Consumers, Producers, and the Efficiency of Markets
Consumer Surplus

• Welfare economics
  – The study of how the allocation of resources affects economic well-being
    • Benefits that buyers and sellers receive from engaging in market transactions
    • How society can make these benefits as large as possible
    • In any market, the equilibrium of supply and demand maximizes the total benefits received by all buyers and sellers combined
Consumer Surplus

• **Willingness to pay**
  – Maximum amount that a buyer will pay for a good
  – How much that buyer values the good

• **Consumer surplus**
  – Amount a buyer is willing to pay for a good minus amount the buyer actually pays for it
  – Willingness to pay minus price paid
Table 1
Four Possible Buyers’ Willingness to Pay

<table>
<thead>
<tr>
<th>Buyer</th>
<th>Willingness to Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>$100</td>
</tr>
<tr>
<td>Paul</td>
<td>80</td>
</tr>
<tr>
<td>George</td>
<td>70</td>
</tr>
<tr>
<td>Ringo</td>
<td>50</td>
</tr>
</tbody>
</table>
Consumer Surplus

- **Consumer surplus**
  - Measures the benefit buyers receive from participating in a market
  - Closely related to the demand curve

- **Demand schedule**
  - Derived from the willingness to pay of the possible buyers
The table shows the demand schedule for the buyers (listed in Table 1) of the mint-condition copy of Elvis Presley’s first album. The graph shows the corresponding demand curve. Note that the height of the demand curve reflects the buyers’ willingness to pay.
Consumer Surplus

• At any quantity, the price given by the demand curve
  – Shows the willingness to pay of the *marginal buyer*
    • The buyer who would leave the market first if the price were any higher

• Consumer surplus in a market
  – Area below the demand curve and above the price
In panel (a), the price of the good is $80 and the consumer surplus is $20. In panel (b), the price of the good is $70 and the consumer surplus is $40.
Consumer Surplus

• A lower price raises consumer surplus

1. Existing buyers: increase in consumer surplus
   • Buyers who were already buying the good at the higher price are better off because they now pay less

2. New buyers enter the market: increase in consumer surplus
   • Willing to buy the good at the lower price
Figure 3
How Price Affects Consumer Surplus

In panel (a), the price is $P_1$, the quantity demanded is $Q_1$, and consumer surplus equals the area of the triangle ABC. When the price falls from $P_1$ to $P_2$, as in panel (b), the quantity demanded rises from $Q_1$ to $Q_2$, and the consumer surplus rises to the area of the triangle ADF. The increase in consumer surplus (area BCFD) occurs in part because existing consumers now pay less (area BCED) and in part because new consumers enter the market at the lower price (area CEF).
Consumer Surplus

- **Consumer surplus**
  - Benefit that buyers receive from a good
    - As the buyers themselves perceive it
  - Good measure of economic well-being
  - Exception: illegal drugs
    - Drug addicts are willing to pay a high price for heroin
    - Society’s standpoint
      - Drug addicts don’t get a large benefit from being able to buy heroin at a low price
Producer Surplus

• **Cost**
  – Value of everything a seller must give up to produce a good
  – Measure of willingness to sell

• **Producer surplus**
  – Amount a seller is paid for a good minus the seller’s cost of providing it
  – Price received minus willingness to sell
# Table 2

## The Costs of Four Possible Sellers

<table>
<thead>
<tr>
<th>Seller</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary</td>
<td>$900</td>
</tr>
<tr>
<td>Frida</td>
<td>800</td>
</tr>
<tr>
<td>Georgia</td>
<td>600</td>
</tr>
<tr>
<td>Grandma</td>
<td>500</td>
</tr>
</tbody>
</table>
Producer Surplus

• **Producer surplus**
  – Closely related to the supply curve

• **Supply schedule**
  – Derived from the costs of the suppliers

• **At any quantity**
  – Price given by the supply curve shows the cost of the *marginal seller*
    • Seller who would leave the market first if the price were any lower
The table shows the supply schedule for the sellers in Table 2. The graph shows the corresponding supply curve. Note that the height of the supply curve reflects sellers’ costs.
Producer Surplus

• **Supply curve**
  – Reflects sellers’ costs
  – Used to measure producer surplus

• **Producer surplus in a market**
  – Area below the price and above the supply curve
Measuring Producer Surplus with the Supply Curve

In panel (a), the price of the good is $600, and the producer surplus is $100. In panel (b), the price of the good is $800, and the producer surplus is $500.
Producer Surplus

• A higher price raises producer surplus
  1. Existing sellers: increase in producer surplus
     • Sellers who were already selling the good at the lower price are better off because they now get more for what they sell
  2. New sellers enter the market: increase in producer surplus
     • Willing to produce the good at the higher price
How Price Affects Producer Surplus

In panel (a), the price is $P_1$, the quantity supplied is $Q_1$, and producer surplus equals the area of the triangle ABC. When the price rises from $P_1$ to $P_2$, as in panel (b), the quantity supplied rises from $Q_1$ to $Q_2$, and the producer surplus rises to the area of the triangle ADF. The increase in producer surplus (area BCFD) occurs in part because existing producers now receive more (area BCED) and in part because new producers enter the market at the higher price (area CEF).
Market Efficiency

• The benevolent social planner
  – All-knowing, all-powerful, well-intentioned dictator
  – Wants to maximize the economic well-being of everyone in society

• Economic well-being of a society
  – Total surplus
  – Sum of consumer and producer surplus
Market Efficiency

- Total surplus = Consumer surplus + Producer surplus
  - Consumer surplus = Value to buyers – Amount paid by buyers
  - Producer surplus = Amount received by sellers – Cost to sellers
  - Amount paid by buyers = Amount received by sellers
- Total surplus = Value to buyers – Cost to sellers
Market Efficiency

• **Efficiency**
  – Property of a resource allocation
  – Maximizing the total surplus received by all members of society

• **Equality**
  – Property of distributing economic prosperity uniformly among the members of society
Market Efficiency

• Gains from trade in a market
  – Like a pie to be shared among the market participants

• The question of efficiency
  – Whether the pie is as big as possible

• The question of equality
  – How the pie is sliced
  – How the portions are distributed among members of society
Market Efficiency

• Market outcomes

1. Free markets allocate the supply of goods to the buyers who value them most highly
   • Measured by their willingness to pay

2. Free markets allocate the demand for goods to the sellers who can produce them at the least cost
Total surplus—the sum of consumer and producer surplus—is the area between the supply and demand curves up to the equilibrium quantity.
Market Efficiency

• At market equilibrium, social planner
  – Cannot increase economic well-being by
    • Changing the allocation of consumption among buyers
    • Changing the allocation of production among sellers
  – Cannot rise total economic well-being by
    • Increasing or decreasing the quantity of the good
Market Efficiency

• Market outcomes

  3. Free markets produce the quantity of goods that maximizes the sum of consumer and producer surplus

• Market equilibrium
  – Efficient allocation of resources

• The benevolent social planner
  – “Laissez faire” = “let people do as they will”
At quantities less than the equilibrium quantity, such as $Q_1$, the value to buyers exceeds the cost to sellers. At quantities greater than the equilibrium quantity, such as $Q_2$, the cost to sellers exceeds the value to buyers. Therefore, the market equilibrium maximizes the sum of producer and consumer surplus.
Market Efficiency

• Adam Smith’s invisible hand
  – Takes all the information about buyers and sellers into account
  – Guides everyone in the market to the best outcome
  – Economic efficiency

• Free markets
  – Best way to organize economic activity
Should there be a market in organs?

• “How a mother’s love helped save two lives”
  – Ms. Stevens - her son needed a kidney transplant
  – The mother’s kidney was not compatible
  – Donated one of her kidneys to a stranger
  – Her son was moved to the top of the kidney waiting list
Should there be a market in organs?

• Questions
  – Trade a kidney for a kidney?
  – Trade a kidney for an expensive, experimental cancer treatment?
  – Exchange her kidney for free tuition for her son?
  – Sell her kidney for cash?
Should there be a market in organs?

• **Current public policy**
  – Illegal for people to sell their organs
  – Government has imposed a price ceiling of zero: shortage

• **Large benefits to allowing a free market in organs**
  – People are born with two kidneys
    • Usually need only one
  – Few people – no working kidney
Should there be a market in organs?

• **Current situation**
  – Typical patient waits several years for a kidney transplant
  – Every year thousands of people die because a kidney cannot be found
Should there be a market in organs?

• Allow for kidney market
  – Balance supply and demand
  • Sellers get extra cash in their pockets
  • Buyers get to live
  • No more shortage of kidneys
  • Efficient allocation of resources
Should there be a market in organs?

• Critics: worry about **fairness**
  – Benefit the rich at the expense of the poor

• Current system: *is it fair?*
  – Some people have an extra kidney they don’t really need
  – Others are dying to get one
Market Efficiency & Failure

• Forces of supply and demand
  – Allocate resources efficiently

• Several assumptions about how markets work
  1. Markets are perfectly competitive
  2. Outcome in a market matters only to the buyers and sellers in that market
Market Efficiency & Failure

• When these assumptions do not hold
  – “Market equilibrium is efficient” may no longer be true

• In the world, competition is far from perfect
  – Market power
    • A single buyer or seller (small group)
    • Control market prices
    • Markets are inefficient
Market Efficiency & Failure

• In the world
  – Decisions of buyers and sellers
    • Affect people who are not participants in the market at all
      – Externalities - cause welfare in a market to depend on more than just the value to the buyers and the cost to the sellers
      – Inefficient equilibrium - from the standpoint of society as a whole
Market Efficiency & Failure

• Market failure
  – E.g.: market power and externalities
  – The inability of some unregulated markets to allocate resources efficiently
  – Public policy
    • Can potentially remedy the problem and increase economic efficiency