# BASICS OF BUSINESS ECONOMY

LEARNING OUTCOME 2 – LECTURE - ELASTICITIES

# WHAT IS ELASTICITY

- Supply and demand can often tell us whether certain forces increase or decrease quantities.
- But for these tools to be truly useful, we need to know *how much* supply and demand respond to changes in price. – we talk about elasticities
- Some purchases, like those for vacation travel, are luxuries that are very sensitive to price changes.
- Others, like food or electricity, are necessities for which consumer quantities respond very little to price changes.

# ELASTICITY OF DEMAND

- The law of demand tells us that demand will fall if the price increases, but it does not give us information on how much demand will fall if the price increases.
- Elasticity of demand gives us information on how much demand will fall if the price increases.
- Price elasticity of demand measures how, or how much the requested quantity reacts to a change in price.

# DEFINITION OF PRICE ELASTICITY OF DEMAND

- The price elasticity of demand (sometimes simply called price elasticity ) measures how much the quantity demanded of a good changes when its price changes.
- The precise definition of price elasticity is the percentage change in quantity demanded divided by the percentage change in price.

$$\text{Price elasticity of demand} = E_D = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}}$$

# Coefficient of price elasticity of demand

We express the price elasticity of demand by the coefficient of price elasticity of demand

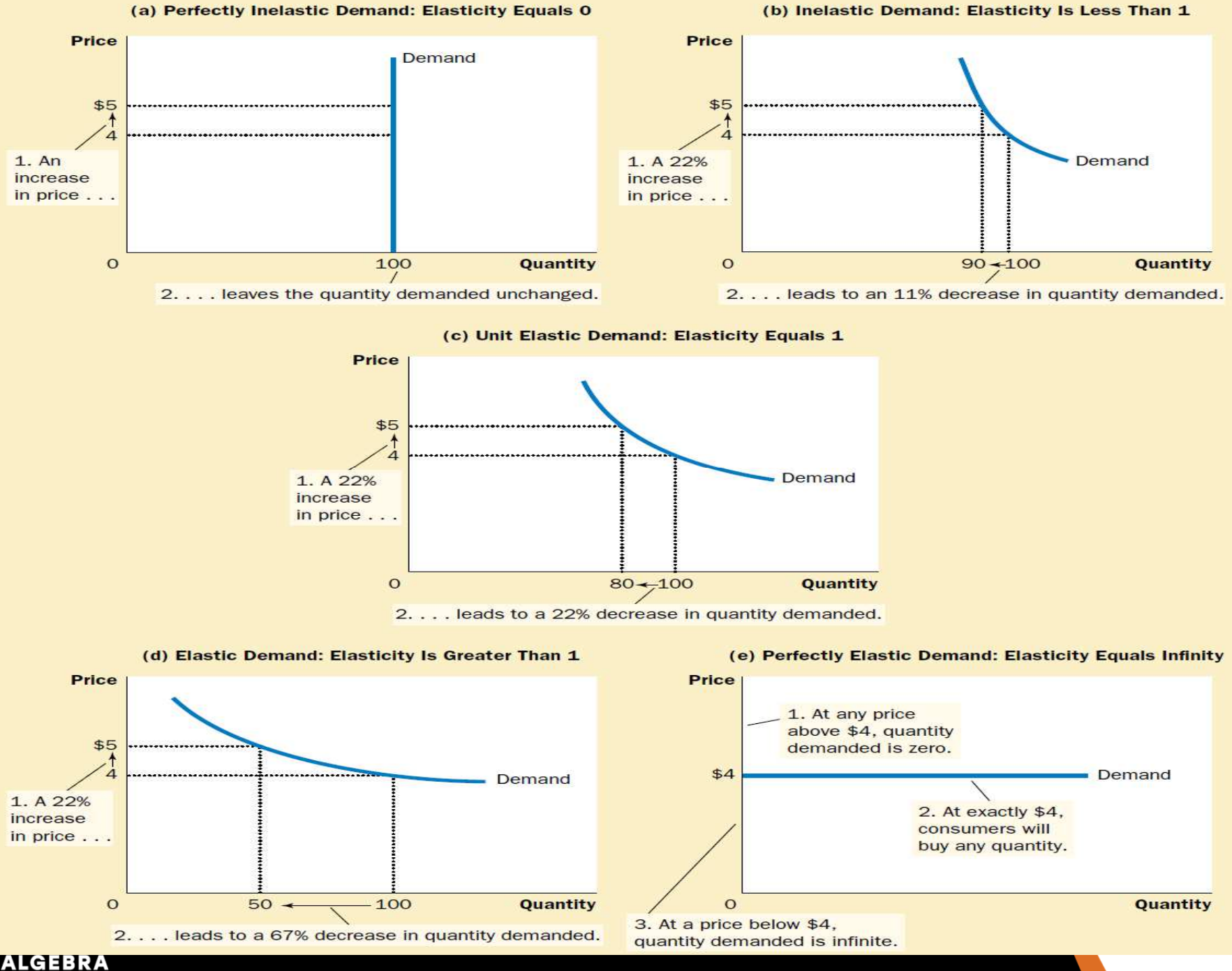
- The coefficient of price elasticity of demand can be:

- Greater than 1 (price-elastic demand)
- If a change in price of 1% leads to a change in the quantity demanded by more than 1%. - tourist arrangements (mass tourism - sun and sea)

- Equal to 1 (unit-elastic demand)
- The percentage change in price is equal to the percentage change in quantity demanded.

- Less than 1 (price-inelastic demand) - eg. Cigarettes, goods you buy from a monopolist
- If a change in price of 1% leads to a change in the quantity demanded of less than 1%.

Extreme cases - perfectly inelastic demand (eg drug addiction); perfectly elastic demand (roughly the marketplace)


(a) Perfectly Inelastic Demand: Elasticity Equals 0
Price
Demand
$5
4
1. An increase in price . . .
0
100
Quantity
2. . . . leaves the quantity demanded unchanged.
(b) Inelastic Demand: Elasticity Is Less Than 1
Price
$5
4
1. A 22% increase in price . . .
Demand
0
90
100
Quantity
2. . . . leads to an 11% decrease in quantity demanded.
(c) Unit Elastic Demand: Elasticity Equals 1
Price
$5
4
1. A 22% increase in price . . .
Demand
0
80
100
Quantity
2. . . . leads to a 22% decrease in quantity demanded.
(d) Elastic Demand: Elasticity Is Greater Than 1
Price
$5
4
1. A 22% increase in price . . .
Demand
0
50
100
Quantity
2. . . . leads to a 67% decrease in quantity demanded.
(e) Perfectly Elastic Demand: Elasticity Equals Infinity
Price
1. At any price above $4, quantity demanded is zero.
$4
Demand
2. At exactly $4, consumers will buy any quantity.
0
Quantity
3. At a price below $4, quantity demanded is infinite.

# What does the price elasticity of demand depend on?

- Intensity of needs, ie whether it is a necessary or luxury good (necessity of that good)
- Substitutes
- Length of consumer reaction time
- What is the share of that good in the total income you earn

# Intensity of need - necessity or luxury

- The greater the need for a good, the less elastic the demand for such a good and vice versa.
- Necessary goods - necessity (eg bread, milk) are necessary for life and their purchase cannot be easily given up regardless of the price.
- Luxury goods (eg yacht, Rolex watch) can be easily given up, so the demand for such goods is more elastic.
- Need is also a matter of personality, which for some is a luxury for another is a necessity. If you make a living from renting a yacht, it is a necessity for you, so your demand for them is less elastic than the average person with a deeper pocket who uses a yacht to show of his/her wealth and as a „chick magnet".

# substitutes

- If a good has easily available substitutes, its demand is elastic - e.g. Holidays (mass tourism) in Croatia and Spain. If Croatia raises prices, tourists go to Spain.
- If a good does not have easily available substitutes, its demand is inelastic - e.g. petrol (if price of petrol goes up you cannot substitute it by diesel or gas)

# Consumer reaction time

- **This is the time the consumer has to respond to a change in price.**
- The elasticity of demand is greater in the long run than in the short run, because consumers have more time to adapt to change.
- **Eg when the price of a soda drops, it will not have a significant effect on demand in the first place, but with time and when consumers learn that prices are lower, they will start buying more of that particular type of soda.**

# Share in personal income

- Pr. Salt - it represents a small share of your consumption and your income, so your price elasticity of demand is less elastic i.e it is inelastic - you do not worry so much about the price of salt and if the price of salt somewhere in Zagreb drops by 10% you will not go searching for particular shop to buy cheaper salt.
- But for the iPhone 13, which represents a significant share of income, you will certainly react to price changes, ie your demand will be elastic and you will react to price changes. If somewhere in Zagreb price drops by 10% you will for sure go and search for the particular store.

# Other demand elasticities - Income elasticity

$$\text{income elasticity of demand} = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}}$$

- The income elasticity of demand measures how the quantity demanded changes as consumer income changes. It is calculated as the percentage change in quantity demanded divided by the percentage
- With respect to change in income we divide goods into: Normal goods(eg clothing) , luxury goods (eg luxury watch) and inferior goods (eg cheap chicken salami, cheapest bread, cheap greenhouse tomatoes)
- For most goods this elasticity is positive in sign (if income increases, we demand more of these goods) . However, for the so-called inferior goods it is negative (the higher the income, the lower the demand for them) .
- Inferior goods are those that are bought by people of low purchasing power. The increase in personal income leads to the fact that a person can afford, for example, food of better quality, so instead of tomatoes from the mall he/she will buy the same amount of tomatoes from organic farming. That is why the sale of cheap tomatoes from mass greenhouse cultivation will fall.

# Other demand elasticities – cross-price elasticity of demand

$$\text{cross-price elasticity of demand} = \frac{\text{percentage change in quantity demanded of good 1}}{\text{percentage change in the price of good 2}}$$

- Measures how the quantity demanded of one good responds to a change in the price of another good. It is calculated as the percentage change in quantity demanded of good 1 divided by the percentage change in the price of good 2.-

Complements , substitutes and neutrals good

Complements - goods that are typically used together, such as computers and software.

- Coefficient cross elasticity is less than 0 (negative)
- Change in prices of one good induces the change in demand for another good in opposite direction
- If the price of petrol increases , the demand for cars will decrease (software and computer)

Substitutes - goods that are typically used in place of one another, such as hamburgers and hot dogs

- Cross elasticity coefficient is greater than 0 (positive)
- Change in prices one good induces the change in demand another good ( substitute ) in the same direction
- If price of Coca -Cola goes up, the quantity demand of Sky Cola will rise (or butter and margarine, hamburgers and hot dogs)

Neutral good – goods that do not affect one another (bread and computers)

- Coefficient of cross elasticity is equal to 0
- Change in prices one good does not affect the demand for another

# Elasticity and revenue

- Businesses wonder if price increases will increase or decrease their revenue?
- Total revenue = price x quantity
- 1. When demand is price-inelastic, a price decrease reduces total revenue.
- 2. When demand is price-elastic, a price decrease increases total revenue.
- 3. In the borderline case of unit-elastic demand, a price decrease leads to no change in total revenue.

# Example of elasticity and revenue

- Business class passengers in air traffic have an inelastic demand for travel (they don't have time, they have to have flexible tickets because the return can change, they have to travel more often unplanned, they are price insensitive) - increasing prices for these passengers increases revenue
- Travelers who travel as tourists for leisure and on holidays, have an inelastic demand for travel so that rising prices reduce revenue (because they will give up flying with company that is more expensive  and substitute it for competition, they have more time to plan, they are price sensitive) – increasing prices for these passangers decreases revenue

# Price Elasticity of supply

- Company's decisions also show greater or lesser reactions to price changes
- the price elasticity of supply is the percentage change in quantity supplied divided by the percentage change in price.

The exact definition of the price elasticity of supply, $E_s$, is as follows:

$$E_s = \frac{\text{percentage change in quantity supplied}}{\text{percentage change in price}}$$

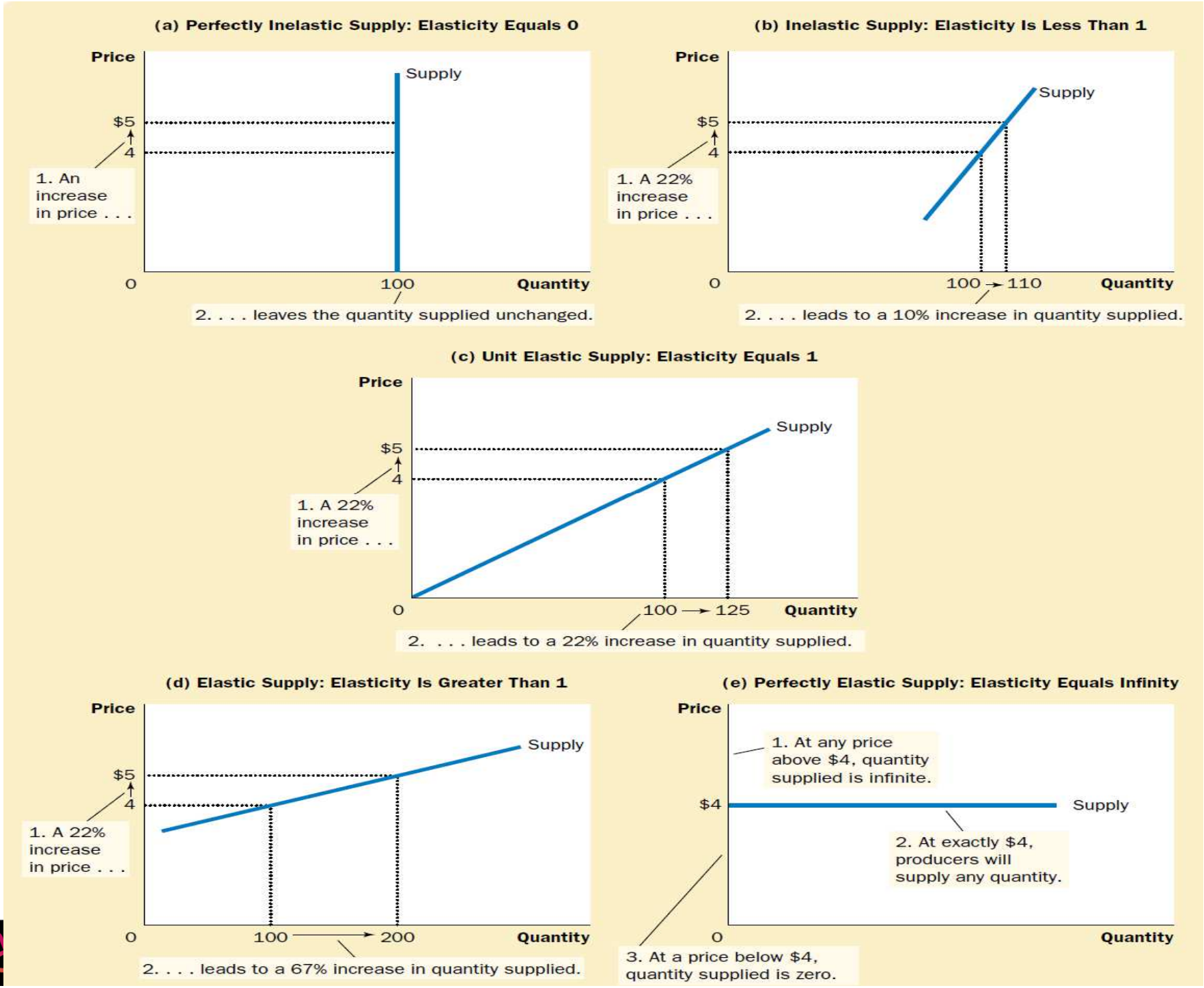
# Coefficient of price elasticity of supply

- The elasticity of supply is measured by the coefficient of elasticity of supply
- Coefficient of price elasticity of supply can be:

- Greater than 1 (price-elastic supply) - for products for which manufacturers can find substitutes very quickly by changing the price or have a lot of products in stock
- Equal to 1 and (unit-elastic supply)
- Less than 1 (price-inelastic supply) - ex. agricultural products because they are seasonal

- • There are also two extreme cases:

- Perfect inelastic offer (Es = 0) - picture Mona Lisa
- Perfectly elastic offer (Es = ∞) - approximately: market offer


(a) Perfectly Inelastic Supply: Elasticity Equals 0
Price
Supply
$5
4
1. An increase in price . . .
0
100
Quantity
2. . . . leaves the quantity supplied unchanged.
(b) Inelastic Supply: Elasticity Is Less Than 1
Price
Supply
$5
4
1. A 22% increase in price . . .
0
100 → 110
Quantity
2. . . . leads to a 10% increase in quantity supplied.
(c) Unit Elastic Supply: Elasticity Equals 1
Price
Supply
$5
4
1. A 22% increase in price . . .
0
100 → 125
Quantity
2. . . . leads to a 22% increase in quantity supplied.
(d) Elastic Supply: Elasticity Is Greater Than 1
Price
Supply
$5
4
1. A 22% increase in price . . .
0
100 → 200
Quantity
2. . . . leads to a 67% increase in quantity supplied.
(e) Perfectly Elastic Supply: Elasticity Equals Infinity
Price
1. At any price above $4, quantity supplied is infinite.
$4
Supply
2. At exactly $4, producers will supply any quantity.
0
Quantity
3. At a price below $4, quantity supplied is zero.

# Factors affecting price elasticity of supply

- Availability of production capacities
- Mobility of factors of production
- Inventories of products/services
- Time
- Length of production process

- Supply is elastic when there are greater opportunities to increase production

- It depends on the production capacity - the larger they are and the more readily you can use it (i.e. now you factory works in one shift but you can easily work in 3 shifts and produce more) – the higher the elasticity of supply

- It also depends on the mobility of production factors ( inputs)

If inputs (eg labor) can be easily procured at current prices, production can also increase due to a relatively small increase in market price - it is resilient

- If the inventory of products is large, the elasticity is also higher

- Large inventories allow available goods to be placed on the market quickly; if there is no goods available at the inventory, the goods must first be produced

- The elasticity of supply is greater if the manufacturer can adapt quickly to changes (less-time needed) and if the production process is short (in less time due to short production process firm can put on market additional products)