

7 Supply and Demand

A bit of economics will help us understand what is going on in financial markets. Especially the spot markets.

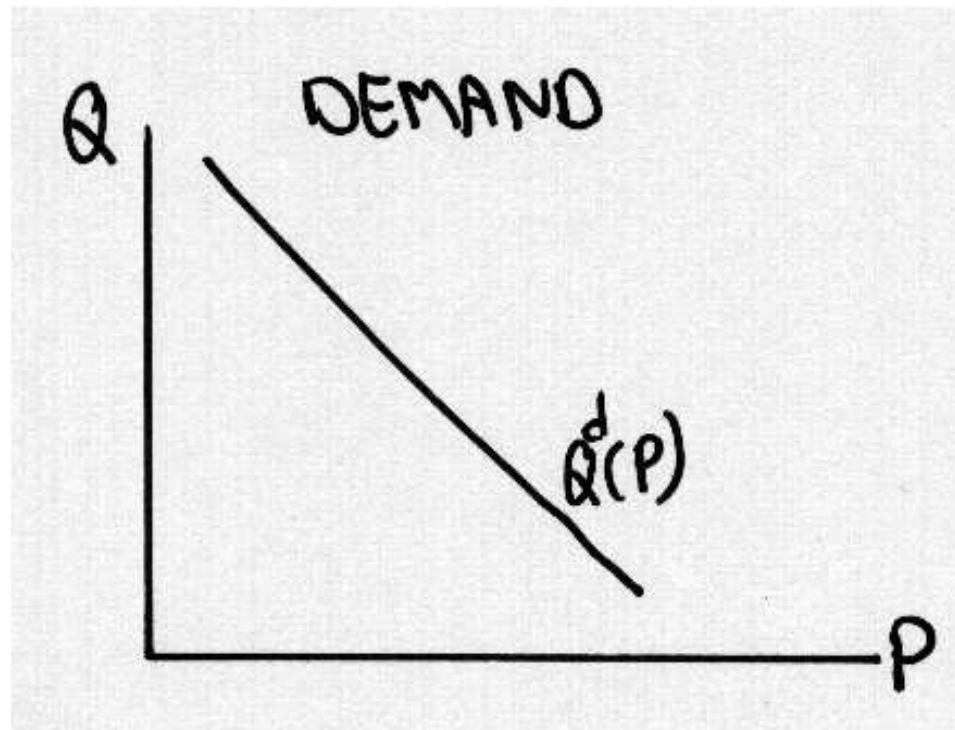
Example: understand the price of oil, the price of electricity.

7.1 Market fundamentals

For a given good, some individuals are demanding it and some are offering it.

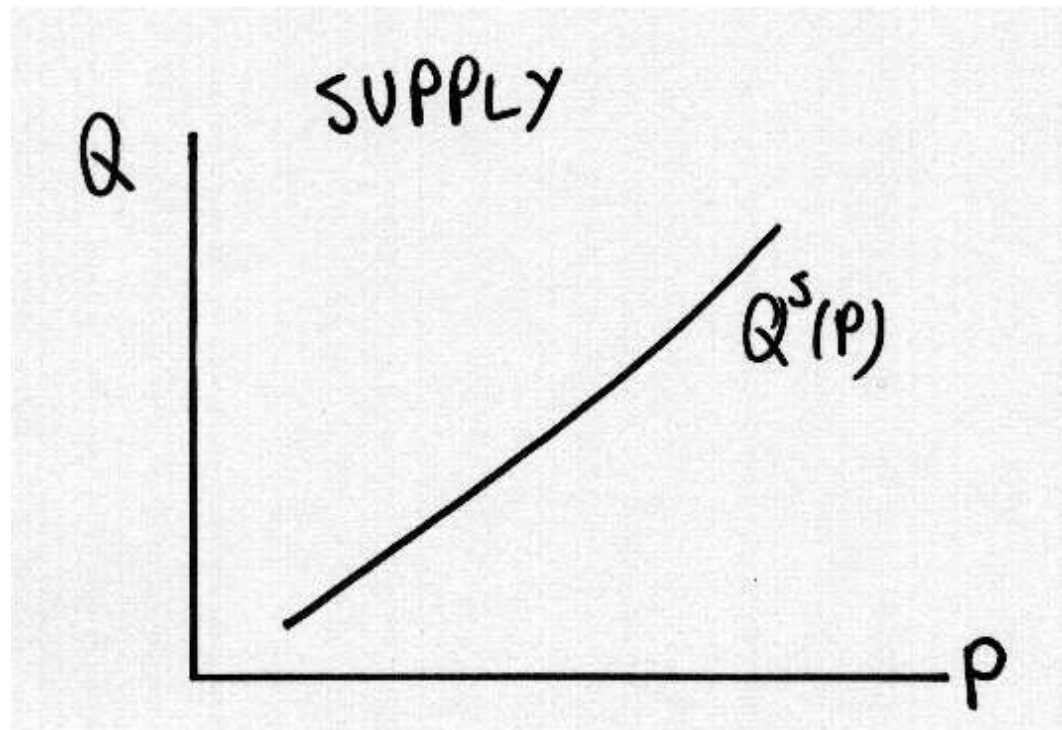
7.1.1 Demand: Q vs. P

- Demand function: $Q^d(P)$
- The quantity demanded Q of a good is a function of its price P .
- Usually, the higher the price, the lower the quantity demanded



7.1.2 Supply: Q vs. P

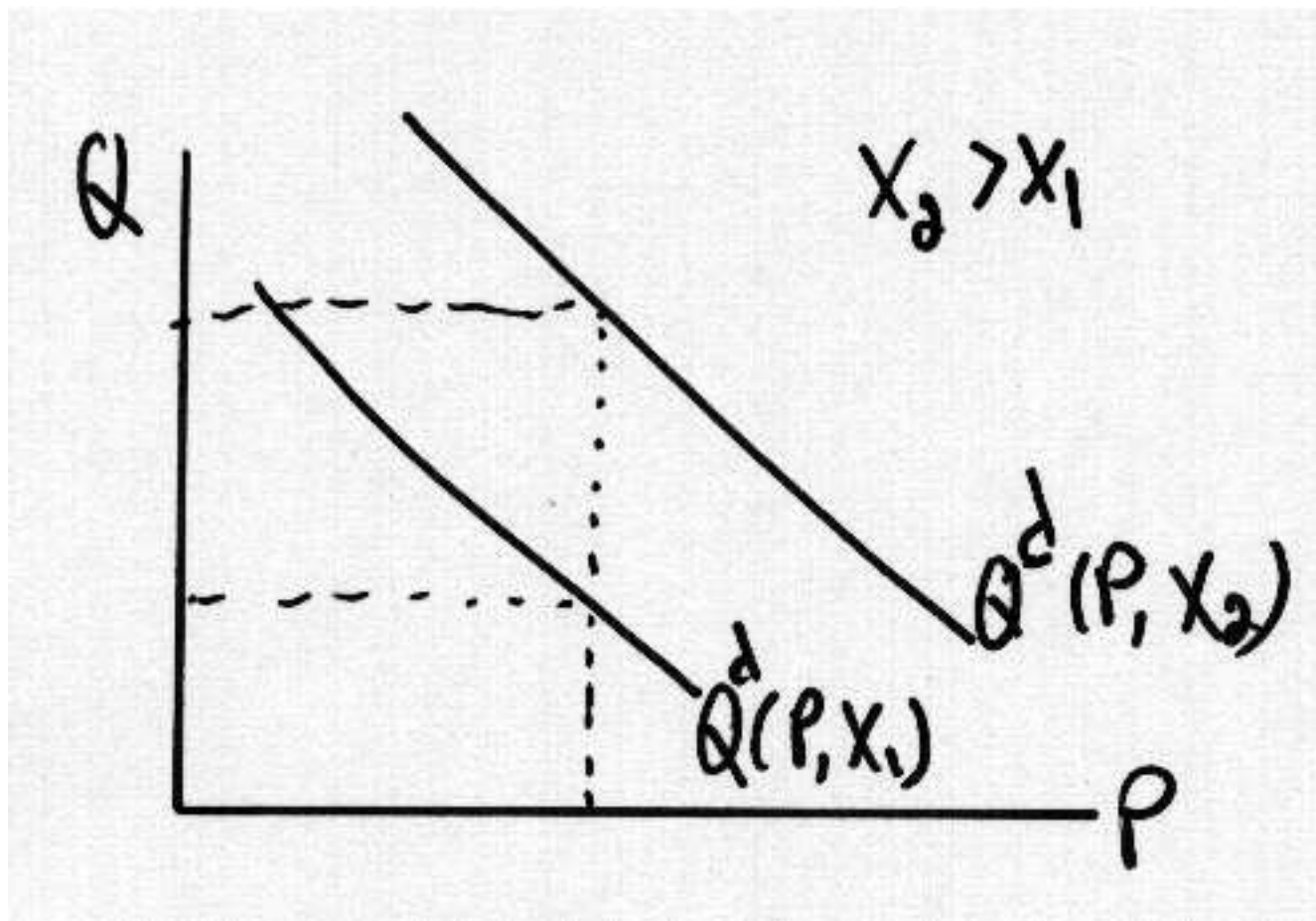
- Supply function: $Q^s(P)$
- The quantity offered Q of a good is a function of its price P .
- Usually, the higher the price, the higher the quantity demanded



7.2 Function of several variables

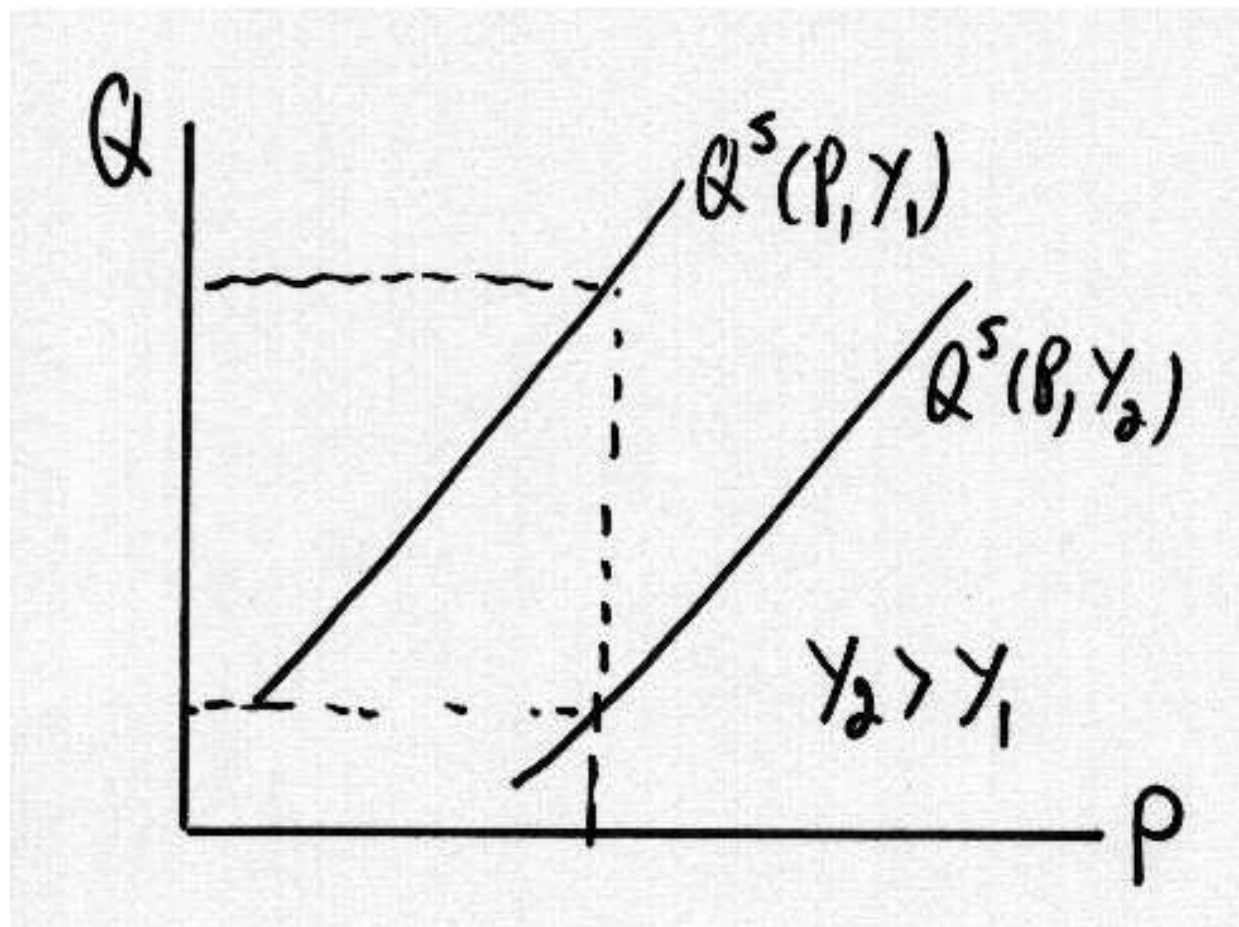
7.2.1 Demand

- The quantity demanded may depend on variables (denoted by X) other than the price.
- $Q^d(P, X)$
- Example: my demand for electricity (Q) is a function of my income (X). For a given price, the higher my income, the higher is my demand for electricity.



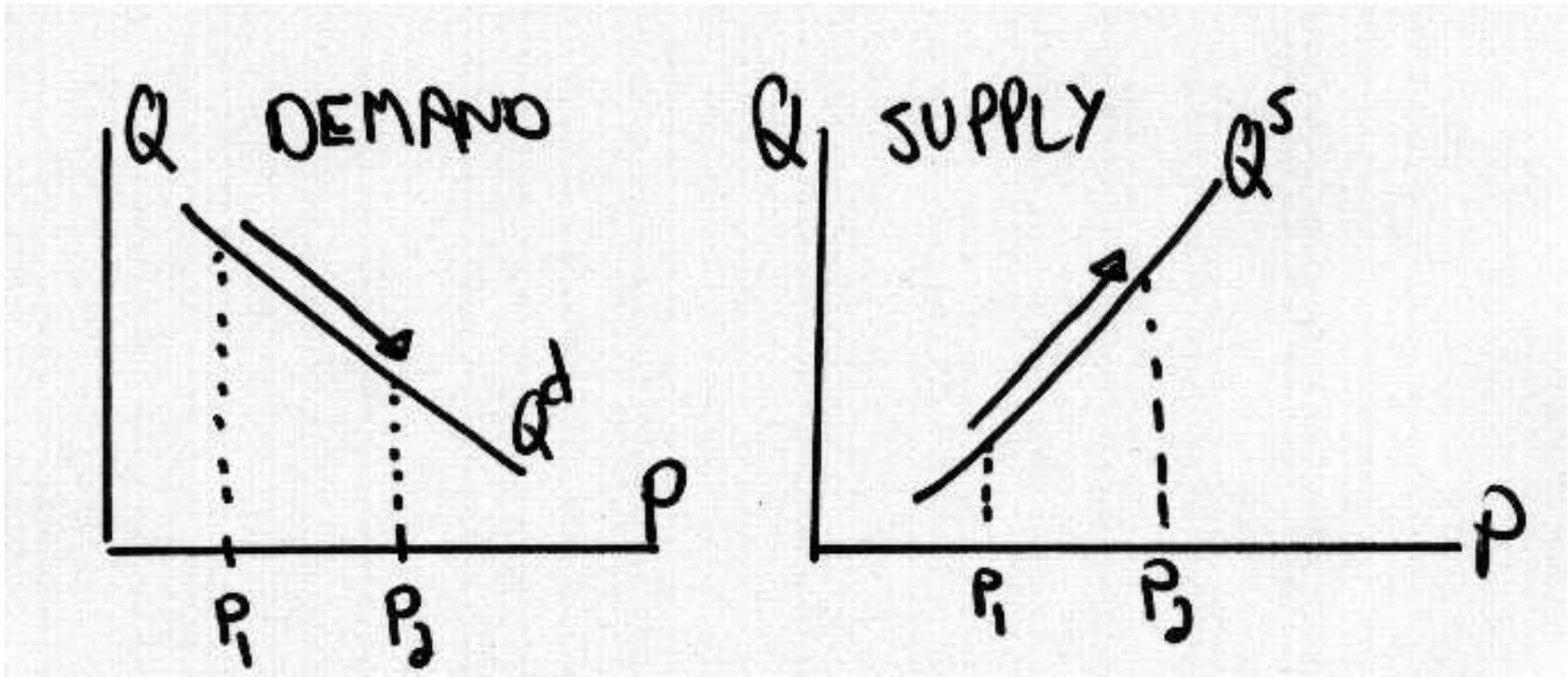
7.2.2 Supply

- The quantity offered may depend on variables (denoted by Y) other than the price.
- $Q^s(P, Y)$
- Example: the amount of electricity Progress Energy is willing to produce (Q) is a function of the price of natural gas (Y). For a given price of electricity, the higher the price of natural gas, the lower the quantity of electricity they are willing to produce.

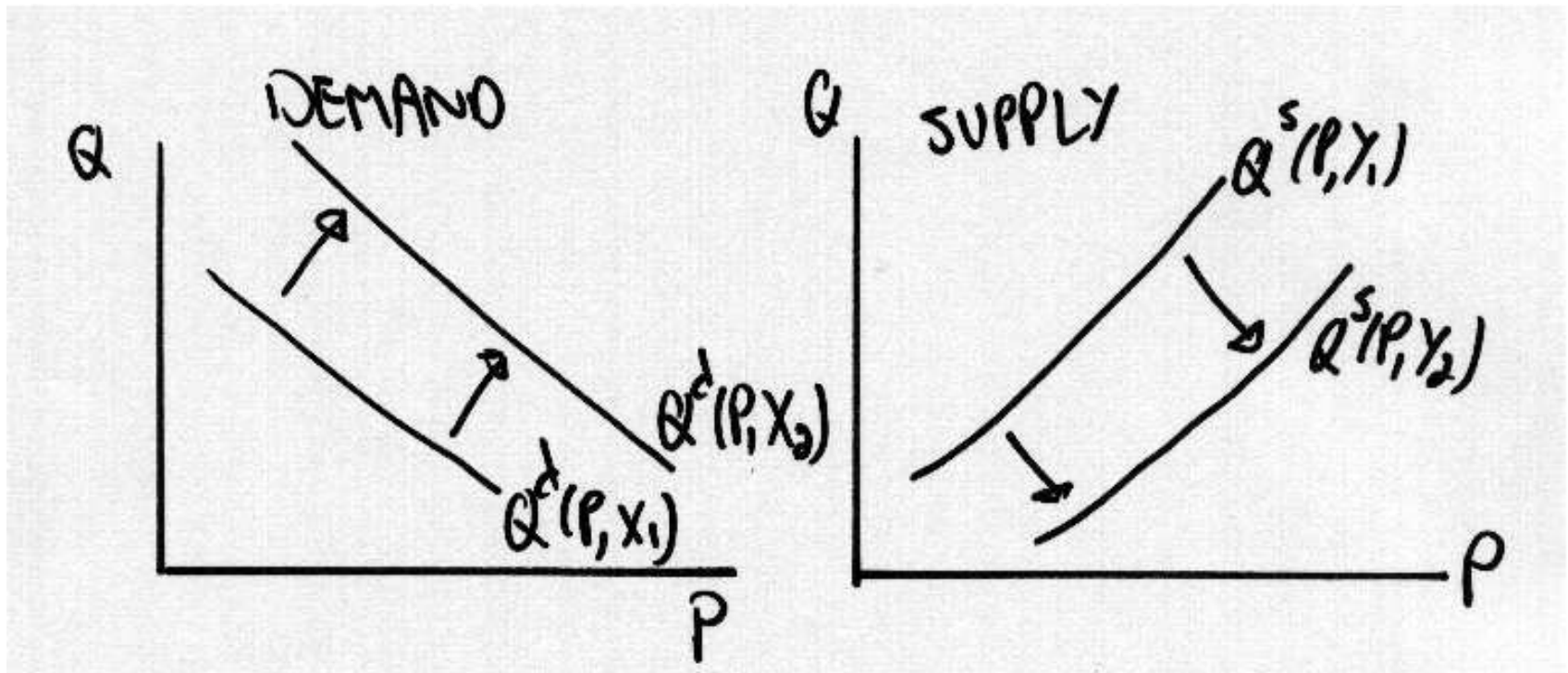


7.2.3 Shift versus movements along

- If the price change, there is a change in the quantity demanded or the quantity supplied. The demand function does not change. The supply function does not change.



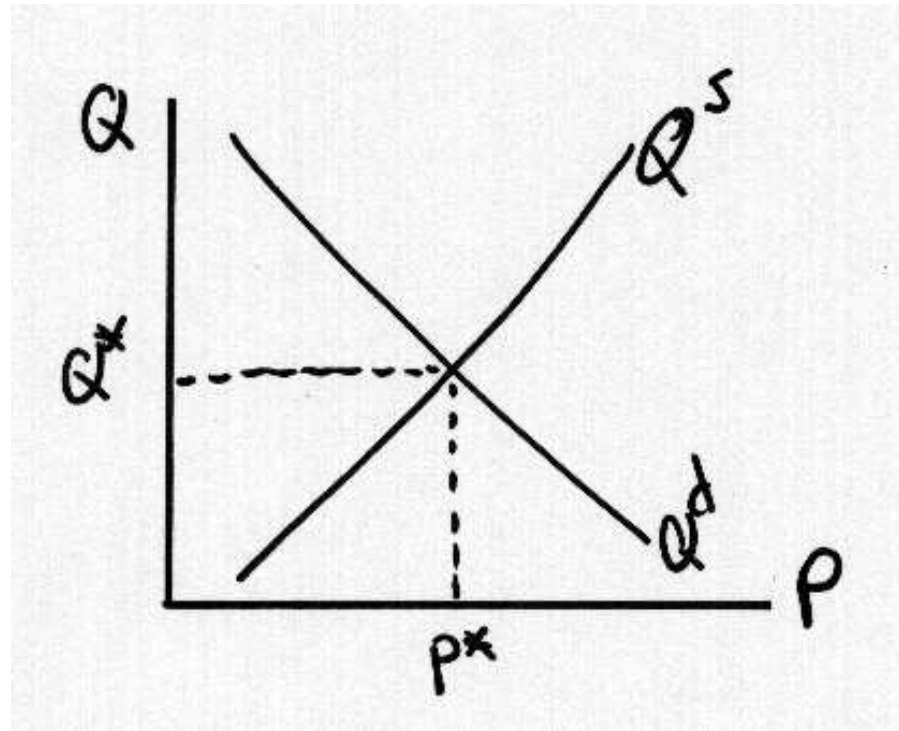
- If my income change, then my demand function shift. If the price of natural gas change, then Progress Energy's supply function shift.



7.3 Market equilibrium

7.3.1 Meaning

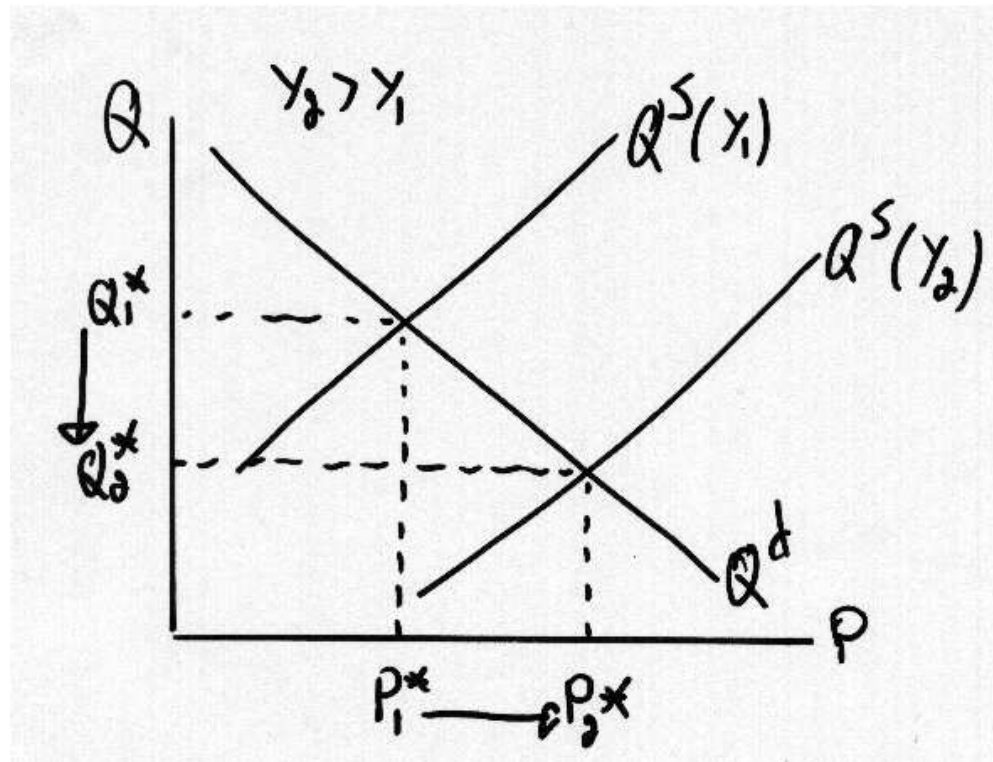
- An equilibrium is defined by a price and a quantity (P, Q) .
- The market will be in equilibrium if for the price P the quantity demanded is equal to the quantity offered [$Q^d(P) = Q^s(P)$].
- We usually assume there are many consumers and many producers (no one can unilaterally fix a price or a quantity).



- Denote the equilibrium by (P^*, Q^*) .
 - If $P < P^*$, then $Q^d(P) > Q^* > Q^s(P)$.
 - If $P > P^*$, then $Q^d(P) < Q^* < Q^s(P)$.

7.3.2 Simple dynamic

- Impact of a shift of the demand function (change in X) or supply function (change in Y).
- For example, suppose we are in equilibrium, what would happen if the price of natural gas goes up?



7.4 Why did the price of oil went from \$20 to \$70?

- It's "easy" to know if the price will go from \$20 to \$21 or \$70 following a "shock", once you know the demand and supply.
- For example, consider the demand and supply for gasoline:
 - The slope of the demand function is usually considered small. Drivers change very little their behavior when the price change.
 - If there is an adverse shock to the supply function, the equilibrium quantity will not decrease much but the equilibrium price will increase a lot.
- Economists like to use the term "elasticity" instead of slope.
- Elasticity: the percent change in quantity offered/demanded when the price goes up by 1%.