MANAGERIAL ECONOMICS

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Lecture No - 9 : Theory of Demand
Recap from last session

- Definition of Demand
- Laws of Demand
- Exception to law of Demand
- Factors influencing Demand
Change in the Demand

- Change in quantity demanded
  - Occurs when price changes
  - Movement along demand curve

- Change in demand
  - Occurs when one of the other variables, or determinants of demand, changes
### Change in the Demand Curve

<table>
<thead>
<tr>
<th>Variable</th>
<th>A Change in This Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>Represents a movement along the demand curve</td>
</tr>
<tr>
<td>Income</td>
<td>Shifts the demand curve</td>
</tr>
<tr>
<td>Prices of related goods</td>
<td>Shifts the demand curve</td>
</tr>
<tr>
<td>Tastes</td>
<td>Shifts the demand curve</td>
</tr>
<tr>
<td>Expectations</td>
<td>Shifts the demand curve</td>
</tr>
<tr>
<td>Number of buyers</td>
<td>Shifts the demand curve</td>
</tr>
</tbody>
</table>
Shifts in Demand

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A policy to discourage smoking shifts the demand curve to the left.
A tax that raises the price of cigarettes results in a movement along the demand curve.
Supply

Supply of a goods refers to the various quantities of the good which a seller is willing and able to sell at a different prices in a given market, at a particular point of time.
Law of Supply

- The law of supply states that, other things equal, the quantity supplied of a good rises when the price of the good rises.
- Example: when the price of a good falls from 25 to 10, the quantity supplied falls from 31 to 16.
Factors Influencing Supply

- Price of good or service \((P)\)
- Input prices \((PI)\)
- Prices of goods related in production \((Pr)\)
- Technological advances \((T)\)
- Expected future price of product \((Pe)\)
- Number of firms producing product \((F)\)
Supply Function

- Supply function

- shows relation between $P$ & $Q_s$ when all other variables are held constant
  - $Q_s = g(P)$
Supply Function: Example

\[ Q_s = 10P_x \]

- If \( P_x = 2 \), \( Q_s = 20 \)
- If \( P_x = 5 \), \( Q_s = 50 \)
Generalize Supply Function

\[ Q_s = h + kP + lP_I + mP_r + nT + rP_e + sF \]

- \( k, l, m, n, r, \) & \( s \) are slope parameters
  - Measure effect on \( Q_s \) of changing one of the variables while holding the others constant
- Sign of parameter shows how variable is related to \( Q_s \)
  - Positive sign indicates direct relationship
  - Negative sign indicates inverse relationship

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### Generalize Supply Function

<table>
<thead>
<tr>
<th>Variable</th>
<th>Relation to $Q_s$</th>
<th>Sign of Slope Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P$</td>
<td>Direct</td>
<td>$k = \frac{\Delta Q_s}{\Delta P}$ is positive</td>
</tr>
<tr>
<td>$P_l$</td>
<td>Inverse</td>
<td>$l = \frac{\Delta Q_s}{\Delta P_l}$ is negative</td>
</tr>
<tr>
<td>$P_r$</td>
<td>Inverse for substitutes</td>
<td>$m = \frac{\Delta Q_s}{\Delta P_r}$ is negative</td>
</tr>
<tr>
<td></td>
<td>Direct for complements</td>
<td>$m = \frac{\Delta Q_s}{\Delta P_r}$ is positive</td>
</tr>
<tr>
<td>$T$</td>
<td>Direct</td>
<td>$n = \frac{\Delta Q_s}{\Delta T}$ is positive</td>
</tr>
<tr>
<td>$P_c$</td>
<td>Inverse</td>
<td>$r = \frac{\Delta Q_s}{\Delta P_c}$ is negative</td>
</tr>
<tr>
<td>$F$</td>
<td>Direct</td>
<td>$s = \frac{\Delta Q_s}{\Delta F}$ is positive</td>
</tr>
</tbody>
</table>
Supply Schedule

- The supply schedule is a table that shows the relationship between the price of the good and the quantity supplied.
## Supply Schedule: Example

<table>
<thead>
<tr>
<th>Price of Ice-cream Cone (Rs)</th>
<th>Quantity of cones Supplied</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>0.50</td>
<td>0</td>
</tr>
<tr>
<td>1.00</td>
<td>1</td>
</tr>
<tr>
<td>1.50</td>
<td>2</td>
</tr>
<tr>
<td>2.00</td>
<td>3</td>
</tr>
<tr>
<td>2.50</td>
<td>4</td>
</tr>
<tr>
<td>3.00</td>
<td>5</td>
</tr>
</tbody>
</table>
### Market Supply Schedule

<table>
<thead>
<tr>
<th>Price of Ice-cream Cone (Rs)</th>
<th>A</th>
<th>B</th>
<th>Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>0</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>0.50</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1.00</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1.50</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2.00</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>2.50</td>
<td>4</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>3.00</td>
<td>5</td>
<td>8</td>
<td>13</td>
</tr>
</tbody>
</table>
Supply Curve

-The supply curve is a graph of the relationship between the price of a good and the quantity supplied.
Supply Curve: Example

Price of Ice-Cream Cone

<table>
<thead>
<tr>
<th>Price of Ice-Cream Cone</th>
<th>Quantity of Ice-Cream Cones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs 3.00</td>
<td>6</td>
</tr>
<tr>
<td>Rs 2.50</td>
<td>8</td>
</tr>
<tr>
<td>Rs 2.00</td>
<td>10</td>
</tr>
<tr>
<td>Rs 1.50</td>
<td>12</td>
</tr>
<tr>
<td>Rs 1.00</td>
<td>0</td>
</tr>
<tr>
<td>Rs 0.50</td>
<td>2</td>
</tr>
</tbody>
</table>

Supply Curve: Example

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The Determinants of Quantity Supplied

<table>
<thead>
<tr>
<th>Variable</th>
<th>A Change in This Variable . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>Represents a movement along the supply curve</td>
</tr>
<tr>
<td>Input prices</td>
<td>Shifts the supply curve</td>
</tr>
<tr>
<td>Technology</td>
<td>Shifts the supply curve</td>
</tr>
<tr>
<td>Expectations</td>
<td>Shifts the supply curve</td>
</tr>
<tr>
<td>Number of sellers</td>
<td>Shifts the supply curve</td>
</tr>
</tbody>
</table>
Shifts in Supply

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Market Equilibrium

- *Equilibrium* refers to a situation in which the price has reached the level where quantity supplied equals quantity demanded.
Market Equilibrium

- Equilibrium price & quantity are determined by the intersection of demand & supply curves
  - At the point of intersection, $Q_d = Q_s$
  - Consumers can purchase all they want & producers can sell all they want at the “market-clearing” price
At Rs 2.00, the quantity demanded is equal to the quantity supplied!
The Equilibrium of Supply and Demand

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Equilibrium

• **Surplus**
  – When price > equilibrium price, then quantity supplied > quantity demanded.
    • There is excess supply or a surplus.
    • Suppliers will lower the price to increase sales, thereby moving toward equilibrium.
Equilibrium

• **Shortage**
  – When price < equilibrium price, then quantity demanded > the quantity supplied.
    • There is excess demand or a shortage.
    • Suppliers will raise the price due to too many buyers chasing too few goods, thereby moving toward equilibrium.
Excess Supply

Price of Ice-Cream Cone

Supply

Demand

Surplus

Quantity Demanded

Quantity Supplied

2.00

2.50

0 1 2 3 4 5 6 7 8 9 10 11

Quantity of Ice-Cream Cones

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1. Hot weather increases the demand for ice cream...

2. ... resulting in a higher price ...

3. ... and a higher quantity sold.
How a Decrease Demand Affects the Equilibrium

1. A technical failure reduces the supply of ice cream...

2. ...resulting in a higher price ...

3. ...and a lower quantity sold.

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A Shift in Both Supply and Demand

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A Shift in Both Supply and Demand

Small increase in demand

Large decrease in supply

Initial equilibrium

New equilibrium

Quantity of Ice-Cream Cone

Price of Ice-Cream Cone

Initial equilibrium

New equilibrium
Simultaneous Shifts

- When demand & supply shift simultaneously
  - Can predict either the direction in which price changes or the direction in which quantity changes, but not both
  - The change in equilibrium price or quantity is said to be indeterminate when the direction of change depends on the relative magnitudes by which demand & supply shift
What Happens to Price and Quantity when Supply or Demand Shifts?

<table>
<thead>
<tr>
<th></th>
<th>No Change in Supply</th>
<th>An Increase in Supply</th>
<th>A Decrease in Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Change in Demand</strong></td>
<td>$P$ same</td>
<td>$P$ down</td>
<td>$P$ up</td>
</tr>
<tr>
<td></td>
<td>$Q$ same</td>
<td>$Q$ up</td>
<td>$Q$ down</td>
</tr>
<tr>
<td><strong>An Increase in Demand</strong></td>
<td>$P$ up</td>
<td>$P$ ambiguous</td>
<td>$P$ up</td>
</tr>
<tr>
<td></td>
<td>$Q$ up</td>
<td>$Q$ up</td>
<td>$Q$ ambiguous</td>
</tr>
<tr>
<td><strong>A Decrease in Demand</strong></td>
<td>$P$ down</td>
<td>$P$ down</td>
<td>$P$ ambiguous</td>
</tr>
<tr>
<td></td>
<td>$Q$ down</td>
<td>$Q$ ambiguous</td>
<td>$Q$ down</td>
</tr>
</tbody>
</table>
Session Summary

• The demand curve shows how the quantity of a good depends upon the price.
  – According to the law of demand, as the price of a good falls, the quantity demanded rises. Therefore, the demand curve slopes downward.
Session Summary

– In addition to price, other determinants of how much consumers want to buy include income, the prices of complements and substitutes, tastes, expectations, and the number of buyers.

– If one of these factors changes, the demand curve shifts.
Session Summary

• The supply curve shows how the quantity of a good supplied depends upon the price.

• According to the law of supply, as the price of a good rises, the quantity supplied rises. Therefore, the supply curve slopes upward.
Session Summary

- In addition to price, other determinants of how much producers want to sell include input prices, technology, expectations, and the number of sellers.

- If one of these factors changes, the supply curve shifts.
Session Summary

• Market equilibrium is determined by the intersection of the supply and demand curves.

• At the equilibrium price, the quantity demanded equals the quantity supplied.

• The behavior of buyers and sellers naturally drives markets toward their equilibrium.
Session References

Managerial Economics; D N Dwivedi, 7th Edition

Managerial Economics; Thomas and Maurice, 9th Edition

Managerial Economics; Mark Hirschey