

Spring 2022 Intermediate Microeconomics Outline

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2. Supply and Demand

- Demand: Curves, Functions, Schedules
- Law of Demand
- Shifts in Demand
- Factors influencing Demand
- Supply: Curves, Functions, Schedules
- Law of Supply
- Shifts in Supply
- Factors influencing Supply
- Market Equilibrium
- What Happens when Supply and Demand Don't Intersect
- Effects of Shifts of Supply and/or Demand
- Measuring Demand: Inverse Slope
- Measuring Demand: Elasticity, %-change in Quantity/%-change in Price
- Elasticity with Linear Demand
- Relation between Elasticity of Demand and Total Spending (revenue)
- Elasticities of Demand: Price, Cross-price, Income
- Elasticity of Supply

3. Using Supply and Demand to Analyze Markets

- Consumer's Surplus, Value minus Cost
- Demand Curve as Marginal Value to Consumer—Marginal Willingness to Pay
- Producer's Surplus (in short run $PS = \text{Profit} + FC$, in long run $PS = \text{Profit}$)
- Price Ceilings and Floors
- Equilibrium with Excise or Sales Taxes
- Equilibrium Tax Incidence & Elasticity

$$t_d = t \times \frac{|\varepsilon_s|}{|\varepsilon_s| + |\varepsilon_d|}, \quad t_s = t \times \frac{|\varepsilon_d|}{|\varepsilon_s| + |\varepsilon_d|}$$

- Direct and Indirect Tax Burdens
- Subsidies and Deadweight Loss

4. Consumer Behavior

- Consumption Bundles or Market Baskets of Goods
- Preferences: Completeness, Transitivity, Monotonicity (More is Better)
- Indifference Map and Utility
- Marginal Utility
- Subjective Trade-offs: Marginal Rate of Substitution—Absolute Slope of Indifference Curves
 $MRS = MU_x / MU_y$
- Substitutes, Complements and the Shape of Indifference Curves
- Constraints: The Budget Line
- Objective Trade-offs: Relative Price—Absolute Slope of Budget Lines, p_x/p_y
- Consumer's Optimum I:

$$1) MRS = p_x/p_y \quad \text{or} \quad MU_x/p_x = MU_y/p_y$$

$$2) p_x x + p_y y = m$$

- Consumer's Optimum II: Corner Solutions
- Demand: Cobb-Douglas, Perfect Substitutes, Perfect Complements

5. Individual and Market Demand

- Price and Real Income
- Income Expansion Path and Engel Curve
- How much does utility cost? Cost Minimization
- Behind the Demand Curve: Income and Substitution Effects
- Inferior Goods and Giffen Goods
- Application: Labor Supply
- Application: Borrowing and Saving

6. Producer Behavior

- Production Function
- Short-run (at least one fixed input) and Long-run (no fixed inputs)
- Production with a single variable factor
 - Total, Average, and Marginal Products
 - Relation between Marginal and Average
 - Law of Diminishing Returns
- Production with two variable inputs (e.g., long-run)
 - Isoquants
 - Marginal Rate of Technical Substitution: $MRTS_{LK} = MP_L / MP_K$ (slope of isoquant)
 - Shape of isoquants and substitution (more sharply curved = more complementary)
 - Constant, Diminishing and Increasing Returns to Scale
 - Technical Change, Total Factor Productivity

7. Costs

- Opportunity Cost
- Sunk Costs
- Costs in Short-run: FC (from fixed factor K), VC (from variable factor L)
- Shape of Short Run Cost Curves: ATC, AVC, MC
- Long-run Cost Minimizing Inputs
- Minimum requires $MRTS_{LK} = w/r$. Equivalently, $MP_K / r = MP_L / w$.
- Deriving the Cost Function
- Relation of SR and LR Cost Curves
- In short run, $MC = w / MP_L$. In long run, $MC = w / MP_L = r / MP_K$
- Returns to Scale

8. Supply in a Competitive Market

- Perfectly Competitive Markets
- Demand as seen by a Price-taker, Price-taking implies $MR = p$
- Profit Maximization: $MR = MC$ becomes $p = MC$
- Derived Demand: $w = p \times MP_L$, $r = p \times MP_K$.
- Short-run Shutdown condition ($p < AVC$)
- Supply is MC curve (above AVC)
- Profitability (compare p and ATC)
- Producer's Surplus (compare p and AVC)
- Entry and Exit imply Zero Long-run Economic Profit
- In Long-run Equilibrium: $p = MC = ATC$
- Long-run Supply: Increasing and Constant Cost Industries
- Analysis of Economic Changes (Demand, Costs) in Short and Long Runs
 - Demand Shifts
 - Taxes

9. Market Power and Monopoly

- Monopoly: One seller, no entry, no close substitutes
- Sources of Monopoly
- Marginal Revenue: $MR = p \times (1 + 1/\varepsilon_D) < p$
- Marginal Revenue with Linear Demand: Same vertical intercept, twice the slope. I.e., if $p = a - bq$, $MR = a - 2bq$
- Profit Maximization: $MR = MC$
- Profit Maximization with Markup Pricing: $p = \frac{\varepsilon_D}{1+\varepsilon_D} \times MC$
- Response of Monopoly to Shifts in Demand
- Response of Monopoly to Cost Changes
- Excise Taxes and Monopoly
- Deadweight Loss due to Monopoly
- Regulation: Effect of Price Ceilings

10. Market Power and Pricing Strategies

- The Key: Preventing Resale
- Perfect Price Discrimination (First Degree)
- Price Discrimination: Segmented Markets (Third Degree): $p_i/p_j = (1 + 1/\varepsilon_j)/(1 + 1/\varepsilon_i)$ where ε is the signed elasticity of demand
- Indirect Price Discrimination (Second Degree): Quantity Discounts, Versioning, and Coupons
- Price Discrimination: Bundling
- Advanced Pricing Strategies: Two-part Tariffs

11. Imperfect Competition

- (Nash) Equilibrium in Oligopoly
 - Best Responses
 - Equilibrium as Mutual Best Responses
 - Example: Advertising Game
 - Dominant Strategies
- Oligopoly: Few sellers of identical or differentiated products. Esp. duopoly = 2 sellers.
- Cartels
- When are Cartels unstable? (covered in game theory chapter)
- Cournot Competition
 - Cournot Competition with two firms
 - Cournot Competition with many firms
 - Cournot Competition with entry (Fixed cost controls entry)
- Stackelberg Competition
- Bertrand Competition with Identical Goods ($P = MC$)
- Bertrand Competition with Differentiated Goods (Reaction Functions)

12. Game Theory

- What is a Game?
 - Pure and Mixed Strategies
 - Expected Payoffs
 - Nash Equilibrium
 - Dominant Strategies
- Games with Multiple Nash Equilibria
 - Coordination Game
 - Escape! (full information)
- Games that require Mixed Strategies for solution
 - Rock, Paper, Scissors
 - Escape! (partial information)
- Extensive Form Games
 - Imperfect Information
 - Perfect Information
 - Solution by Backwards Induction
- Repeated Games
- Grim Trigger and Tit-for-tat: Probabilities and Discounting
- Sequential Games
- Entry Deterance

14. Investment, Time, and Insurance

- Interest Rates and Discounting
- Present (Discounted) Value
- Bond Prices and Interest Rates
- Net Present Value and Investment
- Rule of 72