Micro Handout 9: Consumer and Producer Surplus Applications

Review: Consumer and Producer Surplus

Consumer Surplus: The net benefit buyers enjoy from purchasing and consuming the good.
- **Height of Market Demand Curve**: Reflects the benefit a buyer enjoys from consuming a specific unit of the good.
- **Consumer Surplus**: The benefit each buyer enjoys from consuming the good less what each buyer must pay for the good.
- **Area Beneath the Market Demand Curve Lying Above the Price**: Reflects all the net benefits buyers enjoy, the consumer surplus, from purchasing and consuming the good.

Producer Surplus: The net benefit sellers enjoy from producing and selling the good.
- **Height of Market Supply Curve**: The seller’s opportunity cost of providing a specific unit of the good.
- **Producer Surplus**: What each seller receives from the sale of the good less the opportunity cost each seller incurs by providing it.
- **Area Above the Market Supply Curve Lying Beneath the Price**: Reflects all the net benefit sellers enjoy, the producer surplus, from producing and selling the good.
Taxes: Consumer and Producer Surplus

Tax Incidence Summary

- How does the imposition of a tax affect the equilibrium?
  - The equilibrium quantity decreases;
  - The price from the perspective of consumers increases, but by less than the full amount of the tax.
  - The price from the perspective of firms decreases, but by less than the full amount of the tax.

- How is the burden of a tax shared?
  - The legal incidence of a tax does not affect the real, economic incidence.
  - The economic incidence of a tax depends on the price elasticities of demand and supply:
    - Demand less elastic than supply
    - Supply less elastic than demand
    - Consumers bear more of the burden
    - Firms bear more of the burden

### Geometric Interpretation of Consumer and Producer Surplus

- **Consumer Surplus** – Area Beneath the Market Demand Curve Lying Above the Price:
  - Reflects all the net benefits buyers enjoy, the consumer surplus, from purchasing and consuming the good.

- **Producer Surplus** – Area Above the Market Supply Curve Lying Beneath the Price:
  - Reflects all the net benefit sellers enjoy, the producer surplus, from producing and selling the good.
Revisit to the U.S. Market for Gasoline

Illustrate the effect of a $0.40 per gallon tax on gasoline in Massachusetts.

Gasoline Market in Massachusetts

Calculate the Areas:

B: ___________________________ = ________
C: ___________________________ = ________
D: ___________________________ = ________
E: ___________________________ = ________

Change

Consumer Surplus Lose B + C _______ + _______ = $________ thousand
Producer Surplus Lose D + E _______ + _______ = $________ thousand
Government Surplus (Tax Revenue) Gain B + D _______ + _______ = $________ thousand
Total Surplus (Nation as a Whole) Lose C + E _______ + _______ = $________ thousand

Getting a sense of the costs consumers bear
Massachusetts Population = 6.7 million (6,700 thousand)

Annual per capita cost borne by Massachusetts consumers = $_________
### Total Surplus and Efficiency

**Total Surplus:** The total net benefits to society as a whole that the provision of a good provides.

To explain precisely what we mean by this we return tutor example and calculate the net benefit that the provision of each tutor provides to society as a whole; that is, we calculate society’s surplus, the benefits less the costs to society as a whole of providing each tutor. Total surplus is simply the sum of these net benefits.

To do so recall that heights of the demand and supply curve reflect the benefits and costs of providing a specific unit:

- **Height of Market Demand Curve:** Reflects the benefit a buyer enjoys from consuming a specific unit of the good.
- **Height of Market Supply Curve:** The seller’s opportunity cost of providing a specific unit of the good.

<table>
<thead>
<tr>
<th>Student</th>
<th>Benefit Students Reap when Receiving Tutoring Services</th>
<th>Cost Tutors Incur when Providing Tutoring Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andy</td>
<td>$275</td>
<td>Kim $275</td>
</tr>
<tr>
<td>Kate</td>
<td>225</td>
<td>John $225</td>
</tr>
<tr>
<td>Dan</td>
<td>175</td>
<td>Adam $200</td>
</tr>
<tr>
<td>Liz</td>
<td>100</td>
<td>Lisa $125</td>
</tr>
<tr>
<td>Meg</td>
<td>75</td>
<td>Walt $75</td>
</tr>
<tr>
<td>Ned</td>
<td>25</td>
<td>Beth $25</td>
</tr>
</tbody>
</table>

![Graph showing market demand and supply curves with specific tutor costs and benefits]
We will now consider four scenarios:

**Scenario 1:** One tutor is provided.

**Question:** Which student values tutoring services the most?

**Answer:** ______

Who receives $_______ of benefits

Who incurs $_______ of costs

Net benefit of the first tutor to society as a whole equals $_______

The ____________________________________________.

From the perspective of society as a whole does it make sense for _____ to tutor? _____

**Scenario 2:** A second tutor is provided.

**Question:** Which student values tutoring services the second most?

**Answer:** ______

who receives $_______ of benefits

Who incurs $_______ of costs

Net benefit of the first tutor to society as a whole equals $_______

The ____________________________________________.

From the perspective of society as a whole does it make sense for _____ to tutor? _____
Scenario 3: A third tutor is provided.

**Question:** Which student values tutoring services the third most?

**Answer:**

who receives $_____ of benefits

Net benefit of the first tutor to society as a whole equals $_____.

The ________________________________.

From the perspective of society as a whole does it make sense for _____ to tutor? _____

**Question:** Which tutor incurs the third lowest costs of providing tutoring services?

**Answer:**

who incurs $_____ of costs

Scenario 4: A fourth tutor is provided.

**Question:** Which student values tutoring services the fourth most?

**Answer:**

Receives $100 of benefits

Net benefit of the first tutor to society as a whole equals $_____.

The ________________________________.

From the perspective of society as a whole does it make sense for _____ to tutor? _____

**Question:** Which tutor incurs the fourth lowest costs of providing tutoring services?

**Answer:**

Incurs $200 of costs

Summarize our results by calculating the total surplus of providing tutors:

<table>
<thead>
<tr>
<th>Tutors</th>
<th>Total Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$_____</td>
</tr>
<tr>
<td>2</td>
<td>_____ + _____ = $_____</td>
</tr>
<tr>
<td>3</td>
<td>_____ + _____ + _____ = $_____</td>
</tr>
<tr>
<td>4</td>
<td>_____ + _____ + _____ + _____ = $_____</td>
</tr>
</tbody>
</table>

**Efficiency:** Whenever total surplus, the total net benefit to society as a whole, is maximized.

**Question:** What is the efficient number of tutors? _____

**Summary:**

- A tutor should be provided whenever the benefits exceed the costs; that is, whenever the demand curve lies ______ the supply curve.
- A tutor should not be provided whenever the costs exceed the benefits; that is, whenever the supply curve lies ______ the demand curve.
Generalization

**Efficiency:** Whenever total surplus, the total net benefit to society as a whole, is maximized.

**Efficiency Guidelines:**

When the demand curve lies above the supply curve, the benefits of providing a unit **exceed** its costs. **Therefore** of a good should be provided.

When the supply curve lies above the demand curve, the costs of providing a unit **exceed** its benefits. **Therefore** of a good should be provided.

It appears as though the efficient quantity is just the **__________** quantity.

**Markets and Efficiency**

**Efficiency:** Whenever total surplus, the total net benefit to society as a whole, is maximized.

**Question:** Do markets always lead to efficiency? ______

There are other factors which also cause markets to fail. We will explore them in later lectures.