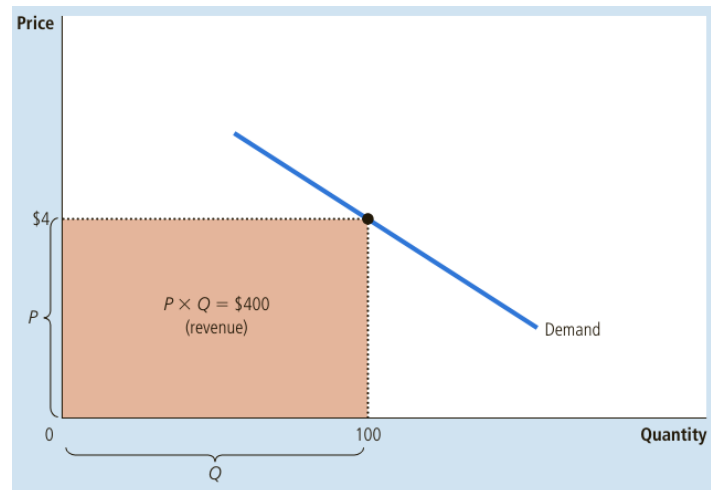


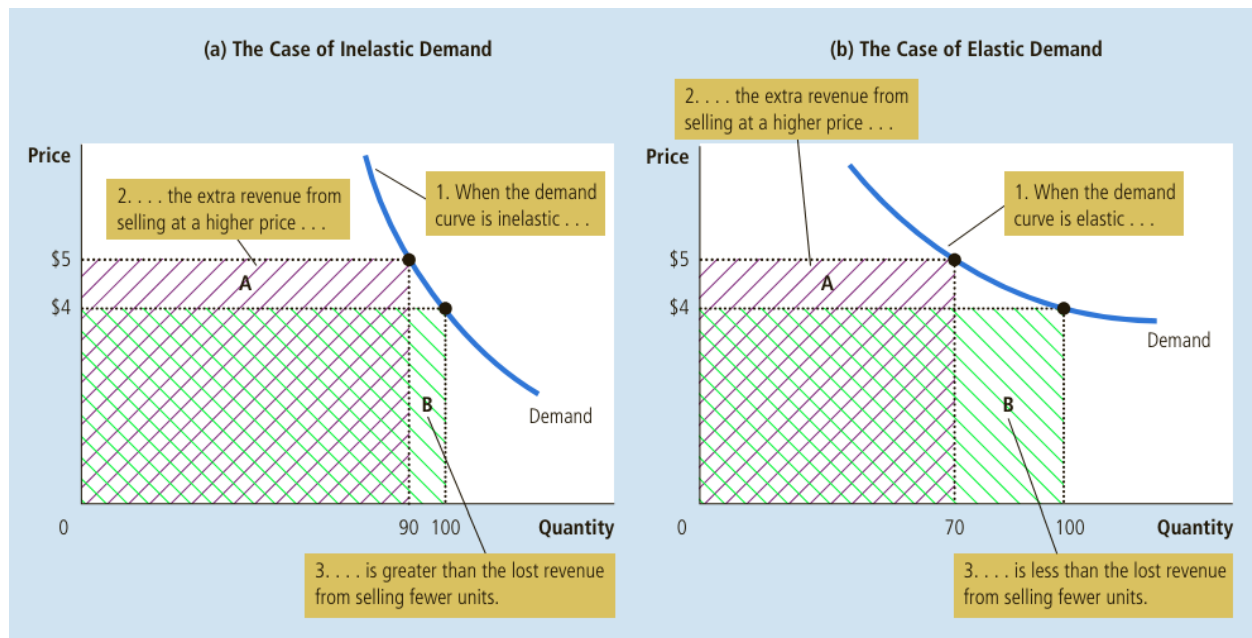
Lecture 6 - Elasticity Part 2

Revenue and Price Elasticity of Demand

- One metric that we are interested in calculating is **revenue**.
- Revenue is price multiplied by quantity sold, $P * Q$.
- Diagrammatically, it is the area of the rectangle as shown below:



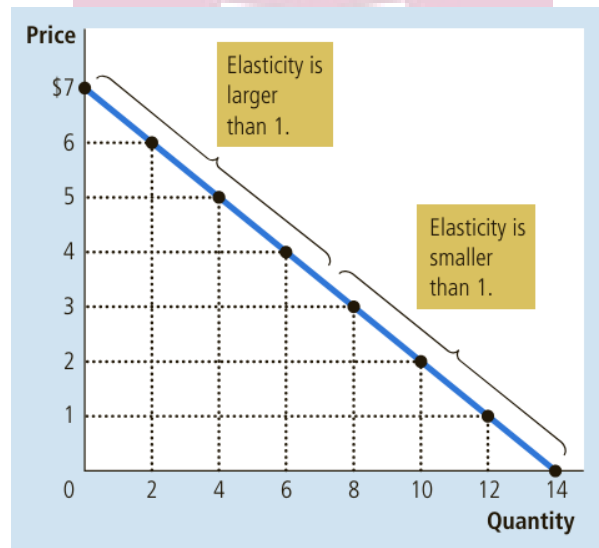
- Here, the revenue is 400, which is calculated by multiplying the price, \$4, with the quantity, 100.
- As you may expect, when price changes, quantity demanded also changes, and so does the revenue.
- Whether the revenue rises, falls, or remains the same, depends on the price elasticity of demand.
- For instance, if the demand curve is inelastic, then this means raising the price will only slightly decrease quantity demanded. Hence, overall, revenue will rise.
- Conversely, if the demand is elastic, then raising the price even slightly will decrease the quantity demanded significantly. Hence, overall, revenue will fall.
- These cases are illustrated in the diagram below:



- Here, in both diagrams, the price **rises** from \$4 to \$5.
- You can calculate the change in revenues to see it rises when demand is inelastic, and falls, when demand is elastic.

The Linear Demand Curve

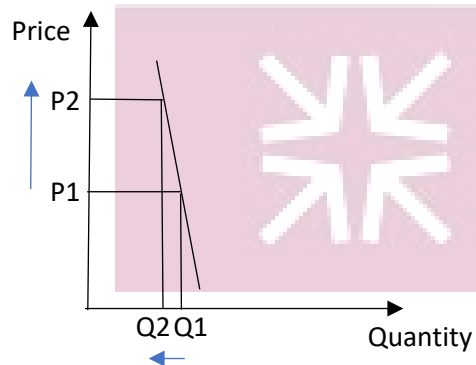
- The diagram below shows a linear demand curve:



- It shows that the elasticity varies as move along the linear demand curve.
- The table shows all the calculations for each point:

Price	Quantity	Total Revenue (Price × Quantity)	Percentage Change in Price	Percentage Change in Quantity	Elasticity	Description
\$7	0	\$0	15	200	13.0	Elastic
6	2	12	18	67	3.7	Elastic
5	4	20	22	40	1.8	Elastic
4	6	24	29	29	1.0	Unit elastic
3	8	24	40	22	0.6	Inelastic
2	10	20	67	18	0.3	Inelastic
1	12	12	200	15	0.1	Inelastic
0	14	0				

- You can see that as price falls from \$7 to 0, the demand curve moves from being elastic to inelastic (calculated using the mid-point formula).
- In other words, as move down the curve, elasticity decreases.
- Also, in the 3rd column, you can see that in the region where demand curve is elastic, decreasing the price, increases revenue.
- Where it's inelastic, decreasing the price decreases the revenue.
- But if a demand curve's elasticity decreases along the line, then is the below curve inelastic, or elastic?



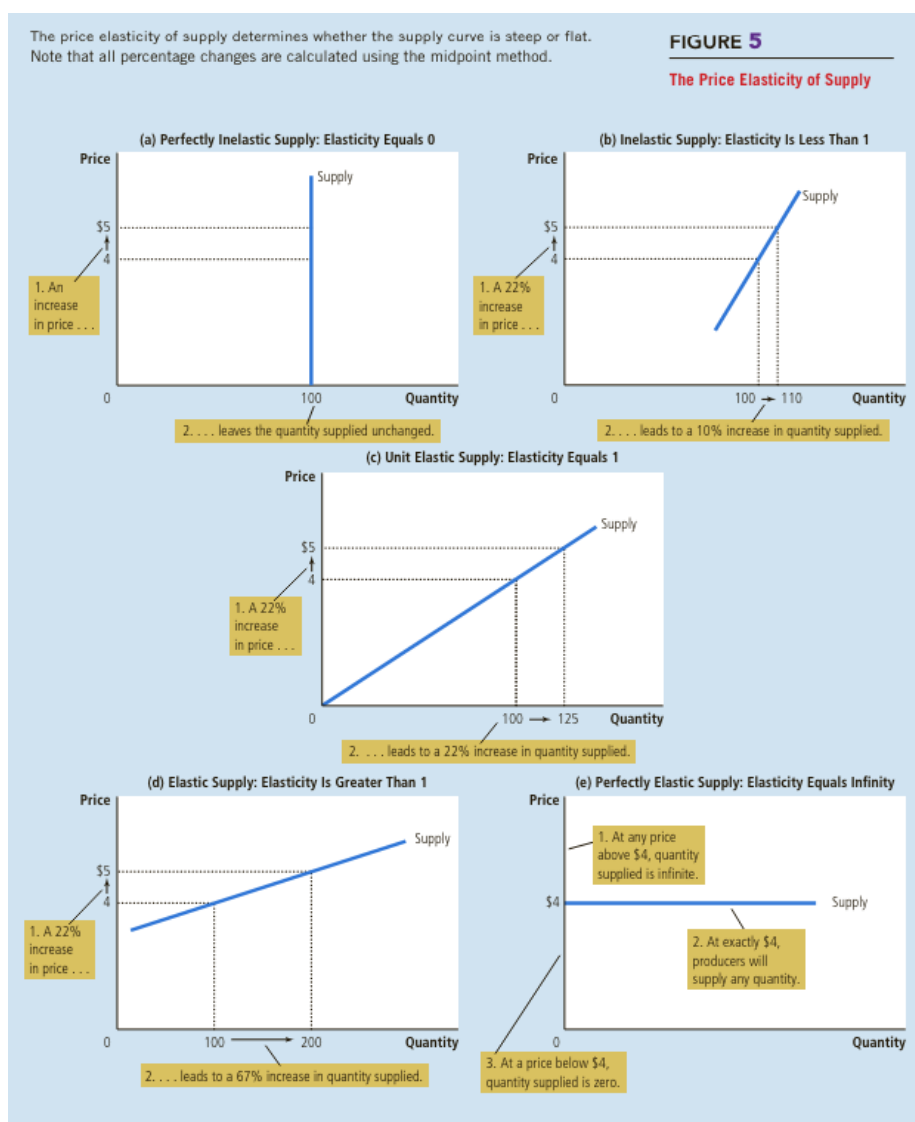
- It is clear from the above diagram, that as prices rise, the quantity demanded falls only by a little. So, the curve is inelastic.
- But this means its elasticity does not change as move along the line, as discussed above.
- The thing is, elasticity is changing, but it remains less than 1 throughout.
- For instance, at the point where price is P2, elasticity may be 0.5, and at point P1, elasticity may be 0.4, and at the bottom, it might be 0.2.
- Although the elasticity is decreasing, it remains below 1, and hence, the demand curve can be classified as inelastic.

Elasticity of Supply

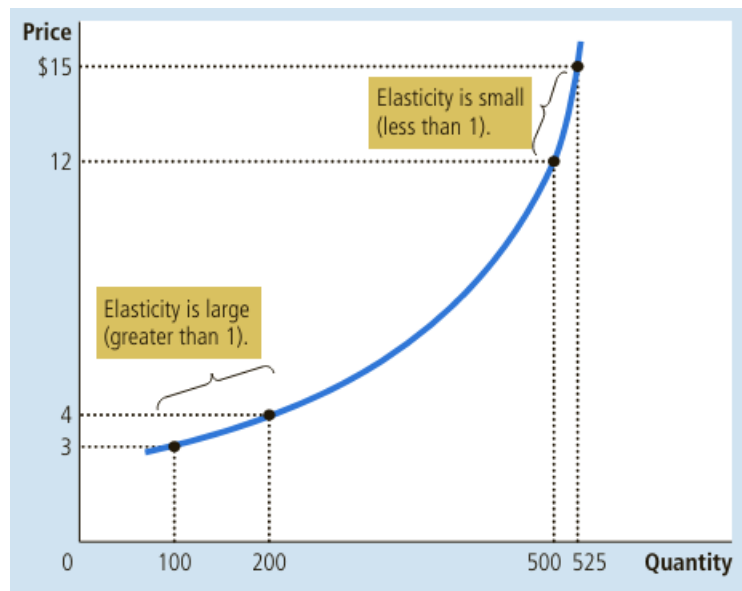
- Almost all the concepts we studied regarding elasticity of demand apply to elasticity of supply.
- The exact same formula applies to computing elasticity of supply:

$$\text{Price Elasticity of Supply (P.E.S)} = \frac{\% \Delta \text{ in quantity supplied}}{\% \Delta \text{ in price}}$$

- Also, you can modify the mid-point method to include quantity supplied
- The following diagram illustrates the variety of supply curves with different elasticities computed according to mid-point formula.:



- The elasticity of supply can change along a single supply curve, as illustrated below:



- This happens because at lower quantities, firms have excess capacity. So, a slight rise in price allows them to increase production significantly.
- However, as they keep increasing quantity, capacity decreases.
- Eventually, firms require a significant rise in price to increase production slightly.

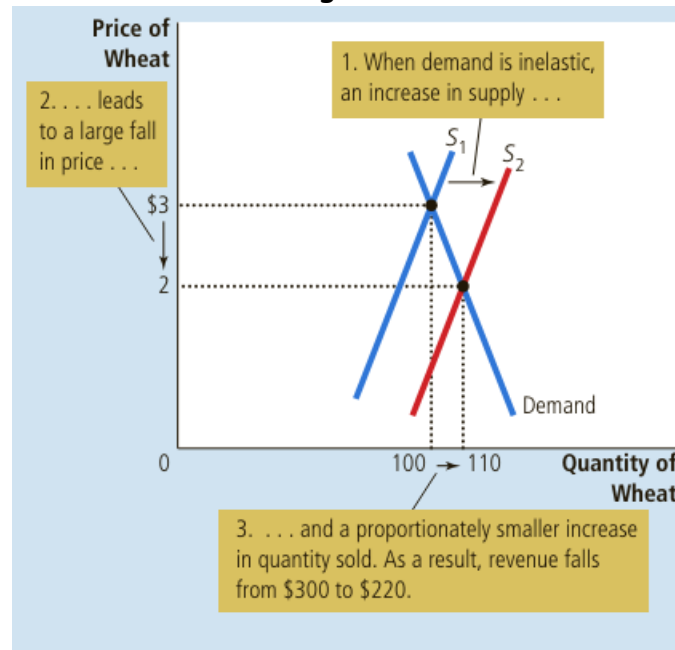
Elasticity Applications

- Now that we know about demand and supply elasticity, let's apply the concepts to analyze a few economic situations.
- This will build the background for more in-depth policy analysis in later chapters.

Improvement in Farm Technology

- Would an improvement farm technology for producing wheat be good for farmers?
- Let's look at this in terms of demand and supply. Improvement in the technology for producing wheat will surely increase the supply of wheat.
- Hence, it will shift the supply curve to the right.
- But we know that wheat is a necessity. Hence, its demand is likely to be inelastic.

- This means if supply increases, price will go down, and there will be a movement down the demand curve.
- Since the demand curve is inelastic, a reduction in price will only increase quantity slightly.
- This means price fell more than the quantity increase.
- Eventually, revenue from wheat will fall and this will be bad for farmers.
- The situation is illustrated in the diagram below:

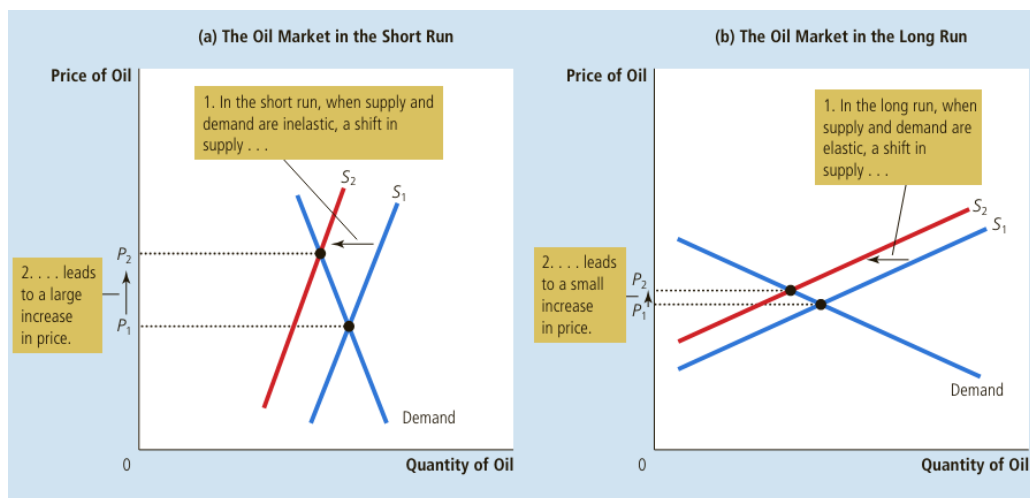


- This means if governments introduce new technology to farm production, it will eventually hurt farmers, but benefit consumers.
- Therefore, governments should carefully analyze who will benefit and lose as a result of their policy.

Why OPEC failed to keep prices high?

- Organization of Petroleum Exporting Countries (OPEC) are a group of nations that export oil. The countries include Kuwait, Saudi Arabia, Bahrain, Qatar, etc.
- In the 1970s, the group decided to restrict the supply of oil to the world.
- As we know, restricting the supply created a shortage and resulted in a high price of oil.
- However, the move benefited the group only in the short-run. In the long-run, their revenues started to fall.

- The reason is the different demand elasticity in the short and long-run.
- Remember, we stated in the short-run, demand for goods is inelastic as people have few substitutes. However, in the long-run, they find other substitutes.
- The same happened with oil. In the short-run, people had few substitutes. In the long-run, other countries discovered oil and both supply and demand became elastic.
- The situation is illustrated below:

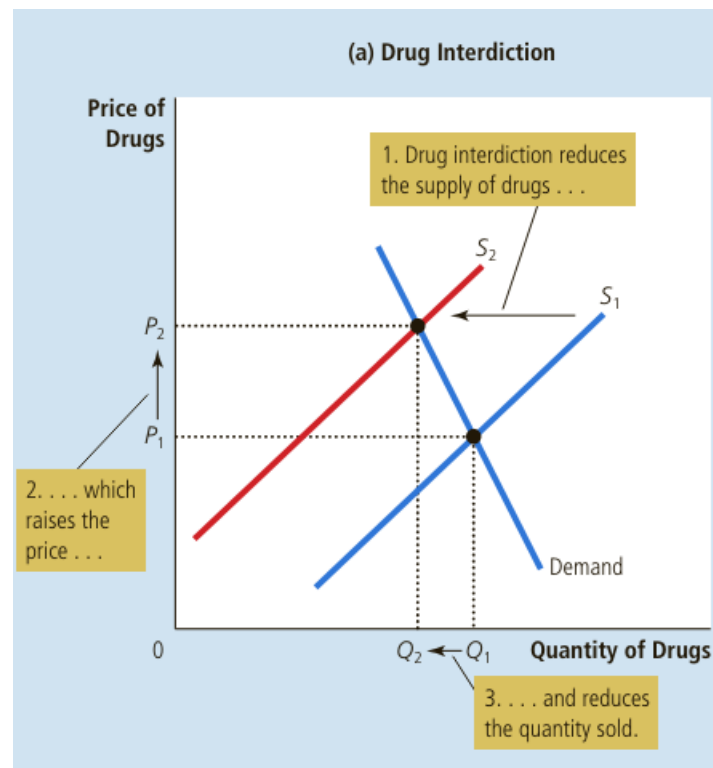


- When OPEC restricted oil in the short-run, supply decreased, and due to inelastic demand, prices increased more than quantity decreased. The result was an increase in revenue.
- In the long-run, with elastic demand and supply, the decrease in supply caused prices to rise only slightly but the quantity demanded of OPEC oil decreased significantly.

Would banning drugs reduce drug-related crimes?

- What if the government imposes a ban on the sale of harmful drugs? Will it result in sellers selling drugs in the black market?
- First, we know that banning drugs will reduce the supply of drugs.
- We also know that demand for drugs is inelastic since it is addictive.
- Hence, the decrease in supply will cause the price of drugs to rise more and quantity demanded to fall only by little.

- This means revenue from drug sales will increase. Hence, sellers will try to sell drugs at a higher price in the black market to benefit from high revenues.
- This is illustrated below:



- Hence, if the original price was PKR 100 for a drug, and after the ban, the price went up to PKR 200, some sellers can sell the drug in black at a price of PKR 190.
- Consumers will buy the drugs in the black market since it is cheaper than the drugs being sold legally in drug stores.
- Hence, the policy of drug intervention will only make things worse. A better policy would be to reduce the demand for drugs through educational campaigns.