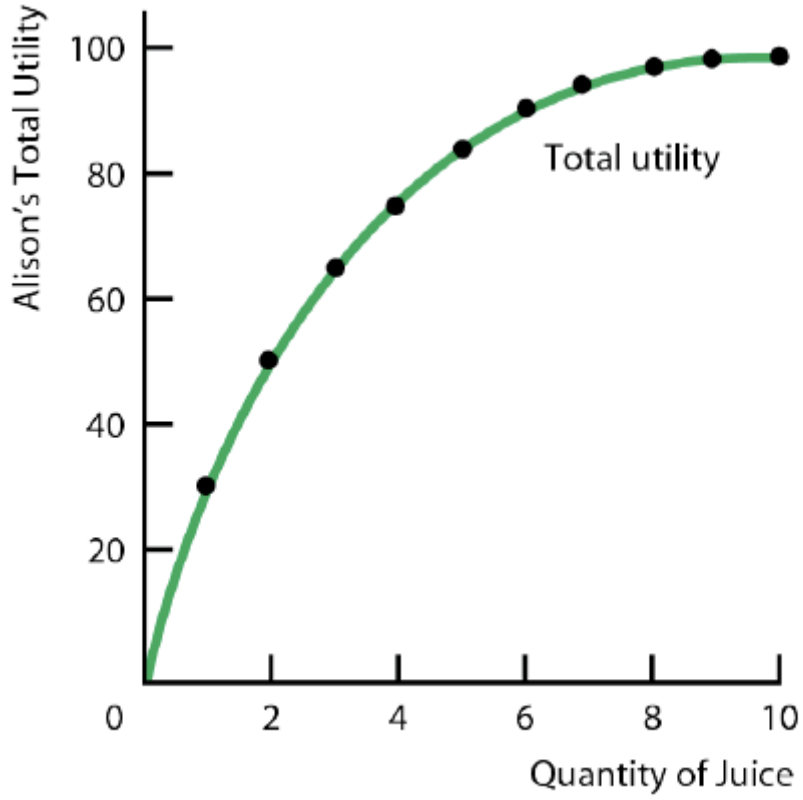


Figure 19. Total Utility

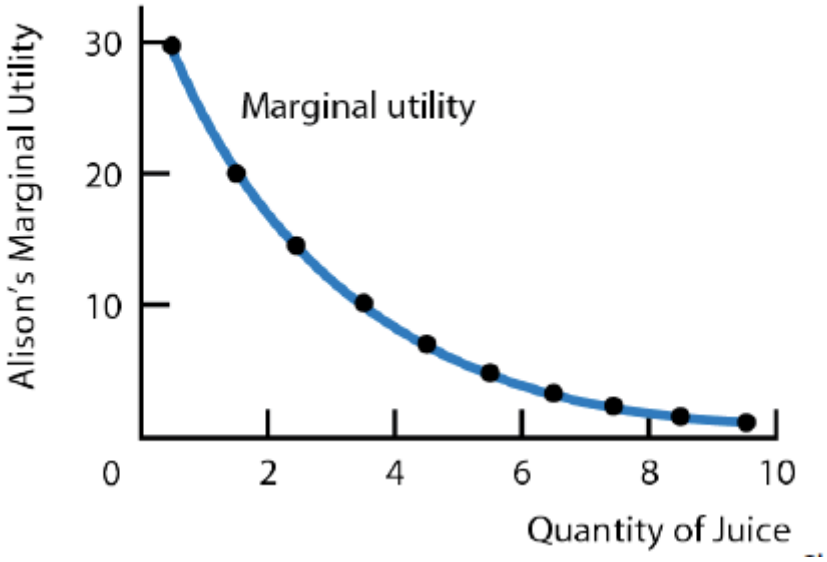


Figure 20. Marginal Utility

Total Utility, Marginal Utility, and Demand Curve

1. Shape of marginal utility = Shape of demand curve
2. Marginal utility is the slope of the total utility function

Market Demand Curve

- Theory of consumer behavior predicts negatively sloped market demand curve in addition to a negatively sloped demand curve for the individual

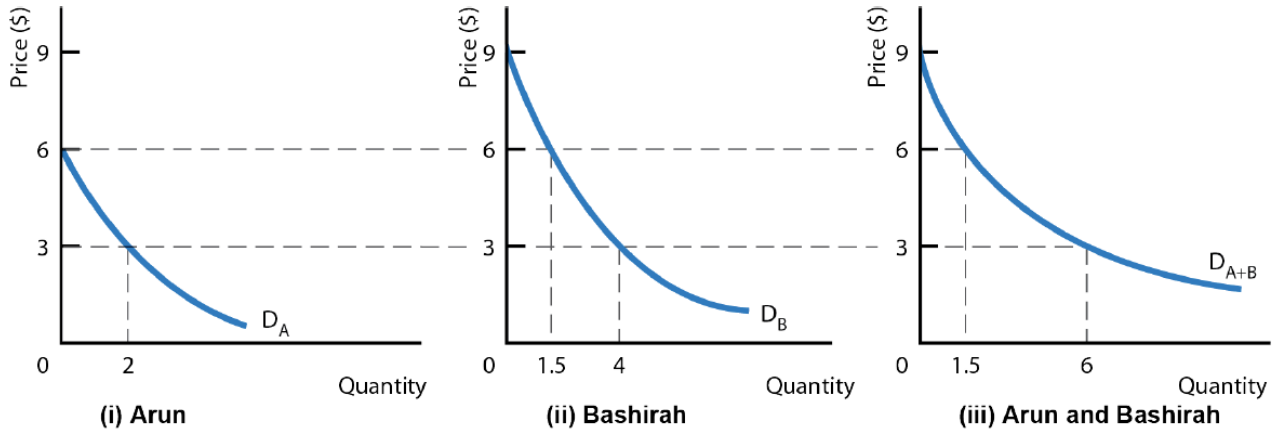


Figure 21. Market and Individual Demand Curves

Maximizing Utility

- Consumers must decide how to adjust their expenditure to maximize total utility
- Assume 2 goods (x and y):
  max. U = f(x,y)
  s.t. income = $p_x x + p_y y$
- A utility maximizing consumer allocates expenditures so that the utility obtained from the last

dollar spent on each product is equal

$$\frac{MU_x}{p_x} = \frac{MU_y}{p_y}$$

Example: Burritos and Juice

Burritos	MU burritos	TU burritos	Juice	MU juice	TU juice
0		0	0		0
1	30	30	1	30	30
2	25	55	2	25	55
3	20	75	3	20	75
4	15	90	4	15	90
5	10	100	5	10	100
6	5	105	6	5	105

	Combination	TU burritos + TU juice	Total Utility
	6 B + 0 J	105 + 0	105
change		-5 + 30	
	5 B + 1 J	100 + 30	130
change		-10 + 25	
	4 B + 2 J	90 + 55	145
change		-15 + 20	
	3 B + 3 J	75 + 75	**150**
change		-20 + 15	
	2 B + 4 J	55 + 90	145

$$\frac{MU_X}{p_X} = \frac{MU_Y}{p_Y} \quad \text{In this case} \quad \frac{20}{1} = \frac{20}{1}$$

Maximizing Utility

- For two products X and Y, the utility maximizing condition is:

$$\frac{MU_X}{p_X} = \frac{MU_Y}{p_Y} \quad \text{or} \quad \frac{MU_X}{MU_Y} = \frac{p_X}{p_Y}$$

The Consumer's Demand Curve

- If the price of juice (X) rises, then at the previous utility-maximizing consumption bundle, we have:

$$\frac{MU_X}{MU_Y} < \frac{p_X}{p_Y}$$

- As the consumer reduces consumption of juice, the marginal utility of juice rises and this increases the relation on the left-hand side of the equation

Income and Substitution Effects of Price Changes

- A change in price has two distinct effects - it alters **relative prices** and it changes consumers' **real income**

The Substitution Effect

- The substitution effect increases the quantity demanded of a good whose (relative) price has fallen and reduces the quantity demanded of a good whose (relative) price has increased

The Income Effect

- For a **normal good**, the income effect leads consumers to but more of a product that has fallen in price
- For and **inferior good**, the income effect leads consumers to but less of a product that has fallen in price
- The size of the income effect depends on the amount of income spent on the good whose price changes and on the amount by which the price changes

The Slope of the Demand Curve

- The overall effect of a price change is the **combination** of the income and substitution effects
- For a price increase:
  - The substitution effect is to reduce quantity demanded
  - The income effect could go either way

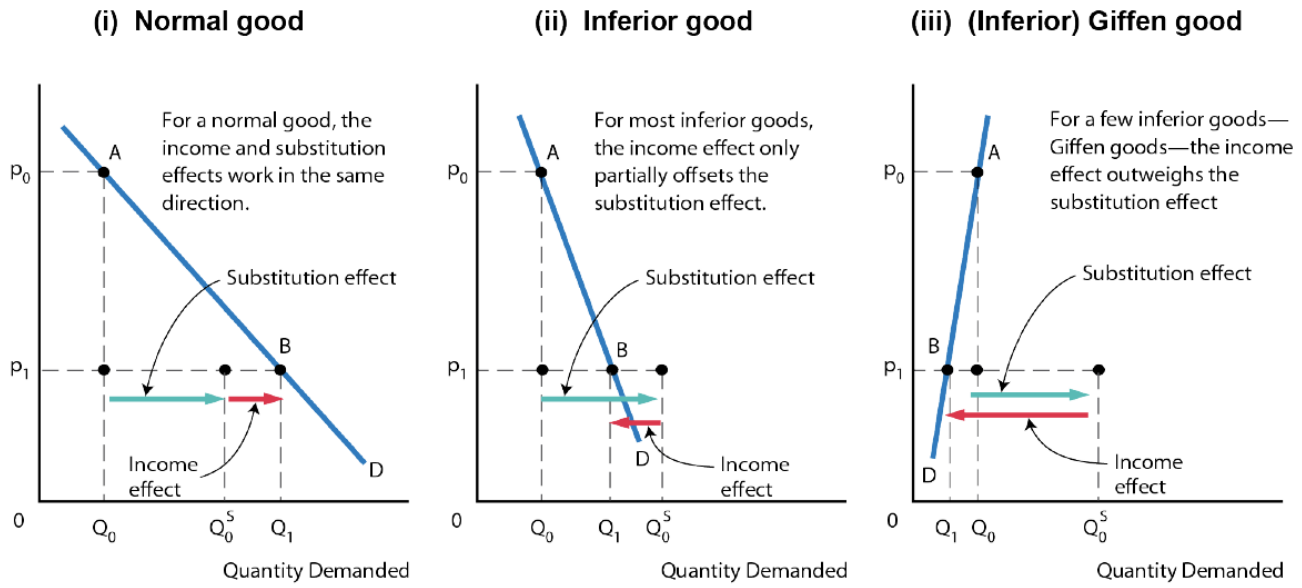


Figure 22. Income and Substitution Effects of a Price Change

Conspicuous Consumption Goods

- Some products are consumed because the have "snob appeal": the high price confers status on its purchaser

Consumer Surplus

- Consumer surplus on each unit is the difference between what the consumer is willing to pay for that unit, and what they actually pay for that unit

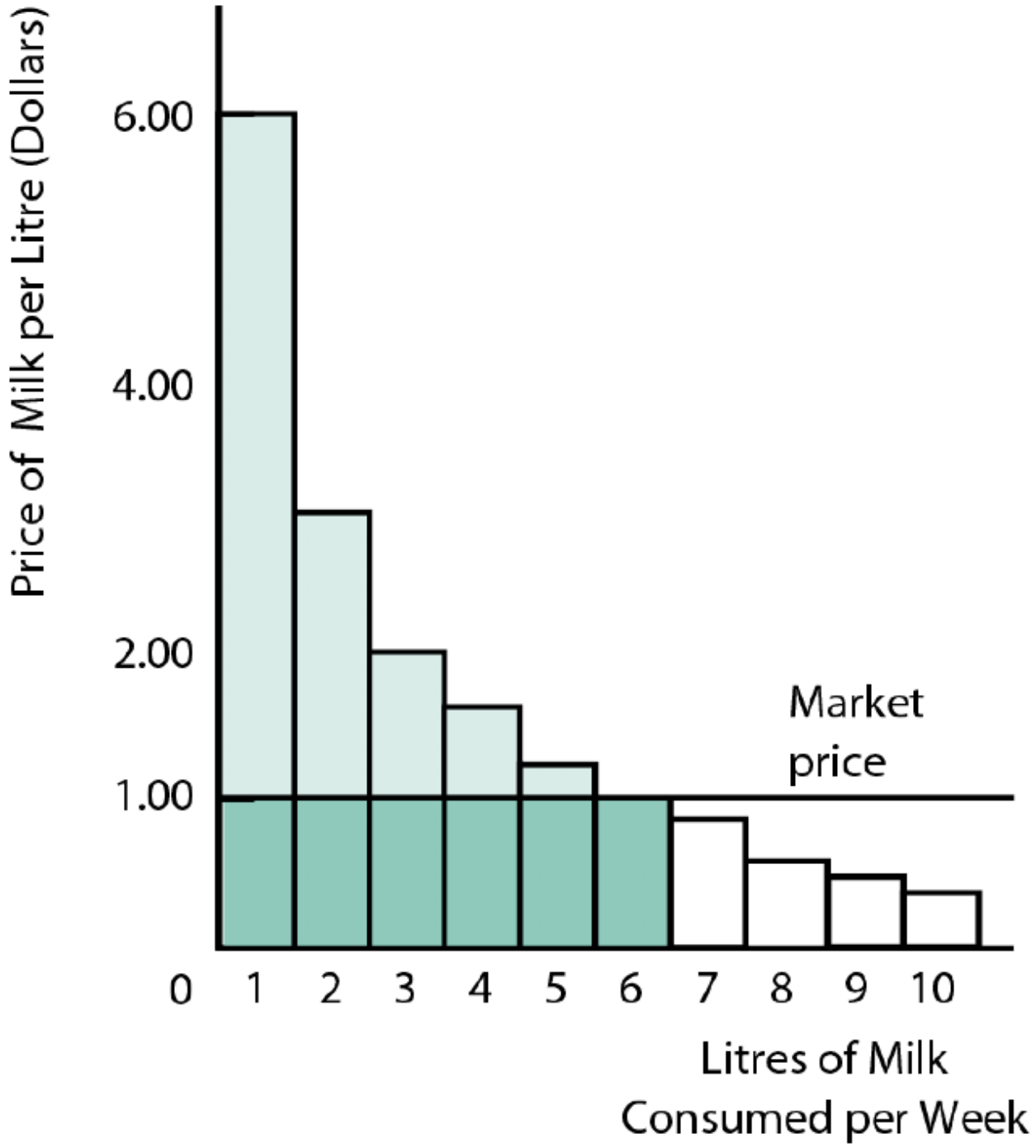
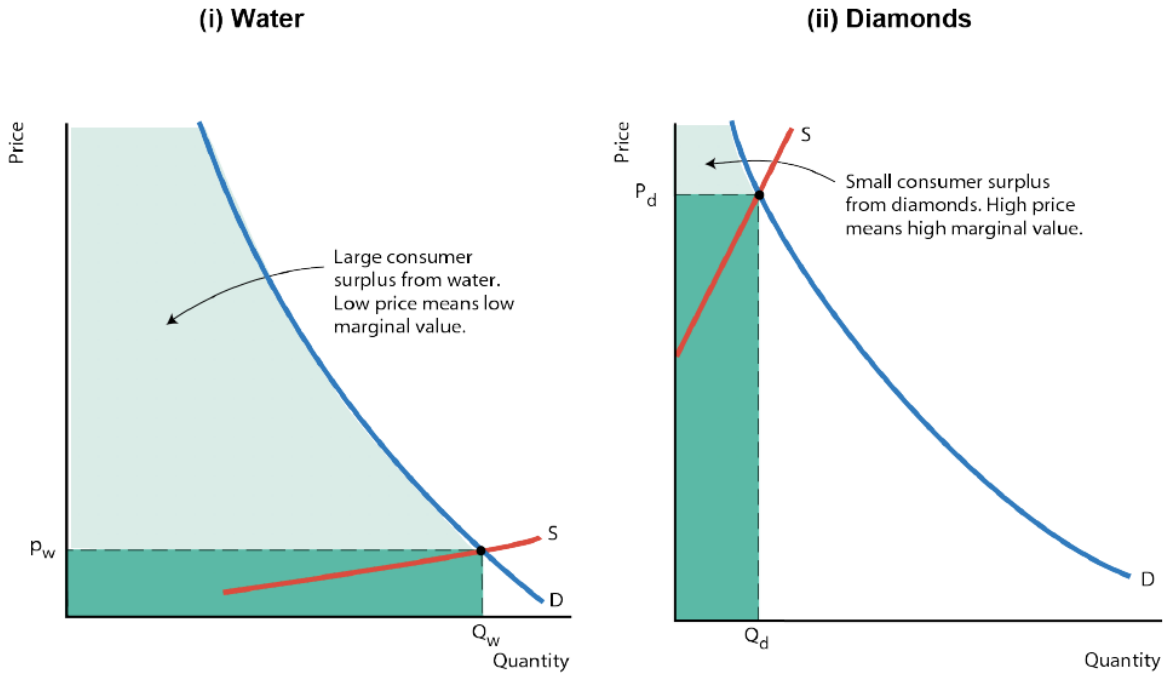


Figure 23. Consumer Surplus on Milk Consumption

- The value placed by a consumer on the total consumption of some product can be estimated in two ways
  1. The valuations that the consumer places on each unit may be summed
  2. The consumer may be asked how much he or she would be willing to pay to consume the **total** amount if the alternative were to consume **more**
- It is important to understand the difference between marginal value and total value to the consumer

The Paradox of Value

- Water is cheap but "invaluable", whereas diamonds are expensive but mostly unnecessary
- We must distinguish between total value (area under the curve) from marginal value (height of the curve)



Producers in the Short Run

What Are Firms?

- Firms come in six basic types
  1. Single proprietorships
  2. Ordinary partnerships
  3. Limited partnerships
  4. Corporations
  5. State-owned corporations
  6. Non-profit organizations
- Some firms are transnational corporations, or often called multinational enterprises

Financing of Firms

- Firms use financial capital - **equity** and **debt**
- A firm acquires funds from its owners in return for **stocks**, **shares**, or **equity**
- A firm's creditors are lenders (not owners) - using debt instruments or **bonds**. Firms have the obligation to repay the principal and some interest to the lender

Goals of Firms

- Economists usually make two key assumptions about firms
  1. Firms are assumed to be profit-maximizers
  2. Each firm is assumed to be a single, consistent decision making unit

Production, Costs, and Profits

Production

- Firms use four types of inputs for production
  1. Intermediate products
  2. Inputs provided by nature
  3. Inputs provided by people
  4. Inputs provided by the services of physical capital
- Factors of production: **land, labour, capital**
- The **production function** describes the technological relationship between the inputs the firm uses and the output it produces
  $q = f(L,K)$
- Production is a flow, number of units per period time

Costs and Profits

- Profit = Total Revenue - Total Cost
- Accounting Profits = Total Revenue - Explicit Costs
- Economic Profits = Total Revenue - (Explicit + Implicit Costs)
- Implicit costs: **Opportunity cost of the owner's time and capital** in the firm's costs
  Economic Profits < Accounting Profits
  If economic profit is positive, then the owner's capital is earning more than it could in its next best alternative use

Profit-Maximizing Output

- A firms economic profit is equal to total revenues minus total (economic) costs
  π=TR - TC
- What happens to profits as output changes depends on what happens to both revenues and costs
- TR: depends on the type of demand firms' face
- TC: depends on the time horizons for decision making

Time Horizons for Decision Making

- The **short run** is a length of time over which some of the firms factors of production are fixed
  - Typically capital is fixed in the short run
- The **long run** is the length of time over which all of the firm's factors of production can be varied, but its technology is fixed
- The **very long run** is the length of time over which all the firm's factors of production **and** its technology can be varied

Production in the Short Run

Total, Average, and Marginal Products

- **Total Product (TP)** is the total amount of output that is produced during a given period of time
- **Average Product (AP)** is the total product divided by the number of units of the variable factor used to produce it (usually labour)
  AP = TP/L
- The **marginal product (MP)** is the change in total output that results from using one more unit of a variable factor

$$MP = \frac{\Delta TP}{\Delta L}$$

Figure 24. Total Product

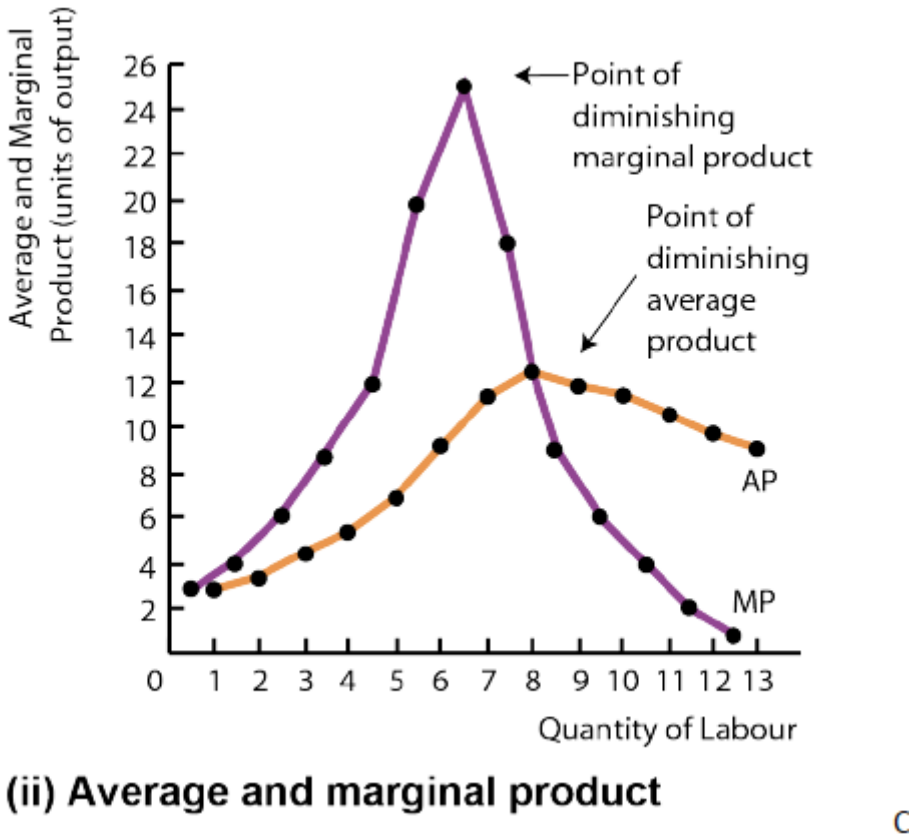
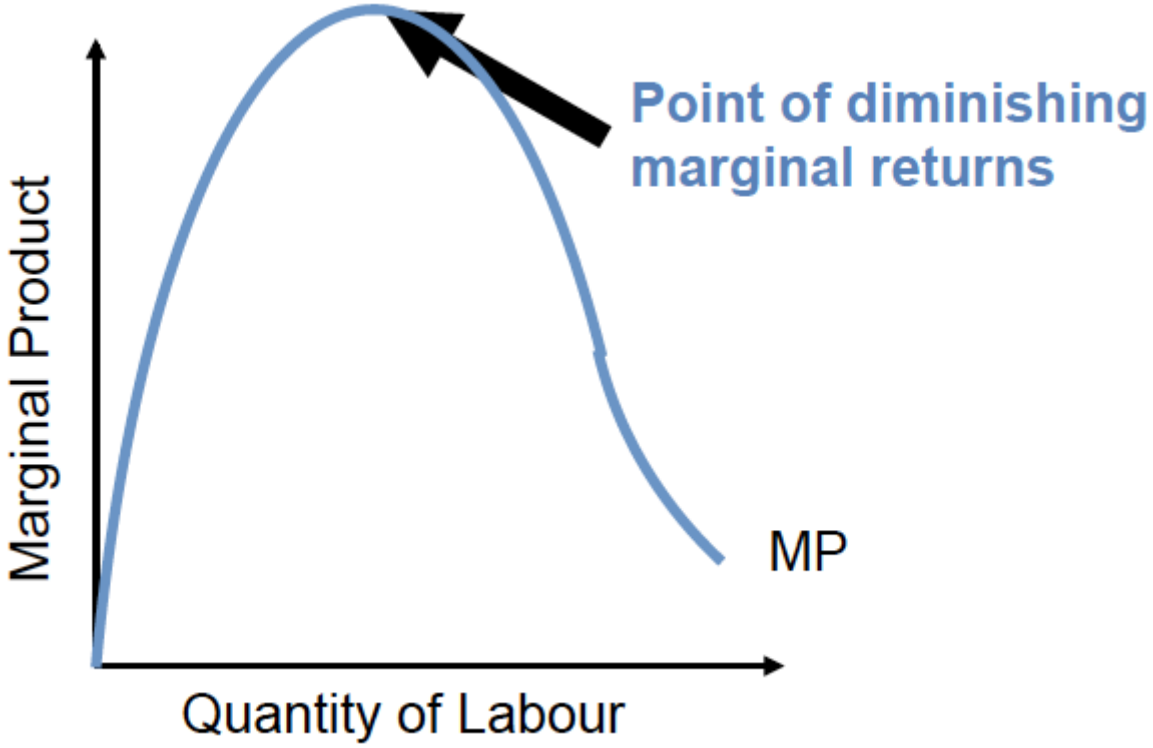


Figure 25. Average and Marginal Product

- MP is the slope, TP is the curve

Diminishing Marginal Product

- The **law of diminishing returns**
- As workers are added to a production process, each can specialize in one task, and the workers' marginal product initially rises
- But there is a fixed amount of physical capital, eventually the marginal product is likely to fail

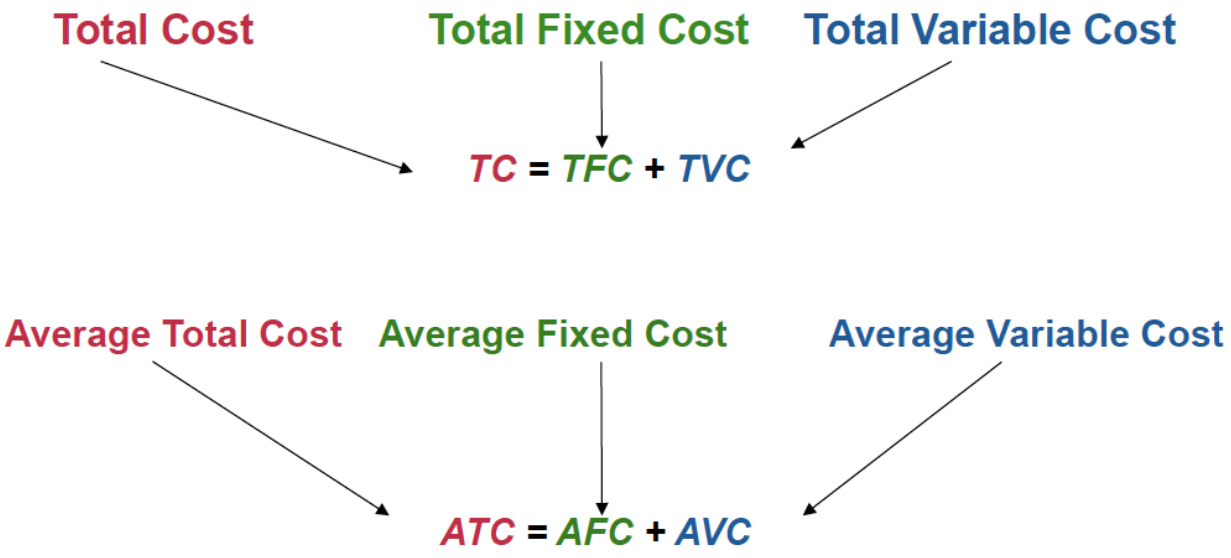


The Average-Marginal Relationship

- If an additional worker's output raises the average product, the **MP** must exceed **AP**
- Similarly, if the marginal worker's output reduces the average product, the **MP** must be less than the **AP**
  - the **AP** curve slopes upward as long as the **MP** curve is above it
- The **MP** curve must intersect the **AP** curve at its maximum point

Costs in the Short Run

Defining Short-Run Costs



- **Marginal Cost (MC)** is the increase in total resulting from increasing output by one unit

$$MC = \frac{\Delta TC}{\Delta Q}$$

- Because fixed costs do not vary the output, the only part of **TC** that changes is the **variable cost**

Why U-Shaped Curve

- **KEY IDEA** each additional worker adds the same amount to total cost but a different amount to total output
- Eventually diminishing **MP** of the variable factor implies eventually rising **MC**

NOTE	**MC** reaches its minimum when **MP** reaches its maximum

- Initially each additional worker costs the same but adds more output than the previous one
- Eventually each additional worker costs the same but adds less output than the previous one

Short-Run Cost Curves

- **MC** is the slop of the **TVS** curve
- **TFC** do not vary with output, it is horizontal
- **TC=TVC+TFC**

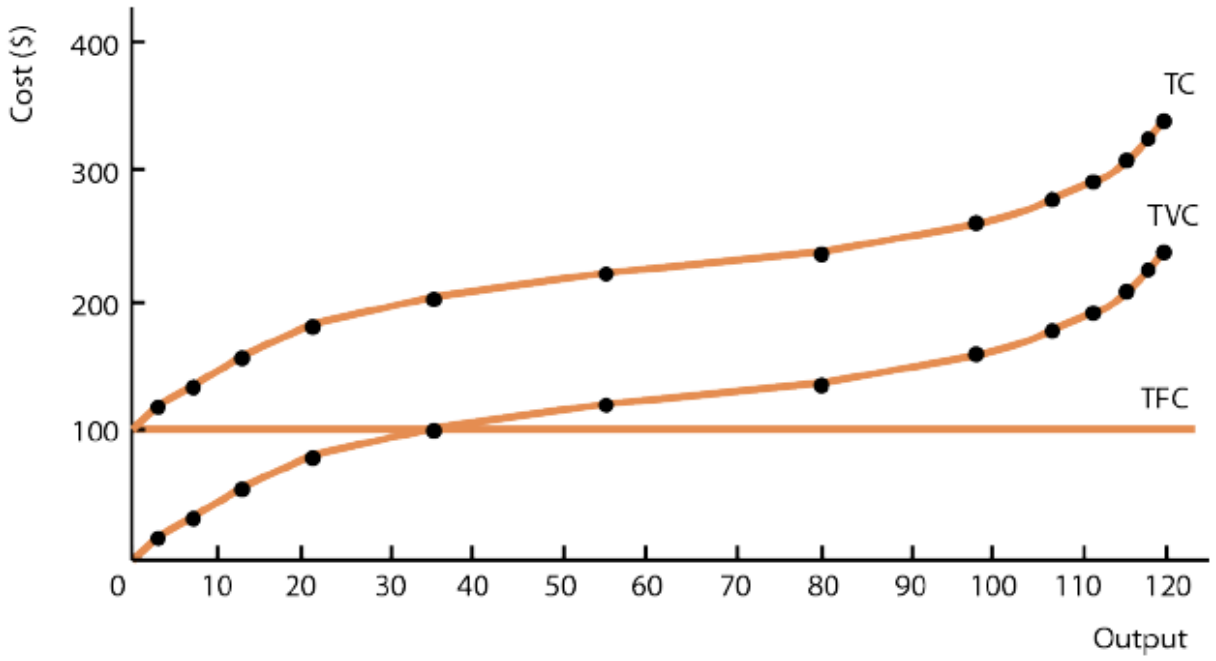


Figure 26. Total Cost Curve

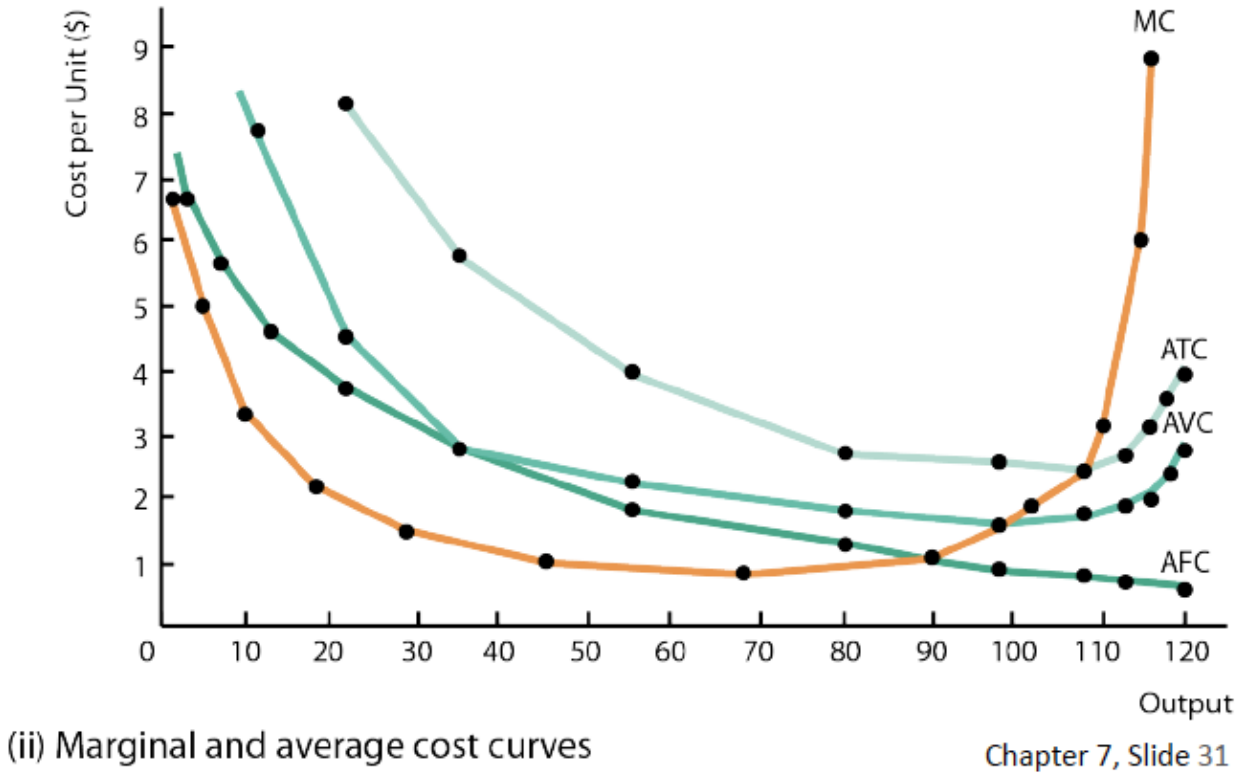


Figure 27. Marginal and Average Cost Curve

- **ATC=AVC+AFC**
- **AFC** declines steadily as output rides - this is called spreading the overhead

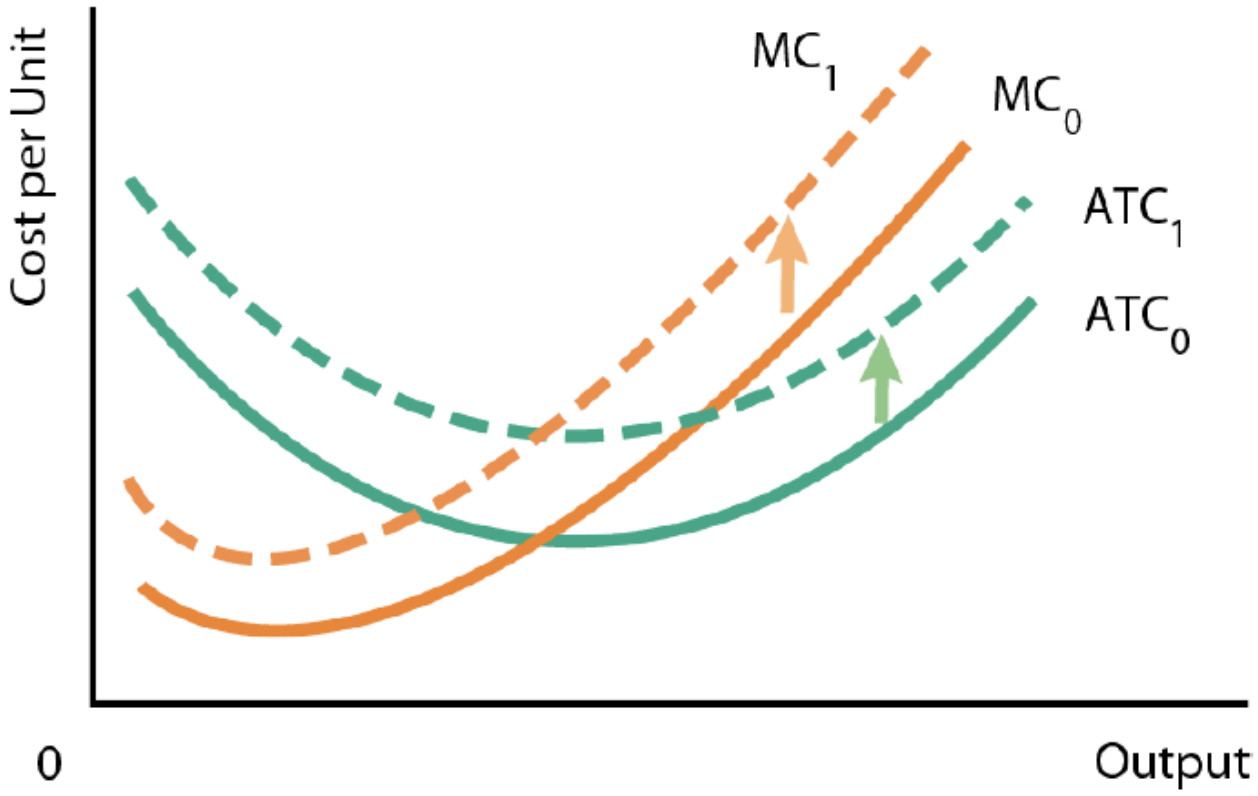
The Shape of the ATC Curve

- Failing **AFC** tends to push down **ATC**
- rising **MC** tends to push up **ATC**
- at some point the second effect overcome the first effect and **ATC** begins to rise
- **ATC** slopes downward when **MC** is below, slopes upward when **MC** is above

Capacity

- The level of output that corresponds to the minimum short-run **ATC** is the **capacity** of the firm
- Capacity is the largest output that can be produced without encountering rising average cost per unit
- A firm that is producing at an output less than the point of minimum **ATC** is said to have **excess capacity**

Shifts in Short-Run Cost Curves



- A change in the price of any variable input will shift the **ATC** and **MC** curves upward for a price increase and downward for a price decrease
- There is also a different short-run cost curve given quantity of the fixed factor s