Demand, Supply, and Market Equilibrium

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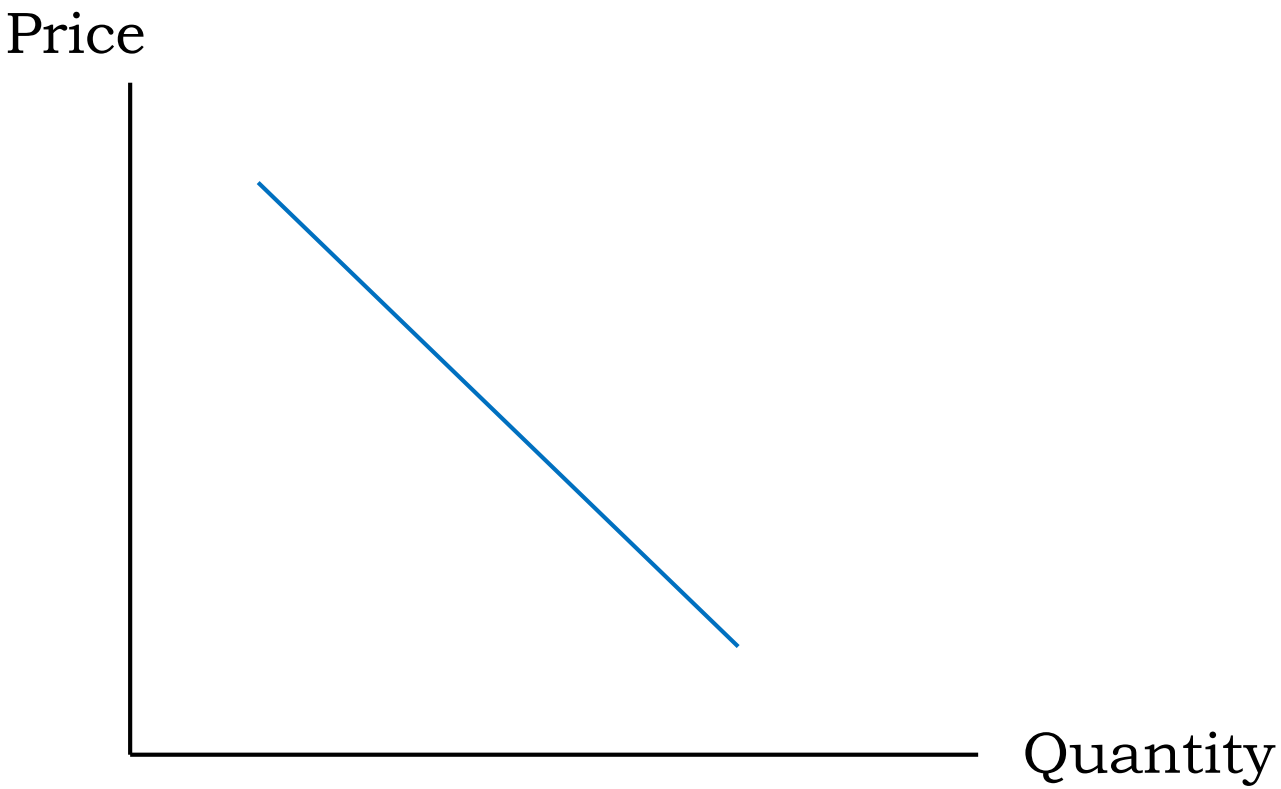
The most successful businesses are those that respond best to consumer demand.

When we discuss demand, we are considering not what a consumer *wants* to buy, but what a consumer is willing and *able* to buy.

The willingness to buy a product depends on the income that consumers have to spend, the effectiveness of advertising campaigns, the price of the product, and the recent purchases of related products (for e.g. if it is a printer, whether they obtained a computer or digital camera). – The main factor will be the price and so we focus on this variable to begin with.



The relationship between the price of a product and the quantity of the product demanded is a demand curve.

The demand curve slopes downwards because individuals will buy more of a product as the price falls. – they can afford to buy more at a lower price and also the product becomes cheaper relative to other products as the price falls.

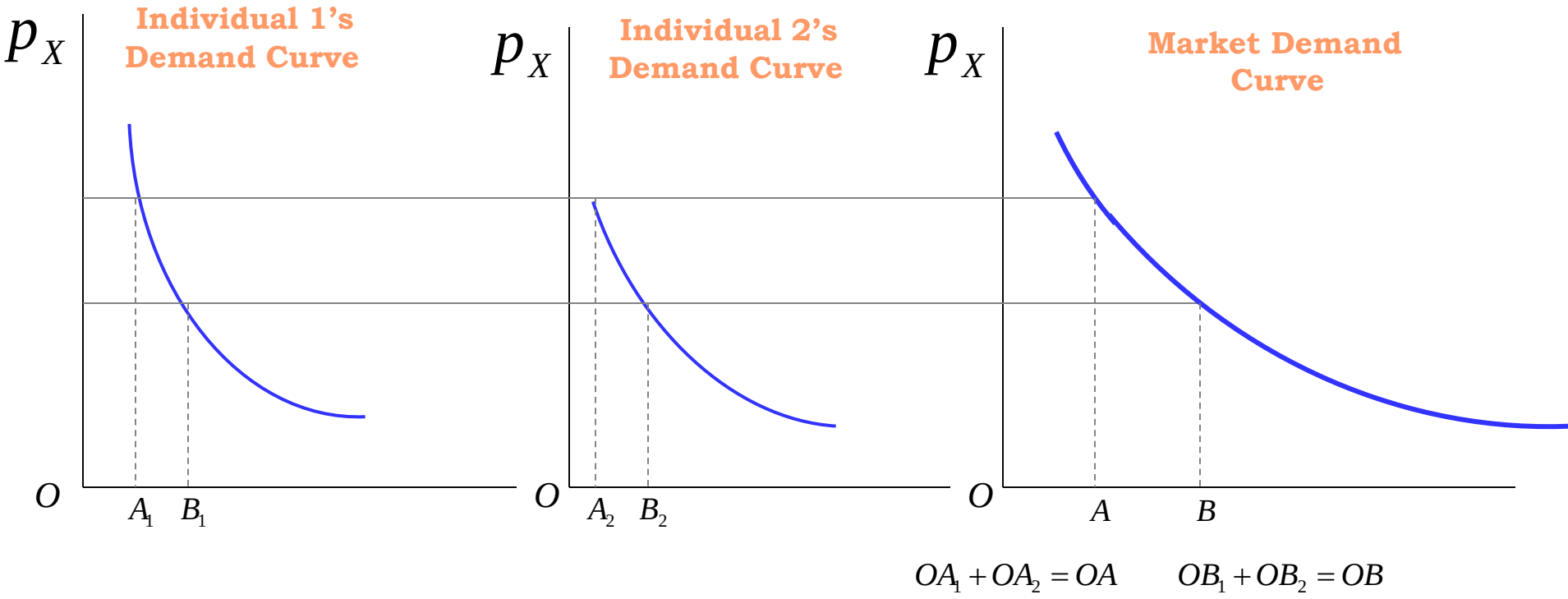
Market demand and individual demand

Market demand is the demand by all the consumers of a given good or service.

Ordinarily the market demand includes all of the consumers of the product in a city and might include all of the consumers in the world.

To keep things simple, we assume the market consists of two individual consumers in the following diagram: →

We find the market demand curve by adding the quantity demanded by each consumer at each price.



Assume for simplicity that there are two individuals in the market.

Then, the market demand curve is the horizontal summation of the individual quantities demanded at any price.

For many consumers, the market demand is the horizontal summation of all their demand curves.

The Law of Demand

Holding everything else constant, when the price of a product falls, the quantity demanded of the product will increase.

The law of demand holds for any market demand curve.

When the price of a good falls consumers buy a larger quantity cause of the substitution effect and the income effect.

Substitution effect – A fall in price makes a good less expensive ***relative*** to other goods that are ***substitutes***. For e.g., if a consumer who has digital camera pictures printed at the photography store may instead buy a printer if the price of printers falls.

Income effect – The change in the quantity demanded of a good that results from the effect of a change in the good's price on consumer's purchasing price.

When the price of a good falls the increased purchasing power of consumers' incomes will usually lead them to purchase a larger quantity of the good.

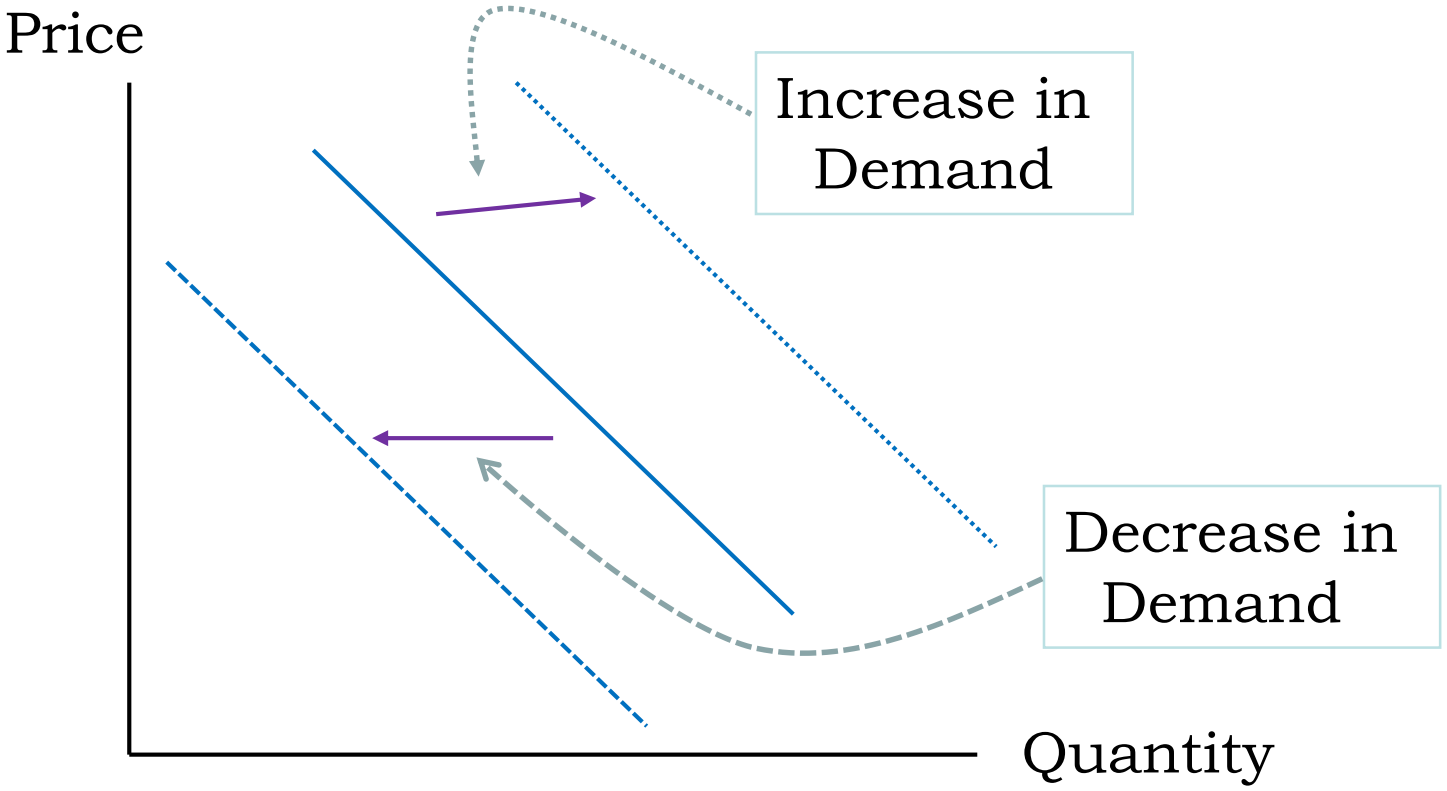
A fall in the price of printers for instance leads consumers to buy more printers, both because they are now cheaper relative to substitute products and because the purchasing power of the consumers' incomes has increased.

Holding Everything Else Constant – The *Ceteris Paribus* Condition

We are holding other variables constant that might affect the willingness of consumers to buy a product when we construct the market demand curve. This is known as the *ceteris paribus* condition: Latin for "all else equal".

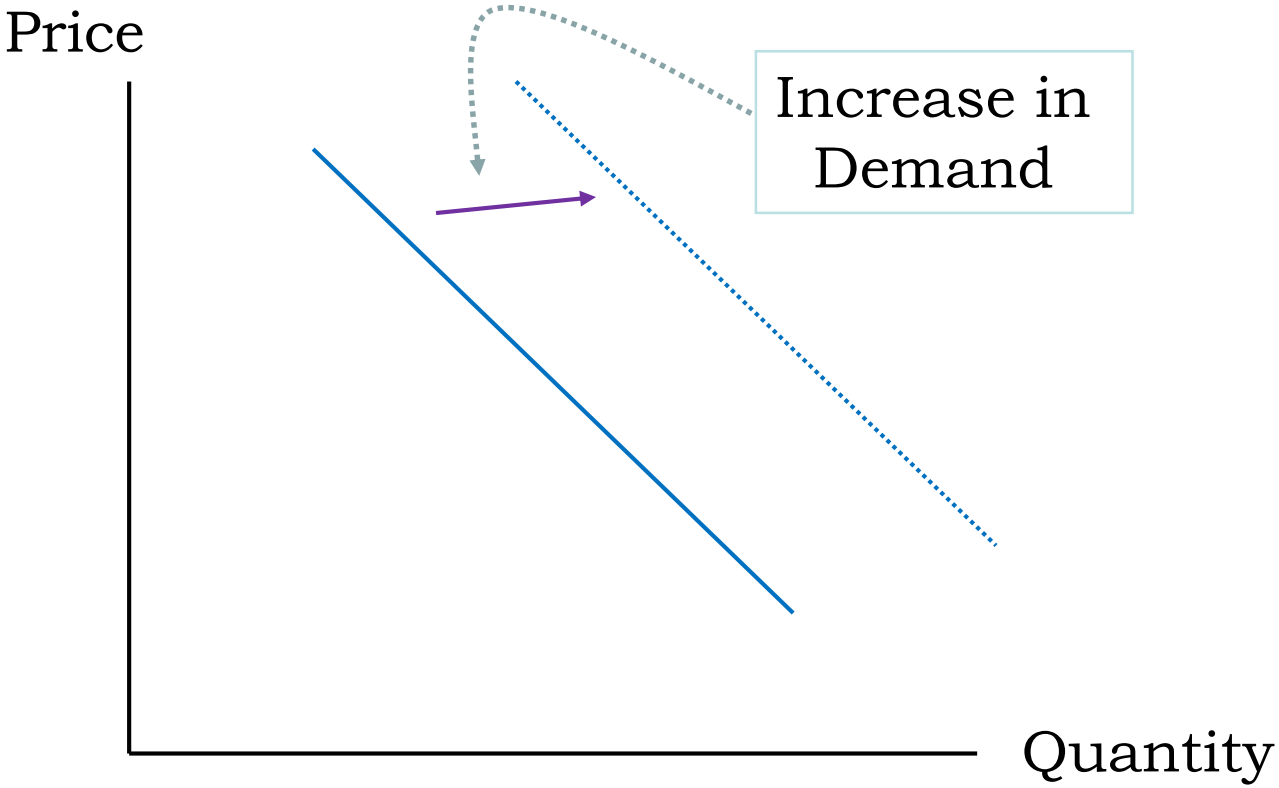
If we allow a variable other than price to change that might affect the willingness of consumers to purchase a product. Consumers then change the quantity they demand at each price. This is indicated by a shift of the demand curve.

A **shift** of the demand curve is *an increase or decrease in demand*. A movement along a demand curve is an *increase or decrease in the quantity demanded*.


Price
Increase in Demand
Decrease in Demand
Quantity

Variables that shift market demand

- Prices of related goods
- Income
- Tastes
- Population and demographics
- Expected future prices



Prices of related goods:

Goods and services that can be used for the same purpose - like printers and having digital photos printed at stores – are **substitutes**. When two goods are substitutes the more you buy of one, the less you will buy of the other.

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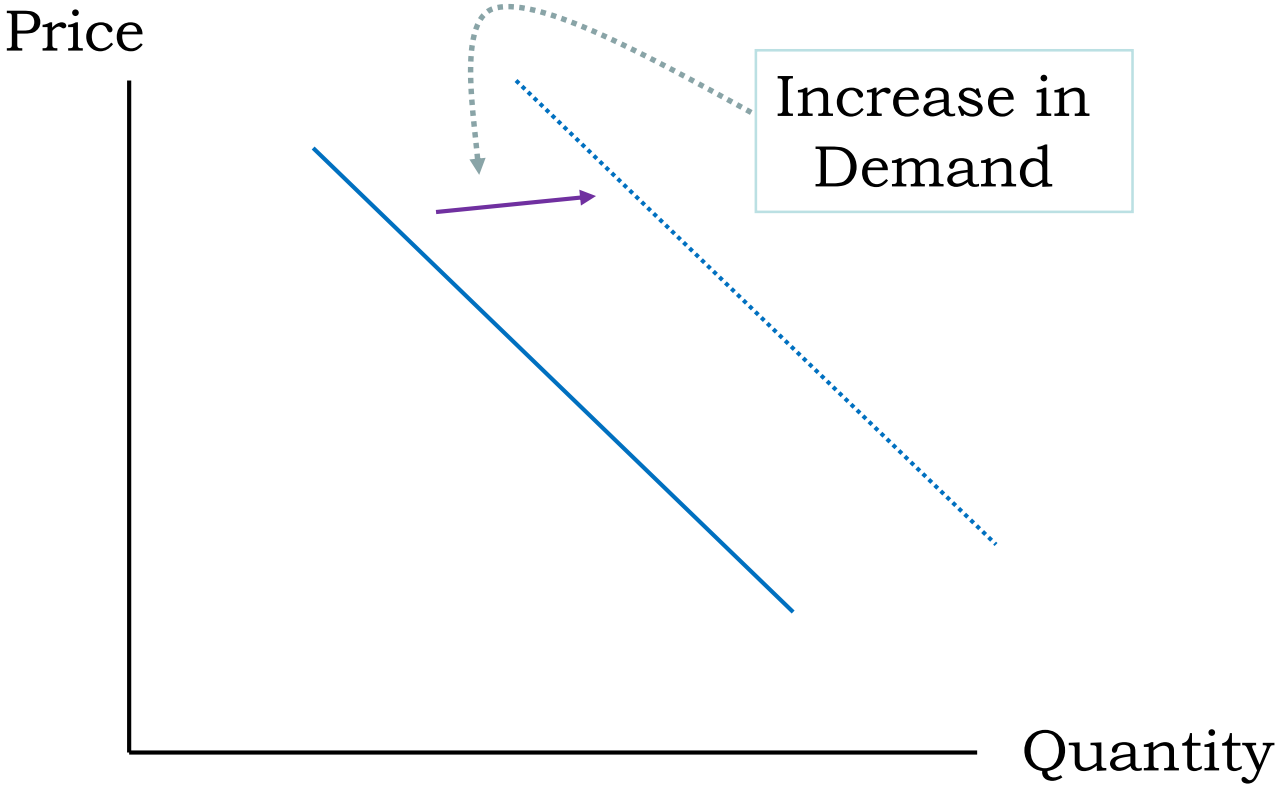
An increase in the price of a substitute causes the demand curve for a good to shift to the right.

Products that are used together – such as PCs and printers – are **complements**. When two goods are complements the more you buy of one, the more you will buy of the other.

A decrease in the price of a complement causes the demand curve for a good to shift to the right.



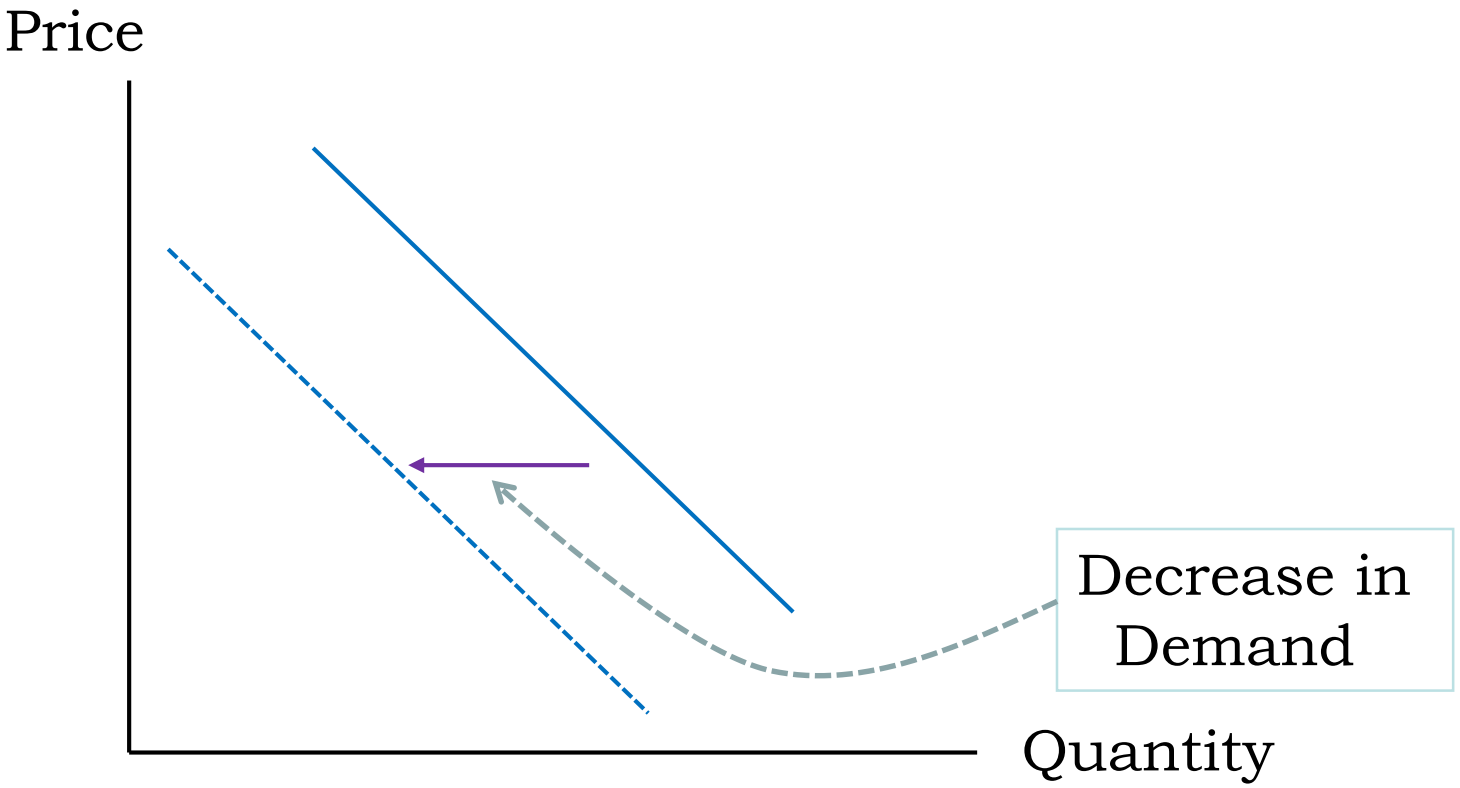
Income:

If household income rises the demand for goods increases which is a rightward shift of the demand curve.

A good is a **normal good** when demand increases following an increase in income.

For e.g., if your income increases you buy might buy less canned tuna fish and buy more of shrimp.

A good is an **inferior good** when demand decreases following an increase in income. – If when your income rises you purchase polished rice instead of husked rice then husked rice is an inferior good.

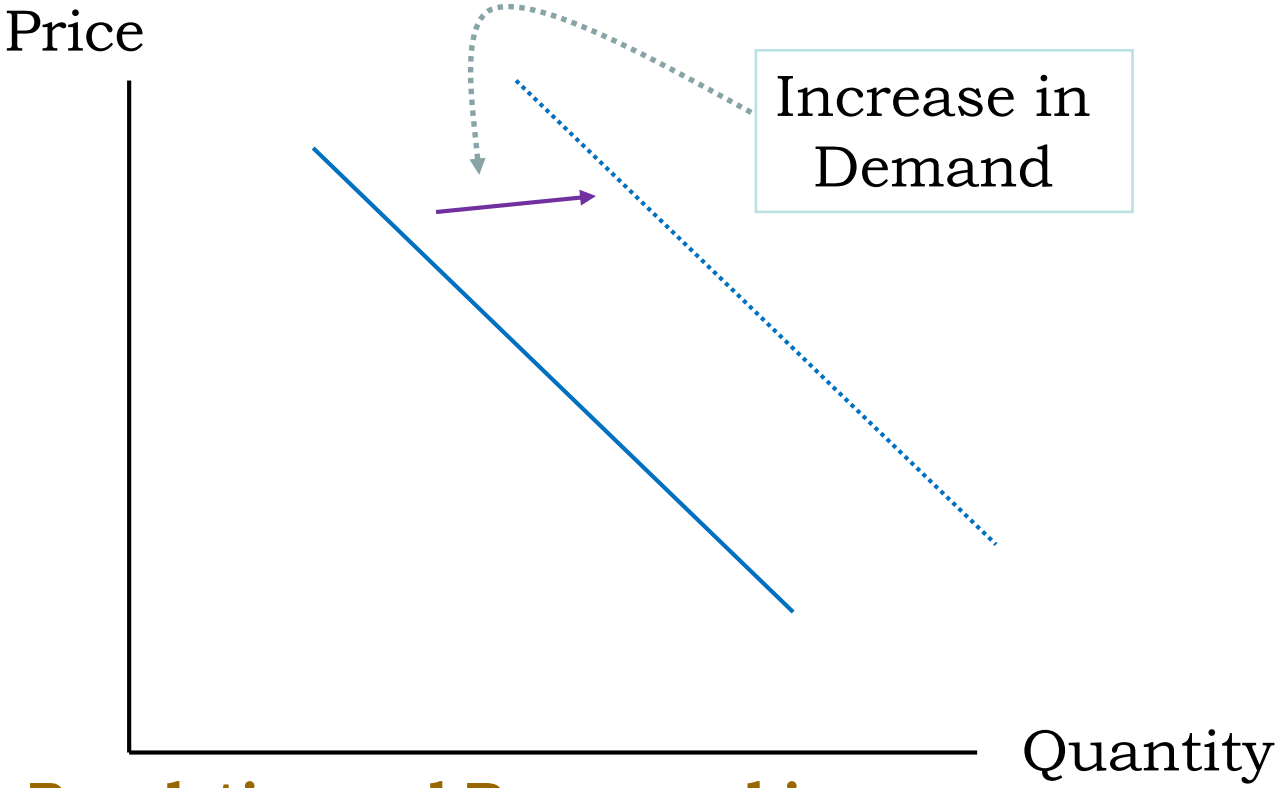


Tastes:

Taste is a catchall category that refers to the many subjective elements that can enter into a consumers' decision to buy a product. – Sometimes trends play a substantial role. For e.g. the popularity of low carbohydrate diets caused a decline in demand for some goods such as bread.

Consumers can also be influenced by an advertising campaign for a product. If an advertising campaign is successful consumers are more likely to buy and the demand curve will shift to the right.

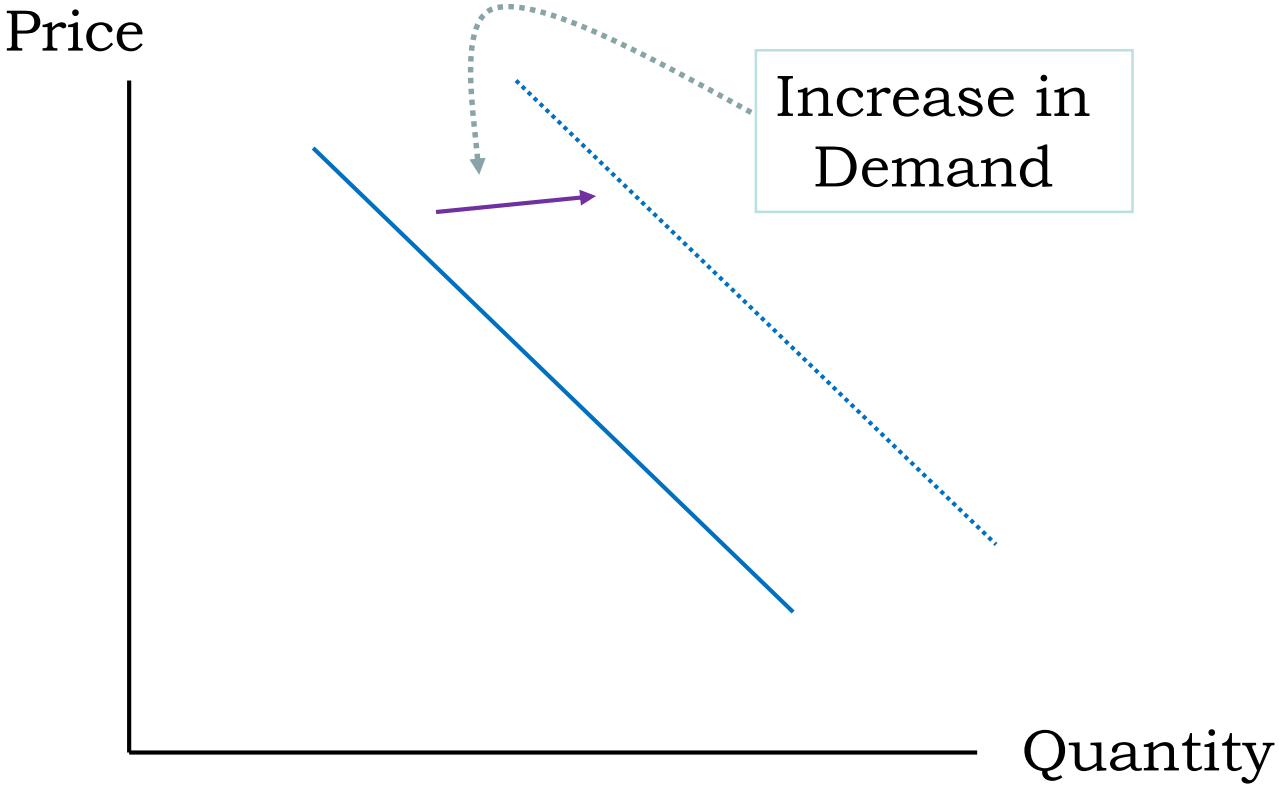
The advertising campaign affects consumers' tastes for a product.



Population and Demographics:

As population increases so will the number of consumers and the demand for most products will increase.

The demographics of a population refers to its characteristics with respect to age, gender , etc. For instance the demand for baby food will be greatest when the fraction of the population under age 2 is the greatest.



Expected Future Prices:

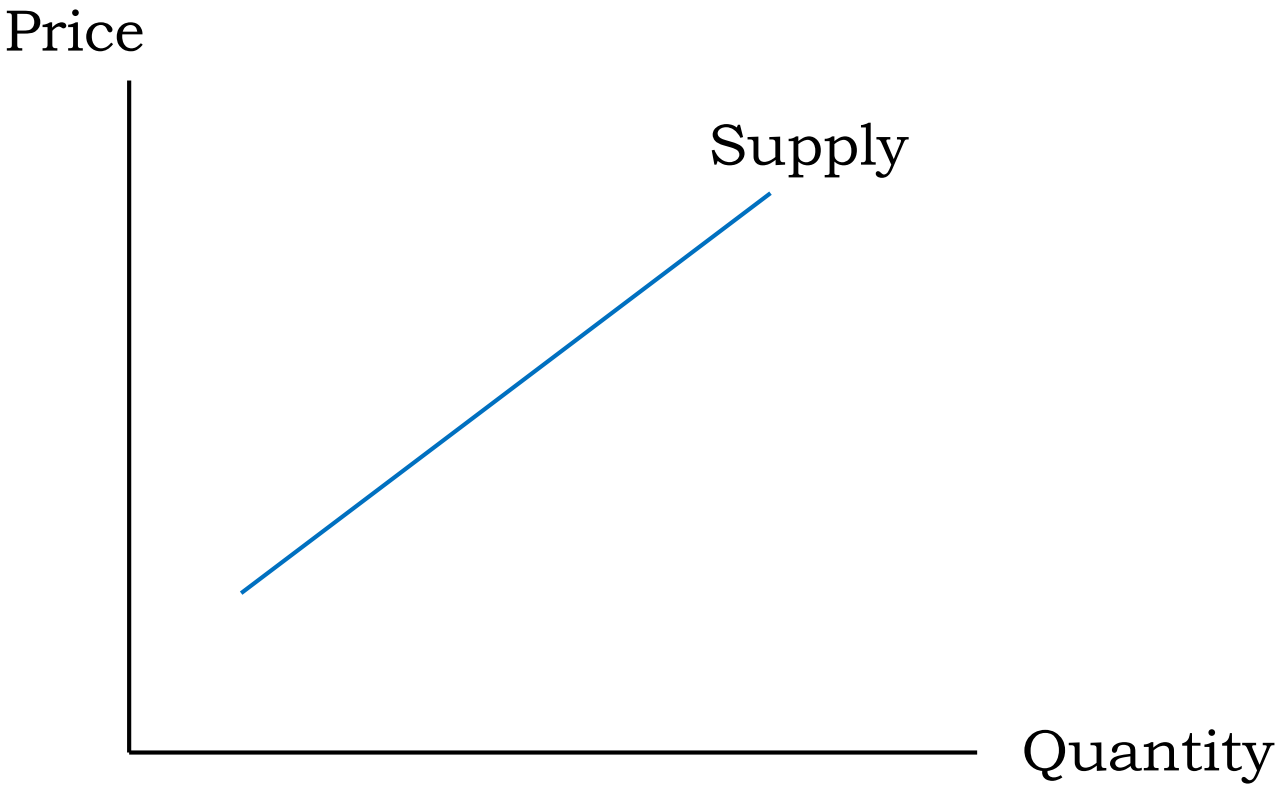
Consumers choose not only which products to buy but also when to buy them. – If they become convinced that the price of a good will be higher 3 months from now, they will increase their purchases now as they try to beat the expected price increase.

Supply

The amount of a good or service that a firm is willing and able to supply at a given price is the quantity supplied.

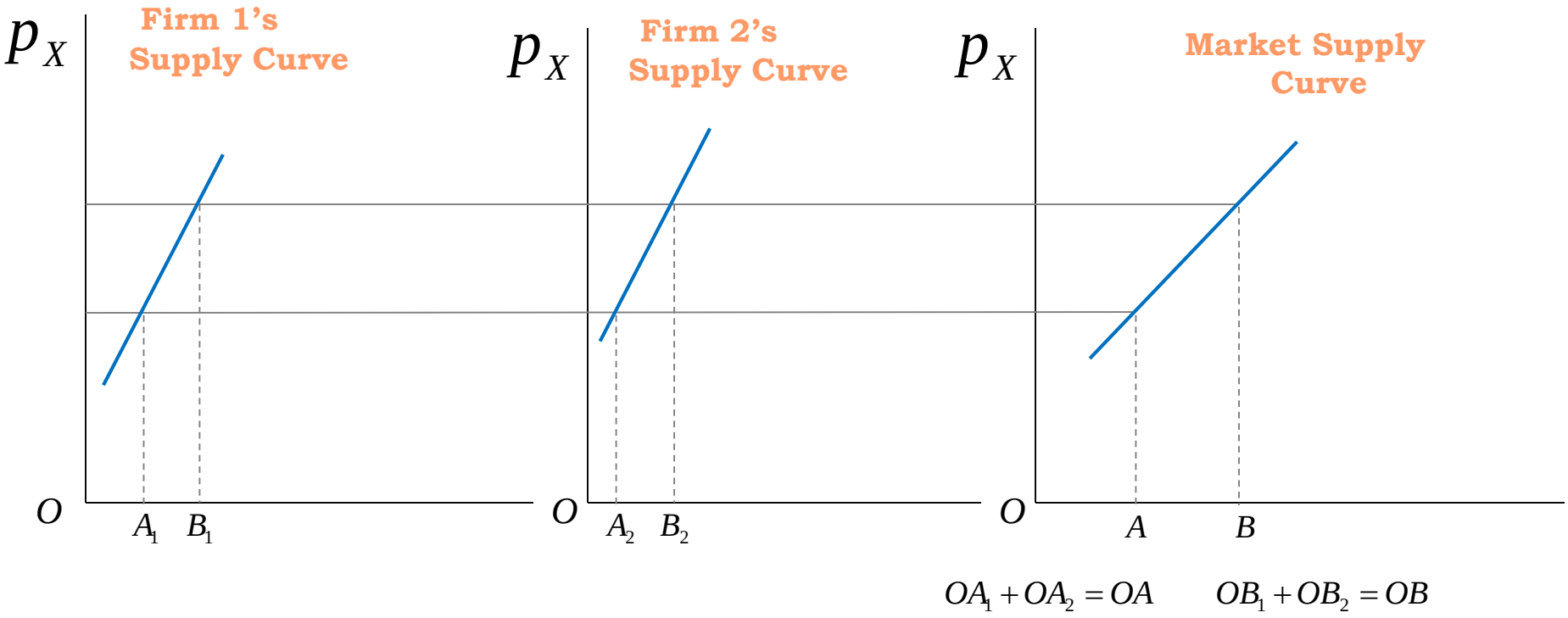
Holding all other variables constant, when the price of a good rises, producing the good is more profitable and the quantity supplied will increase.

A supply curve shows the relationship between price of a product and the quantity of the product supplied.



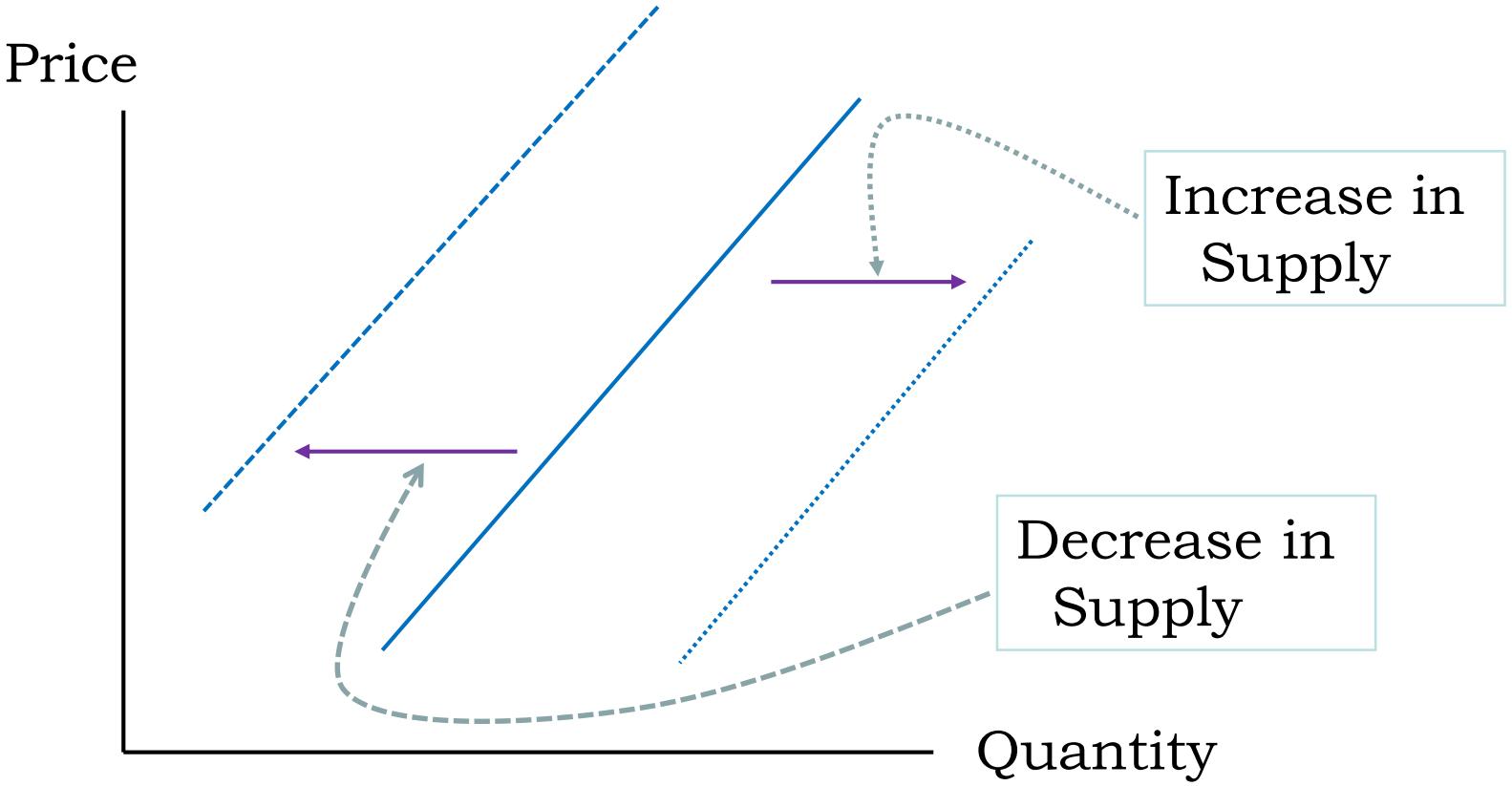
The **Law of Supply** states that, holding everything else constant, increases in price cause increases in the quantity supplied.

If only the price of the product changes, there is a movement along the supply curve, which is an increase or decrease in the quantity supplied.



Assume for simplicity that there are two firms in the market.

To get the **market supply** we add the number of the product supplied by each company producing the product.



If any other variable that affects the willingness of a firm to supply a good, other than the price of the product, changes, the supply curve will shift.

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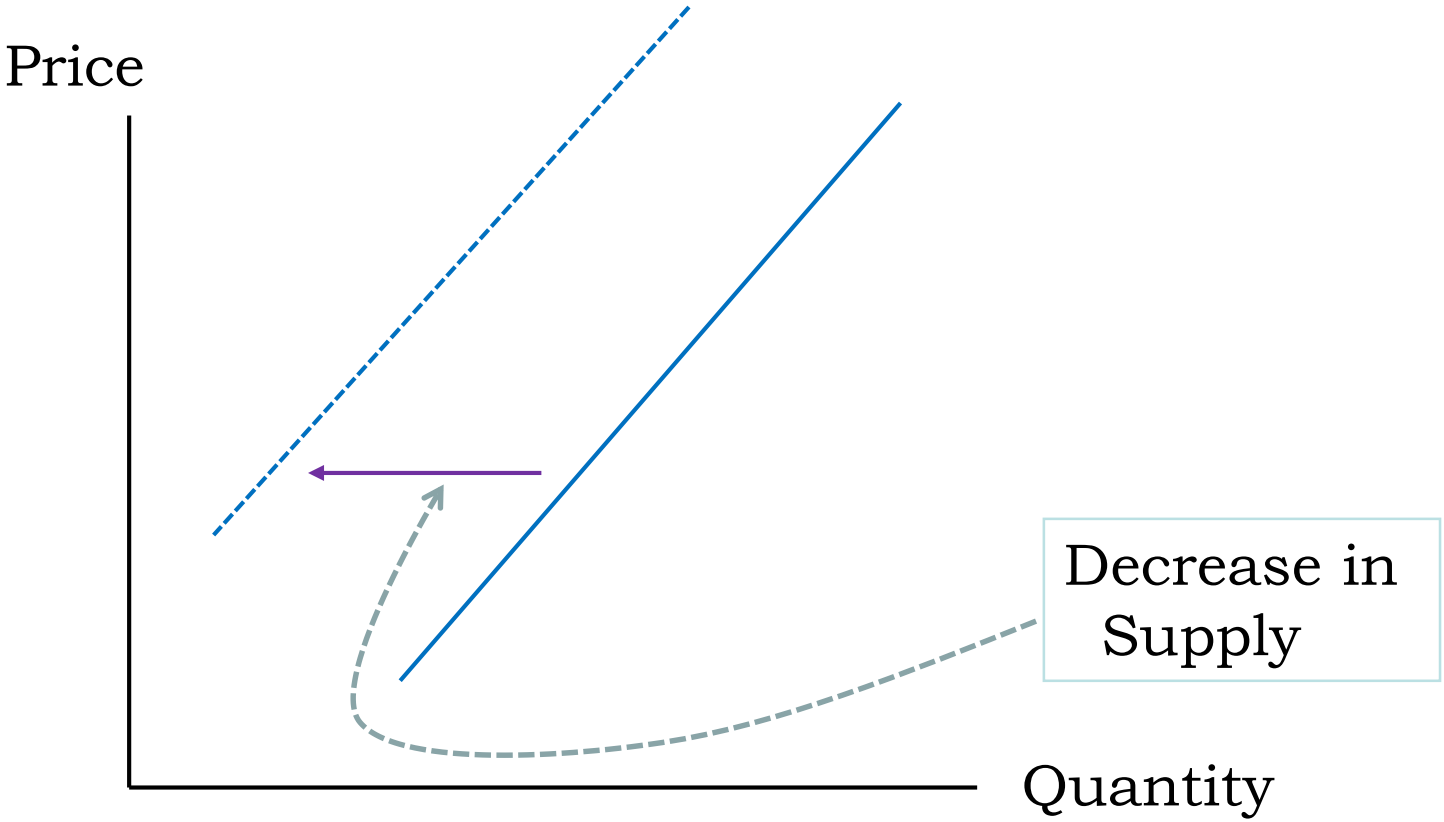
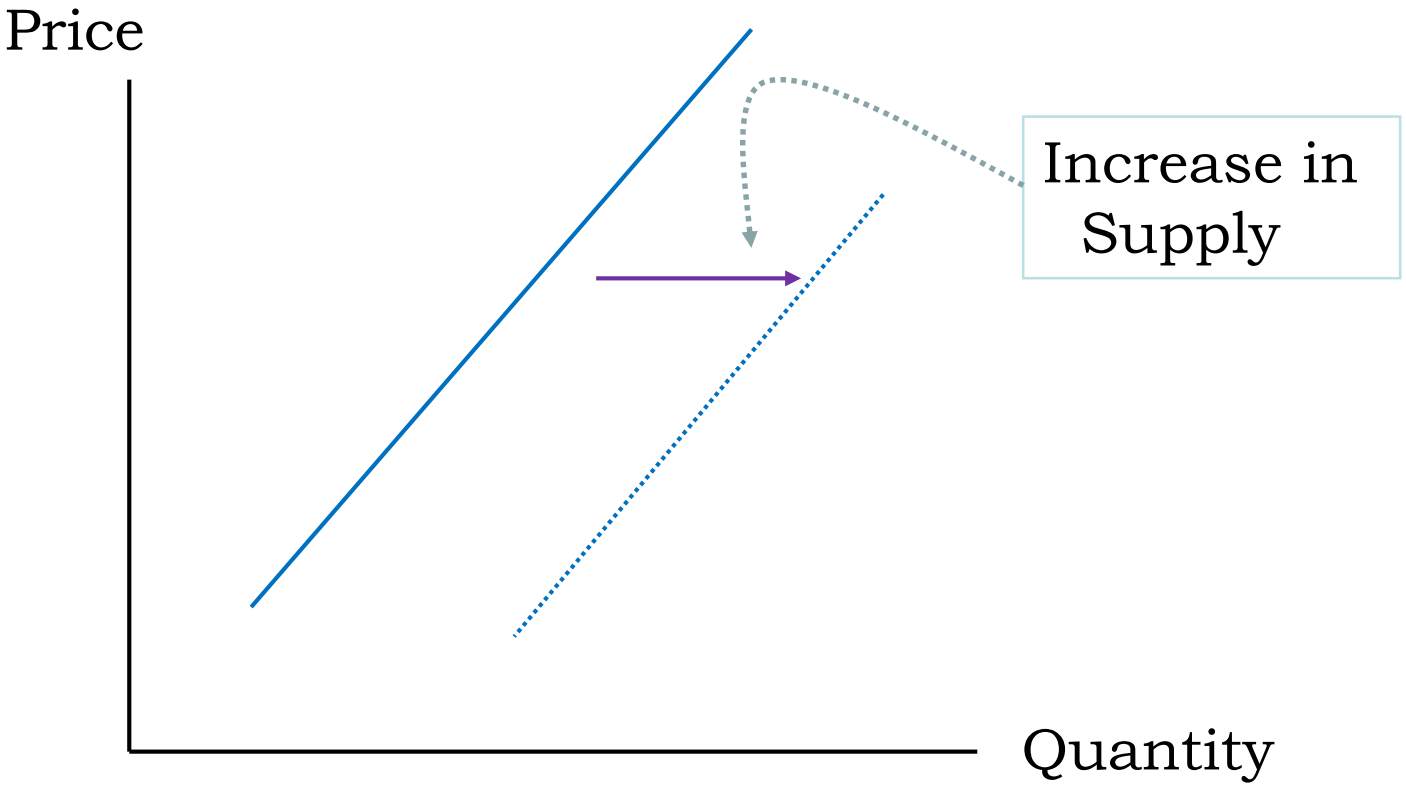
Variables that shift Supply

- Prices of inputs
- Technological change
- Prices of substitutes in production
- Expected future prices
- Number of firms in the market



Prices of Inputs:

An increase in the price of an input raises the cost of production and the product will be less profitable at every price. The supply of the product will decline, and the market supply curve will shift to the left.



Technological Change:

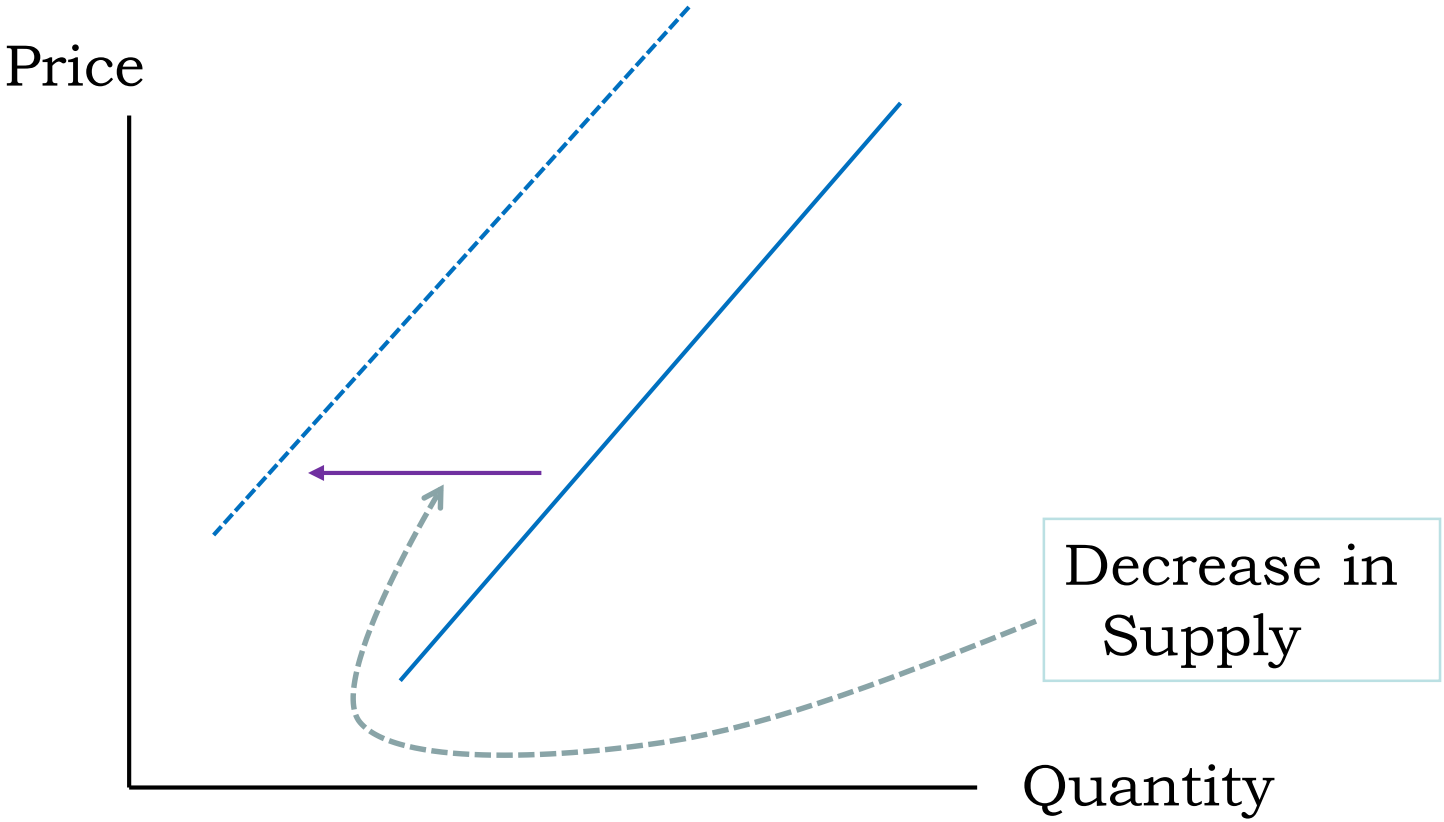
A positive technological change allows a firm to produce more output using the same amount of inputs. – This happens when the productivity of workers or machines increases.

If a firm can produce more output with the same amount of inputs, its costs will be lower and the good will be more profitable to produce at any given price.

The firm will increase the quantity supplied at every price and its supply curve will shift to the right.

Negative technological change could result from a natural disaster or a war that reduces the ability of a firm to supply as much output with a given amount of inputs.

This raises a firms costs and the good will be less profitable to produce. Such negative technological change will cause a firm's supply curve to shift to the left.

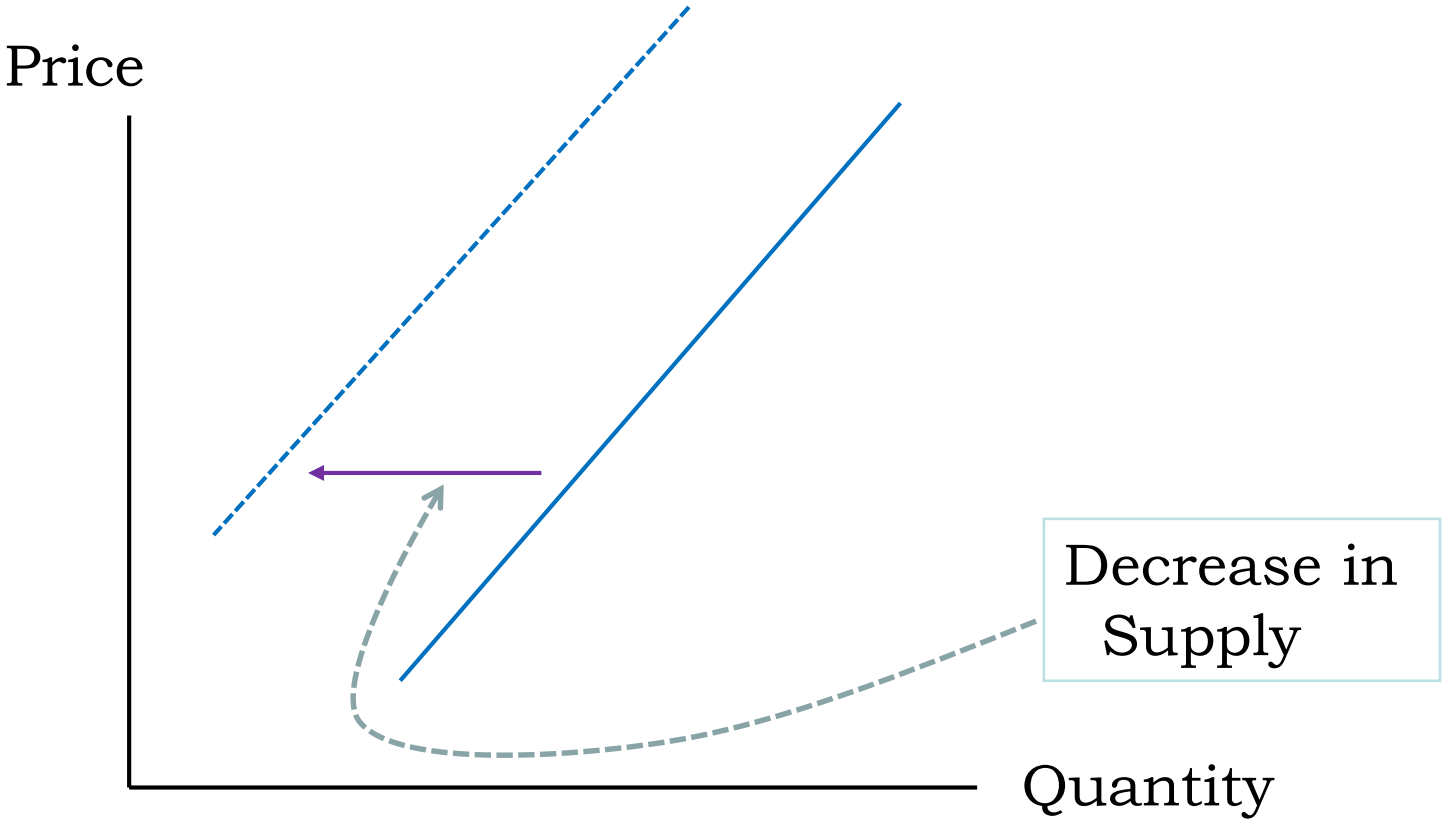


Prices of Substitutes of Production:

Alternative products that a firm could produce are called *substitutes in production*. – For e.g. if the price of colour printers increases printer companies will shift some of their productive capacity from black & white printers towards colour printers.

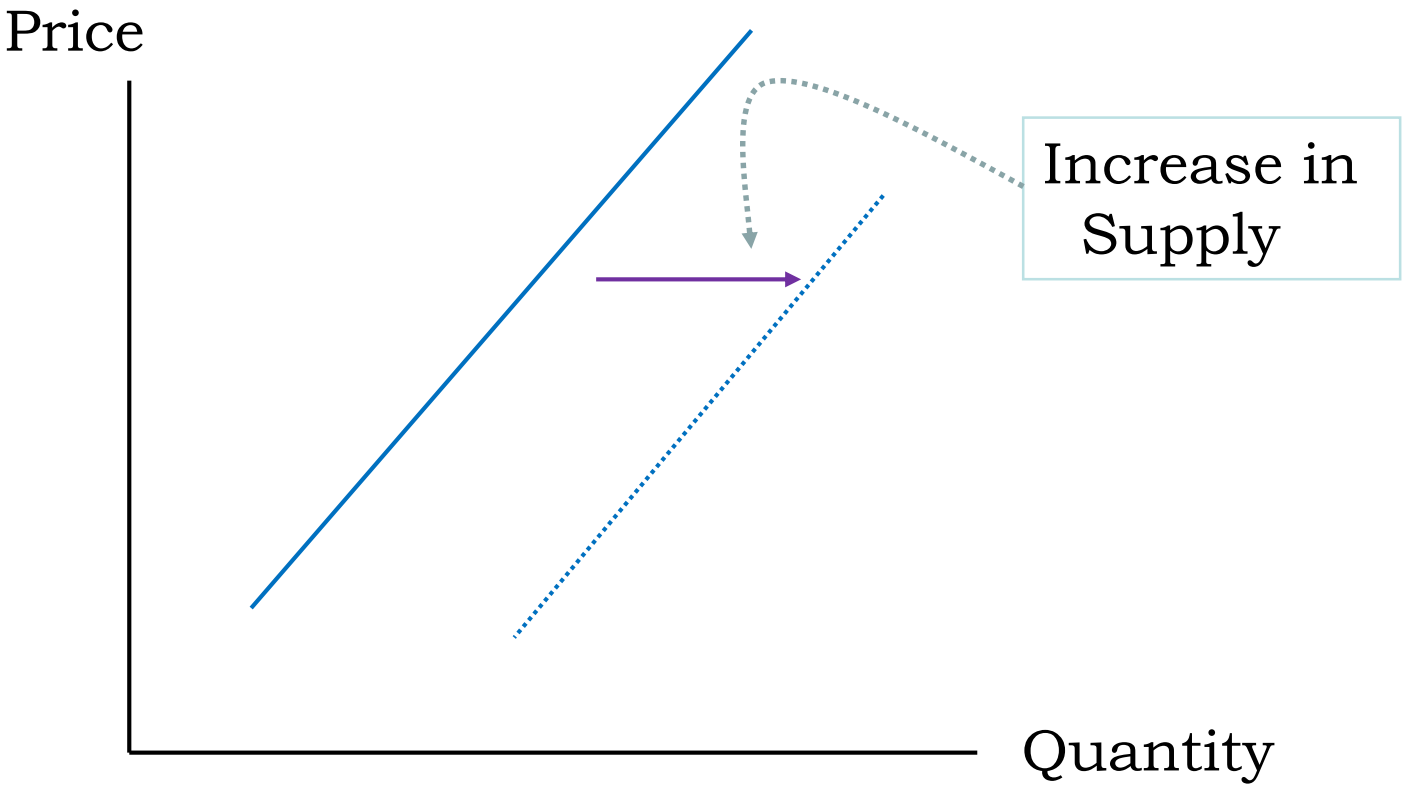
As productive capacity shifts from black & white printers towards colour printers fewer black & white printers will be offered for sale at every price.

The supply of black & white printers will shift to the left.



Expected Future Prices:

If a firm expects the price of the product to be higher in the future than it is today, it has an incentive to decrease supply now and increase it in the future.

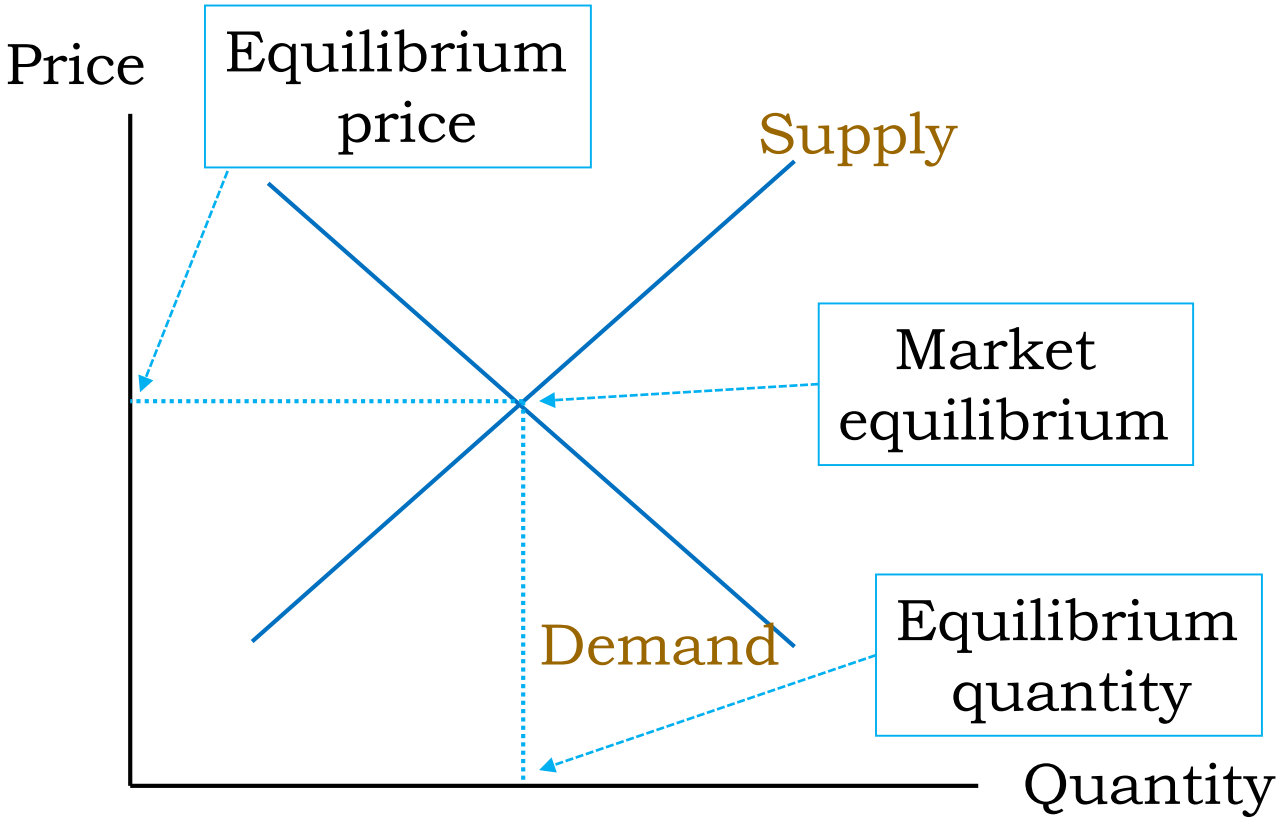


Number of firms in the market:

When new firms enter a market, the supply curve shifts to the right.

Putting Demand and Supply together:

The purpose of markets is to bring buyers and sellers together. The interaction of buyers and sellers in markets ultimately leads to firms being able to produce those goods and services most desired by consumers.

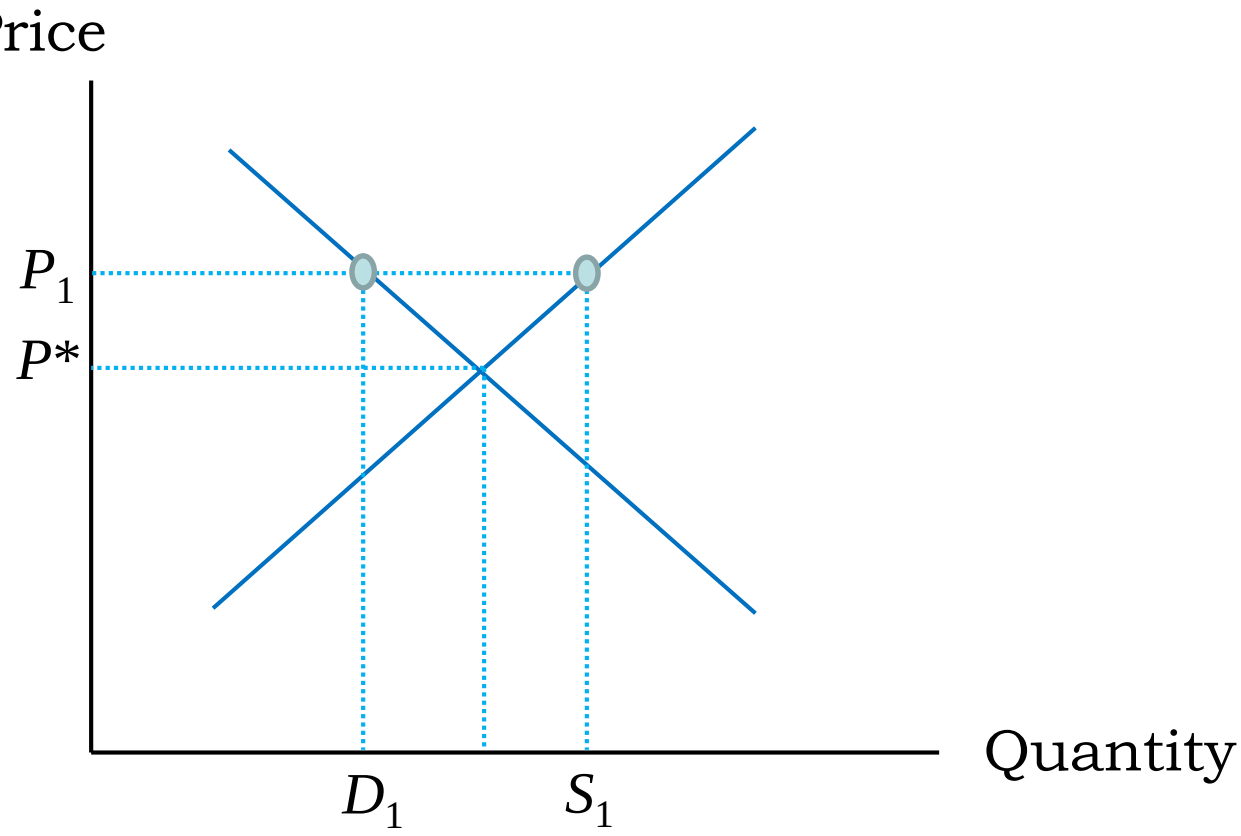


The point where the quantity that consumers are willing to buy equals the quantity firms are willing to sell is the point of **market equilibrium**.

The price at which market equilibrium occurs is the **equilibrium price** and the quantity associated with this equilibrium is the **equilibrium quantity** supplied and demanded.

Important: A market that is not in equilibrium moves toward equilibrium.

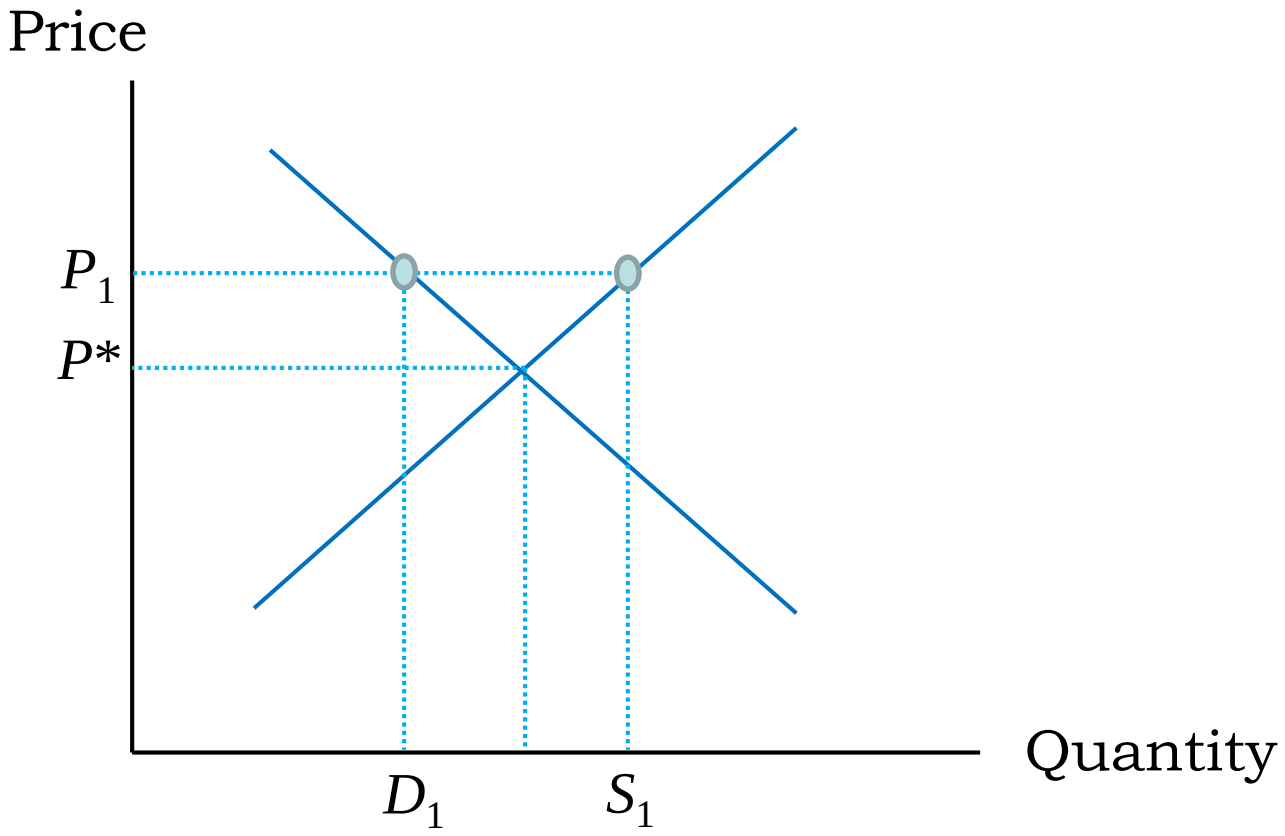
Once a market is in equilibrium, it remains in equilibrium.



Important: A market that is not in equilibrium moves toward equilibrium.

Suppose the price in the market were P_1 instead of the equilibrium price P^*.

How will equilibrium be achieved?



Suppose the price in the market were P_1 instead of the equilibrium price P^*. The quantity supplied S_1 is greater than the quantity demanded, D_1. There is a surplus in the market. – Firms will have unsold goods piling up giving them an incentive to increase sales by cutting the price. – This adjustment will reduce the surplus and put a downward pressure on price till it reaches P^* and the surplus vanishes.

Similarly when the quantity demanded is greater than the quantity supplied there is a shortage in the market. Some consumers will be unable to obtain the product and will have an incentive to offer to buy the product at a higher price. – This adjustment will reduce the shortage and put an upward pressure on price till the market is in equilibrium.

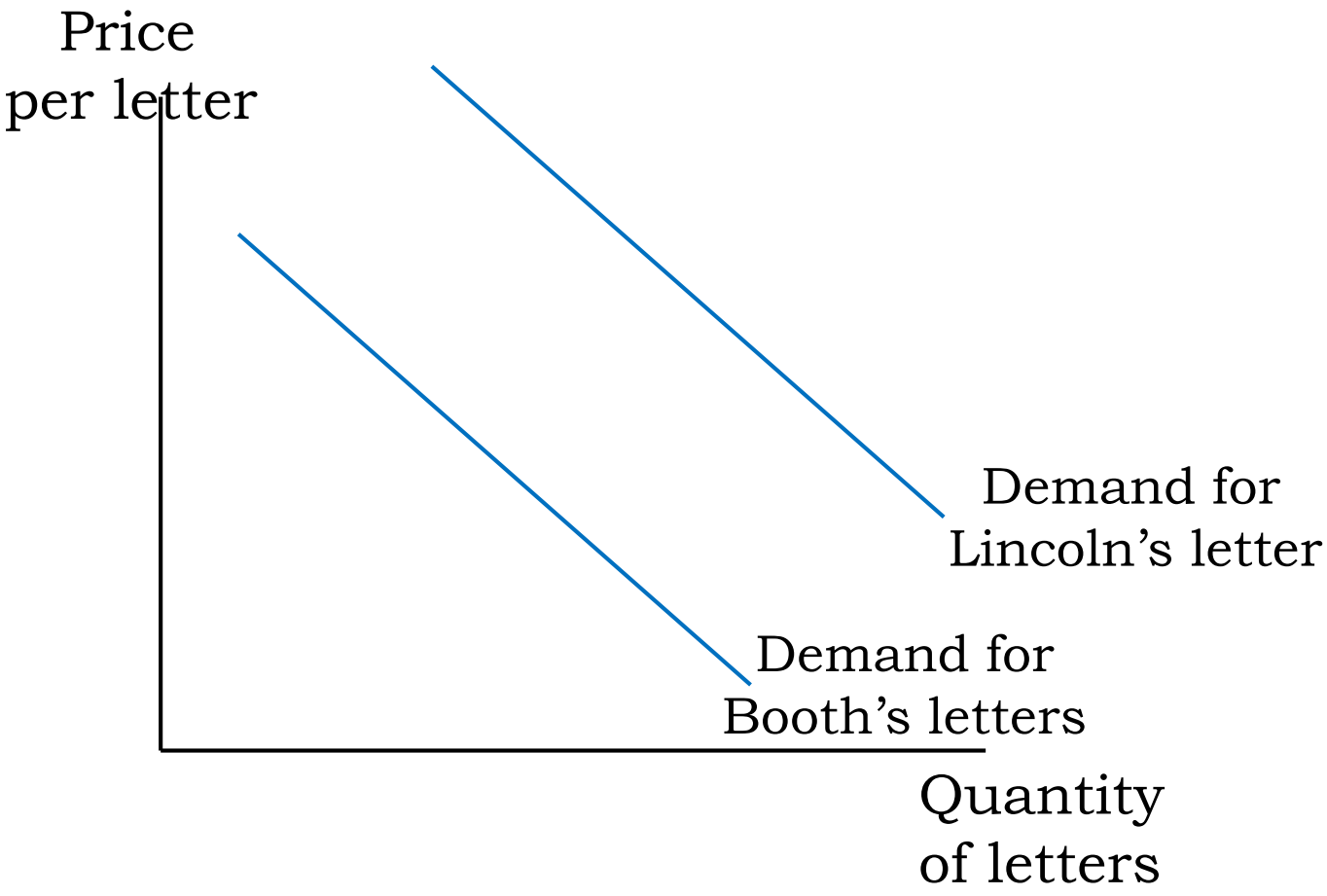
It is the interaction of demand and supply that determines the equilibrium price. Neither consumers nor firms can dictate the equilibrium price. No firm can sell anything at any price unless it can find a willing buyer, and no consumer can buy anything at any price without finding a willing seller.

Demand and Supply both count:

A Tale of Two Letters – Which letter is likely to be worth more? One written by Abraham Lincoln or one written by his assassin, John Wilkes Booth?

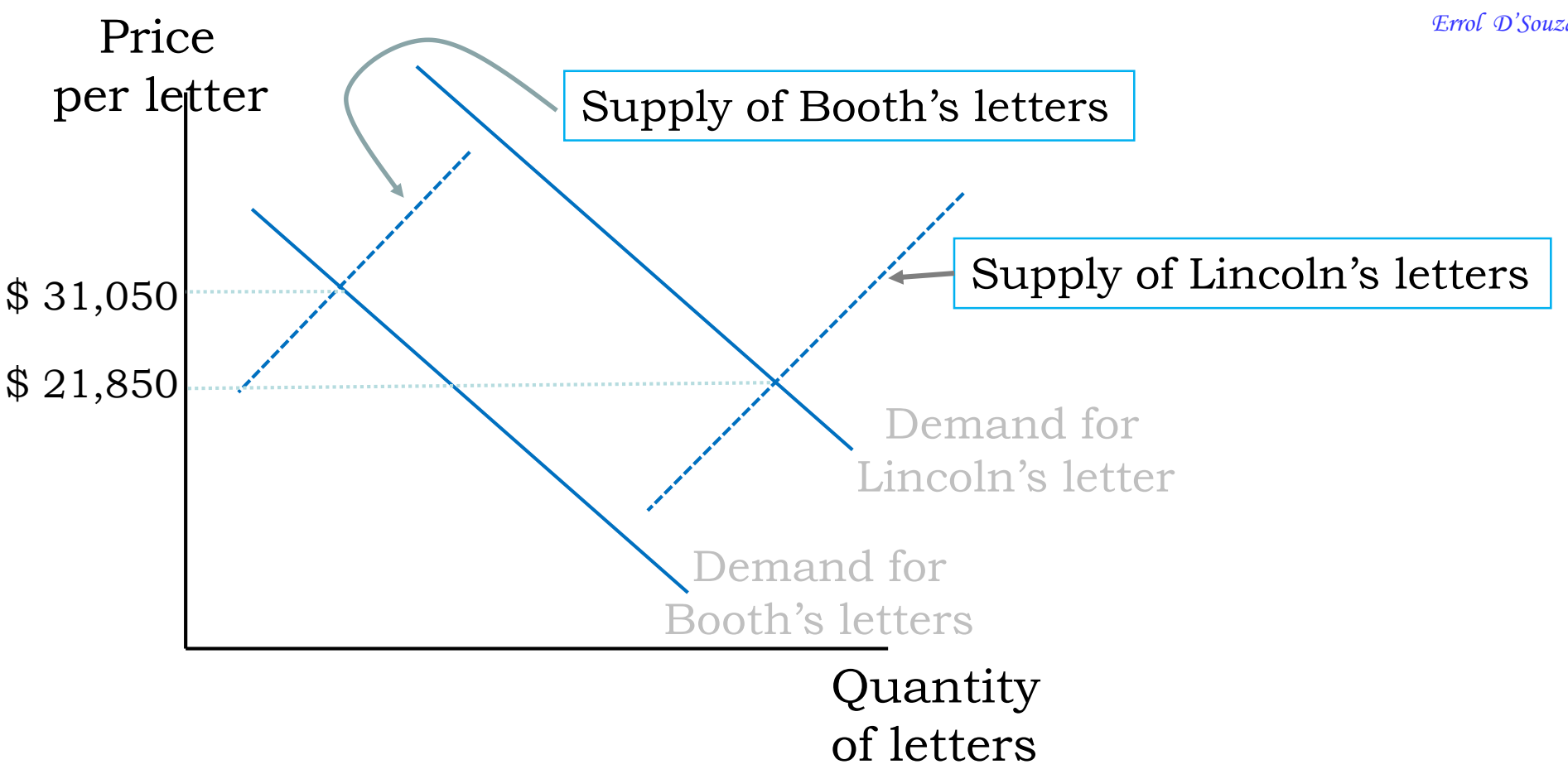
The demand for letters written by Lincoln surely would be much greater than the demand for letters written by Booth.

Yet the letter written by Booth sold at an auction for $ 31,050 and on the same day a letter written by Lincoln sold for only $ 21,850.



The demand for Lincoln's letters is much farther to the right than the demand for Booth's letters.

Then how is it possible for the market price of Lincoln's letters to be lower than the market price for Booth's letters?



The supply of Lincoln's letters is much greater than the supply of Booth's letters. – This results in the equilibrium price for Lincoln's letters to be lower than the equilibrium price for Booth's letters.

The Falling Price of Large Flat-Screen TVs

Research on flat screen tvs using liquid crystal displays (LCDs) began in the 1960s. It was difficult to use this research to produce a tv prices low enough for many consumers to purchase. – A key technical problem was making glass sheets ▪ large enough, ▪ thin enough, and ▪clean enough to be used as LCD screens.

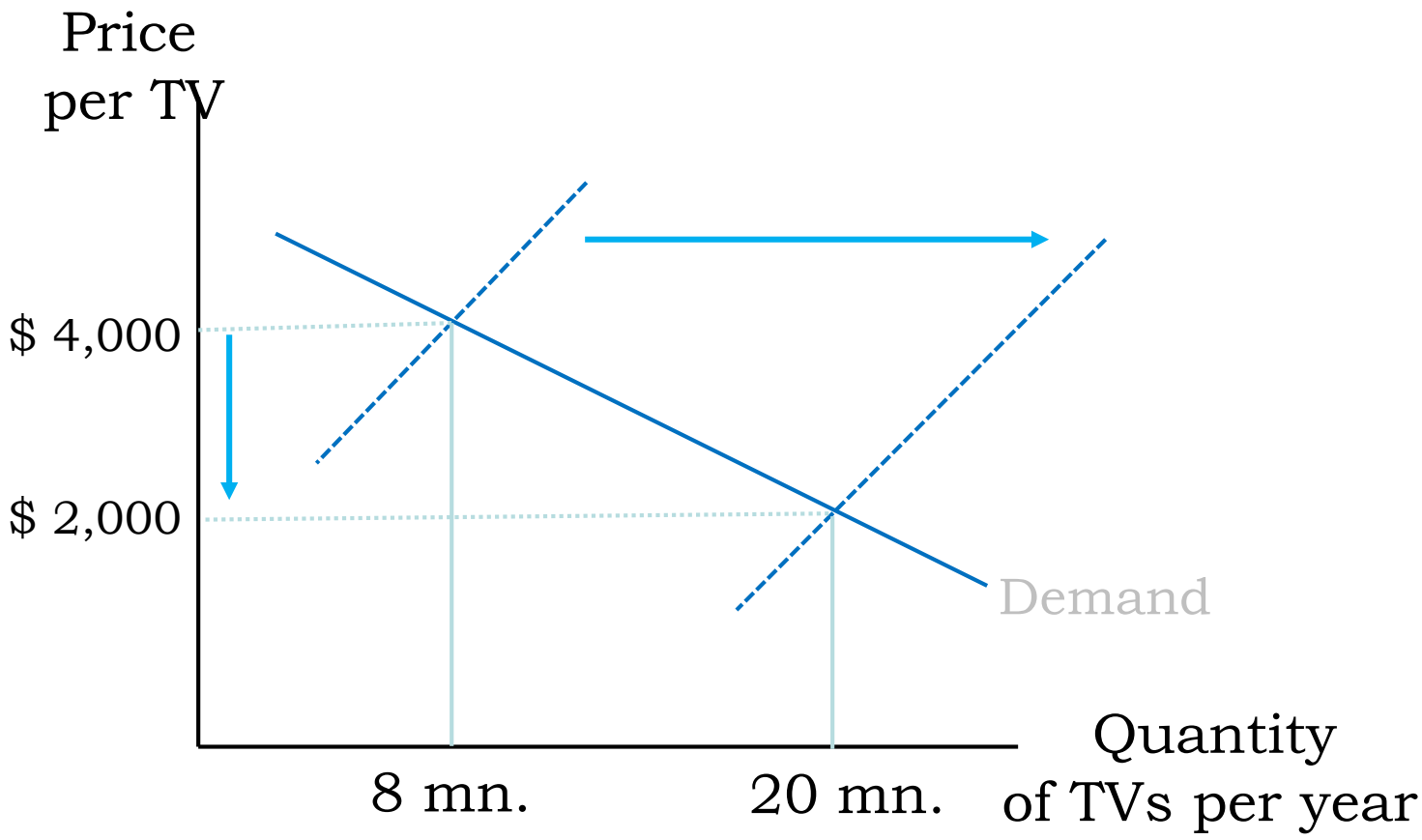
Finally in 1999, Corning Inc., developed a process to manufacture glass less than 1 mm. thick that was very clean because it was produced without being touched by machinery.

Corning's breakthrough led to a race to build new, better factories. – These firms are located in Taiwan, South Korea, and Japan.

The leading firms producing flat screen tvs are Korea's Samsung Electronics and LG Phillips LCD, Taiwan's AU Optronics, and Japan's Sharp Corp.

In 2004, AU Optronics opened a new factory with 2.4 million square feet of clean room in which LCD screens are manufactured. This factory is nearly 5 times as large as the largest factory in which Intel makes computer chips.

In all 10 new factories were scheduled to come into operation between late 2004 and late 2005. This increase in supply was expected to drive the price of a typical large LCD tv from $4,000 in 2004 to $2,000 in 2006, increasing the quantity demanded worldwide from 8 million to 20 million →


Price
per TV
$ 4,000
$ 2,000
Demand
8 mn.
20 mn.
Quantity
of TVs per year

Shifts in Demand and Supply over Time:

When only demand or only supply shift we can easily predict the effect on equilibrium price and quantity. What happens if *both* curves shift?

In many markets the demand curve shifts to the right as population and income grow. The supply curve also shifts to the right as new firms enter the market and positive technological change occurs.

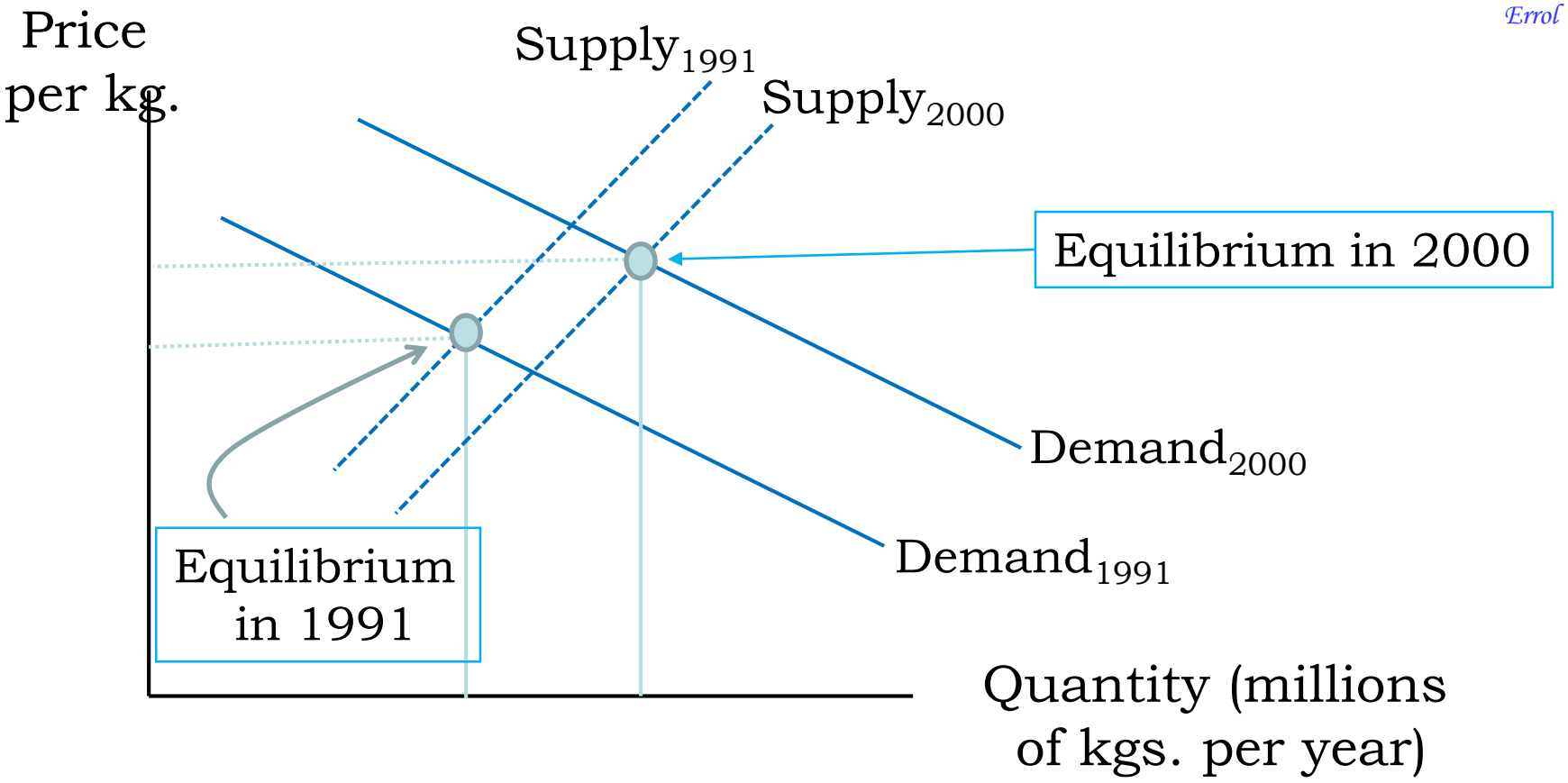
Whether the equilibrium price rises or falls over time usually depends on whether demand shifts to the right more than does supply.

During the 1990s the demand for chicken increased rapidly as many consumers attempted to avoid the potential health problems associated with eating too much red meat.

At the same time positive technological change occurred in the feed, hatchery, processing, and breeding stages of producing chickens.

Whether the retail price of chicken would be higher in 2000 than it was in 1991 depended on whether the increase in demand for chicken was greater or smaller than the increase in supply.

In the next diagram the demand for chicken shifted further to the right than did supply causing the retail price of chicken to rise ⟹


Price per kg.
Supply1991
Supply2000
Equilibrium in 2000
Demand2000
Demand1991
Equilibrium in 1991
Quantity (millions of kgs. per year)