

Economics 2
Fall 2024

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LECTURE 3

Supply and Demand



I. INTRODUCTION TO MARKETS, SUPPLY, AND DEMAND

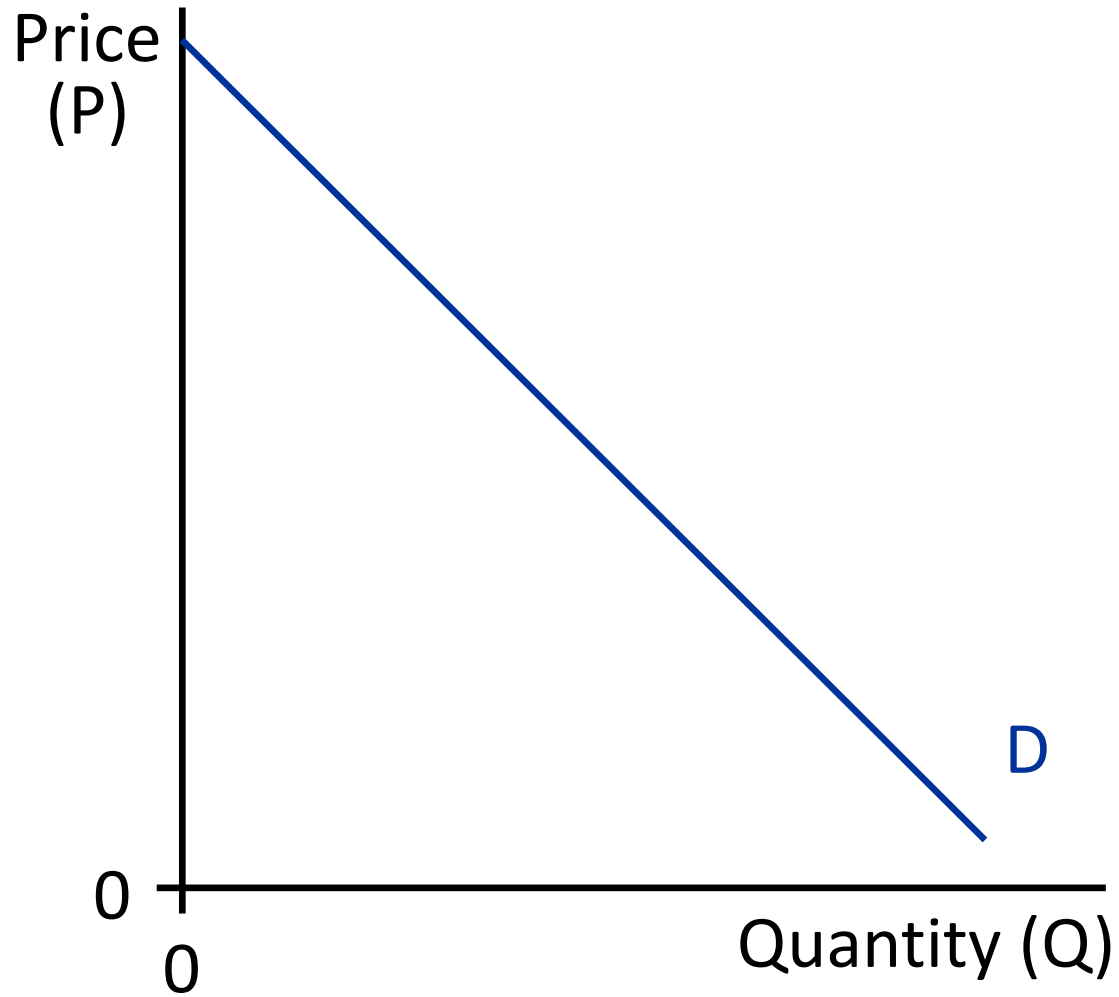
Market

- An arrangement by which economic exchanges between people/firms take place
 - Specialization in production requires us to exchange
- Market exchange voluntarily entered into for mutual benefit (unlike taxation from government)
- Exchange is often impersonal (unlike transfers/exchanges among friends, family)
- Market is a relatively novel form of exchange in human history (last 5000 years)
 - anthropology: reciprocated gifts more ancient, less calculating form of exchange-like friends/families today

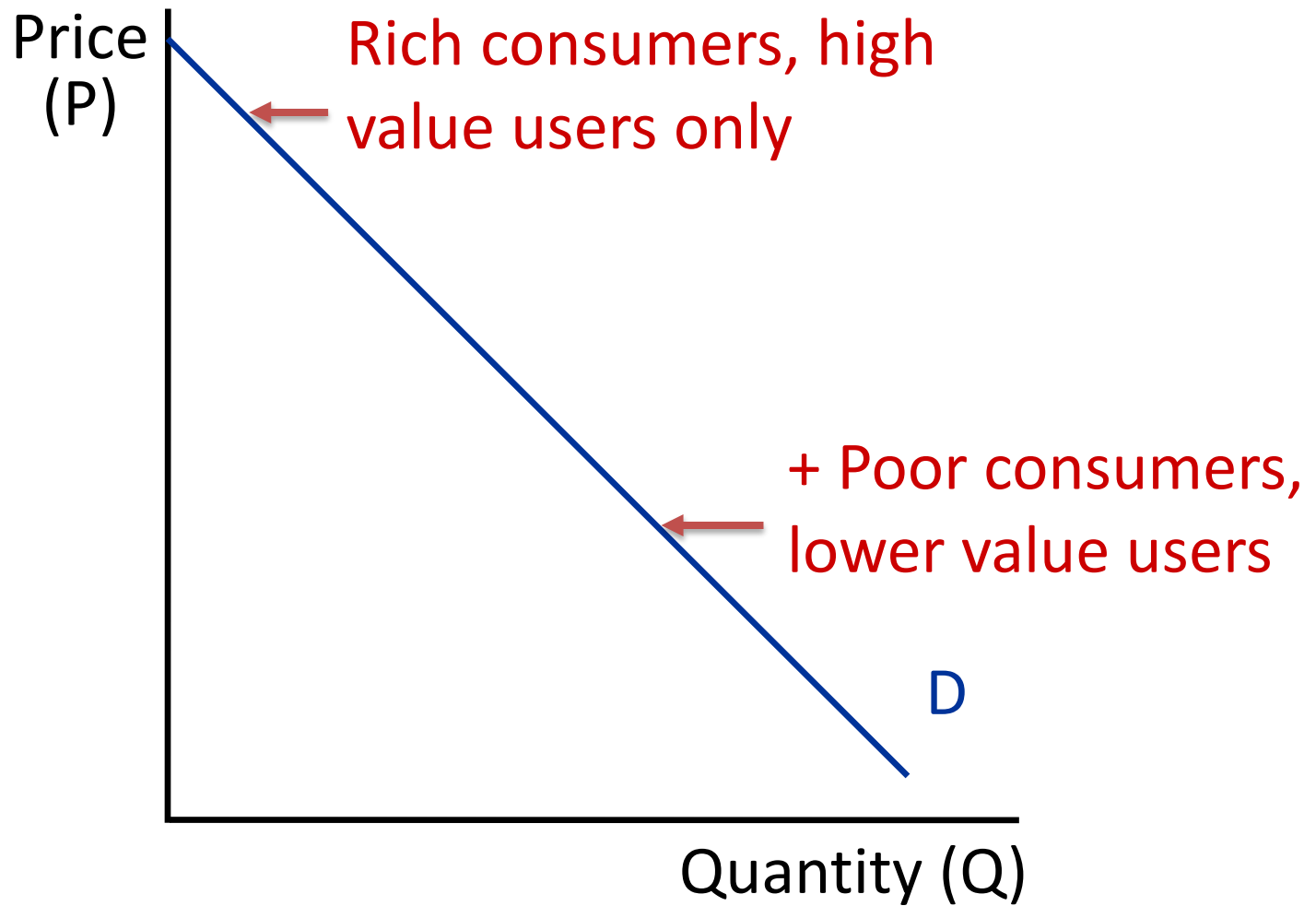
Demand

- The buying side of the market (generally consumers)
- There is a negative relationship between the quantity demanded of a good and its price.
- The relationship reflects optimizing behavior on the part of buyers: if price of the good is high, I can't buy as much or I'll buy something else.
- At price P , buyers want to buy quantity $Q=D(P)$ of the good.
- Key assumption: buyers are price takers

Demand Curve for oil (worldwide)



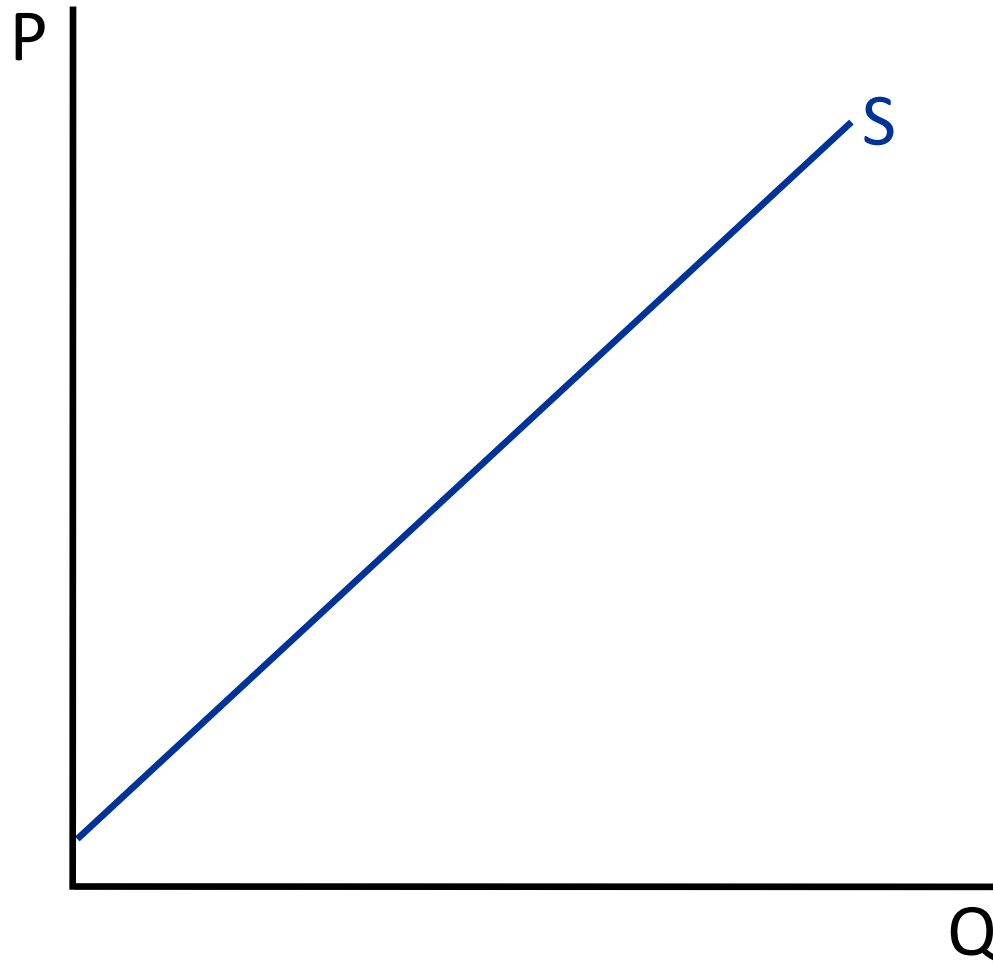
Demand Curve for oil (worldwide)



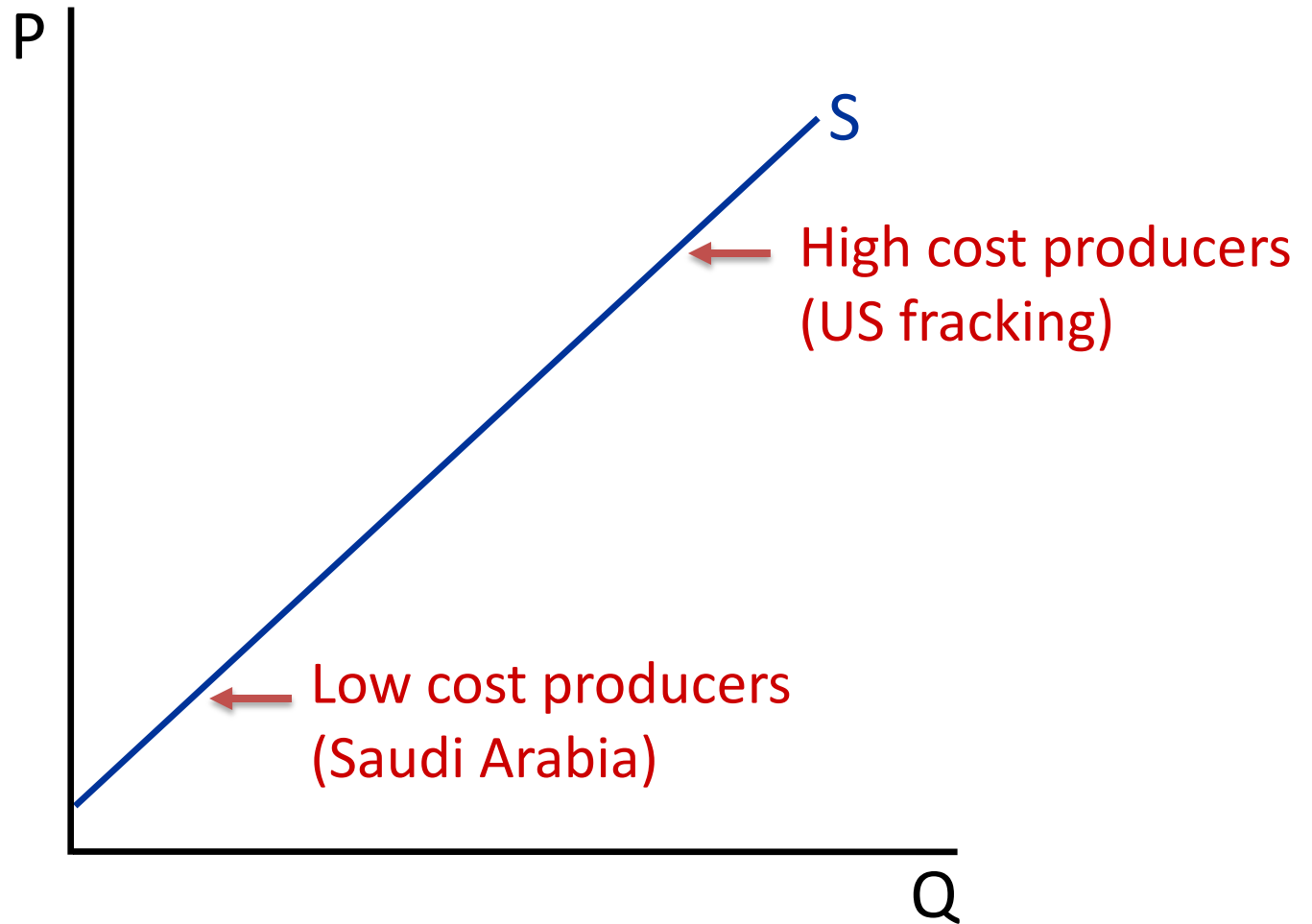
Supply

- The selling side of the market (generally producers)
- There is a positive relationship between the quantity supplied of a good and its price.
- This relationship reflects optimizing behavior on the part of producing firms.
- A price P , producers are willing to supply quantity $Q=S(P)$ of the good.
- Key assumption: producers are price takers

Supply Curve of oil worldwide



Supply Curve of oil worldwide



Quiz 1:

Question: Why is demand for oil sloping down?

- A. There are trade offs
- B. Oil is cheaper to produce in Saudi Arabia than North America
- C. Some consumers are willing to pay more for oil than others
- D. I don't know

Quiz 2:

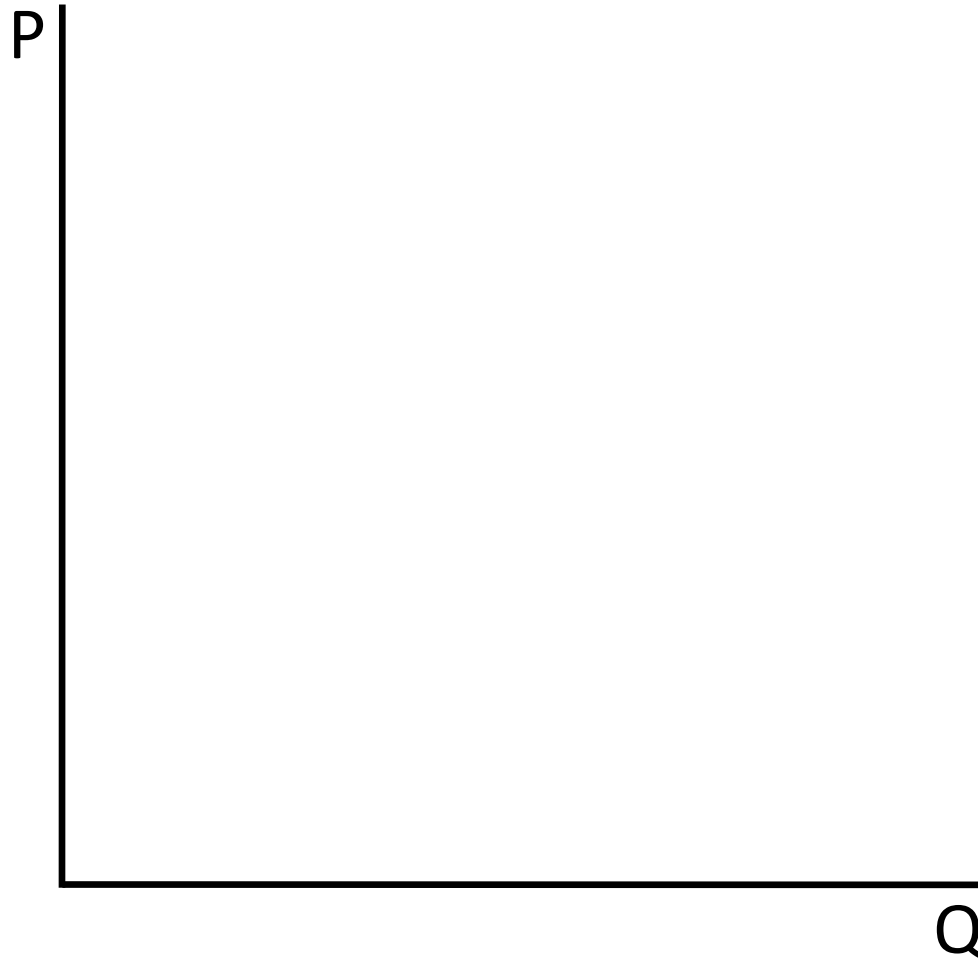
Question: Why is supply for oil sloping up?

- A. There are trade offs
- B. Oil is cheaper to produce in Saudi Arabia than North America
- C. Some consumers are willing to pay more for oil than others
- D. I don't know

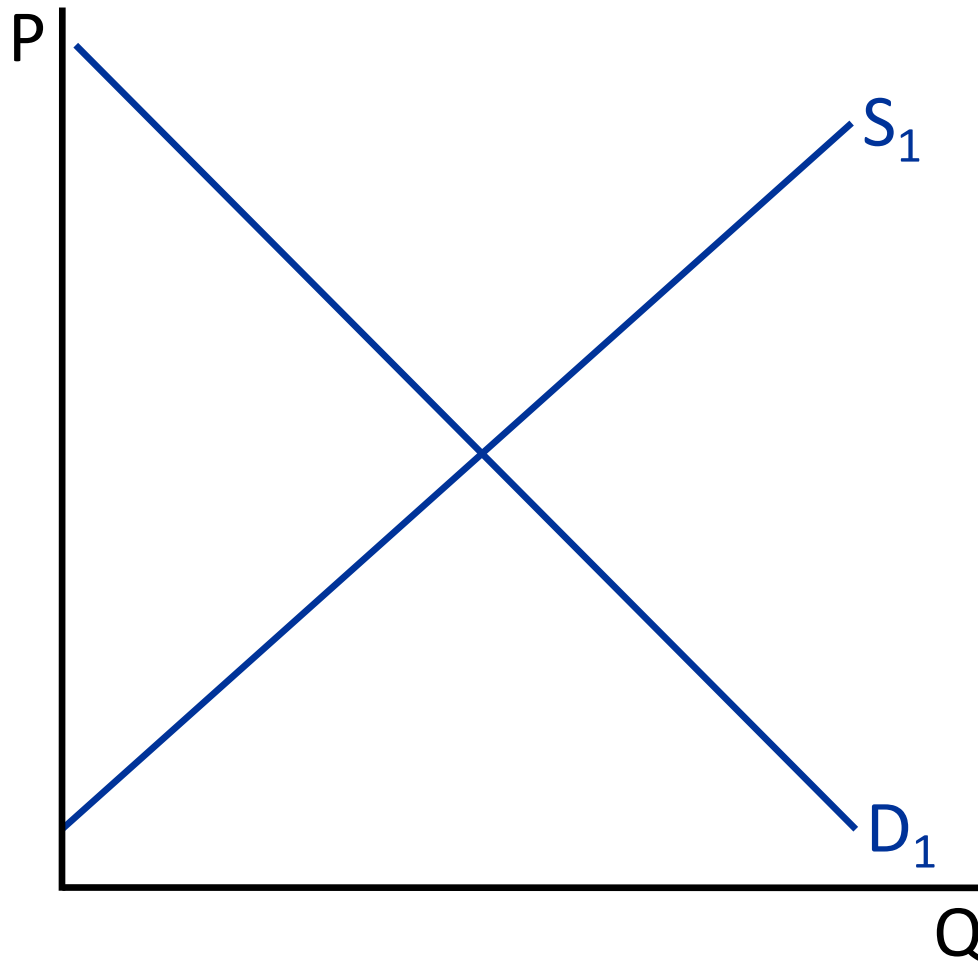
II. MARKET EQUILIBRIUM

- **Key assumption 1:** consumers are price takers (makes sense if many small consumers)
- **Key assumption 2:** producers are price takers (makes sense if many small producers who don't collude)
- This is called the competitive model

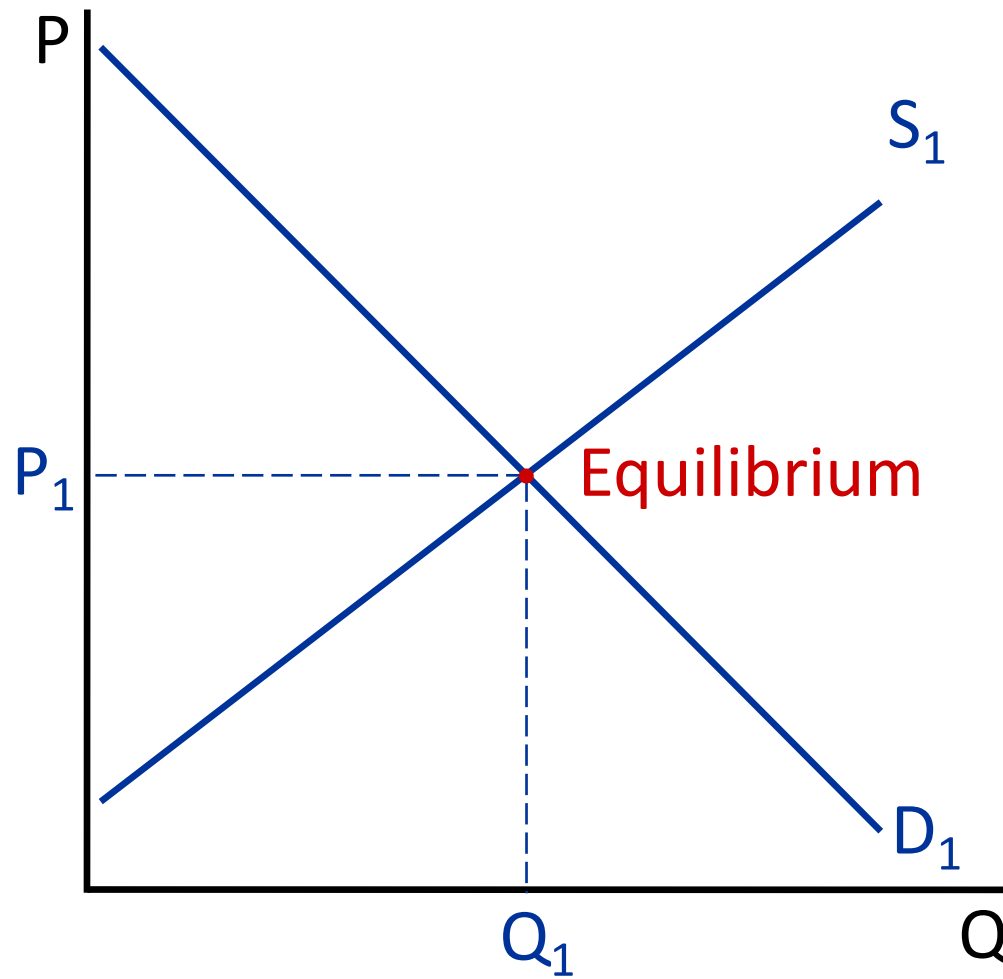
Equilibrium in the Market for oil



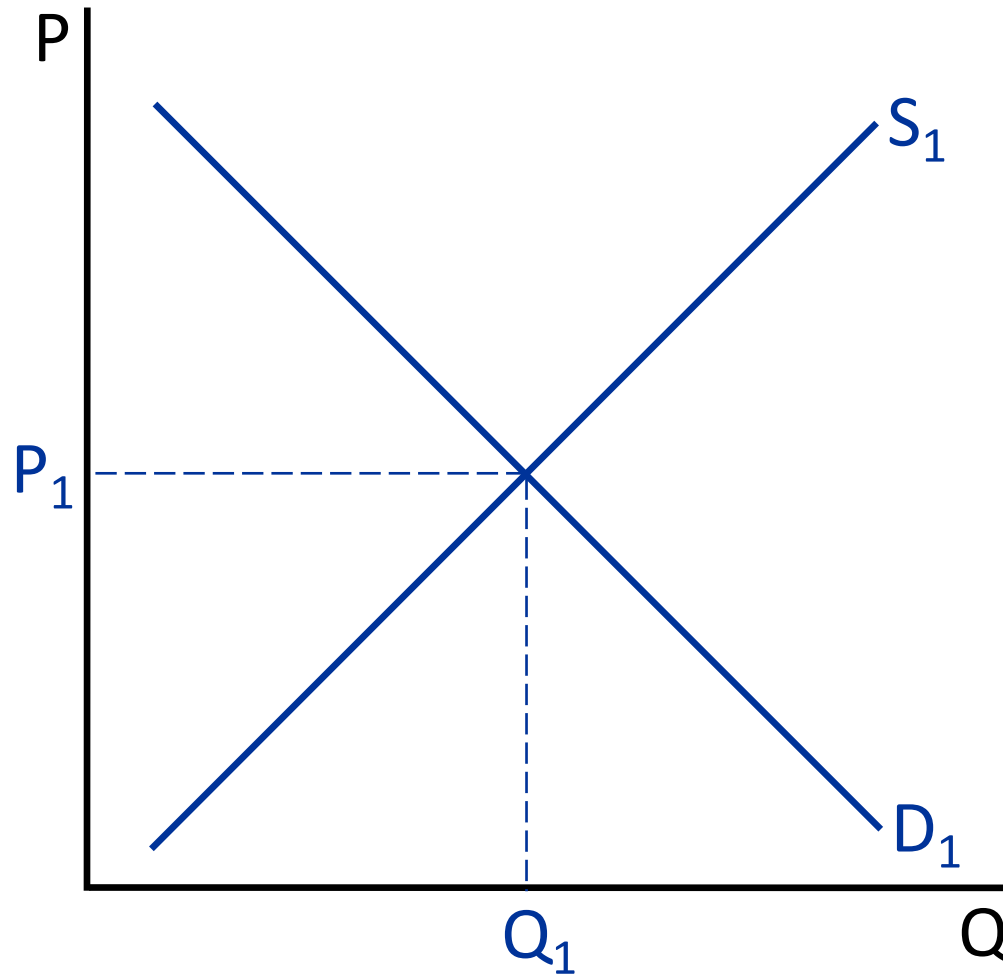
Equilibrium in the Market for oil



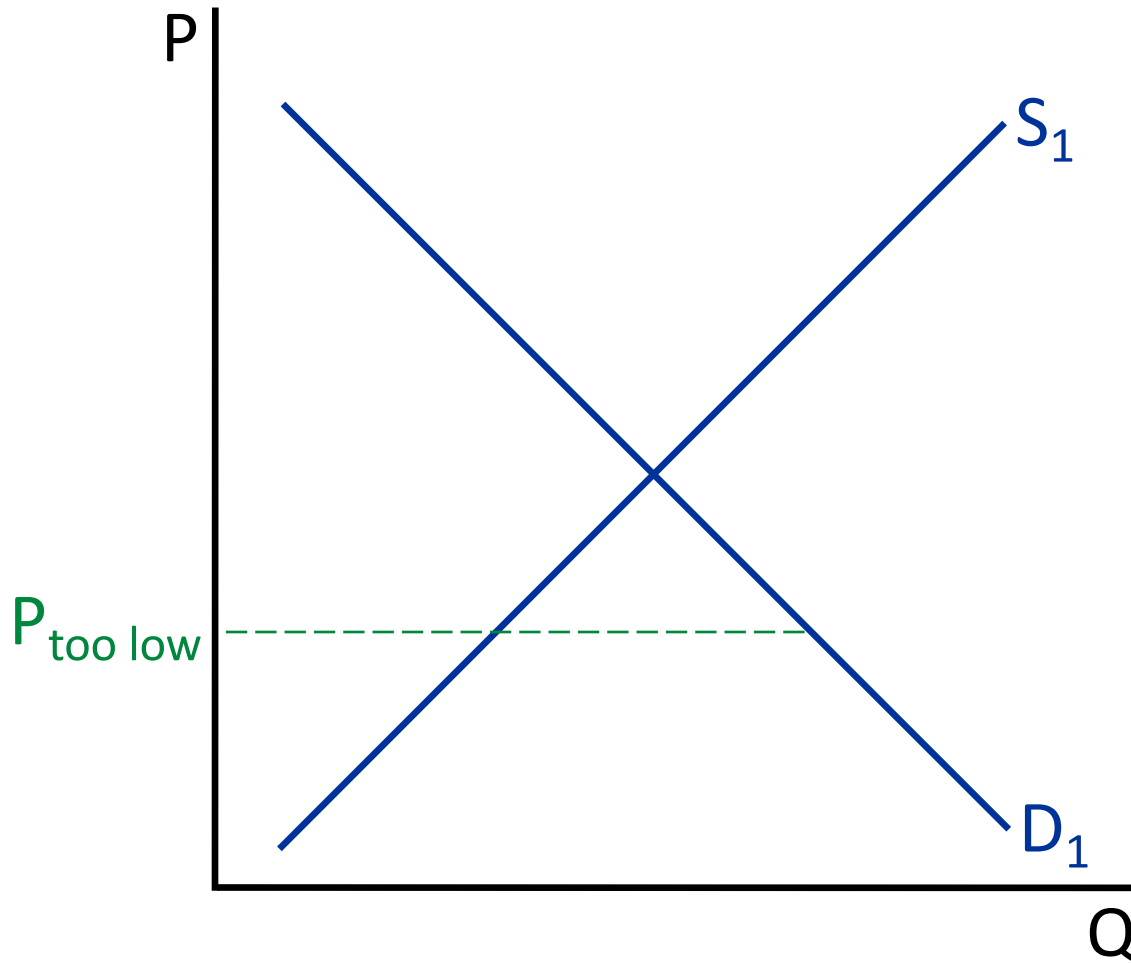
Equilibrium in the Market for Oil



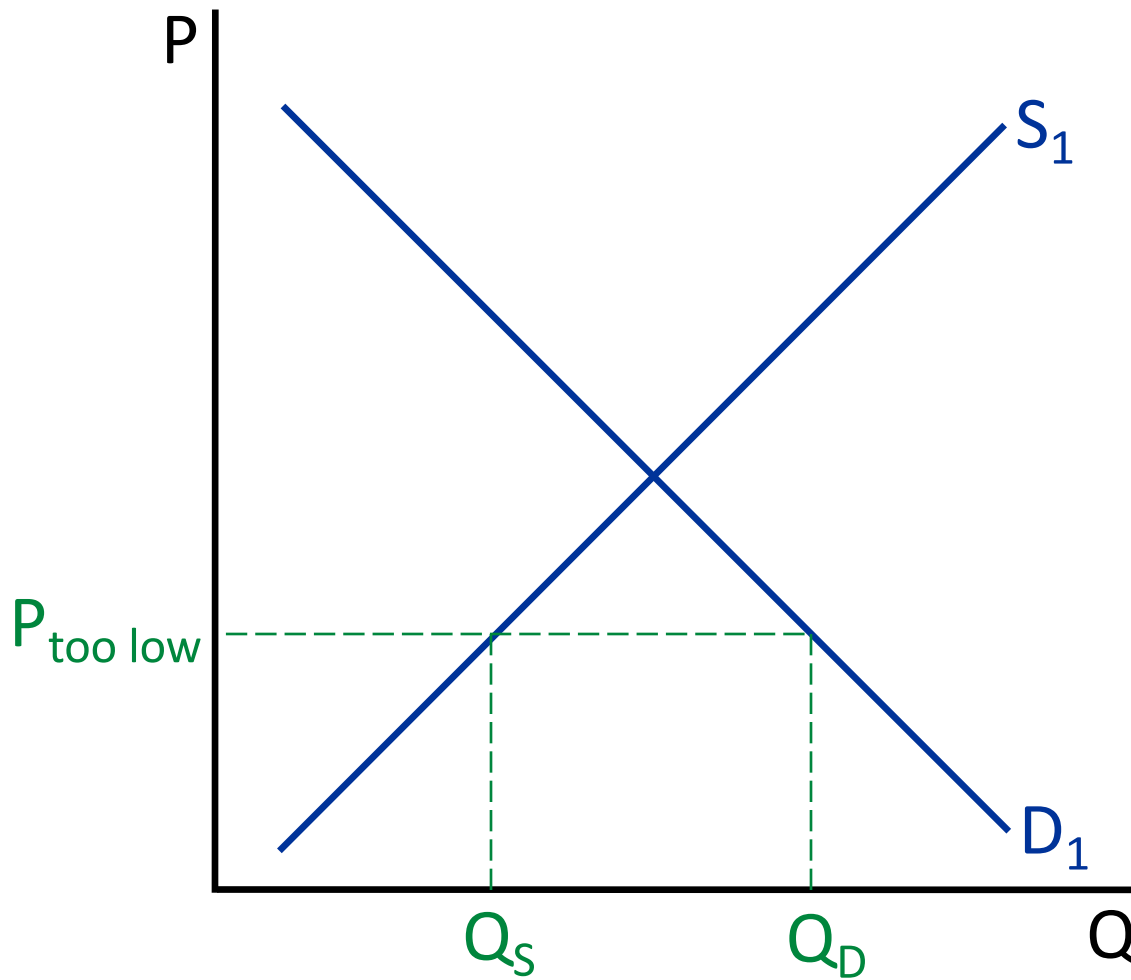
What happens if the price is **below** P_1 ?



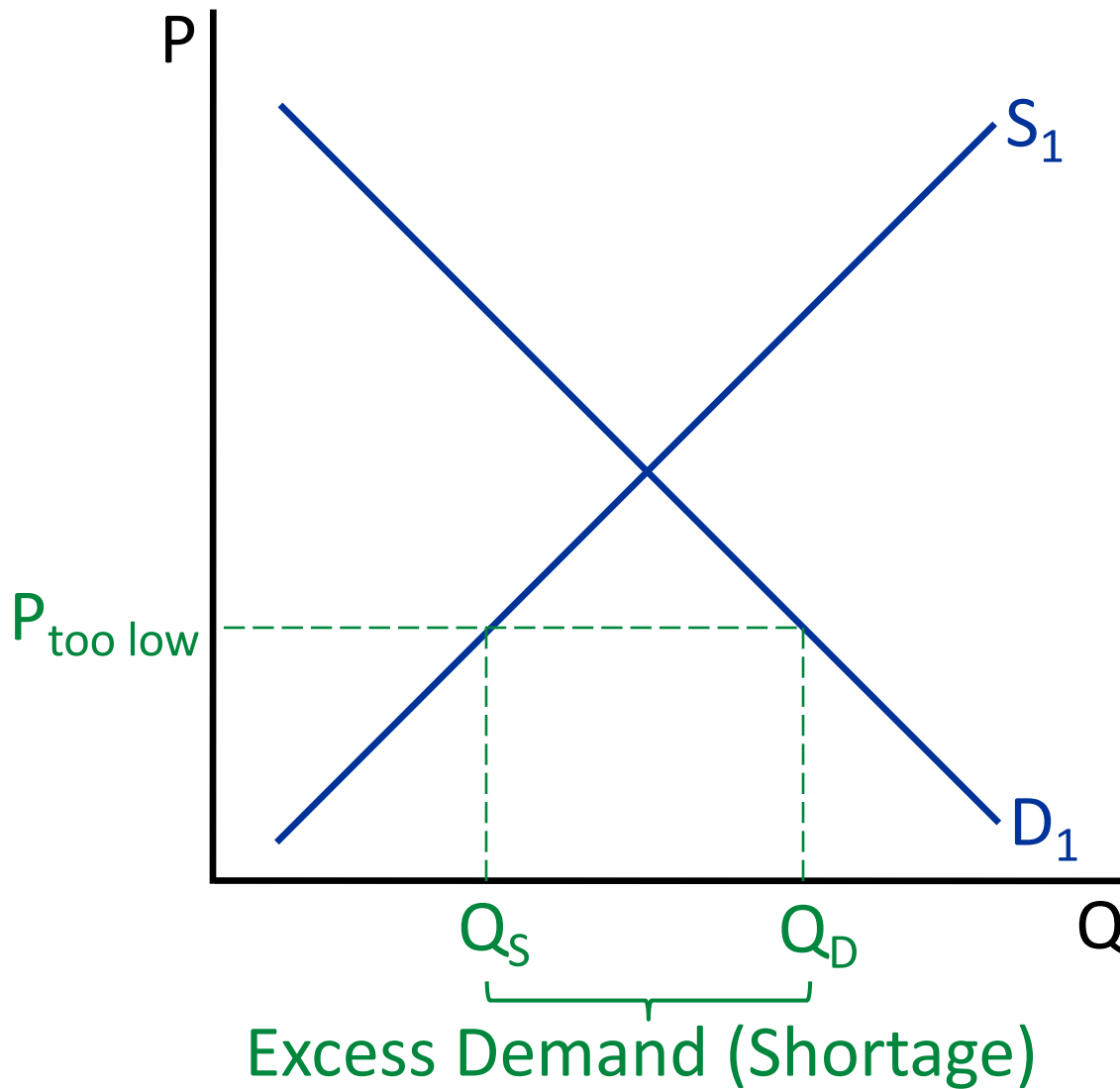
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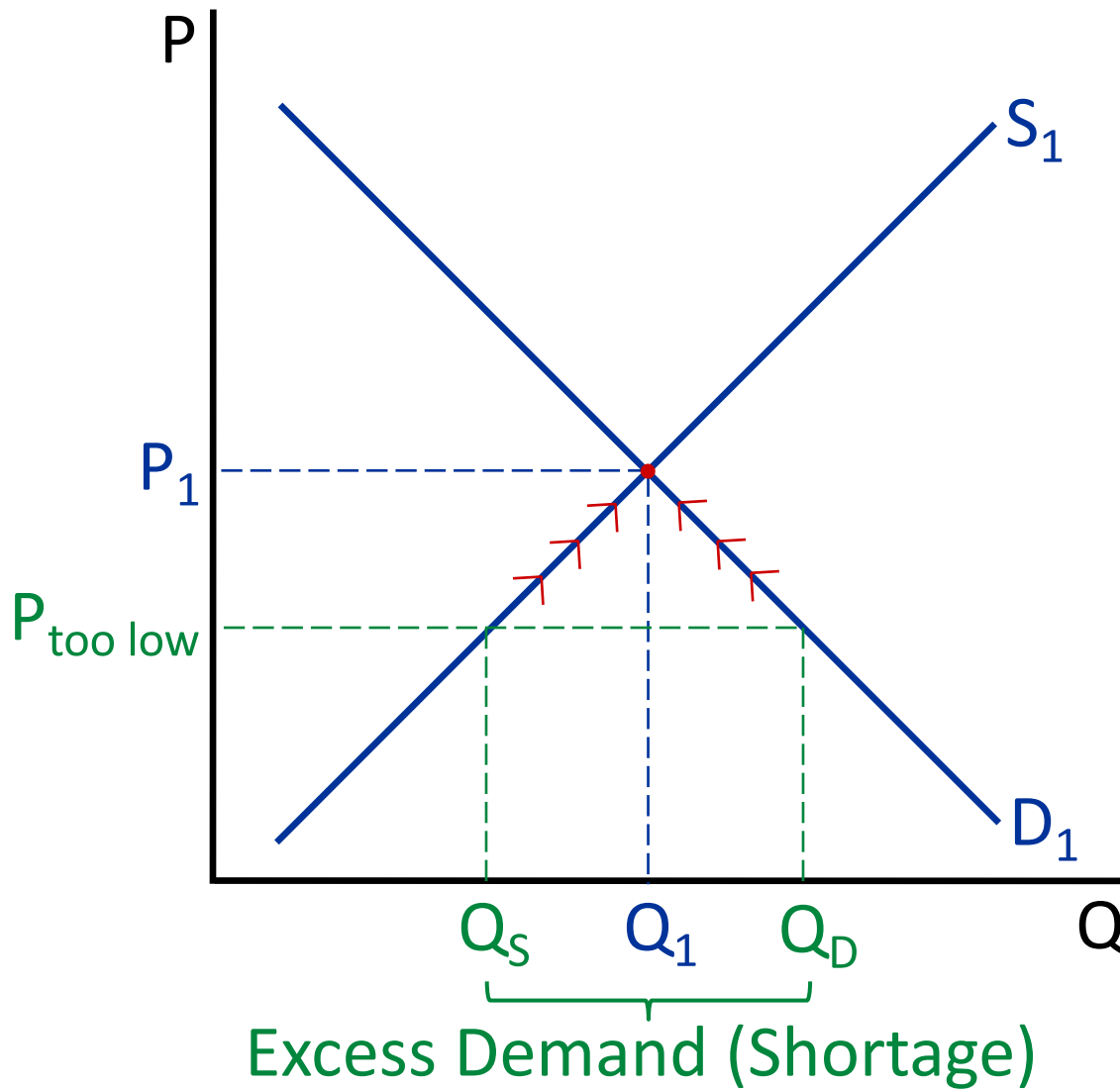
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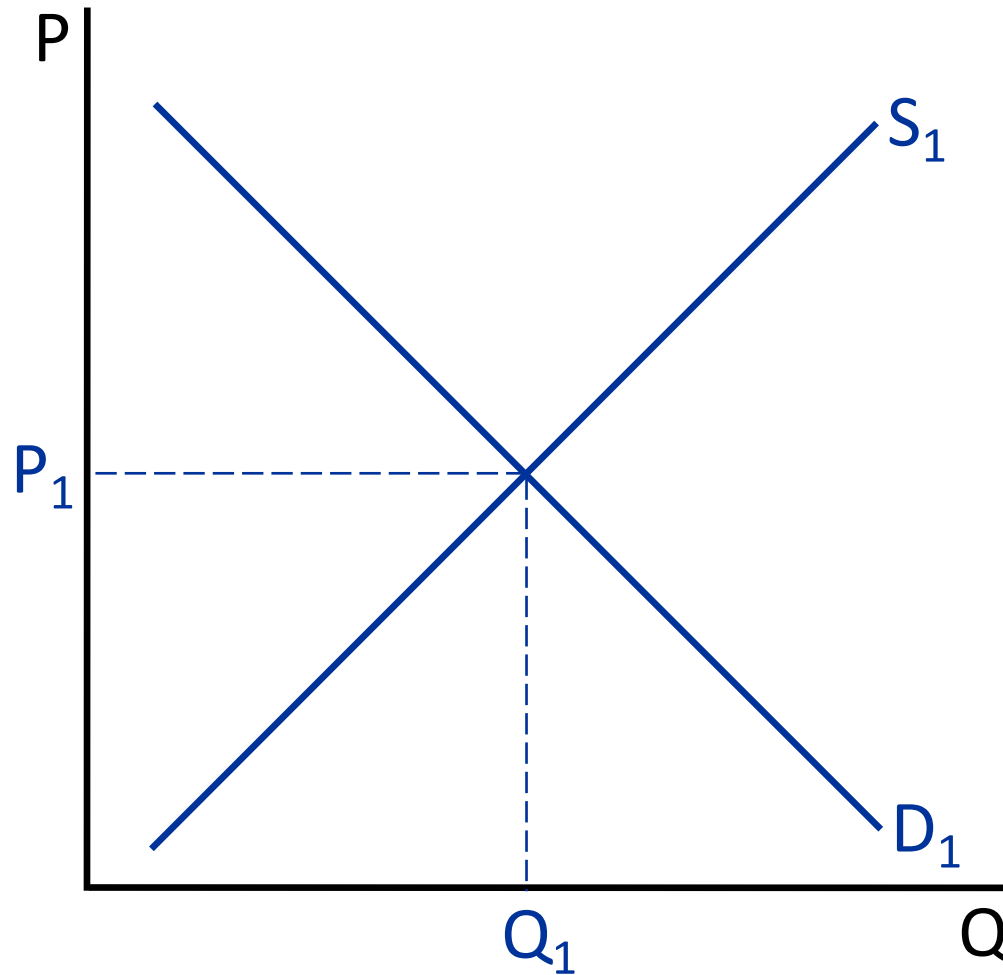
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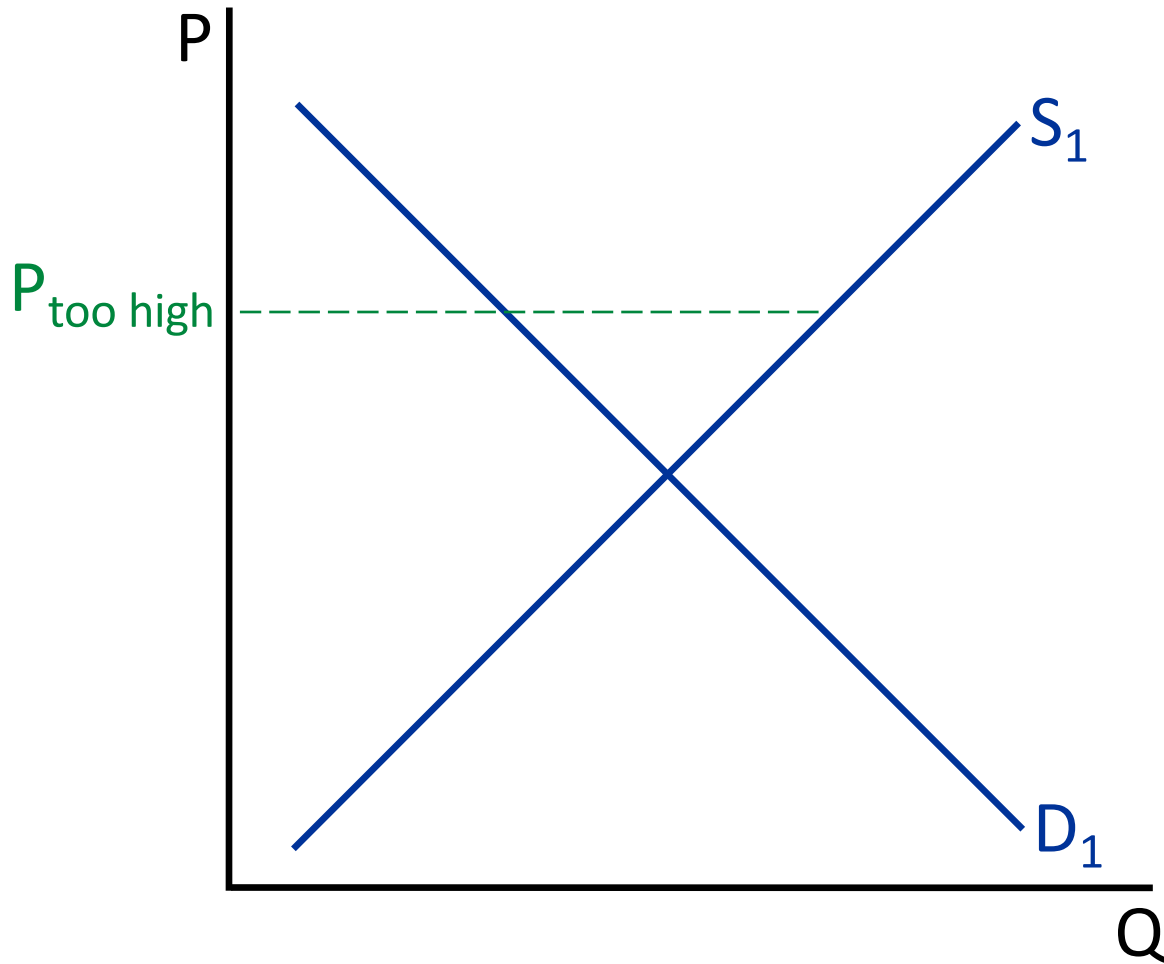
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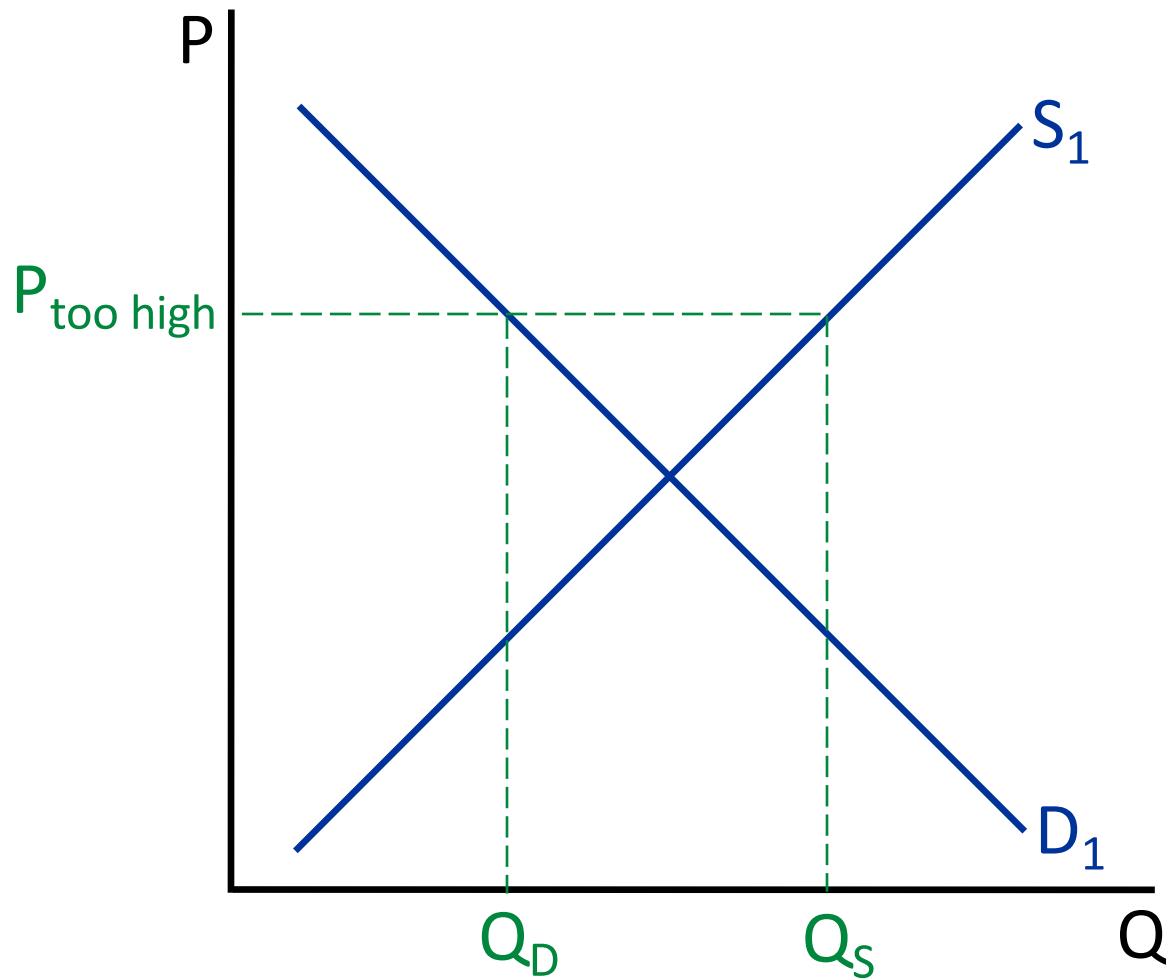
What happens if the price is **above** P_1 ?



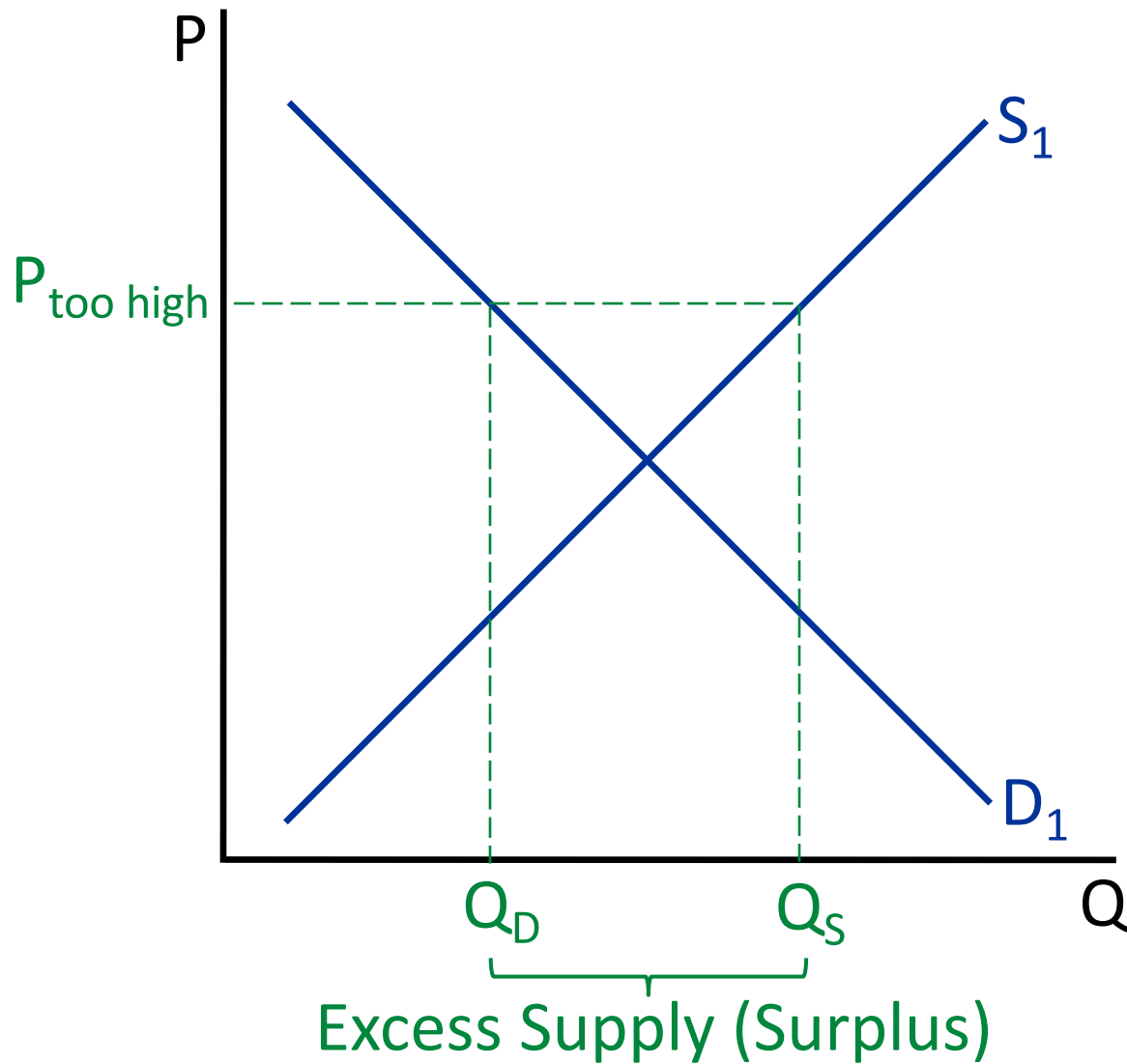
What happens if the price is **above** P_1 ?



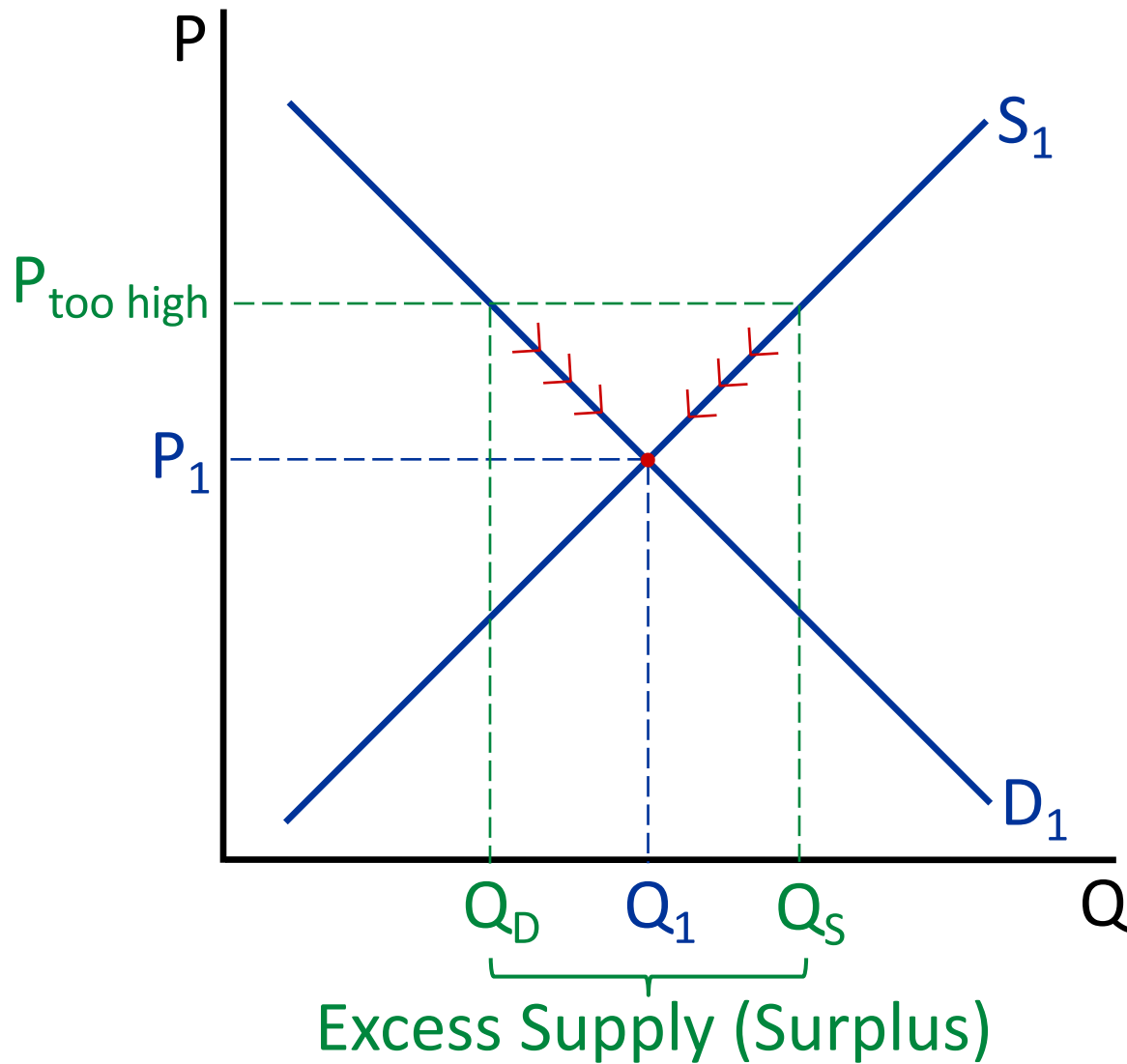
What happens if the price is **above** P_1 ?



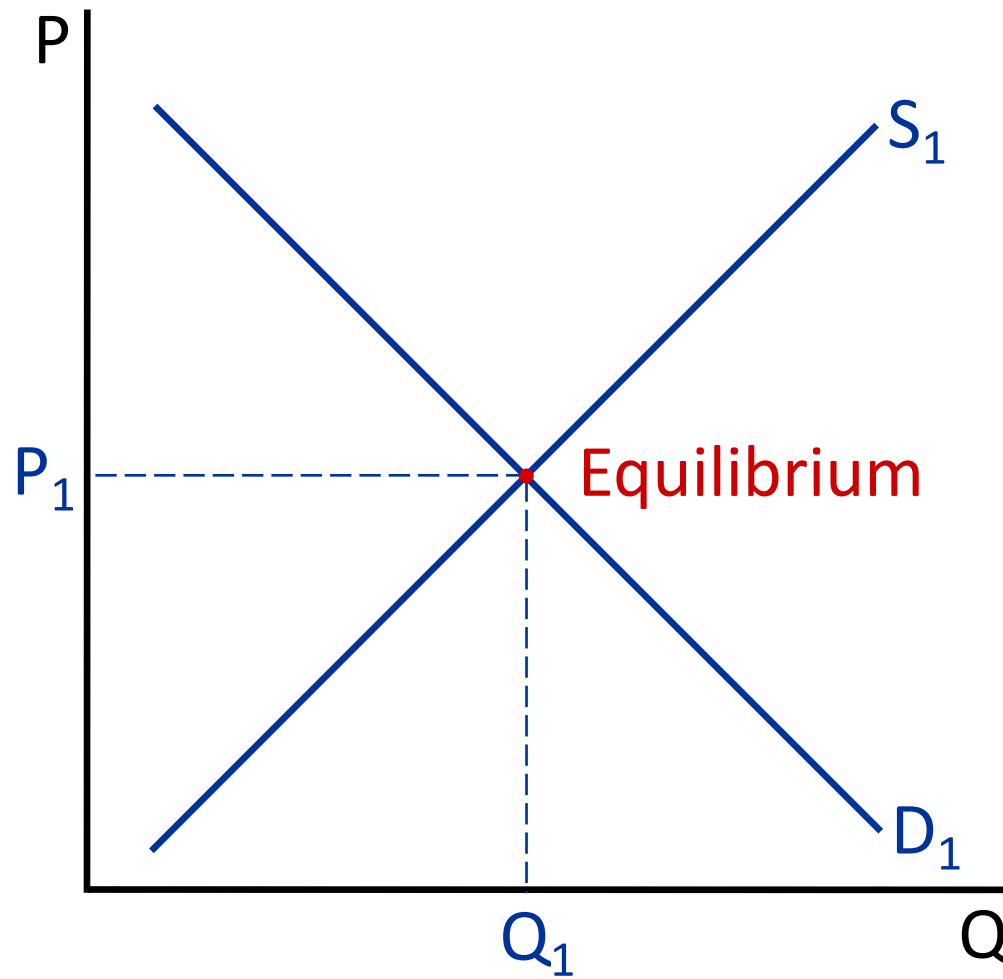
What happens if the price is **above** P_1 ?



What happens if the price is **above** P_1 ?



Equilibrium in the Market for Oil



How Do Markets Deal with Scarcity and the Gains from Specialization?

- The existence of markets allows people to specialize along the lines of comparative advantage because they can trade for other goods that they want.
- Markets deal with scarcity by balancing the optimizing behavior of consumers and producers. Prices adjust to equilibrate the two sides of the market.
- The consumers who actually get the good are those who are willing and able to pay the equilibrium price.
- The firms that actually produce the good are those that find it profit-maximizing to produce at the equilibrium price.

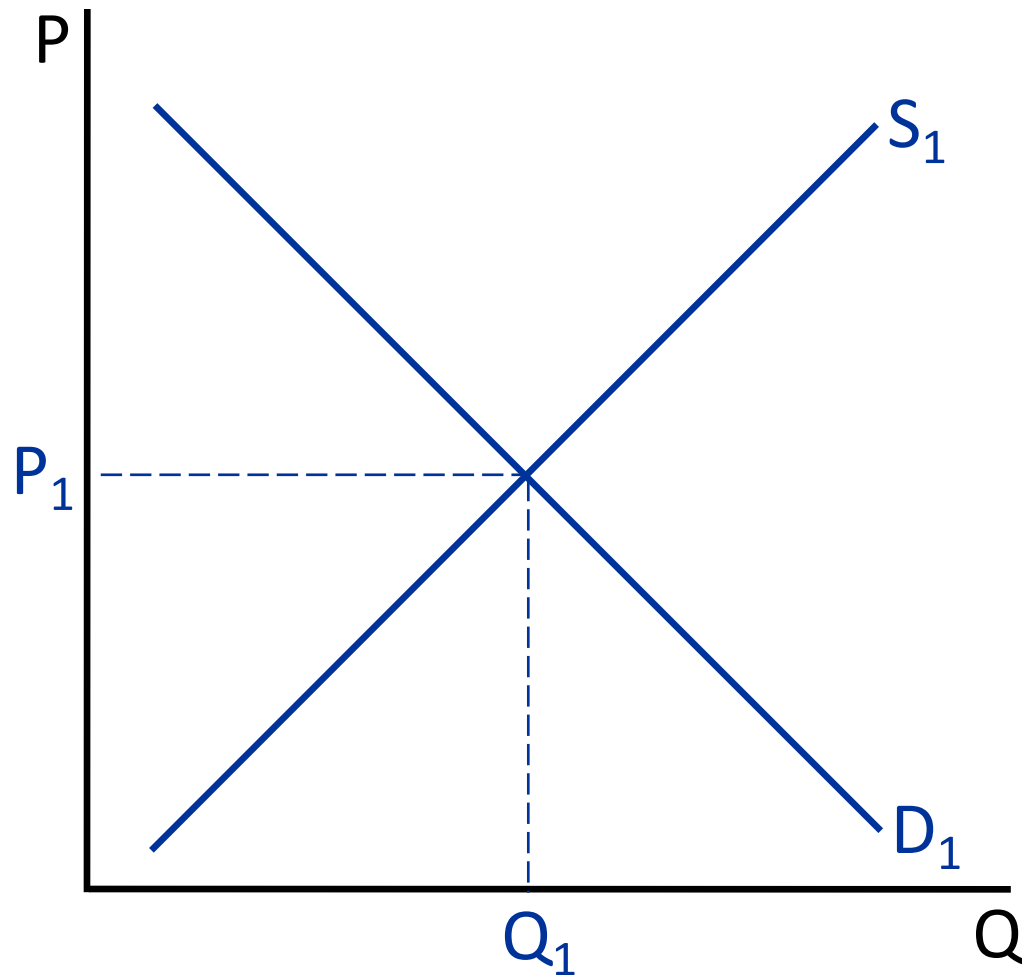
III. SHIFTS IN THE CURVES

- We have looked at the equilibrium where given demand and supply curves intersect
- We now analyze how the equilibrium changes when supply or demand curves shift

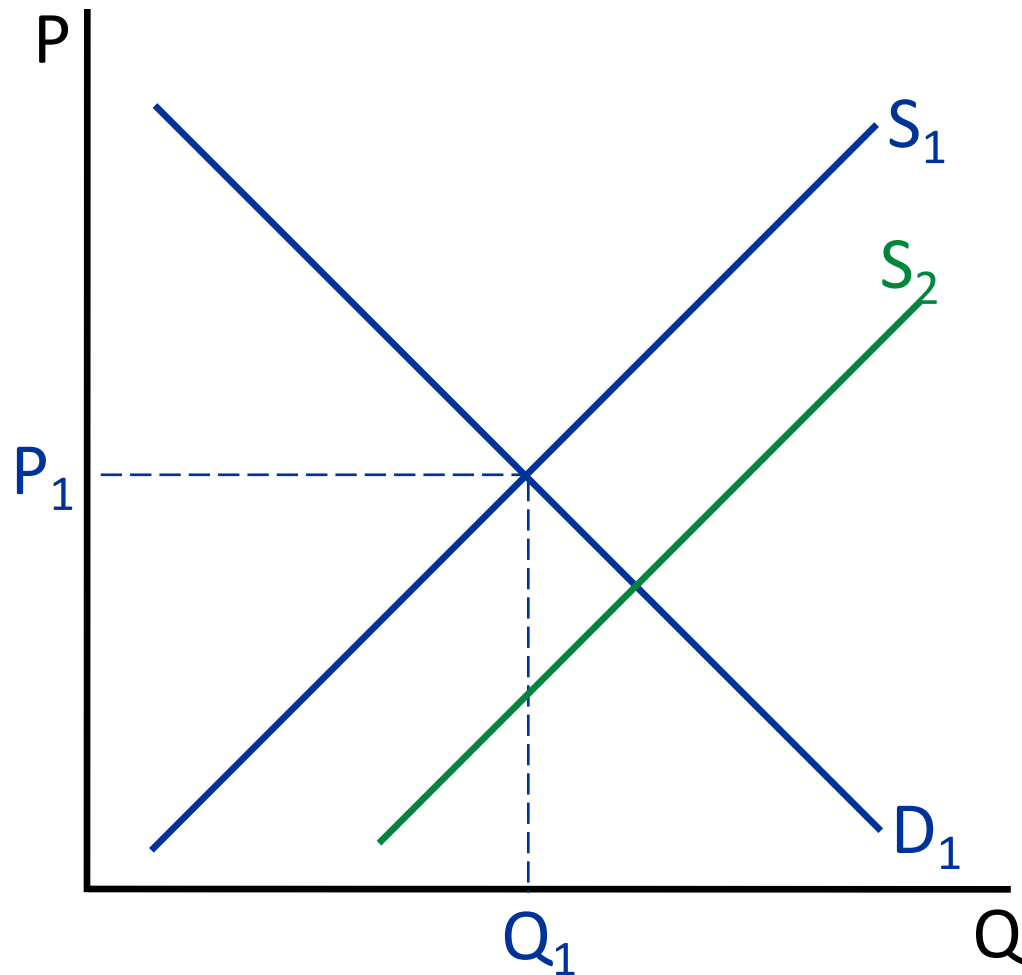
Ceteris Paribus

- “other things being equal”
- We have been looking at the relationship between the quantity demanded and price and between the quantity supplied and price, assuming that the only thing that varies is the price.

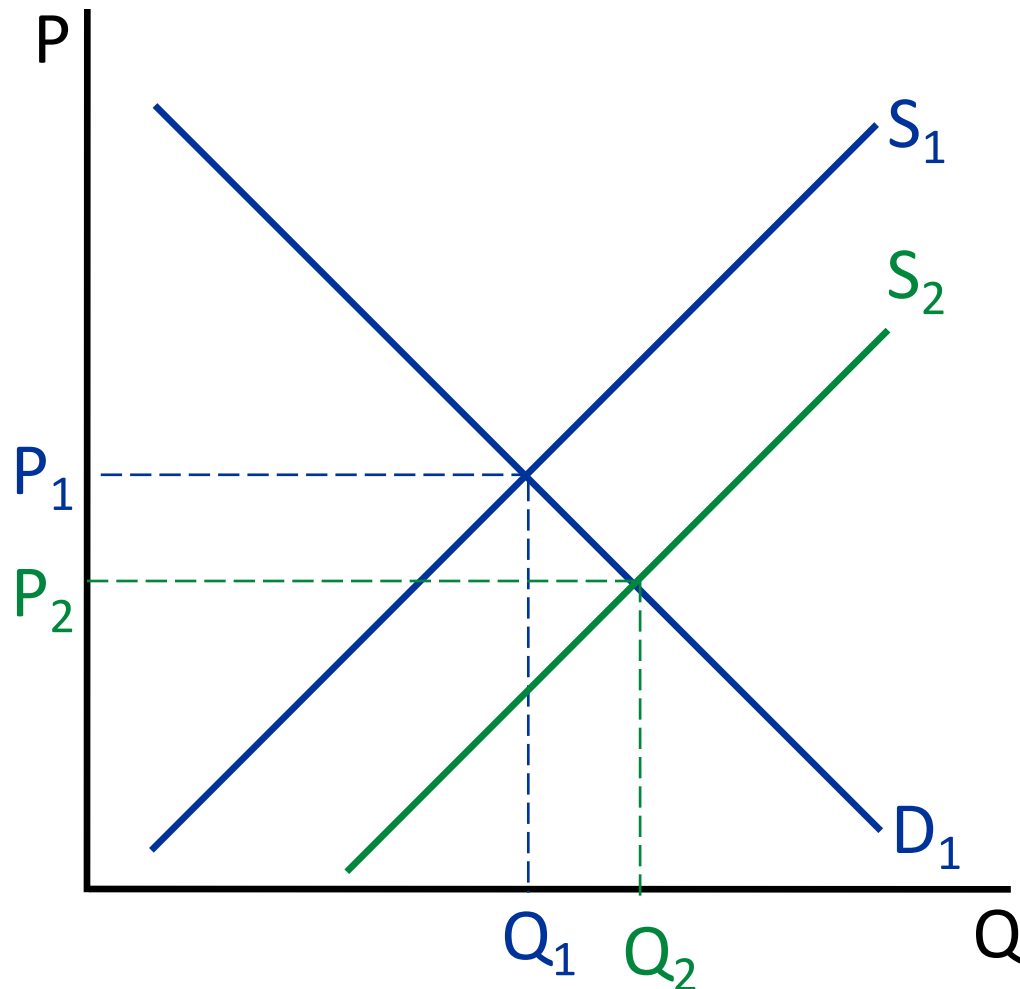
Oil market: Supply goes up
A new technology (fracking)



Oil market: Supply goes up
A new technology (fracking)



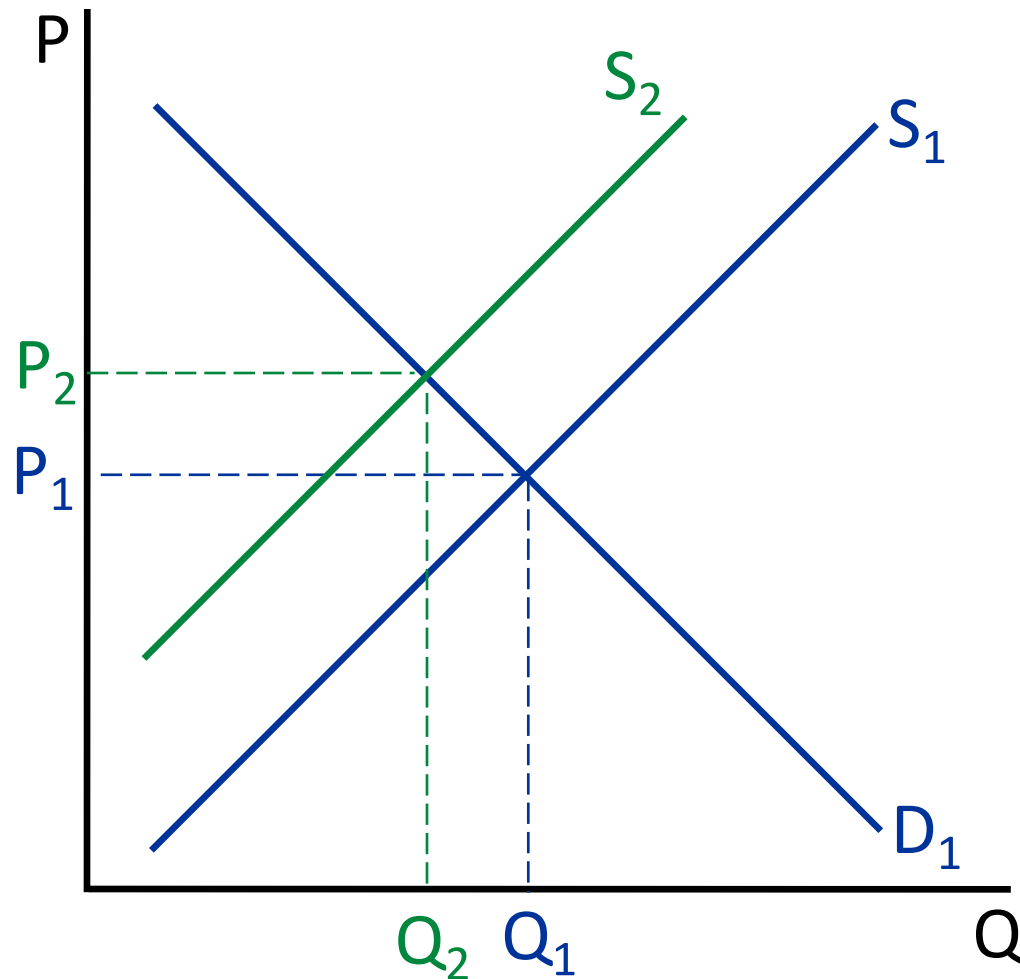
Oil market: Supply goes up A new technology (fracking)



When supply goes up, quantity increases and the price decreases

Oil market: Supply goes down

The US bans fracking

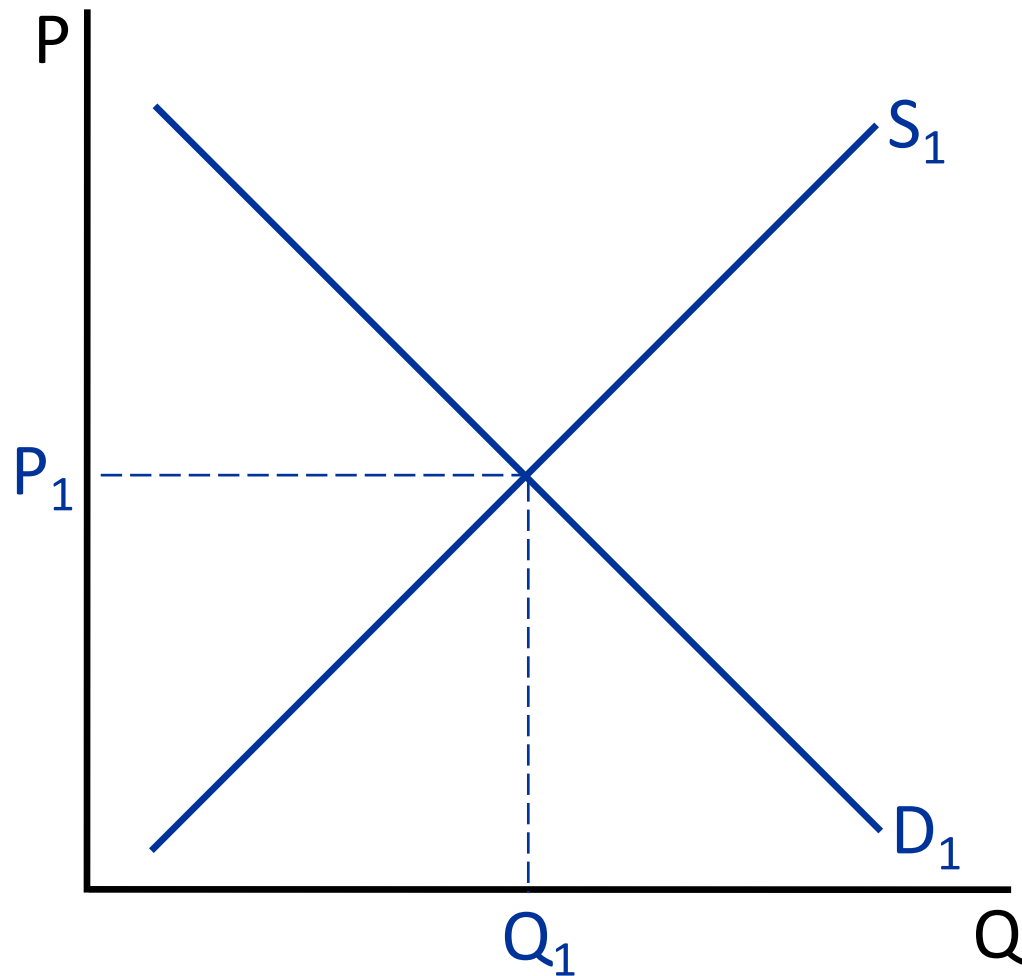


When supply goes down, quantity decreases and the price increases

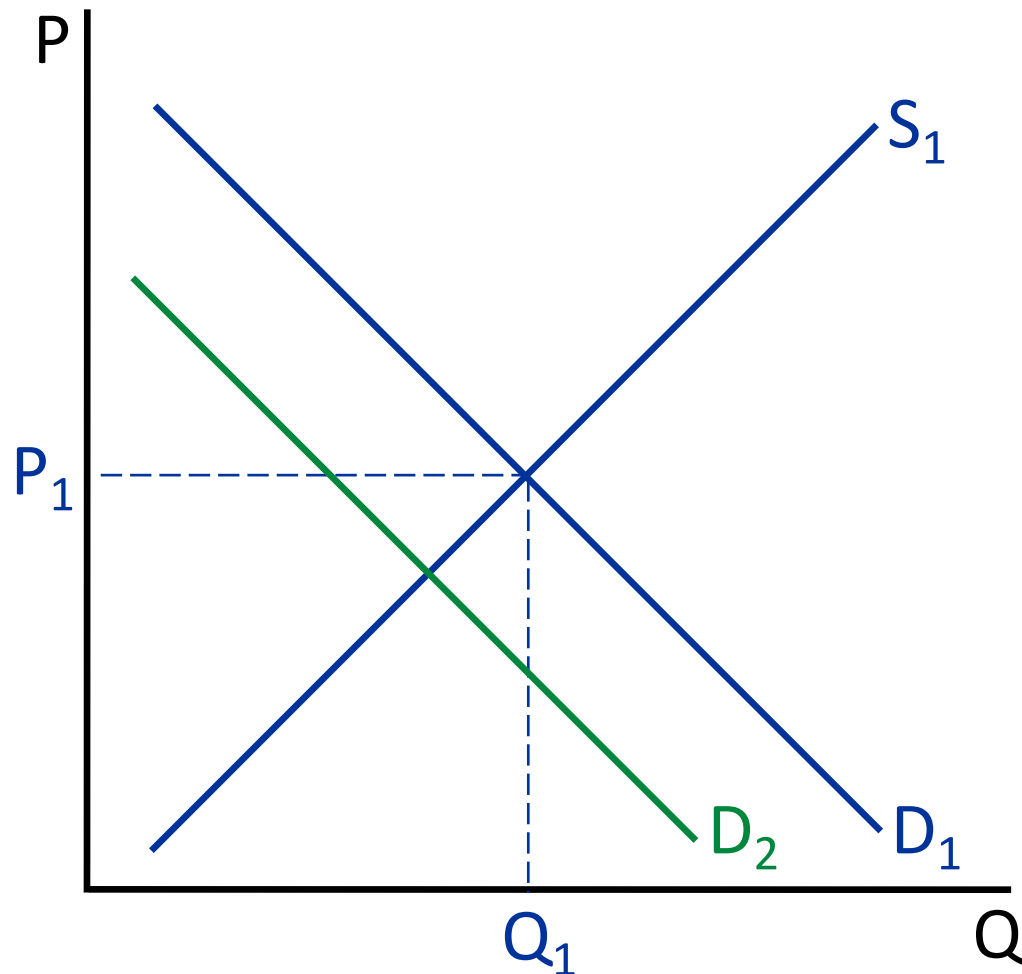
What can shift supply curves?

- Outward supply shifts (supply increases, goes up):
 - Innovation that increases productivity
 - Prices of inputs needed for production going down
 - More producers enter the industry
- Inward supply shifts (supply decreases, goes down):
 - Regulation decreases productivity
 - Prices of inputs needed for production going up
 - Producers exit the industry

Oil market: Demand goes down Electric cars appear

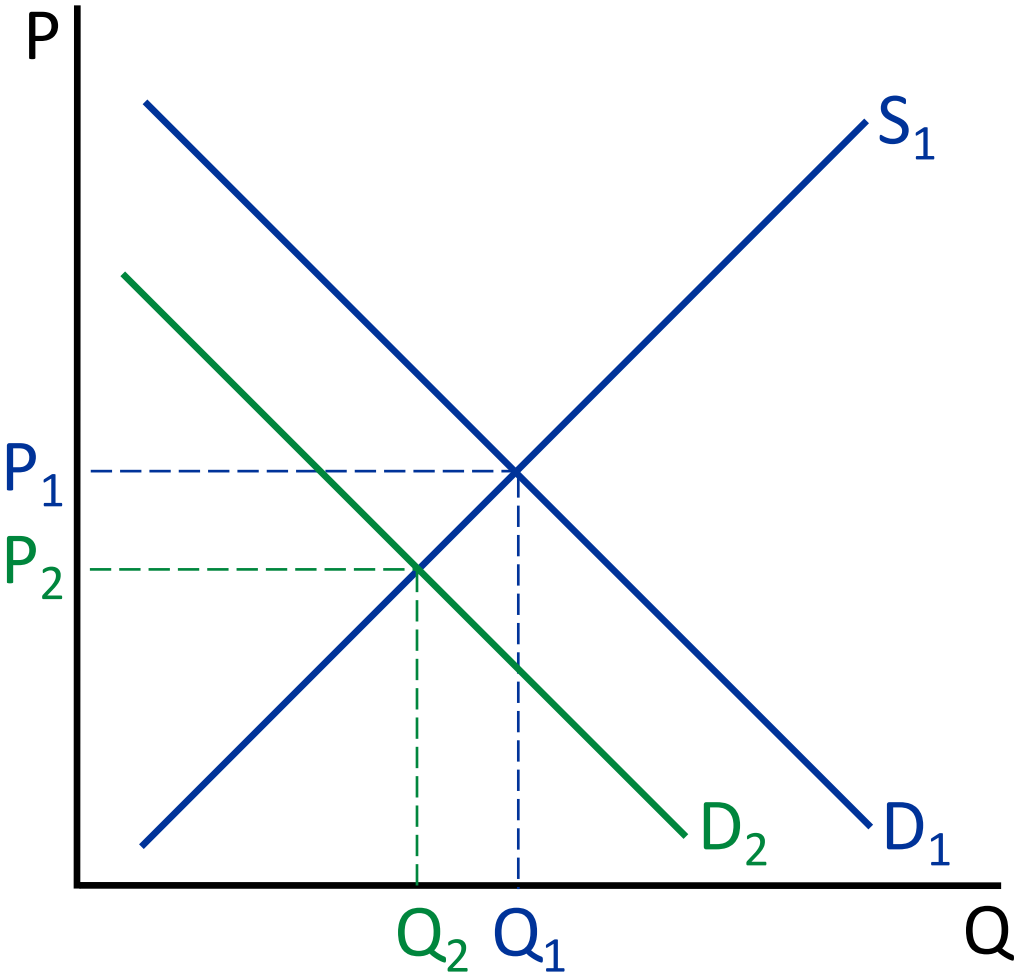


Oil market: Demand goes down Electric cars appear



Oil market: Demand goes down

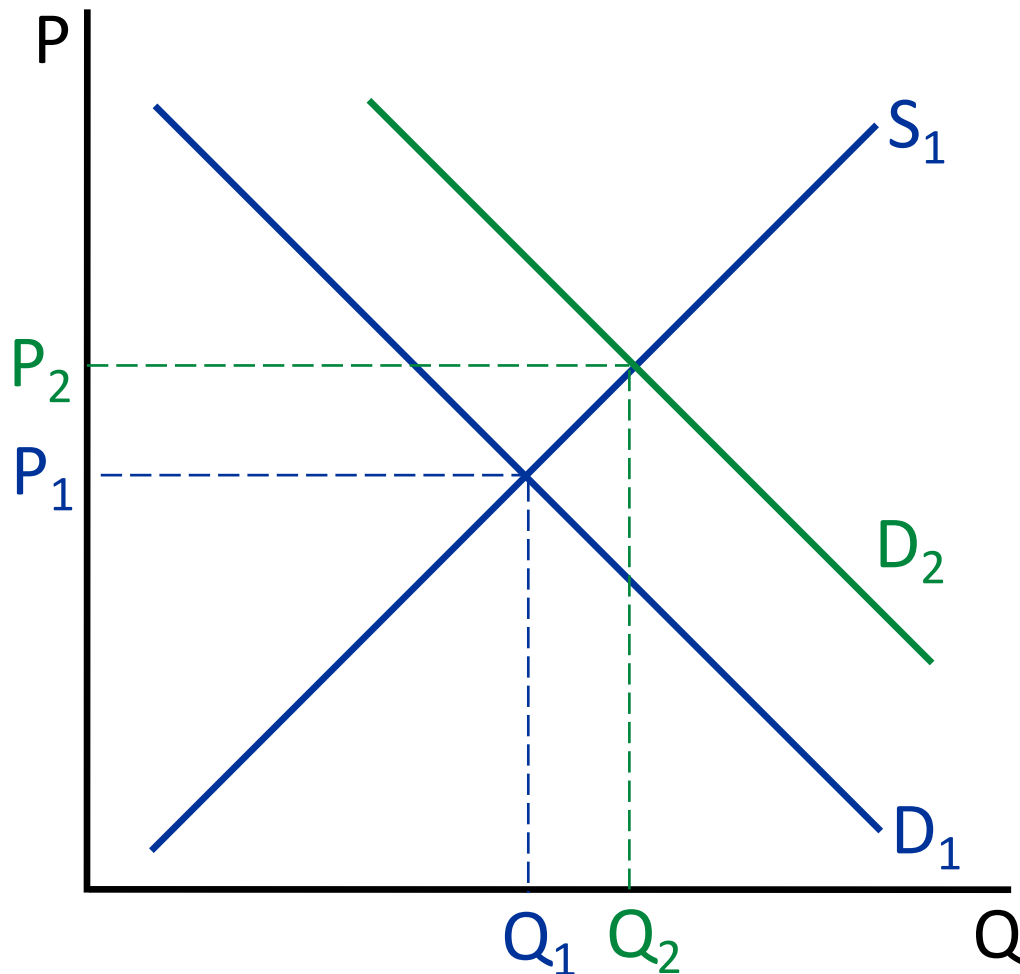
Electric cars appear



When demand goes down, quantity decreases and the price decreases

Oil market: Demand goes up

US bans electric cars



When demand goes up, quantity increases and the price increases

What can shift demand curves?

- Outward demand shifts (demand increases, goes up)
 - New complementary good is released
 - The price of a substitute good goes up
 - People got richer
 - The product becomes fashionable
- Inward demand shifts (demand decreases, goes down)
 - The price of a complementary good goes up
 - The price of a substitute good goes down
 - The product goes out of fashion or becomes obsolete

Quiz 3:

Question: World market for oil. Europe removes its ban on fracking (lots of oil sits deep in European continent). What is the effect on P & Q of oil worldwide?

- A. P increases, Q increases
- B. P decreases, Q increases
- C. P increases, Q decreases
- D. P decreases, Q decreases
- E. P effect unknown, Q decreases

Anchor House Building Opens at UC Berkeley



Quiz 4:

Question: Market for rental apartments in city of Berkeley. UC Berkeley opens the new Anchor House building that provides 244 new apartments for 772 UC students (at market prices). What is the effect on P & Q of rental apartments in Berkeley?

- A. P increases, Q increases
- B. P decreases, Q increases
- C. P increases, Q decreases
- D. P decreases, Q decreases
- E. P effect unknown, Q decreases

Quiz 5:

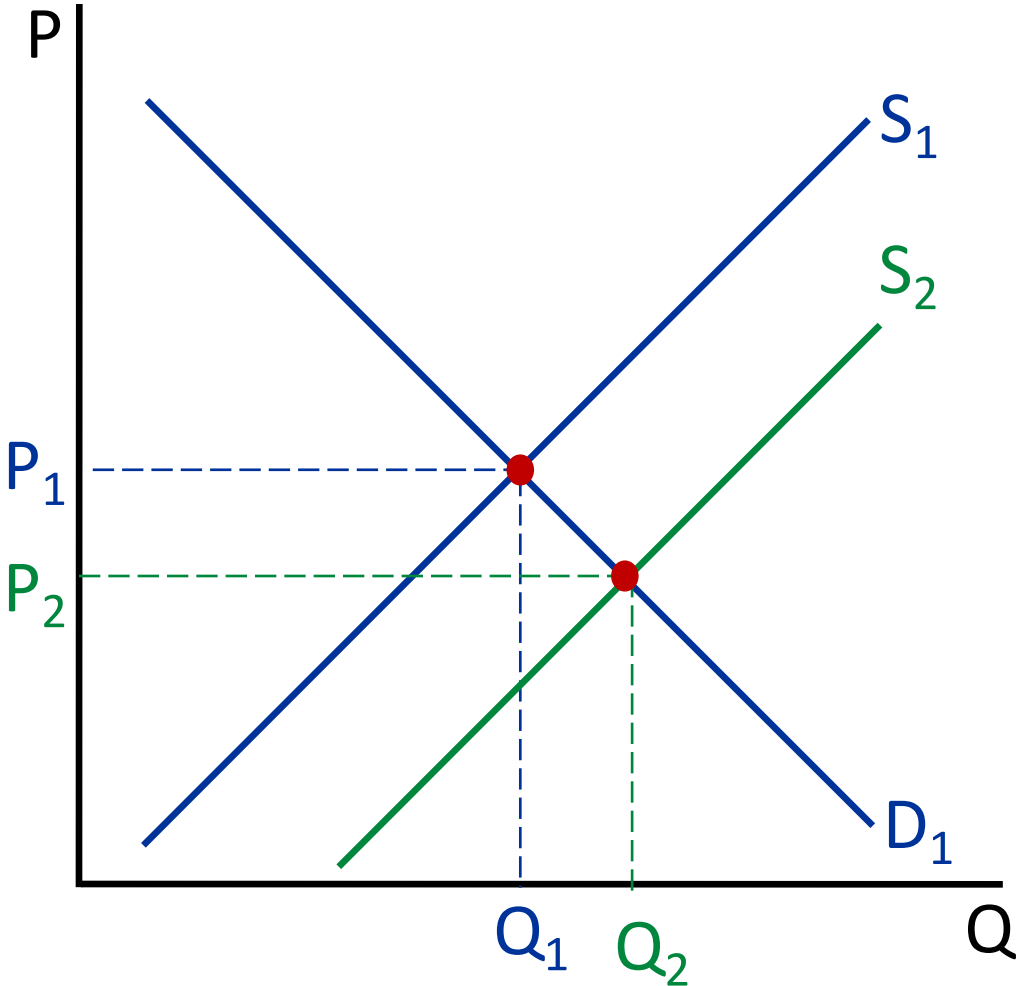
Question: UC Berkeley increases the size of its undergraduate class from current 8000 to 10000. What is the effect on P & Q of rental apartments in the city of Berkeley?

- A. P increases, Q increases
- B. P decreases, Q increases
- C. P increases, Q decreases
- D. P decreases, Q decreases
- E. P effect unknown, Q decreases

Estimating Demand Curves Empirically

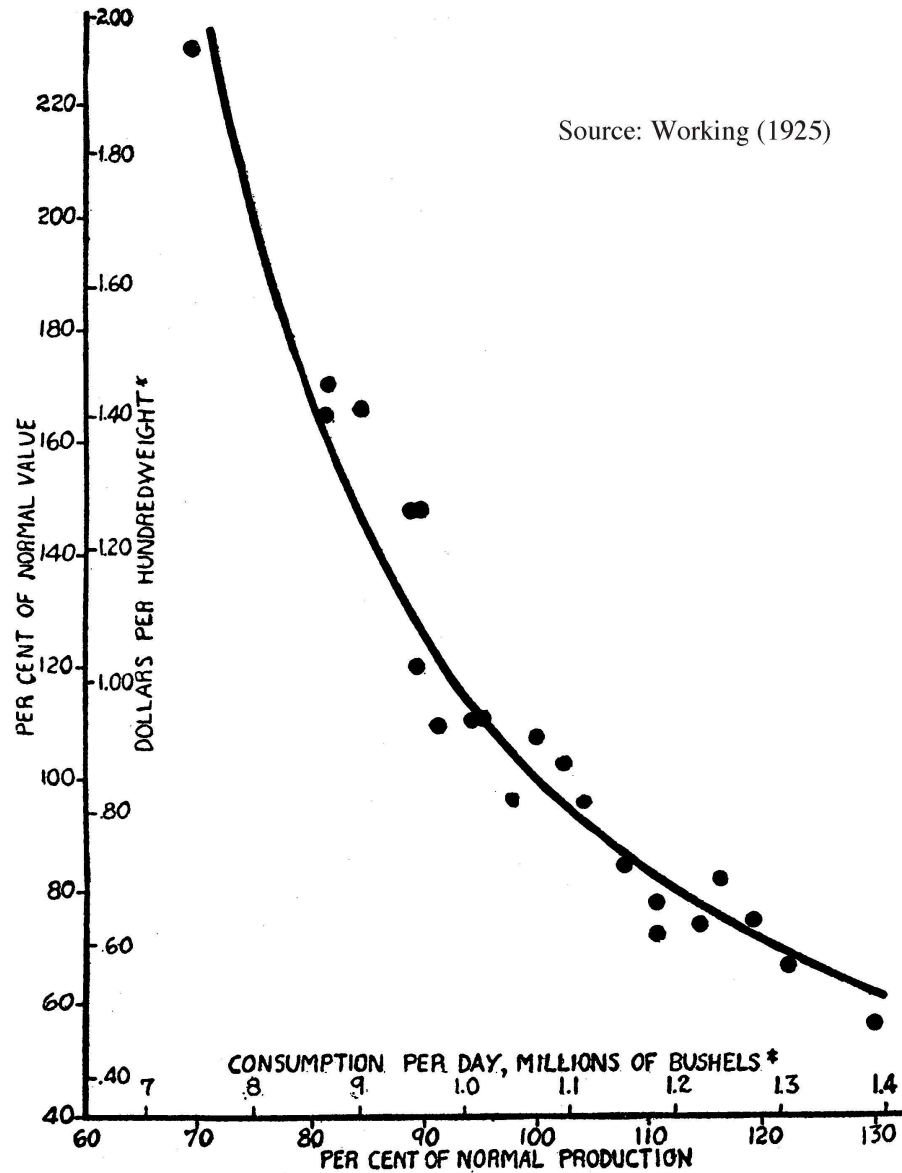
- In real data, we observe only the intersection of supply and demand curve, not the curves
- Demand curve is revealed in real data when there is a supply shift with stable demand curve.
- [Working \(1925\)](#) is early example using potatoes in Minneapolis area: annual production varies with weather (supply shift) while demand curve is expected to be stable
- Is this compelling estimation?

Supply shifts can reveal the demand curve



When supply shifts, equilibrium moves along the demand curve

FIGURE 1



* ON BASIS OF 1913 PRICE LEVEL AND DEMAND

FIGURE 1. The Demand for Potatoes in the United States in Terms of Prices in St. Paul and Minneapolis

This is a representative consumers' demand curve, the quantities being essentially rates, as indicated explicitly by the inside horizontal scale. In this case consumption for feed on the farm and all other uses of potatoes are included in the demand.

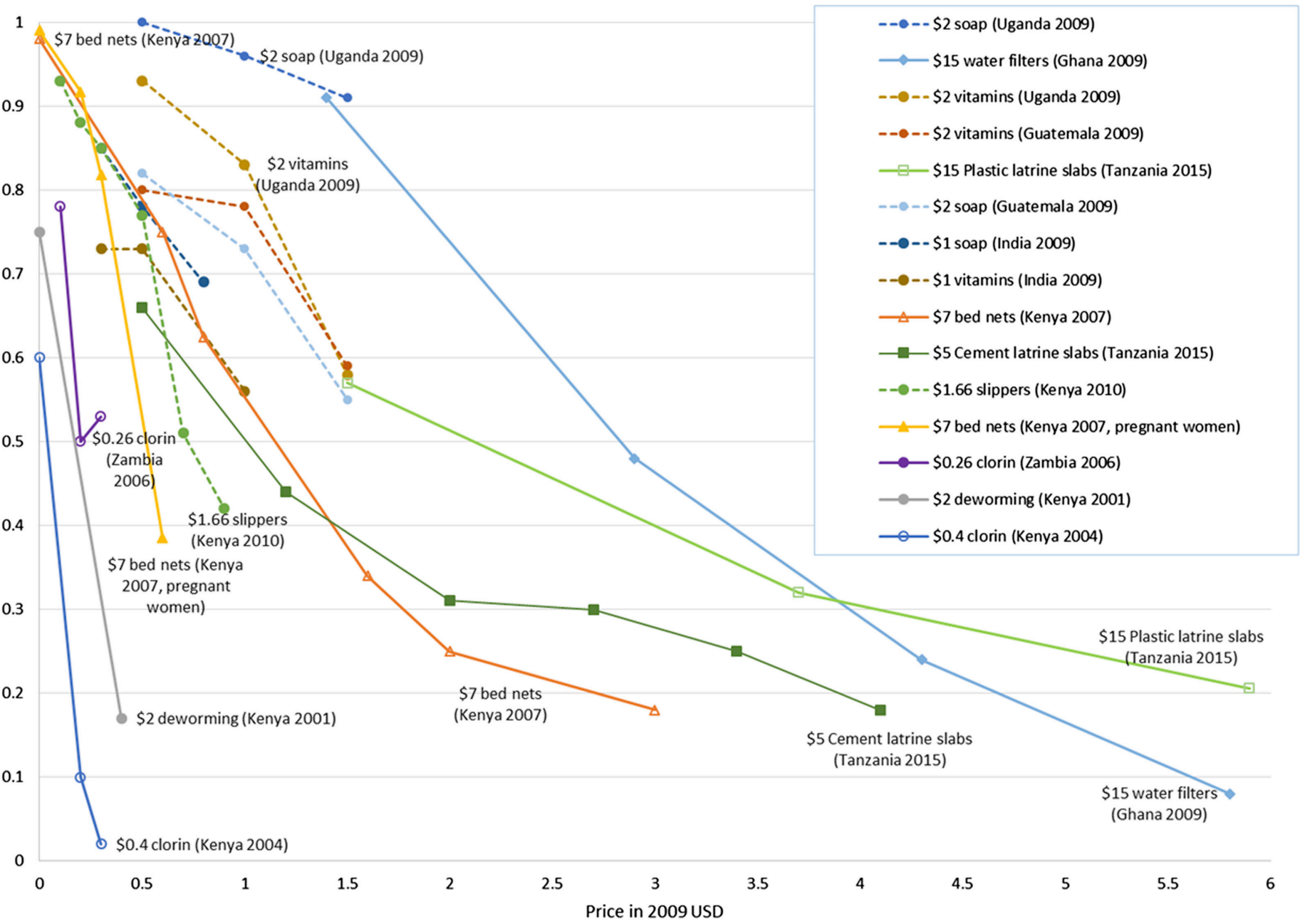
Estimating Demand Curves Empirically

- Demand curve is revealed in real data when there is a supply shift with no change in demand curve
- [Working \(1925\)](#) is early example using potatoes in Minneapolis area: annual production varies with weather (supply shift) while demand curve is expected to be stable
- Is this compelling estimation? Yes, for 1925 but:
 - Weather can affect other crops and their prices and that can affect demand for potatoes as well
 - Ideal would be to have **exogenous** change in price of potatoes only and look at demand response

Randomized experiments to Estimate Demand

- Randomized experiments: sample is randomized into treatment vs. control (like medical science experiment)
- Widely used today in development economics ([Banerjee, Duflo, Kremer 2019 nobel prize](#))
- Studies offer important preventive health products at randomized prices to estimate demand [ultimate goal of studies is to study health impacts]

Figure 2. Purchase rate of preventive health products, by TIOLI price, [Dupas and Miguel \(2017\)](#)



Randomized experiments to Estimate Demand

- Randomized experiments: sample is randomized into treatment vs. control (like medical experiment)
- Widely used today in development economics ([Banerjee, Duflo, Kremer 2019 nobel prize](#))
- Studies offer important preventive health products at randomized prices to estimate demand
 - Higher prices sharply reduce demand
 - Demand small at market prices for many such goods in spite of substantial future health (and hence economic) benefits
 - Makes sense for government to provide such goods (instead of market allocation) if consumers don't value/buy products
 - Libertarian vs. socialism debate

Meta Quiz:

Question: What do you think of in-class quizzes?

- A. I like them, they help keep me focused
- B. I like them, it's a way to communicate with the class
- C. I dislike them, they stress me out
- D. I dislike them, I find them boring

References

- CORE-The Economy 2.0, micro, [Unit 8](#).
- Principles of Economics, Chapter 3.
- [Working, Holbrook. 1925 "The Statistical Determination of Demand Curves," Quarterly Journal of Economics.](#)
- [Dupas, Pascaline, and Edward Miguel. "Impacts and determinants of health levels in low-income countries." In *Handbook of economic field experiments*, vol. 2, pp. 3-93. North-Holland, 2017.](#)