Learning Objectives

• Use basic supply and demand model to explain the price of trading cards
• Describe how teams allocate the players’ talents to generate wins
• Distinguish monopoly from perfect competition and apply it to ticket pricing
• Explain the origins of the professional sports
2.1 Supply and Demand

• This is the first model we use
• Models are simplified versions of reality that isolate the most important factors
• We will use this model throughout the book
• The following slides offer a review
Law of Demand

• Price and quantity demanded of a good are inversely related, ceteris paribus

• As own price rises, consumers switch to other products to make them happy
  – They purchase more of other goods that are cheaper and less of the good whose price has fallen, for example baseball cards
  – They can afford more cards as well
Law of Supply

- Price and quantity supplied of a good are positively related, ceteris paribus
- As reward rises, so does the activity
- Example: the supply of baseball cards
- See Figure 2.2
Figure 2.2
Equilibrium

• The equilibrium in the market occurs at the intersection of supply and demand (Figure 2.3)
• If the price in the market is above the equilibrium, there is excess supply or a surplus
• If the price is below equilibrium, there is excess demand or a shortage
Figure 2.3

(a) Excess supply

(b) Excess demand
Factors that Shift Demand

• Consumer income (usually positively related)
• Prices of other related goods
  – Substitutes (+) or complements (-)
• Consumer tastes
• Number of consumers in the market (+)
• Expectations of consumers
Factors that Shift Supply

- Prices of inputs (-)
- Technology (+)
- Taxes (-)
- Natural and man-made disasters (-)
- Expectations of suppliers
Figure 2.4

(a) Demand

- Increase in income
- Decrease in price of substitute

(b) Supply

- Increase in cost
- Improvement in technology
Application

• Why is a Mickey Mantle card more expensive than a Hank Aaron card?
• We assume that the supply of both cards is the same
• The demand for Mickey Mantle cards is higher because of the effect of three variables: income, the number of consumers, and tastes
Effect of Three Variables

- Larger number of consumers for Mantle
  - We assume that people prefer the players in their home towns teams
  - Mantle spent his career in larger NY and Aaron in smaller Milwaukee & Atlanta
- NY consumers have higher incomes
- “Taste:” Discriminatory consumers might prefer Mantle, who was white
2.2 Producing Output and the Production Function

• Production functions show how much output a firm generates from its inputs
• What is output in sports?
  – Games played?
  – Wins generated?
• Either is possible, depending on context
Figure 2.5
Figure 2.6

A graph showing the change in supply from $S_0$ to $S_1$. The supply curve shifts to the right from $S_0$ to $S_1$, indicating an increase in the quantity supplied at each price level. The graph includes a horizontal axis labeled $Q$ (quantity of cards) and a vertical axis labeled $p$ ($\text{per card}$). Points $A$ and $B$ are marked on the graph, as well as $Q_0$, $Q_1$, $Q_0'$, and $Q_1'$. The price levels are indicated by $p_0$ and $p_1$. The shift from $S_0$ to $S_1$ suggests an increase in the supply curve due to factors such as an increase in the number of suppliers or an increase in the availability of resources.
Figure 2.7
Figure 2.8
Figure 2.9

(a) Mickey Mantle

(b) Hank Aaron
An Example: The Production of Wins

- \( Q = f(T_O, T_D) \)
  - Wins are a function of offensive talent (\( T_O \)) and defensive talent (\( T_D \))

- Wins rise as each talent rises
  - Marginal Product of Offensive (Defensive) talent is the contribution of a one-unit increase in offensive (defensive) talent to wins (\( MP_{T_O} = \Delta Q/\Delta T_O \))
  - \( MP_T \) rises then falls (Figures 2.10a – 2.10b)
  - What does Tom Brady add when the team already has Eli Manning?
Marginal Cost

• MC is the cost of producing one more unit of output
  – The cost of one more win (or game)
  – $MC = \Delta C / \Delta Q$

• MC is inversely related to MP
  – More productive inputs add to output more cheaply
  – See Figures 2.10b and 2.10c
Figures 2.10b and 2.10c

- **MP** (marginal product)
- **OT** (offensive talent)
- **MC** (marginal cost)
Price Ceilings

• An official upper limit on price
• Ceilings must be set below $P^e$ to have any effect
• Price ceilings create
  – Excess Demand (Figure 2.11)
  – Black markets – ticket scalping
    • Openly violate the law
  – Gray markets – selling tickets and pencils
    • Violate the spirit but not the letter of the law
2.3 Market Structures

• In **perfect competition**, each producer is too small to affect prices

• The competitor takes market price as given; it represents his marginal revenue (P=MR) (Figure 2.12)

• The perfect competitor, as any other producer, maximizes profit at output where MR=MC (Figure 2.13)
Figure 2.11

The diagram shows a price-quantity graph with the price of tickets ($ per ticket) on the vertical axis and the quantity of tickets (in thousands) on the horizontal axis. The supply curve is labeled S, and the demand curve is labeled D. The price ceiling is indicated by a horizontal line at $15, and the equilibrium price at $100. The quantity demanded at the price ceiling is $Q_d$, and the quantity supplied is $Q_s$. The price ceiling restricts the market price to $15, creating a shortage in the market.
Figure 2.12

(a) Market supply and demand

(b) Firm demand
Figure 2.13

A diagram showing the relationship between price ($ per unit) and quantity of output (Q). The graph includes the marginal cost (MC) and marginal revenue (MR) curves, with the point where they intersect indicating the optimal quantity of output, denoted as $Q^*$. The price (p) is shown at a certain level, parallel to the horizontal axis, indicating competitive pricing conditions.
Monopoly

• This market structure has a single producer of a unique product
• The producer faces the market demand curve, which slopes down
• The marginal revenue (MR) curve also slopes down and lies below demand (MR<P)
• To sell another unit, the monopolist must also reduce the price at which all previous units are sold
Figure 2.14
Application

- Ticket prices of the Colorado Rockies
- Their MC curve is L-shaped
  - Marginal cost of another seat is almost zero
  - At capacity, it is not possible to add another seat—the cost is infinite
- The profit-maximizing quantity presents a paradox: it is below capacity (Figure 2.15)
Figure 2.15
Comparison

• Figure 2.15 illustrates two more conclusions:
  – The profit-maximizing monopolist will not sell more tickets than when MR = 0
  – In perfect competition, prices are much lower than in monopoly
    • They are given by the intersection of demand and capacity
Some Teams Sell out

• Figure 2.16 provides a comparison of the Blackhawks and White Socks
• White Sock charge prices just like the Broncos
• Blackhawks have a much smaller stadium and charge much higher prices
  – Any team with demand much larger than capacity can do that; prices are as in perfect competition
Figure 2.16
Another Paradox: Fixed Costs

• If a team resigns its own player for a much larger salary than he is currently getting, should it raise ticket prices?

• Recall how ticket prices are determined: at the intersection of MC and MR
  – If salaries rise, does MC of tickets rise?
  – Salaries represent fixed costs and thus do not change MC
Higher Ticket Prices

• Figure 2.17 shows that higher ticket prices come from higher MR, which comes from higher demand.
• When a new player – a star— is signed, demand for the team’s tickets rises and the team can charge higher prices.
Figure 2.17
2.4 Professional Sports

• Baseball in the US and soccer in the UK both developed in mid- to late-1800s
• We use marginal analysis to explain it
• Optimal decisions occur at the intersection of Marginal Benefit (such as revenue, as we have seen) and MC
Subsistence Economies

- All your time is spent producing
  - If not – you die
- MC of leisure time is very high
- Higher than MU at all levels of leisure time
- The optimal amount of leisure is zero

\[ MU,MC \]

\[ MC \]

\[ MU \]
The Industrial Revolution

• Raised productivity
• Living standards rose in the late 18\textsuperscript{th} century
• MC of leisure time fell
  – Middle class expanded
• Quantity of leisure time became positive
History of Professional Sports

• Soccer began in British “public” schools
• Baseball began in the US among gentlemen’s clubs
• Both grew in popularity as larger segments of the population could afford to participate and follow the sport
• Working class participation led to the professionalization of sports