UNIT 2

Supply and Demand

How competitive markets set prices, measure efficiency, and respond to elasticity and government policy

20–25%	13–15	9
EXAM WEIGHTING	CLASS PERIODS	TOPICS IN UNIT

Teacher presentation · Aligned to the College Board Course and Exam Description

What This Unit Covers

TOPICS IN THIS UNIT

- 2.1 Demand
- 2.2 Supply
- 2.3 Price Elasticity of Demand
- 2.4 Price Elasticity of Supply
- 2.5 Other Elasticities
- 2.6 Market Equilibrium and Consumer & Producer Surplus
- 2.7 Market Disequilibrium and Changes in Equilibrium
- 2.8 The Effects of Government Intervention in Markets
- 2.9 International Trade and Public Policy

BIG IDEAS

- MKT — Scarcity and Markets: What determines the market price of a good?
- POL — Market Inefficiency and Public Policy: How does government policy affect outcomes?

WHY IT MATTERS

The supply-and-demand model explains how the interaction of consumers and producers in competitive markets determines prices and leads to an efficient allocation of scarce resources — and how elasticity and government policy alter those outcomes.

20–25% of the AP Exam multiple-choice and free-response score

TOPIC 2.1

Demand

Enduring Understanding MKT-3 — Individuals and firms respond to incentives and face constraints.

LEARNING OBJECTIVES: MKT-3.A — The law of demand and consumer decision-making. MKT-3.B — Buyers' responses to changes.

The Law of Demand

The law of demand: a change in a good's own price causes a change in quantity demanded in the OPPOSITE direction.

- Price and quantity demanded are inversely related — the demand curve slopes downward.
- A change in the good's own price is a MOVEMENT ALONG the curve — a change in quantity demanded.
- The downward slope is explained by the income effect, the substitution effect, and diminishing marginal utility.
- Market demand is the horizontal sum of all individual consumers' demand curves.

KEY TAKEAWAY

A change in the good's own price moves you along the demand curve. The demand curve is also a marginal benefit curve.

The Determinants of Demand

A change in any factor OTHER than the good's own price shifts the entire demand curve.

- TASTES & PREFERENCES — trends and advertising change demand.
- INCOME — for a normal good, higher income raises demand; for an inferior good, it lowers demand.
- PRICES OF RELATED GOODS — a substitute's price rise raises demand; a complement's price rise lowers it.
- NUMBER OF CONSUMERS and EXPECTATIONS about future prices or income also shift demand.

KEY TAKEAWAY

The good's own price moves you ALONG demand. Any determinant SHIFTS the whole demand curve.

Change in Demand vs. Change in Quantity Demanded

This distinction is one of the most heavily tested — and most often missed — ideas in the course.

Change in Quantity Demanded

A MOVEMENT ALONG a fixed demand curve. The cause is ALWAYS a change in the good's own price. Example: the price of coffee falls, so consumers buy more coffee.

Change in Demand

A SHIFT of the entire demand curve. The cause is a change in a determinant — tastes, income, related-goods prices, number of buyers, or expectations.

The Diagnostic Question

Ask: 'Did the good's OWN price cause this?' If yes → move along the curve. If no → shift the curve. The good's own price NEVER shifts its own demand curve.

TOPIC 2.2

Supply

The producer side of the competitive market — a mirror image of demand.

LEARNING OBJECTIVES: MKT-3.C — The law of supply. MKT-3.D — Producers' responses to changes in incentives and technology.

The Law of Supply

The law of supply: a change in a good's own price causes a change in quantity supplied in the SAME direction.

- Price and quantity supplied are positively (directly) related — the supply curve slopes upward.
- A change in the good's own price is a MOVEMENT ALONG the supply curve.
- Higher prices make production more profitable, so firms supply more.
- Market supply is the horizontal sum of all individual producers' supply curves.

KEY TAKEAWAY

A change in the good's own price moves you along the supply curve. The market supply curve is upward-sloping.

The Determinants of Supply

A change in any factor other than the good's own price shifts the supply curve. Memory aid: ROTTEN.

- RESOURCE (input) prices — cheaper inputs raise supply; costlier inputs reduce it.
- OTHER goods' prices, TECHNOLOGY (better tech lowers cost and raises supply).
- TAXES and subsidies — taxes shift supply left; subsidies shift it right.
- EXPECTATIONS of producers and the NUMBER of sellers also shift supply.

KEY TAKEAWAY

The good's own price moves you along supply. A ROTTEN determinant shifts the whole curve.

Change in Supply vs. Change in Quantity Supplied

Change in Quantity Supplied

A MOVEMENT ALONG the supply curve, caused only by a change in the good's own price. Example: the price of wheat rises, so farmers supply more wheat.

Change in Supply

A SHIFT of the entire supply curve, caused by a ROTTEN determinant. Example: a frost destroys crops (an input shock) — the whole curve shifts left.

Same Diagnostic Question

Ask: 'Did the good's OWN price cause this?' Yes → move along. No → shift. Apply the identical test to both supply and demand.

TOPIC 2.3

Price Elasticity of Demand

Measuring how strongly quantity demanded responds to a change in price.

LEARNING OBJECTIVES: MKT-3.E — Define, explain, and calculate measures of elasticity and the effect on total revenue.

Calculating Price Elasticity of Demand

Price elasticity of demand measures the responsiveness of quantity demanded to a change in price.

PRICE ELASTICITY OF DEMAND

PED = %change Qd / %change P

Use PERCENTAGE changes, not raw changes. Example: a 10% price rise causes a 20% drop in quantity demanded → PED magnitude = 20/10 = 2.

PERCENTAGE CHANGE

%change = (new - old) / old x 100

Compute the percentage change in quantity and in price separately, then divide. Economists use the magnitude (absolute value) of PED.

Categories of Elasticity

The benchmark is a magnitude of 1 — where price and quantity changes are exactly proportional.

- ELASTIC (PED > 1) — quantity is highly responsive; demand curve is relatively flat.
- INELASTIC (PED < 1) — quantity is unresponsive; demand curve is relatively steep.
- UNIT ELASTIC (PED = 1) — the percentage changes in price and quantity are equal.
- PERFECTLY INELASTIC (PED = 0) is vertical; PERFECTLY ELASTIC (PED = infinity) is horizontal.

KEY TAKEAWAY

Elastic = responsive (PED > 1). Inelastic = unresponsive (PED < 1). The dividing benchmark is a magnitude of 1.

Elasticity Varies Along a Linear Demand Curve

On a straight-line demand curve the slope is constant, but elasticity is NOT — slope is not elasticity.

- The UPPER portion of a linear demand curve is elastic (PED > 1).
- The MIDPOINT is unit elastic (PED = 1).
- The LOWER portion is inelastic (PED < 1).
- Elasticity falls steadily as you move down the curve, even though the slope never changes.

KEY TAKEAWAY

Slope is constant along a linear demand curve, but elasticity falls as you move down it. Slope is NOT elasticity.

Determinants of PED and the Total Revenue Test

What Makes Demand Elastic

Demand is more elastic when there are many SUBSTITUTES available, when the good is a luxury, when it takes a large share of the budget, and over a longer time horizon.

The Total Revenue Test

If demand is ELASTIC, price and total revenue move in OPPOSITE directions. If INELASTIC, they move TOGETHER. If UNIT elastic, total revenue does not change.

Why It Matters

Firms and governments use the total revenue test: a seller facing inelastic demand can raise revenue by raising price; one facing elastic demand cannot.

TOPIC 2.4

Price Elasticity of Supply

Measuring how strongly quantity supplied responds to a change in price.

LEARNING OBJECTIVES: MKT-3.E — Define, explain, and calculate price elasticity of supply.

Price Elasticity of Supply

The Formula

PES = percentage change in quantity supplied ÷ percentage change in price. It measures the responsiveness of quantity supplied to a price change.

The Categories

Same benchmark of 1: elastic (PES > 1), inelastic (PES < 1), unit elastic (PES = 1). The extremes are perfectly elastic (horizontal) and perfectly inelastic (vertical).

Determinants of PES

Supply is more elastic when producers can easily adjust — availability and price of alternative inputs, spare capacity, the ability to store goods, and a longer time horizon.

TOPIC 2.5

Other Elasticities

Elasticity can be measured for any determinant — not just a good's own price.

LEARNING OBJECTIVES: MKT-3.E — Income elasticity of demand and cross-price elasticity of demand.

Income and Cross-Price Elasticity of Demand

The SIGN of these elasticities — positive or negative — classifies the type of good or the relationship.

INCOME ELASTICITY OF DEMAND

- **= %change in Qd / %change in income**
- Measures how demand responds to a change in consumer income.
- POSITIVE → a NORMAL good (demand rises with income).
- NEGATIVE → an INFERIOR good (demand falls as income rises).

CROSS-PRICE ELASTICITY OF DEMAND

- **= %change in Qd of good A / %change in price of good B**
- Measures how the demand for one good responds to another good's price.
- POSITIVE → the goods are SUBSTITUTES.
- NEGATIVE → the goods are COMPLEMENTS. Zero → unrelated goods.

TOPIC 2.6

Market Equilibrium and Consumer & Producer Surplus

Enduring Understanding MKT-4 — Equilibria are stable, but markets move to new equilibria when conditions change.

LEARNING OBJECTIVES: MKT-4.A — Define equilibrium, consumer surplus, and producer surplus; calculate the surplus areas.

Market Equilibrium

Equilibrium is the price at which quantity demanded equals quantity supplied — the market clears.

- Equilibrium occurs where the demand and supply curves intersect.
- At equilibrium, buyers wish to purchase exactly the quantity sellers wish to provide — no surplus, no shortage.
- The equilibrium price conveys information that guides the allocation of scarce resources.
- Equilibrium is stable: with no change in conditions, there is no pressure for price to move.

KEY TAKEAWAY

Equilibrium clears the market: quantity demanded = quantity supplied. The equilibrium price guides resource allocation.

Consumer and Producer Surplus

Surplus measures the benefit a market creates for buyers and sellers — the gains from trade.

- CONSUMER SURPLUS is the area below the demand curve and above the price — buyers' willingness to pay minus what they actually pay.
- PRODUCER SURPLUS is the area above the supply curve and below the price — what sellers receive minus their cost.
- TOTAL ECONOMIC SURPLUS = consumer surplus + producer surplus.
- Calculate each as the area of a triangle: one-half times base times height.

KEY TAKEAWAY

Consumer surplus sits below demand and above price; producer surplus sits above supply and below price. Together they are total surplus.

Efficiency: Markets Maximize Total Surplus

The Market Clears Efficiently

At the competitive equilibrium, every unit whose marginal benefit exceeds its marginal cost is produced and traded — and no unit beyond that point is.

Total Surplus Is Maximized

In the absence of market failures, market equilibrium maximizes total economic surplus. Perfectly competitive markets are allocatively efficient.

Why This Matters

This efficiency result is the benchmark for the rest of the course — Units 4 and 6 study what happens when markets are NOT perfectly competitive or fail.

TOPIC 2.7

Market Disequilibrium and Changes in Equilibrium

How markets self-correct, and how shifts move price, quantity, and surplus.

LEARNING OBJECTIVES: MKT-4.B — Surpluses and shortages; how shocks alter price, quantity, and surplus.

Disequilibrium: Surpluses and Shortages

When price is not at equilibrium, market forces push it back. Markets are self-correcting.

- SURPLUS (excess supply): price is ABOVE equilibrium → quantity supplied exceeds quantity demanded → price is bid down.
- SHORTAGE (excess demand): price is BELOW equilibrium → quantity demanded exceeds quantity supplied → price is bid up.
- The size of a surplus or shortage is the horizontal gap between the supply and demand curves at that price.
- Price adjusts until the imbalance is eliminated and the market returns to equilibrium.

KEY TAKEAWAY

Price above equilibrium → surplus → price falls. Price below equilibrium → shortage → price rises.

Changes in Equilibrium

When a determinant changes, a curve shifts and the market settles at a new equilibrium.

- Increase in demand → price rises, quantity rises. Decrease in demand → price falls, quantity falls.
- Increase in supply → price falls, quantity rises. Decrease in supply → price rises, quantity falls.
- Shifts also change consumer surplus, producer surplus, and total surplus.
- When both curves shift, one of the two equilibrium values is indeterminate without knowing the relative shift sizes.

KEY TAKEAWAY

Demand shifts move price and quantity the SAME way; supply shifts move them OPPOSITE ways. Double shifts leave one variable indeterminate.

TOPIC 2.8

The Effects of Government Intervention in Markets

Enduring Understanding POL-1 — Government policies influence consumer and producer behavior and affect outcomes.

LEARNING OBJECTIVES: POL-1.A — Price and quantity controls, taxes and subsidies, deadweight loss, and tax incidence.

Price Ceilings

A price ceiling is a legal maximum price. It is binding only when set BELOW the equilibrium price.

- A binding price ceiling sits below equilibrium, so quantity demanded exceeds quantity supplied — a persistent SHORTAGE.
- Examples include rent control and limits on the price of necessities.
- A binding ceiling creates DEADWEIGHT LOSS — mutually beneficial trades no longer happen.
- A ceiling set ABOVE equilibrium is non-binding and has no effect.

KEY TAKEAWAY

A binding price ceiling is set below equilibrium and causes a persistent shortage and deadweight loss.

Price Floors

A price floor is a legal minimum price. It is binding only when set ABOVE the equilibrium price.

- A binding price floor sits above equilibrium, so quantity supplied exceeds quantity demanded — a persistent SURPLUS.
- Examples include the minimum wage and agricultural price supports.
- A binding floor also creates DEADWEIGHT LOSS — beneficial trades are prevented.
- A floor set BELOW equilibrium is non-binding and has no effect.

KEY TAKEAWAY

A binding price floor is set above equilibrium and causes a persistent surplus and deadweight loss.

Per-Unit Taxes, Deadweight Loss, and Incidence

A per-unit tax shifts the supply curve up by the amount of the tax, raising the price buyers pay and lowering what sellers keep.

- Buyers pay a higher price (Pb); sellers receive a lower net price (Ps). The gap between them is the tax.
- Equilibrium quantity falls, and a DEADWEIGHT LOSS triangle appears — lost gains from trade.
- TAX INCIDENCE — who bears the burden — depends on relative elasticity.
- The more INELASTIC side of the market bears the larger share of the tax burden.

KEY TAKEAWAY

A tax drives a wedge between Pb and Ps, shrinks quantity, and creates deadweight loss. The more inelastic side pays more of the tax.

Why Intervention Creates Deadweight Loss

Efficient Markets Are Already Optimal

A competitive market with no market failure already maximizes total surplus. Any price control, tax, or quantity control moves output away from the efficient quantity.

Deadweight Loss

Deadweight loss is the loss of total surplus — the value of mutually beneficial trades that no longer occur because of the intervention.

Taxes, Subsidies, and Revenue

Taxes and subsidies change incentives and shift the supply or demand curve. Taxes raise government revenue; subsidies are a government cost.

TOPIC 2.9

International Trade and Public Policy

How opening to trade — and restricting it with tariffs and quotas — changes market outcomes.

LEARNING OBJECTIVES: POL-1.B — Define tariffs and quotas; explain how public policy affects markets through international trade.

International Trade and Tariffs

Opening an economy to trade lets the world price replace the autarky price, and trade fills the gap between domestic supply and demand.

- At the world price, the gap between domestic quantity demanded and domestic quantity supplied is filled by trade.
- Opening to trade changes consumer surplus, producer surplus, and total economic surplus.
- A TARIFF — a tax on imports — raises the domestic price, increases domestic production, and reduces imports.
- A tariff generates government revenue but reduces consumer surplus and total economic surplus.

KEY TAKEAWAY

Free trade lets a country consume at the world price; a tariff raises the domestic price, cuts imports, and reduces total surplus.

Tariffs and Quotas Compared

Tariffs

A tariff is a tax on imported goods. It raises the domestic price and quantity supplied domestically, reduces quantity demanded and imports, and generates government revenue.

Quotas

A quota is a legal limit on the quantity of a good that may be imported. It restricts the quantity available, raising the domestic price.

Effects on Surplus

Both tariffs and quotas raise domestic prices, reduce consumer surplus, and reduce total economic surplus. A key difference: a tariff generates government revenue; a quota generally does not.

Common Pitfalls & Exam Tips

Elasticity uses percentages

PED = % change in quantity ÷ % change in price. Never use raw changes. Compute each percentage change first.

Slope is not elasticity

On a linear demand curve, slope is constant but elasticity falls as you move down — elastic on top, inelastic on bottom.

Shift vs. movement along

A change in the good's own price moves you along the curve. A determinant shifts the whole curve.

Pick the right surplus area

Consumer surplus is below demand and above price; producer surplus is above supply and below price. Verify before calculating.

Binding controls only

A ceiling matters only below equilibrium; a floor only above. Non-binding controls have no effect.

Tax incidence and elasticity

The more inelastic side of the market bears the larger share of a tax. Label Pb and Ps clearly.

Unit 2 — Key Takeaways

1. The law of demand (inverse) and law of supply (direct) describe how the good's own price moves quantity along each curve.
2. Determinants shift the whole curve; equilibrium is where supply and demand intersect and the market clears.
3. Price elasticity (% change in quantity ÷ % change in price) measures responsiveness and predicts the total-revenue effect.
4. Consumer and producer surplus measure the gains from trade; competitive equilibrium maximizes total surplus.
5. Price ceilings, floors, and taxes in an efficient market create shortages, surpluses, and deadweight loss.
6. Opening to trade changes surplus; tariffs and quotas raise domestic prices and reduce total economic surplus.