Microeconomics in 40 Slides or Less

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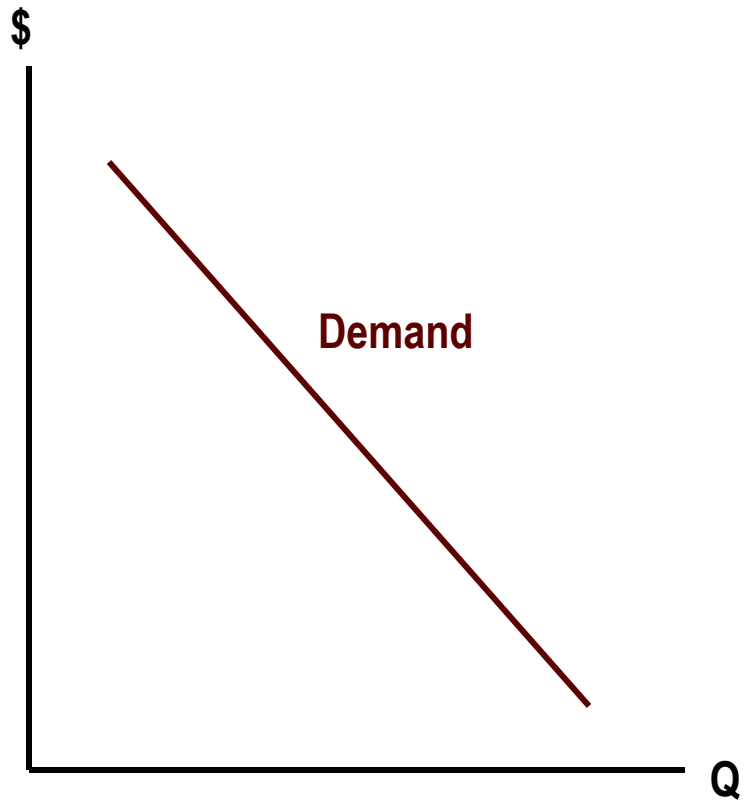
Overview

- Tools
  - demand & supply curves
  - elasticity
  - cost concepts & curves
- Industry Types
  - competitive
  - monopoly
  - oligopoly
  - monopolistic competition
- Applications
  - imperfect information
  - network effects
- Thinking Like an Economist

1. Capitalist Tools

1a. Demand Curves

- DC's plot what someone is willing to pay for each unit purchased
  - or how many can be sold at each price
- *Always slopes down* (why?)
  - can derive demand curves from analysis of indifference curves & budget constraints
- 2 useful properties
  - elasticity
  - consumer surplus



Elasticity of Demand

- $\varepsilon = \%\Delta Q / \%\Delta P = (dQ/dP)(P/Q)$
- Intuitively
  - % change in sales for a given % change in price
  - measures price sensitivity of your customers
- A units-free measure of how sales vary with price
  - always negative; often referred to informally in absolute value terms
  - *inelastic* demand: "small" elasticity close to zero
  - *elastic* demand: "large" elasticity approaching $-\infty$

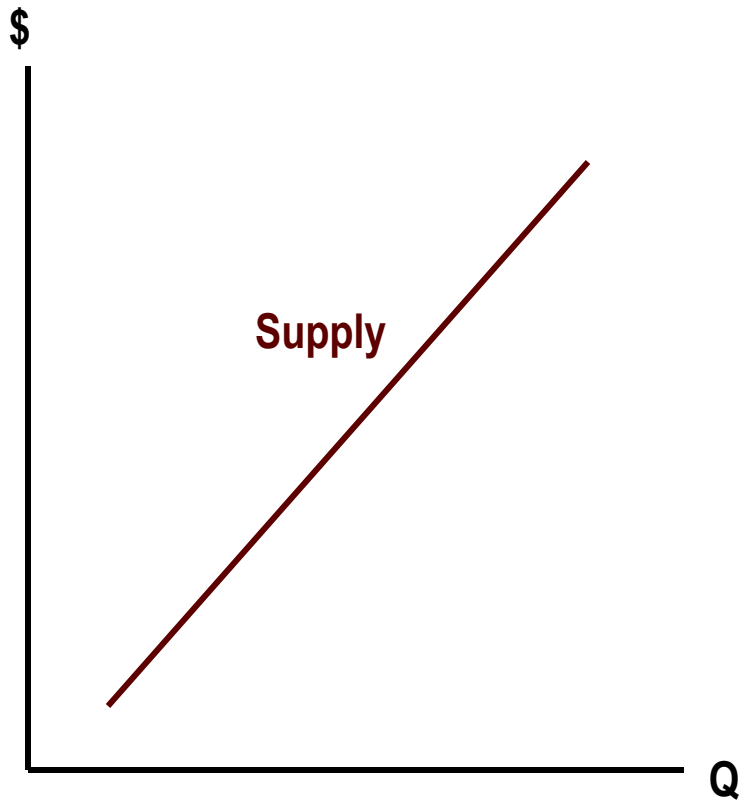
Determinants of Elasticity of Demand

- Availability of substitutes
- Use with complements
- Budgets & incentives of customers

Why Elasticity is Useful

- A simple starting point for modeling your customers
  - and determinants of revenue
- A simple, rough measure of monopoly power
- Very important in pricing

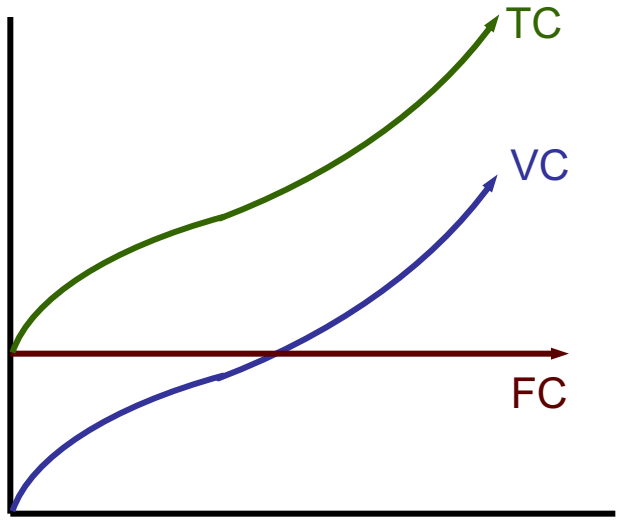
1b. Supply Curves

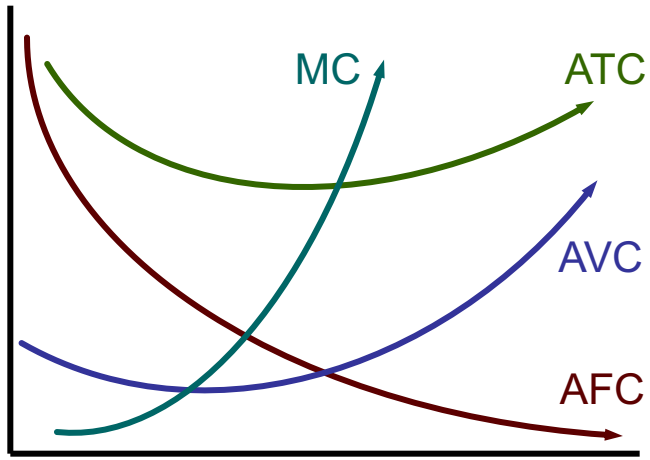


- In competitive industries, firms are price takers
- Firm should only produce if
  - P ≥ min AVC in short run (FC "sunk" in short run)
  - P ≥ min ATC in long run
  - **total costs matter for entry/ exit**
- Continue selling if P > MC
  - since MC is typically rising, produce *until* P = MC
  - thus MC = supply curve
  - **MC matters for pricing**

1c. Costs

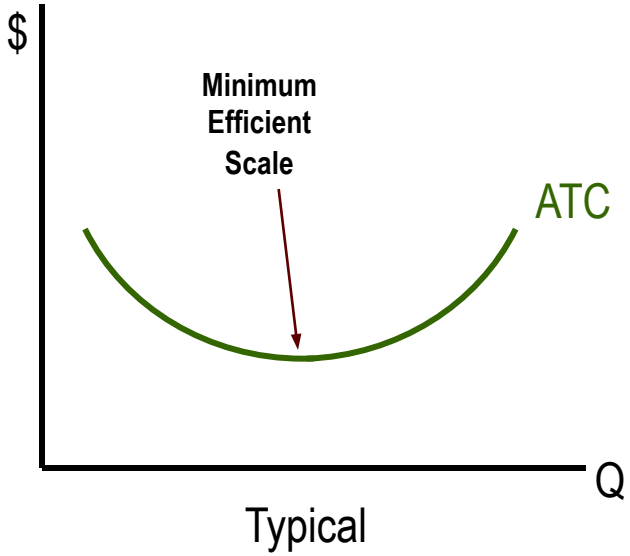
- Always think in terms of *economic* costs, *not* accounting costs
  - include opportunity costs
  - ignore sunk costs
- TC = FC + VC
- ATC = TC/Q = AFC + AVC
- MC = dTC/dQ = dVC/dQ
  - MC generally rising in Q
  - MC intersects ATC & AVC at their minimums

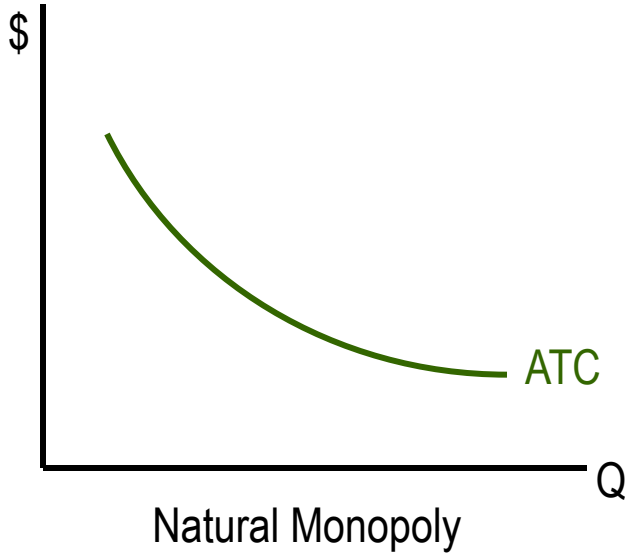




Economies of Scale

- *Economies of Scale:* ATC declining with Q
- *Dis-economies of Scale:* ATC rising with Q
- EOS are driven primarily by FC
  - **determines efficient firm size, & thus rough market structure**
  - extreme EOS can lead to oligopoly or "natural" monopoly – but this is rare



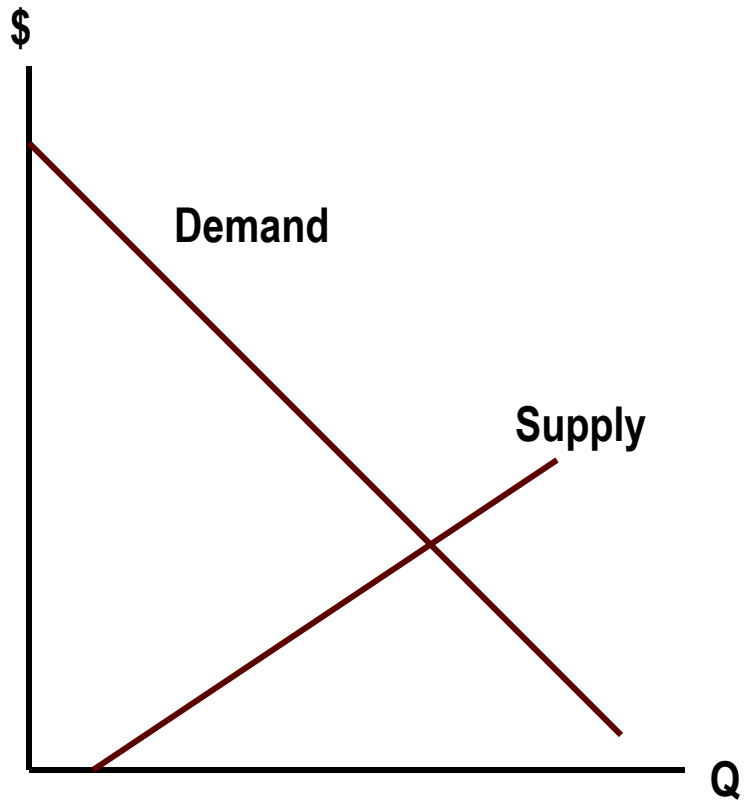


Economies of Scope

- *Economies of Scope:* producing one good lowers costs of producing another ("synergies")
  - sharing assets or management (esp. support functions)
  - sharing customers or distribution
  - related knowledge / expertise
  - production by-products

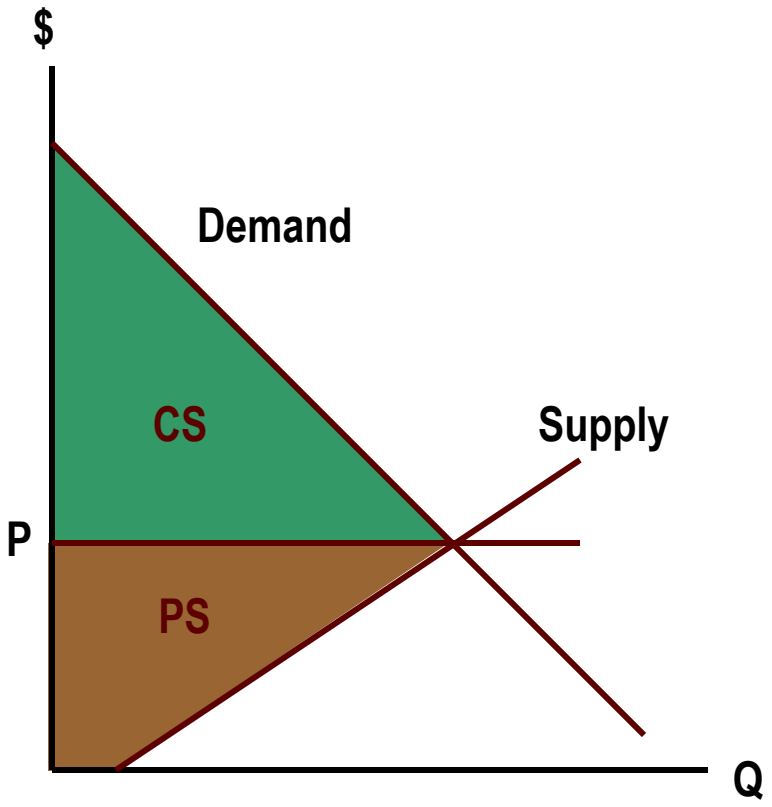
- When a firm has economies of scope, it is often optimal to produce both goods

1d. Gains From Trade



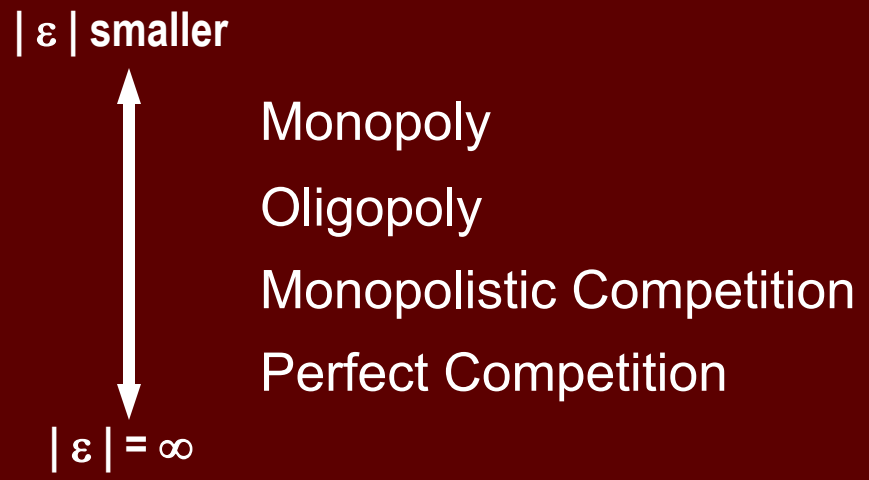
- Height of demand = maximum amount someone is willing to pay for that unit
- Height of supply = minimum amount some firm is willing to sell that unit for (reflecting MC)
- As long as demand curve is above supply curve, we have *gains from trade*
  - how are the gains split?
    - » price
    - » auction
    - » negotiation
    - » e-commerce business models

Measuring Gains From Trade



- CS = difference between:
  - maximum someone is willing to pay (height of demand curve), & what they actually pay (price)
  - why do we care?
    - » measure of welfare
    - » business opportunity!
- PS
  - area above supply, below price
  - equals profit ignoring FC
  - of less practical use
- DWL

2. Industry Types



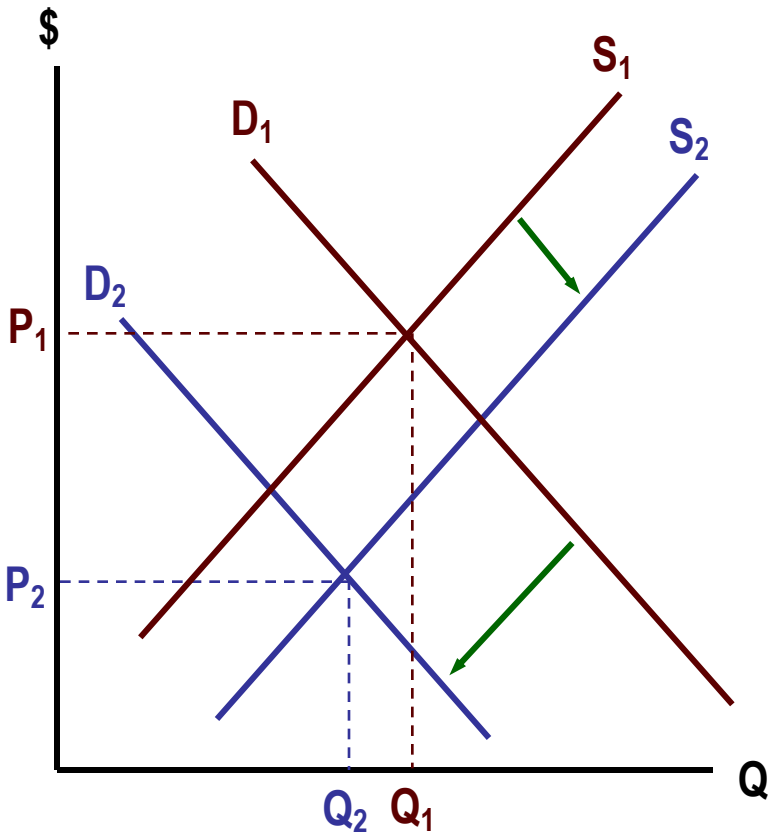
2a. Perfect Competition

- Theoretical ideal that industries tend toward over time
  - no barriers to entry or exit
  - many good substitutes, so firms are price takers

- Strategy is simple
  - in short run, produce if $P \geq$ min AVC; in long run, if $P \geq$ min ATC
  - produce until MC = P
    - » competition drives P to min ATC $\Rightarrow$ profit = zero
  - emphasize operational efficiency / cost

1e. Competitive Market Equilibrium

- How does a market come to equilibrium?
- How does it adjust if S,D shift?
- Remember: both demand & supply tend to be much more elastic in the long run



The Invisible Hand

- Competitive markets are possibly the single most important institution society has ever developed
  - spontaneous & ubiquitous
  - enormously important mechanism for improving people's welfare
    - » maximize gains from trade (minimize DWL)
    - » at maximal efficiency (lowest cost)
    - » provide strongest incentives for innovation & creativity
    - » make best use of knowledge & skills dispersed throughout the economy (next)

- More generally, the *"Coase Theorem"*
  - the outcome will always be efficient, *regardless* of ownership of assets, if
    - » property rights (ownership) is completely specified
    - » there are no transactions / bargaining costs

Markets as an Information System

- Markets are powerful examples of *collective intelligence*
  - an important example of the general idea of *decentralization*
- Examples
  - jelly beans
  - prediction markets
    - » Iowa Electronic Markets
      - Bush or Kerry?
    - » Tradesports.com
      - Cubs get Wildcard?
      - Cubs win World Series?
  - securities & insurance markets
  - my breakfast

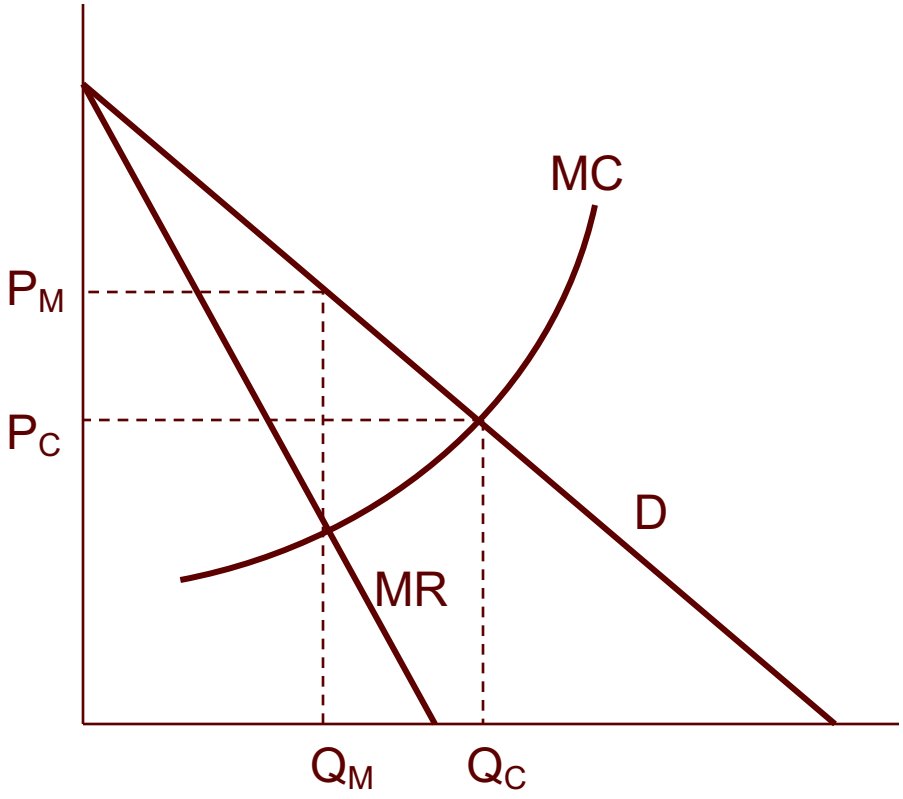
Regulation of Markets

- If markets are perfectly competitive, government regulation *reduces welfare* (causes DWL)
  - e.g., taxes, price or quantity controls, import restrictions

- When might government regulation be justified?
  - to redistribute wealth to improve equity (at the expense of efficiency)
  - if markets are imperfectly competitive – antitrust
  - if there are externalities ignored by buyers & sellers
    - » negative: pollution, congestion
    - » positive: technological spillovers
  - if there is imperfect information

2b. Monopoly

- Rare outside natural monopoly
  - large EOS
  - barriers to entry (e.g., patent)
  - positive network effects (section 3c below)
- Strategy is relatively simple
  - protect barriers to entry
  - try to avoid antitrust regulation
  - not a price taker: produce until MC = MR
    - » $P = MC(1+1/\varepsilon) > MC \Rightarrow$ profit > 0
  - more sophisticated pricing strategies are possible (section 3b below)
  - fight possible tendency toward organizational complacency



2c. Monopolistic Competition

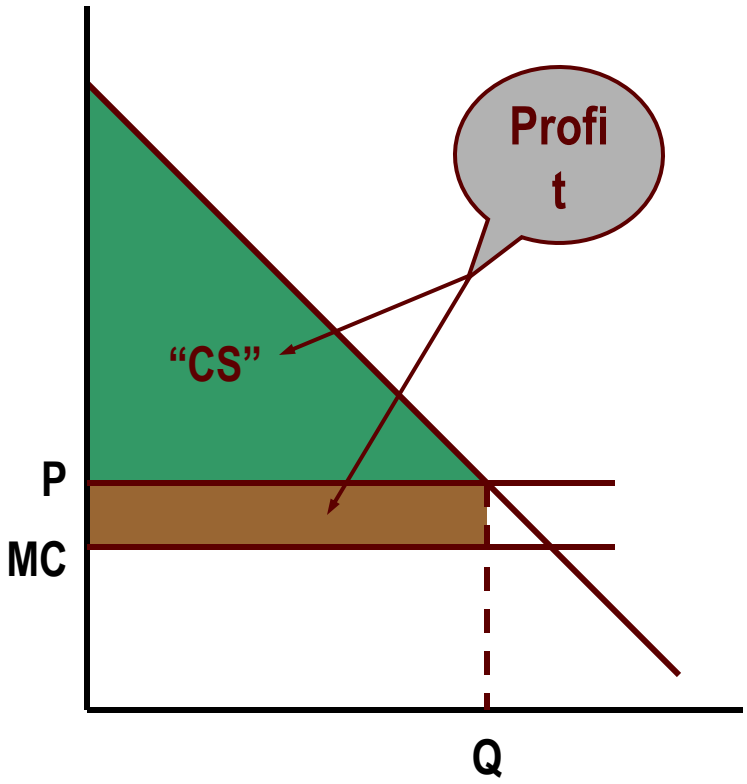
- Many firms, none dominant, but not perfectly competitive
  - each firm has some monopoly power, if only a little
- Firms too small to have large effects on each other
  - game theoretic intuition not as important
- Strategy emphasizes Marketing
  - try to create (short run) monopoly power
    - » product differentiation
    - » establish switching costs, etc.
  - tactics such as price (or quality) discrimination

Pricing Strategies

- Offering a single price ignores 2 profit opportunities
  - CS implies some paid less than they were willing to
  - other customers didn't buy b/c price was too high (if you exercised some monopoly power)

- More elaborate pricing strategies allow the firm to sell more, & convert CS into PS (profits)

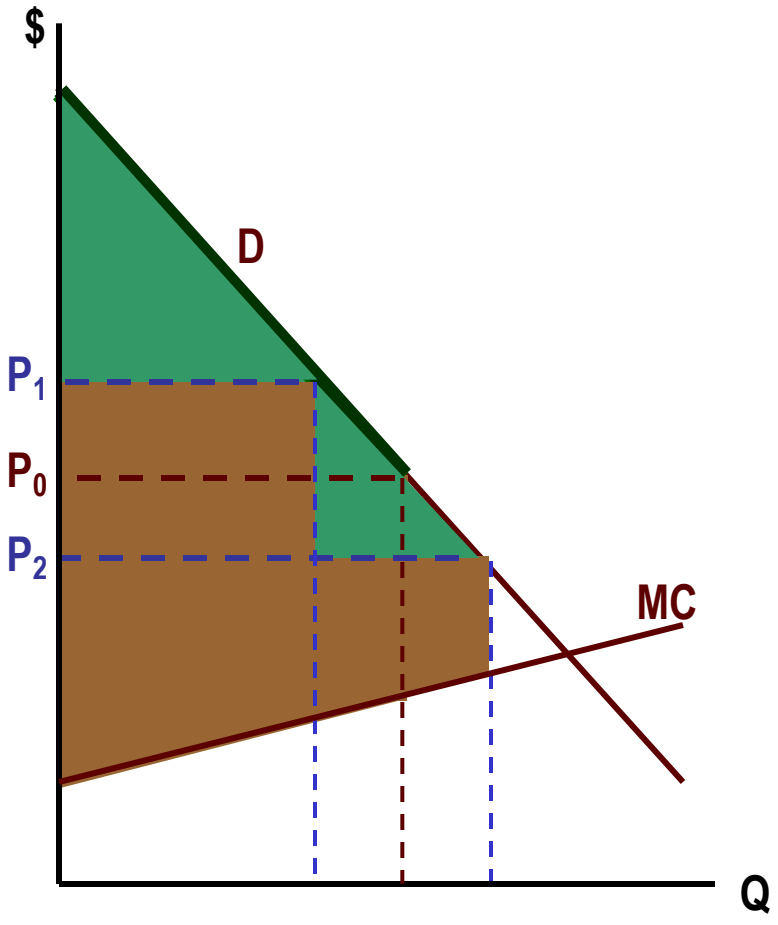
Two-Part Pricing



- One approach: charge fixed *entry fee* F, & *per-unit fee* P
  - revenue = F + P•Q
- For given P, largest possible F = "CS"
  - profit = F + (P–MC)Q – FC
- Profit max at P=MC, F="CS"
  - set P to maximize value/ usage of product to consumer
  - use F to turn CS into profit
- Problem: 2PP ineffective w/ heterogeneous customers

Price Discrimination

- Another approach: charge different prices to different customers
  - 1st degree: charge down demand curve
    - » e.g., Priceline; auctions; college aid
  - 3rd degree: segment market into groups; monopoly pricing in each (e.g., P_1,P_2)
    - » e.g., airlines
    - » $P_k = MC(1+1/\varepsilon_k) > MC$
      - markup of P_k over MC is higher, the more inelastic is segment k ($|\varepsilon_k|$ closer to 0)



Notes on Price Discrimination

- Requires 3 conditions
  - must have some monopoly power
  - must sort customers, or get them to self-sort, by willingness to pay
    - » check IDs
    - » how much of, where, or when good is bought
    - » discounts to better informed customers
  - must prevent arbitrage across segments
    - » restrict resale
    - » adulterate the product to make it less valuable to others
    - » limit purchases

- Closely related: quality discrimination
  - prices vary with product quality, reflecting not just cost differences, but also differences in elasticity of demand across customer types

2d. Oligopoly

- Small # of firms w/ large market shares
- Strategy becomes complex
  - each firm's actions have large effects on major competitors, so game theoretic intuition applies
    - » you need to foresee your competitor's response, & take that into account when choosing your strategy
  - considerations include:
    - » key strategic variables (e.g., price, quantity, quality)
    - » first mover advantage
    - » pre-commitment
    - » tacit collusion
    - » expectations; credibility of threats

Example 1: Competition Between 2 Firms

- Suppose 2 firms compete on price (Bertrand)
  - each would like to charge P > MC to make profits
  - but each has an incentive to cut price a little, & grab profits from the other
  - the result: they *undermine* each other, leading to perfect competition & zero profits!

- Instead suppose 2 firms compete on quantity (Cournot)
  - each would like to reduce Q, so that P rises
  - when each does so, it helps their competitor, since it reduces competition
  - the result: they *reinforce* each other, leading to monopoly profits!

- If they moved sequentially, results would differ
  - the one who moved first would have an advantage

Example 2: The Prisoners' Dilemma

		Prisoner 2: Silence	Prisoner 2: Confess
Prisoner 1	Silence	1 Year, 1 Year	5 Years, Free
	Confess	Free, 5 Years	3 Years, 3 Years

- What are the cooperative & non-cooperative outcomes?

2. Repeated (Dynamic) Games

- Many games are played again & again (multiple stages)
  - e.g., many firms face each other year after year
- How might this change the outcome? Often, greater cooperation is possible
  - more scope for punishment of non-cooperation with more future periods
  - might be able to invest in a reputation, which may improve cooperation
  - can use complex multi-period strategies; actions now can affect future options
- Example: tit-for-tat

Credibility

- How to elicit cooperation?
  - invest in a reputation through your actions to date
  - constrain your actions ("tie your hands behind your back"; pre-commit)
  - try to change the payoffs for events that prevent "good" equilibria
    - » extend contractual guarantees
    - » allow "escape clauses"

- In some cases, a player can improve the equilibrium by reducing its own payoffs in some states of the world
  - e.g., damaging others signals a market share battle; damaging one's own profits signals a proposal for industry-wide change in strategy

Example: Airline Fare Wars

- Firms with monopoly power often charge different prices to different customers; this is called price discrimination
  - in the airline industry this is very common
- Complicated fares create tension in an oligopoly
  - each wants to extract as much surplus as possible
  - but complexity makes enforcing collusive agreement difficult
- In summer 1992, American Airlines sought to simplify fares to make it easier to collude
  - 4 basic fares: 1st class, unrestricted coach, 7-day & 21-day advance
  - prices lower, but no discounting, corporate deals, convention fares, etc.
  - American expected revenues to rise by $350 million / year

The Perils of Tacit Collusion

- April 10 AA implements 4 tiers; all others match by end of day
- April 14 TWA & USAir cut fares on selected routes
- April 21 AA matches decreases on all routes
- May 20 AA increases prices 10-25%
- May 26 NW announces "Grownups Fly Free"
- May 27 AA cuts prices 50% & others follow
- June 15 NW files predatory pricing lawsuit against AA
- June 17 NW announces 10% price increase for June 27
- June 24 AA announces 10% price increase for July 7
- July 10 Continental cuts prices 10%; others match
- Sep. 1 Prices return to pre-April level
- Oct. 9 AA abandons 4-tier program

3. Applications

3a. Imperfect Information

- Imperfect information arises in many (most?) markets
  - if information is simply missing, there is *risk*
    - » thus arise capital & insurance markets, hedging, derivatives, etc.
  - if information is *asymmetric*, two general problems arise
    - » adverse selection
    - » moral hazard (incentives)

Lemons & Adverse Selection

- You buy a new car, drive it 1 day, & then sell it
  - what price will you get for your car? Why?
  - what should a buyer rationally conclude about a brand-new used car?

- There is adverse selection: sellers know quality, but buyers do not
  - lower quality sellers have more incentive to sell than do high quality sellers
  - other examples
    - » recruiting employees
    - » venture capital
    - » medical insurance

- This causes DWL
  - products are risky
  - overall quality is lower than is efficient

General Ways to Address Adverse Selection

- The market for information
  - quality data, product analysis, product inspection, credit ratings, etc.
- Certification & standards
  - UL, government licensing, OSHA, etc.
- Seller reputation
  - brand names
- Signaling
  - one common solution is for high quality types to *signal* quality in some way
    - » a used car may come with a warranty
    - » a healthy customer may accept a large deductible on medical insurance
  - if high quality types find it profitable to invest in the signal, but low quality types do not, the signal is credible

Moral Hazard (Incentives)

- Health insurance pays costs if certain events occur
  - what if customers can affect the probability of those events occurring?
  - what if they can affect the damage that occurs in such events?
  - e.g., not smoking, exercising regularly, etc.

- When insurance is offered, incentive problems arise
  - the insurance industry calls this moral hazard
  - there are myriad examples
    - » politicians
    - » CEO & other employees' effort
    - » "agency costs" or "principle-agent" problems discussed in your Finance, Accounting, & HR courses

Solving Moral Hazard Problems

- Monitor more carefully
  - have health insurance customers come in for regular exams
  - monitor employees at work
  - accounting, budget & control systems
- When monitoring is too costly, use incentives
  - co-payments in insurance
  - pay for performance in employment
  - contractual clauses based on performance
- The ultimate solution: ownership
  - entrepreneurship
  - independent contracting instead of employment
  - outsourcing (e.g., sales)
  - franchising

3b. Network Effects

- *(Positive) Network Effects* exist if a product is more valuable to consumers, the more others also use it
  - a *standard* is important
  - there are two general reasons why a market might need a standard
    - » customers want to exchange data
    - » there may be an "ecology" of related products
  - how is the standard set?
    - » government
    - » industry committee
    - » dominant firm
  - if the standard is privately owned, network effects create monopoly power

Strategy w/ Network Effects

- Strategic implications
  - possible “winner take all” (monopoly)
  - first-mover advantage
  - price &/or quality wars to try to gain market share
  - “coopetition”

- Monopoly network effects are often over-hyped
  - evidence suggests they are usually short term
  - “rapid scalability”, esp. of information products like software, means that such industries sometimes have “serial monopoly”
  - in other words, little (if any) economics is different in the “new economy”

4. Thinking Like an Economist

Analysis

- Know your customer
  - determinants of price or quality sensitivity (elasticity)
  - market segmentation
- Know your costs
  - sunk v. avoidable
  - FC v. VC & economies of scale
  - SR v. LR
  - supplier relations
- Know your competition
  - create / maintain monopoly power, where possible
  - which industry type fits? What strategic approach does this imply?

Economic Attitude

- You're *not* an accountant!
  - accounting measures are imperfect proxies for real economic costs
  - don't forget opportunity cost
- "Only the paranoid survive" (Andy Grove)
  - what's your "market"? Think broadly!
  - always assume your industry will end up perfectly competitive
    - » but if you can, create & exploit short-run monopoly power
- Let's Make a Deal
  - the Coase Theorem
- A little analytical thinking can go a long way
  - & is what distinguishes GSB MBAs

Good Luck!