Governments sometimes intervene in markets, in response to dissatisfaction from some groups in society, by instituting price ceilings or price floors. This intervention can have unintended—and sometimes harmful—consequences.
Price ceilings

- When quantity demanded and quantity supplied are different, the shorter side of the market will prevail
  - That is, which is smaller of quantity supplied and quantity demanded
- A price ceiling creates a shortage and increases the time and trouble required to buy the good
  - While the price decreases, the opportunity cost may rise
    - Possible emergence of a black market

Figure 1: Price Ceilings in the Market for Maple Syrup

<table>
<thead>
<tr>
<th>Number of Bottles of Maple Syrup</th>
<th>Price per Bottle</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,000</td>
<td>$2.00</td>
</tr>
<tr>
<td>5,000</td>
<td>$3.00</td>
</tr>
<tr>
<td>6,000</td>
<td>$4.00</td>
</tr>
<tr>
<td>T</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td></td>
</tr>
</tbody>
</table>
Price floors

- Price floor
  - Is a government imposed minimum price in a market
  - Example of loan rates in US agriculture
    - Prices are usually set above the equilibrium and this causes excess supply
    - To maintain the price floor the government must prevent the excess supply from driving down the market price
    - To deal with the excess, the government often purchases the excess supply.

Price floors and ceilings

- Note:
  - A price floor below the market equilibrium would have no impact on the market
  - A price ceiling above the market price would have no impact on the market
  - Remember to draw the effective price floor above the equilibrium price and an effective price ceiling below the equilibrium price
Excise tax – is a tax on a specific good or service
- The key here is on a specific good
- Examples include cigarettes, alcohol, airline tickets, gasoline
  - Note that these taxes do not change with the price of good
    - i.e. the tax for cigarettes does not depend on how much you paid in the store (do not confuse this with sales tax)

Example – Airline tickets
- If government imposes a tax of $100 then this will cause a shift in the supply curve to shift up by $100
Elasticity

- Elasticity measures the sensitivity of one variable to a change in some other variable.
- Slope is not a desirable measure of sensitivity because slope does not take into account the relative size of the changes occurring.
- Elasticity is a better measure of sensitivity because it does take the relative size of the changes into account.
Elasticity

- **Price elasticity of demand**
  - measures the sensitivity of quantity demanded to a change in price.
  - The greater the absolute value of this number, the more sensitive quantity demanded is to price.

- Demand can be classified as inelastic, unitary elastic, or elastic.
  - A special case of inelastic demand is perfectly inelastic demand, shown by a vertical demand curve.
  - A horizontal demand curve shows perfectly elastic demand—a special case of elastic demand.

Elasticity

- The price elasticity of demand ($E_D$) for a good is the percentage change in quantity demanded divided by the percentage change in price:

$$E_D = \frac{\%\Delta Q^D}{\%\Delta P}$$
Elasticity

- Calculating the elasticity

\[
\%\Delta Q^D = \frac{(Q_1 - Q_0)}{\left(\frac{Q_1 + Q_0}{2}\right)}
\]

\[
\%\Delta P^D = \frac{(P_1 - P_0)}{\left(\frac{P_1 + P_0}{2}\right)}
\]
Figure 5

<table>
<thead>
<tr>
<th>Movement Along Demand Curve</th>
<th>ΔQ/D</th>
<th>ΔP</th>
<th>Elasticity of Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>B (500,000 – 600,000)/650,000</td>
<td>18.2%</td>
<td>40%</td>
<td>– 18.2%/40%</td>
</tr>
<tr>
<td>C (100,000 – 200,000)/150,000</td>
<td>66.7%</td>
<td>15.4%</td>
<td>– 66.7%/15.4%</td>
</tr>
</tbody>
</table>

Elasticity

- A straight line demand curve can be used to show that elasticity changes as we move along a demand curve.
  - This happens because elasticity is generally not a characteristic of a demand curve, but rather is a measure of price sensitivity for a particular price change along that curve.
- When demand is price inelastic, total expenditure moves in the same direction as price.
  - When demand is price elastic, total spending moves in the opposite direction as price.
  - When demand is unitary elastic, total expenditure remains the same as price changes.
Figure 6  Elasticity and Straight-Line Demand Curves

Since equal dollar increases (vertical arrows) are smaller and smaller percentage increases . . .

. . . and since equal quantity decreases (horizontal arrows) are larger and larger percentage decreases . . .

. . . demand becomes more and more elastic as we move leftward and upward along a straight line demand curve.

Figure 7  Extreme Cases of Demand

(a) Perfectly Inelastic Demand

(b) Perfectly Elastic Demand
### Table 1  Effects of Price Changes on Expenditure

<table>
<thead>
<tr>
<th>Where demand is:</th>
<th>A price increase will:</th>
<th>A price decrease will:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inelastic $(</td>
<td>E_D</td>
<td>&lt; 1)$</td>
</tr>
<tr>
<td>Unitary elastic $(</td>
<td>E_D</td>
<td>= 1)$</td>
</tr>
<tr>
<td>Elastic $(</td>
<td>E_D</td>
<td>&gt; 1)$</td>
</tr>
</tbody>
</table>