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Topic 2. Demand, supply and the market

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Demand, supply and the market

- The demand for a good is the amount of the good that consumers would like to buy for each possible price (and other factors).
- The supply of a good is the amount of the good that producers are willing and able to sell at each possible price (and other factors).
- The price of a good is determined in the market, where all consumers and producers meet
  - If the price is *too low*, consumers will demand a lot but producers wont be willing to sell that much: excess demand.
  - If the price is *too low*, consumers will demand very little but producers would like to sell much more: excess supply.
  - The price at which the quantity demanded by consumers is equal to the quantity supplied by producers is the equilibrium price.

Outline

1. The demand curve
2. The supply curve
3. The market equilibrium

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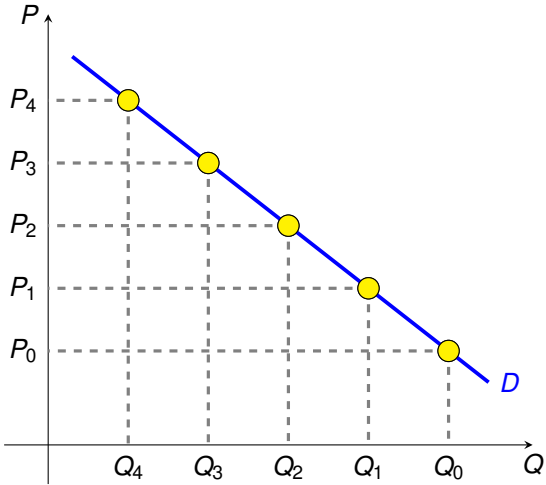
The demand curve



- The demand curve for good *A* is the relationship between the quantity demanded by consumers and the price, keeping everything else constant.
- The demand is decreasing in its price:
  - Why? For consumers, the price measures the opportunity cost of buying it: the more I pay for good *A*, the more units of good *B* I'm giving up.

The demand curve

- How much does the demand for a good decrease when its price increase?

  This is measured by the price elasticity of demand (PED), given by:

$$\text{PED} = \frac{(-)\ \%\ \text{change in quantity demanded}}{\%\ \text{change in price}}$$

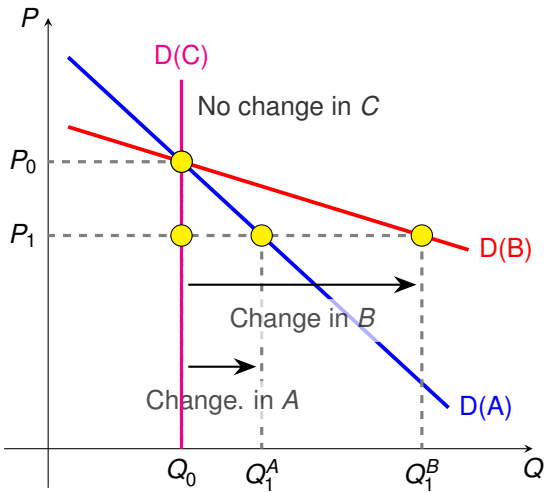
  - The PED is negative and typically reported in absolute value.

    A PED of 2.5, means that the demand decreases by 2.5% when the price rises by 1%.

  - When the PED is very low (or even 0), we say the demand is inelastic.

- The PED determines the slope of the demand curve: the higher the PED, the flatter the curve.

The demand curve



- When the price goes from P_0 to P_1...
  - The demand for good B increases more than the demand for good A:

    The demand for good B is more elastic than for good A.
  - The demand for good C is the same:

    The demand for good C is inelastic.

The demand curve

- What's behind the demand curve? In other words: why do we demand Q_0 units of the good when its price is P_0 and we don't demand more or less? Three main factors:
  - The price of other goods.
  - Consumers' income.
  - Tastes and preferences.

The demand curve

The price of other goods

- What happens with the demand for cars if the price of gas goes up?
  - It will likely decrease: we need gas to use the car.
  - We say that cars and gas are complements.
    - → *A* and *B* are complements if a rise in the price of *B* decreases the demand for *A*.
- What happens with the demand candies if the price of chocolate goes up?
  - It will likely increase: we substitute chocolate by candies as they are now cheaper.
  - We say that candies and chocolate are substitutes.
    - → *A* and *B* are substitutes if a rise in the price of *B* increases the demand for *A*.

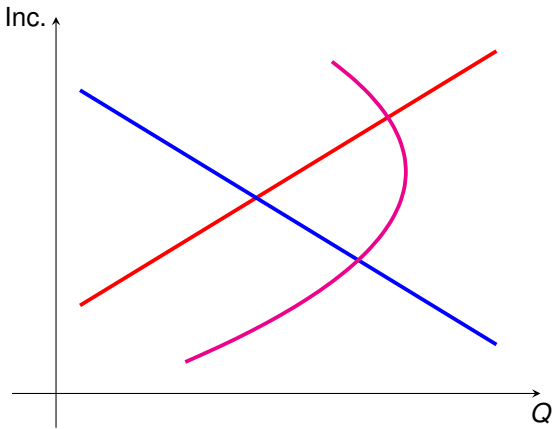
The demand curve

Consumers' income

- What happens with the demand for cinema tickets if your income increases?
  - It will likely increase: we can afford going to the movies more often.
  - We say that cinema tickets are a normal good.
    - → A good is a normal good if its demand increases when income rises.
- What happens with the demand for metro tickets if your income increases?
  - It will likely decrease: we can afford taking a taxi.
  - We say that metro tickets are an inferior good.
    - → A good is an inferior good if its demand decreases when income rises.

The demand curve

Engel's curve



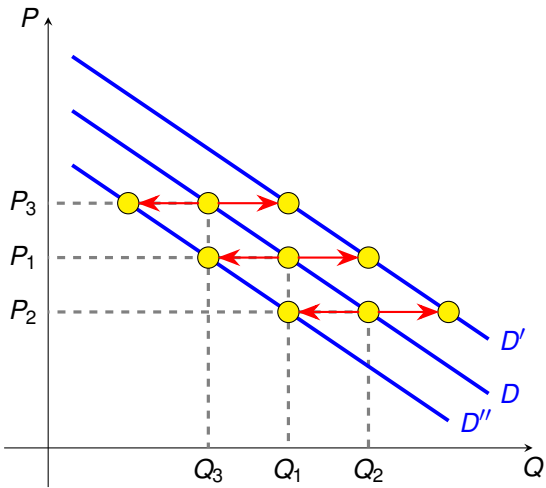
- The demand for a normal good increases as income rises.
- The demand for an inferior good decreases as income rises.
- Some goods are normal goods and then become inferior (eg. McDonalds).
  - When income increases from low to medium, we demand more burgers.
  - But when it increases from medium to high, we demand less burgers.

The demand curve

Tastes and preferences

- What happens to the demand for toys if you have a newborn? It will likely increase: we derive more utility/happiness from toys now than we did before the baby was born.
- Tastes and preferences refer to how happy we are owning the good and this changes over time and across people, places and circumstances:
  - Cars are more demanded by people living in the suburbs.
  - A drink in a terrace is more demanded in summer.
  - Umbrellas are more demanded in Bilbao than in Seville.
  - Healthy food is more demanded now that it was 30 years ago.

The demand curve

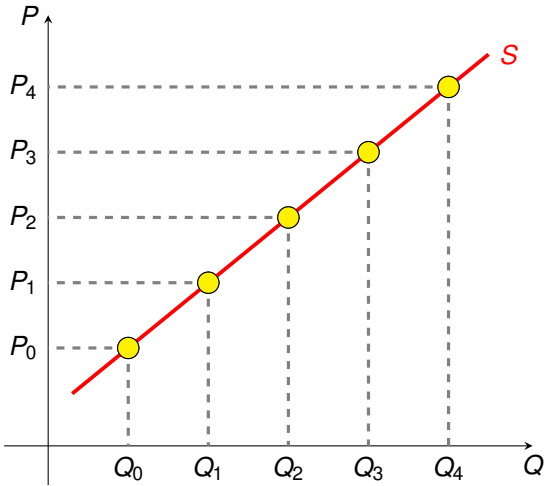


- When any of these factors change, the whole demand curve is shifted.
- An increase in the price of a substitute good or a stronger preference, increases the demand for any price.
- An fall in total income (if good is normal) or an increase in a complement good, decreases the demand for any price.

Outline

1. The demand curve
2. The supply curve
3. The market equilibrium

The supply curve



- The supply curve for good A is the relationship between the quantity supplied by producers and the price, keeping everything else constant.
- The supply is increasing in its price:
  - Why? For producers, the price captures the opportunity cost of not producing one extra unit of the good.

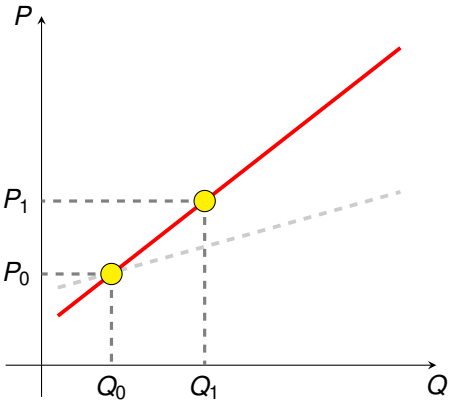
The supply curve

- As we did with demand, we can define the price elasticity of supply (PES) as the % increase in the quantity of the good supplied by producers when its price increases by 1%. That is:

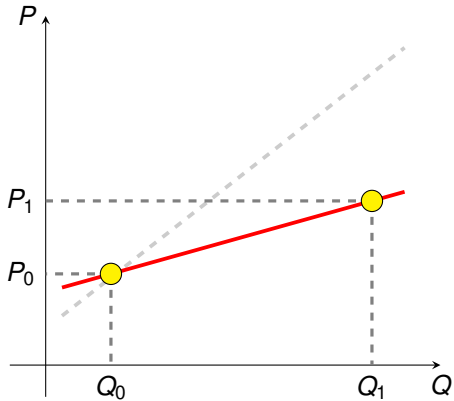
$$\text{PES} = \frac{\%\text{ change in quantity supplied}}{\%\text{ change in price}} \geq 0$$

- This elasticity is positive and may be larger or smaller depending on:
  - Production flexibility: if production is more flexible, the supply can respond more ($\uparrow$ PES).
  - Availability of inputs: if inputs are easily available, the supply can respond more ($\uparrow$ PES).
  - Time horizon: if we look at a longer time horizon, the supply can respond more ($\uparrow$ PES).
- The magnitude of the PES determines the slope of the supply curve.

The supply curve



Low PES (steeper supply curve)



High PES (flatter supply curve)

The supply curve

- What's behind the supply curve? In other words: why do producers supply Q_0 units of the good when its price is P_0 and they don't produce more/less? Three main factors:
  - The production technology
  - The price of inputs.
  - Legislation and regulations.

  We can boil these three factors down to one: how costly it is to produce.

The supply curve

The production technology

- An improve in the production technology allows producers to generate more units of the good with the same amount of inputs (machines, energy, workers, materials, etc.).
- Technology does not mean machines and software: technology includes every knowledge or technique that is used in production. An improvement in technology could be:
  - A new software that reduces the time needed to produce a good.
  - Being able to place each worker to the task in which she/he is more productive.
  - An agreement with Amazon to sell the good online.
- All these improvements allow producers to sell more for the same cost.

The supply curve

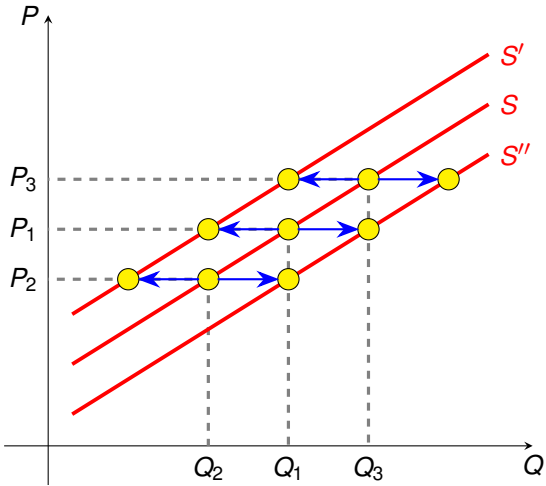
The price of inputs

- Inputs prices increases/decreases because of an increased/decreased scarcity:
  - When Russia invaded Ukraine, the price of grain in Europe went up.
  - When the COVID-19 spread over Taiwan, the price of microchips skyrocketed.
- A fall in the price of inputs (wages, energy prices, of the price of raw materials) allows producers to make a higher profit per unit sold, incentivizing them to produce more.

Legislation and regulations

- Many times, regulations imposes extra costs on production (eg. a tax on carbon emissions).
- Any regulation that makes it more costly to produce, decreases the among of the good that producers are willing to sell.

The supply curve



- When any of these factors change, the whole supply curve is shifted.
- An increase in the level of technology or more relaxed climate policies, increases the supply for any price.
- A increase in wages or the establishment of security controls, decreases the supply for any price.

Outline

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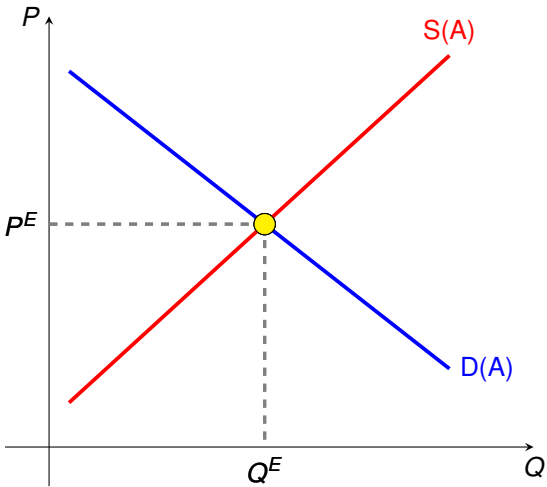
The market equilibrium

- When we look at the market for a good, we do not observe the supply or the demand curves: what we observe is the equilibrium of the market.

  Remember: many objects of interest in Economics are unobservable!

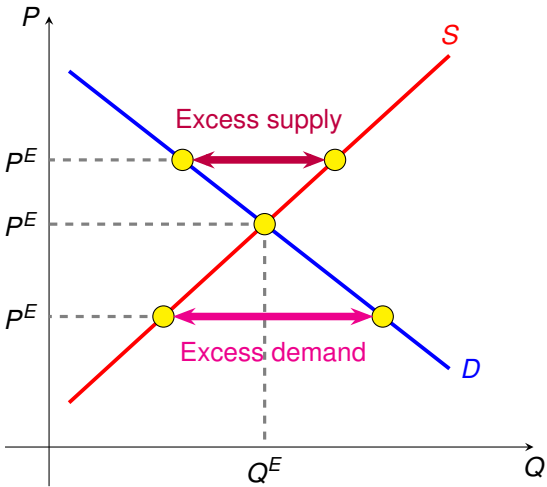
- The equilibrium of the market is the situation in which the supply and the demand coincides.
  - It is given by a price, P^E, and a quantity Q^E such that:
    - Consumers demand Q^E when the price is P^E.
    - Produces are willing (and able) to sell Q^E units at a price of P^E.

The market equilibrium



- For P^E, consumers are willing to buy Q^E.
- For P^E, producers are willing to sell Q^E.
- (P^E, Q^E) is the market equilibrium:
  - No consumer is willing to buy more units: there is no excess demand.
  - No producer is willing to sell more units: there is no excess supply.

The market equilibrium



- For any price higher than P^E...

  Consumers are willing to buy less than Q^E but producers would be happy to sell more.

  $\rightarrow$ Excess supply: P should go down.

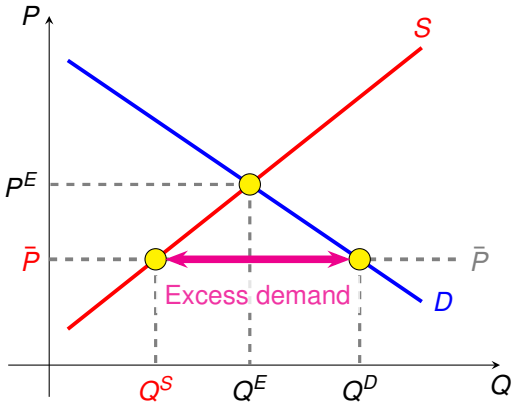
- For any price lower than P^E...

  Consumers are willing to buy more than Q^E but producers are not willing to sell that much.

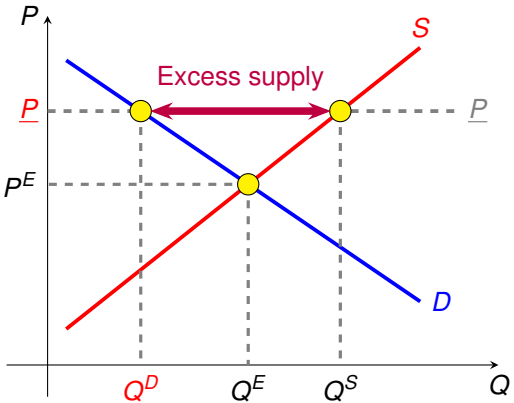
  $\rightarrow$ Excess demand: P should go up.

The market equilibrium

There are situations in which what we observe is not the equilibrium price...



A distortionary maximum price, $\bar{P} < P^E$



A distortionary minimum price, $\underline{P} > P^E$

Changes in the equilibrium

- This supply and demand analysis is useful to understand why prices and quantities change.
  - Positive shocks to demand: higher income, higher taste for the good, etc.

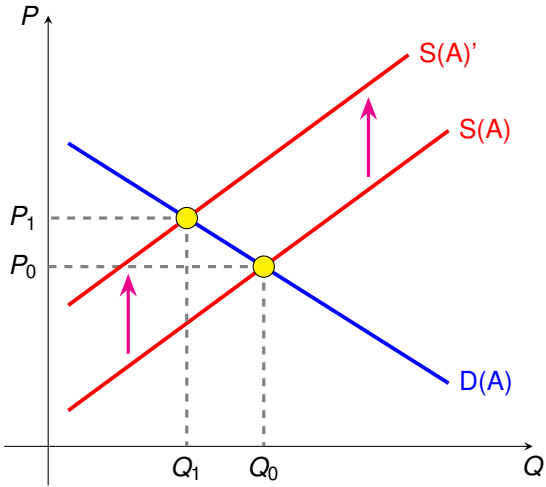
    The demand curve shifts to the right (or upwards)
  - Negative shocks to demand: higher price of a complement good, a credit crunch.

    The demand curve shifts to the left (or downwards)
  - Positive shock to supply: better technology, fall in wages, etc.

    The demand curve shifts to the right (or downwards)
  - Negative shock to supply: lower competition in the market, increase in energy prices, etc.

    The demand curve shifts to the right (or upwards)
- For instance, if we observe a market in which the price increased but the quantity decreased, then we know that supply received a negative shock.

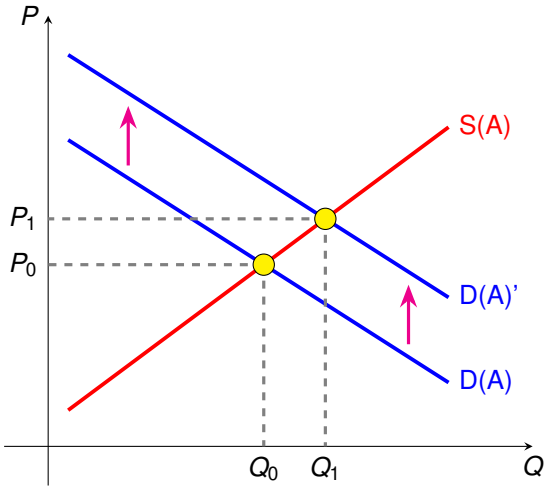
Changes in the equilibrium



- Starting from $(P_0, Q_0)\ldots$
- The supply receives a negative shock, shifting the supply to the left/upwards.

  eg. an increase in energy prices makes selling Q_0 at price P_0 not profitable.
- At price P_0 there is an excess demand: prices should go up.
- The equilibrium price increase until it reaches a new equilibrium: (P_1, Q_1).

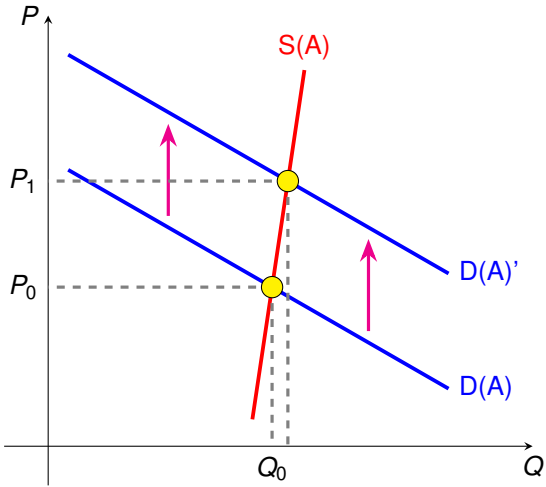
Changes in equilibrium: positive demand shock



- Starting from $(P_0, Q_0)\ldots$
- The demand receives a positive shock, shifting the demand to the right/upwards.

  eg. an increase in total income, assuming the good is a normal good.
- At price P_0 there is an excess demand: prices should go up.
- The equilibrium price increase until it reaches a new equilibrium: (P_1, Q_1).

Example: the problem of housing

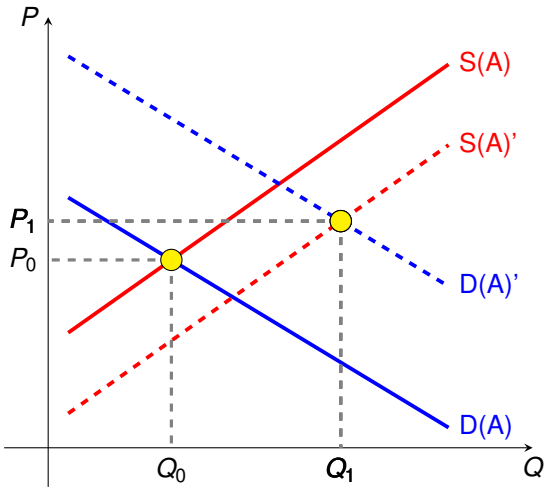


- The supply of housing is very inelastic: it takes a long time until producers are able to sell more housing.

  The supply curve is very steep.

- The increasing number of households (population growth, new families, etc.) pushed the housing demand to the right.
- The price increases substantially but the quantity of housing does not: supply cannot react.

Example



- What has happened in this market?

  Both P and Q has increased.

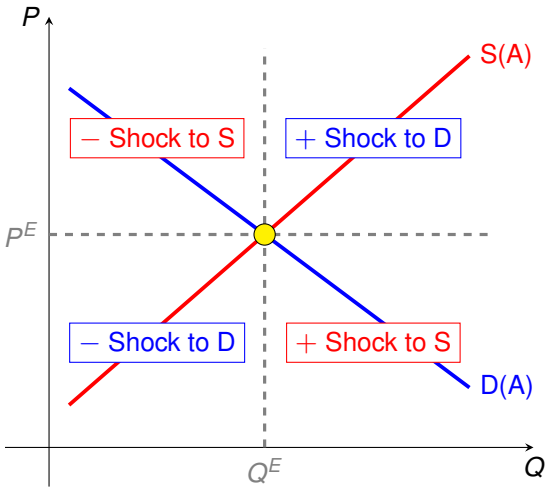
  - For D(A) to cross the new equilibrium, we need to shift it upwards

    → Positive demand shock.

  - For S(A) to cross the new equilibrium, we need to shift it downwards.

    → Positive supply shock.

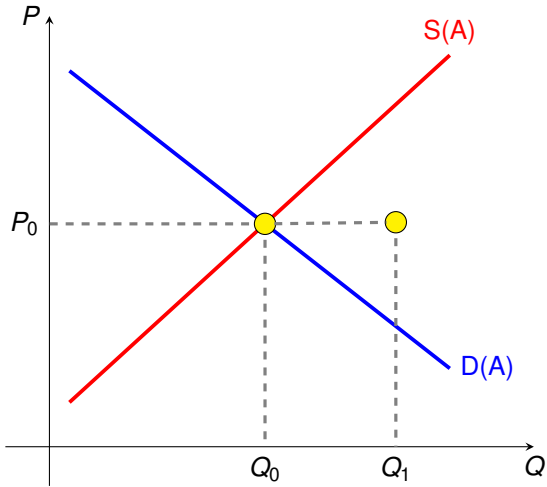
Summary



- If $\uparrow P$ and $\uparrow Q$: $+$ shock to demand
- If $\uparrow P$ and $\downarrow Q$: $-$ shock to supply
- If $\downarrow P$ and $\uparrow Q$: $+$ shock to supply
- If $\downarrow P$ and $\downarrow Q$: $-$ shock to demand

Note: these changes may be accompanied by others, but they are dominant.

Example for home: What has happened?



Questions?