Problem Set #7
PPA897
Professor John McPeak

1) Public goods, voting, and benefit cost.
Onondaga County is considering modifying the waiting area at Hancock airport. Option one is to install an exhibit focusing on the history of flying dinosaurs. Option two is to install an exhibit presenting the collection of liquids and lotions collected at the security checkpoint since the 3 oz. restriction went into effect. The third option is an exhibit explaining the process of deicing airplanes before takeoff. Each project will cost $3,000 to install, and any option passing with a majority vote will be installed even if more than one passes.

There are three households who will share the costs of the project equally ($1,000 each) if it wins a majority of votes. The following table reports each household’s willingness to pay for each of the three proposed projects.

<table>
<thead>
<tr>
<th></th>
<th>Dinosaurs</th>
<th>Liquids and Lotions</th>
<th>Deicing</th>
</tr>
</thead>
<tbody>
<tr>
<td>McPeak</td>
<td>400</td>
<td>1700</td>
<td>1100</td>
</tr>
<tr>
<td>Popp</td>
<td>1700</td>
<td>100</td>
<td>1200</td>
</tr>
<tr>
<td>Wilcoxen</td>
<td>900 (medium)</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

a) How will each household vote if they are allowed to vote “yes” or “no” to each project? (circle)

- Compare the individual WTP vs. the individual cost ($1,000).
- If WTP > cost, then vote yes.
- If WTP < cost, then vote no.

<table>
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<tr>
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<th>Liquids and Lotions</th>
<th>Deicing</th>
</tr>
</thead>
<tbody>
<tr>
<td>McPeak</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Popp</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Wilcoxen</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

b) Contrast the benefits as reflected in the sum of the WTP and the costs to compare the three options. What is the best option from society’s point of view? Did voting select this option? Why or why not?

<table>
<thead>
<tr>
<th>Benefits (WTP)</th>
<th>Costs</th>
<th>B-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dinosaurs</td>
<td>3,000</td>
<td>0</td>
</tr>
<tr>
<td>Liquids &amp; Lotions</td>
<td>1,800</td>
<td>-1,200</td>
</tr>
<tr>
<td>Deicing</td>
<td>2,400</td>
<td>-600</td>
</tr>
</tbody>
</table>

'Dinosaurs' is the best option from society's point of view, but the voting selected 'Deicing' because the yes-no vote ignores the intensity of preferences (Median voter theorem).
2) On a supply and demand graph, illustrate the impact of an import tariff as we discussed in class.

Describe how this policy impacts; government revenues, domestic producers, domestic consumers, and international producers.

1) Autarky (Before open market to int'l producers)

Price is high at \( p^* \), supply \( q^* \) is met by domestic production.

2) Open market (to int'l producers)

Lower price at \( p_w \). Supply \( q_{open} \) is met by domestic production \( (q^D_{open}) \) and imports \( (\text{imports w/o } T = q_{open} - q^D_{open}) \).

This has the lowest price.

3) Import tariff

Price goes up to \( p_w + T \) from \( p_w \).
Supply/Demand goes down to \( q^* \) from \( q_{open} \).
Domestic production share of the supply goes up from \( q^D_{open} \) to \( q^* \).

International share of the supply (imports) decreases from \( \text{import w/o } T = q_{open} - q^D_{open} \) to \( \text{import w/ } T = q^* - q^D_{open} \).
Tax revenue is increased from none to \( TR \).
Consumers face higher price \( p_w + T \).
3) Modify the budget problem from the book and see if it changes the outcome.
Low – low cost budget
Medium – same as the area norm
High – with fancy high cost stuff

Three groups in society:
Moderates, who prefer Medium, to High, to Low (40%)
Fiscal Conservatives, who prefer Low, to Medium, to High (35%)
Effective Schoolers, who prefer High, to Low, to Medium (25%)

<table>
<thead>
<tr>
<th>Preferences over Budget Levels</th>
<th>Percent of the vote</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Choice</td>
<td>Second Choice</td>
</tr>
<tr>
<td>Moderates (M)</td>
<td>Medium</td>
</tr>
<tr>
<td>Fiscal Conservatives (FC)</td>
<td>Low</td>
</tr>
<tr>
<td>Effective Schoolers (ES)</td>
<td>High</td>
</tr>
</tbody>
</table>

**Agenda A: Compare High to Low, then winner takes on Medium**

1. **High vs. Low**: High wins with 65% (M 40% + ES 25%) vs. Low (FC 35%)

2. **High vs. Medium**: Medium wins with 75% (M 40% + FC 35%) vs. High (ES 25%)

**Result**: Medium

**Agenda B: Compare Medium versus Low, winner takes on High**

1. **Medium vs. Low**: Low wins with 65% (M 40% + FC 35% + ES 25%) vs. Medium (M 40%)

2. **Low vs. High**: High wins with 65% (M 40% + ES 25%) vs. Low (FC 35%)

**Result**: High

**Agenda C: Compare High versus Medium, winner takes on Low**

1. **High vs. Medium**: Medium wins with 75% (M 40% + FC 35%) vs. High (ES 25%)

2. **Medium vs. Low**: Low wins with 65% (FC 35% + ES 25%) vs. Medium (M 40%)

**Result**: Low
4) Contrast the impact of a price floor on total social welfare if the government allocates the right to sell at the price floor by quota compared to a price support sustained by government purchase and destruction of the excess supply.

\[
\begin{align*}
&\text{Gov't purchase and destruction of the excess supply.} \\
&\text{CS} = a \\
&\text{PS} = b + c \\
&\text{DwL}^1 = d + e \\
&\text{DwL}^2 = F + g + h . \\
&\text{(DwL}^2 \text{ captures the marginal cost of producing the excess supply and destroying it.)} \\
&TSW = (a + b + c) - (F + g + h)
\end{align*}
\]
4) Contrast the impact of a price floor on total social welfare if the government allocates the right to sell at the price floor by quota compared to a price support sustained by government purchase and destruction of the excess supply.

\[ TSW = CS' + PS' - DWL \]

\[ TSW = CS + PS - DWL \]

\[ TSW = CS' + PS' - DWL^2 \]

\[ TSW = CS + PS - DWL^1 - DWL^2 \]