# Principles of Economics (Spring 2024)
## Lecture 4
## Demand and Supply

### Part I

**Market** – An arrangement through which buyers and sellers meet or communicate and engage in transactions at mutually agreeable prices.

### Part II

#### Demand

- **Quantity Demanded ($Q^D$)** – The amount that buyers are willing and able to purchase at a certain price, given all other influences on their decision to buy.

key word

(Depended Variable) Quantity Demanded; Price (Independent Variable)

Demand function : $Q^D = aP + b$

- **Demand (D)** – A relationship between the price of an item and the quantity demanded.

- **The Law of Demand** – Holding everything else constant (ceteris paribus condition*), when the price of a product falls, the quantity demanded of the product will increase; when the price of a product rises, the quantity demanded of the product will decrease.

$P\uparrow \Rightarrow Q^D\downarrow$ $P\downarrow \Rightarrow Q^D\uparrow$

* Ceteris Paribus Condition – The requirement that when analyzing the relationship between two variables, such as price and quantity demanded, other variables must be held constant.

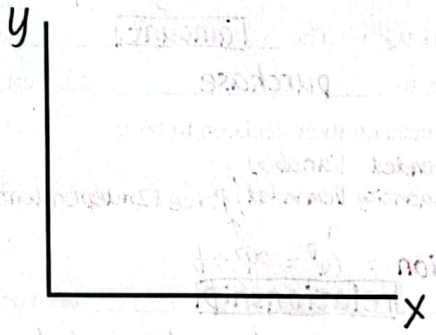
*Math Review*

## Function

❖ In mathematics $y = f(x) = ax + b$

Dependent variable — Independent variable

To graph it, we put the independent variable on the horizontal axis and the dependent variable on the vertical axis:

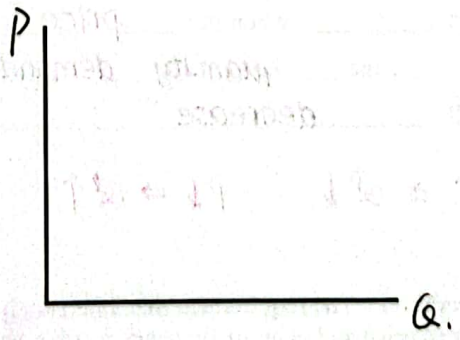



❖ In economics

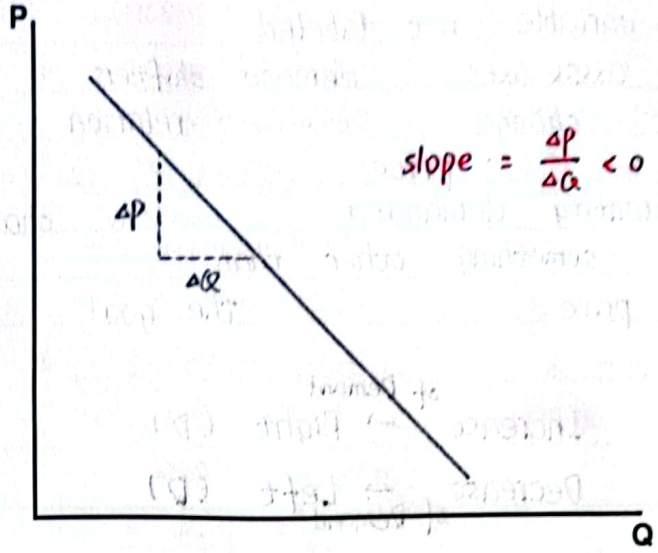
$Q = f(P) = aP + b$

Dependent variable — Independent variable

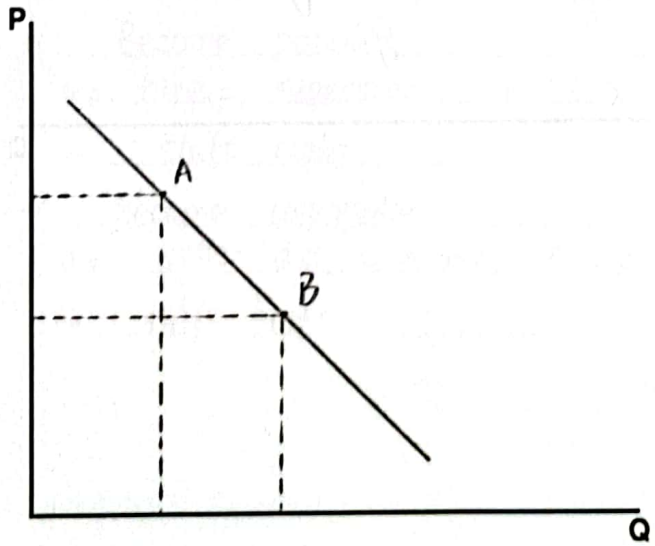
To graph it, the crucial difference between economics and mathematics is that we put the independent variable on the vertical axis and the dependent variable on the horizontal axis:



- The law of demand reveals that the demand curve is downward slopping.



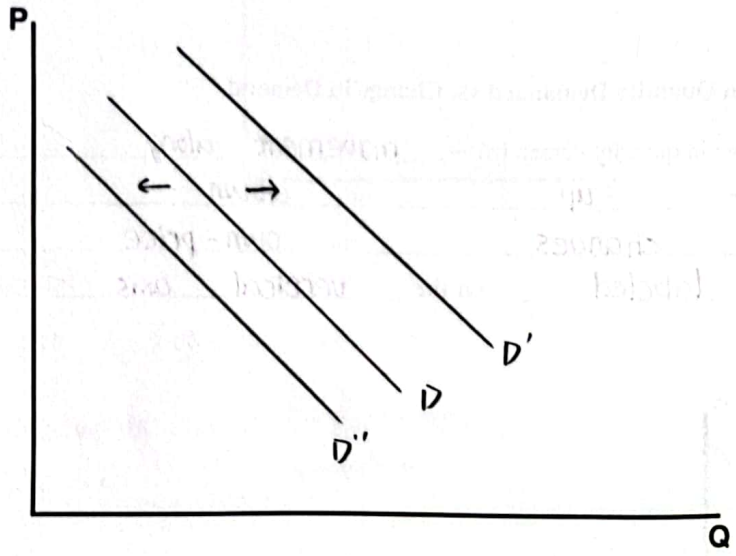

- **Change in Quantity Demanded vs. Change in Demand**
  - Change in quantity demanded → movement along the line: Either up or down caused by changes in own-price (labeled on the vertical axis).



- Change in demand → shift the entire line: Either left or right caused by changes in variable not labeled on the axes axes (demand shifters), i.e., a change in the relation between the price of a good and the quantity demanded caused by changes in something other than the price of the good.

➢ Rule of Thumb

- ❖ Increase of Demand → Right (D')
- ❖ Decrease of Demand → Left (D'')



- **Demand Shifters**

① Income

- ❖ Normal good
  (e.g., ~~iPone~~ iPhone, ballet ticket):
  higher income
  ⇒ Buy more
  ⇒ shifts right
- ❖ Inferior good
  (e.g., bus riding, canned food (food of low quality)):
  higher income
  ⇒ Buy less
  ⇒ shift the demand curve left

② Population / Number of buyers

- ❖ Increase in Number of buyers
  ⇒ shift right
- ❖ decrease in Number of buyers
  ⇒ shift left

③ Tastes / Preferences

- ❖ Become popular
  (e.g., hire a superstar for commercial (advertisement)):
  ⇒ shift right
- ❖ Become unpopular
  (e.g., seller did something really bad):
  ⇒ shift left

④ expectations : future events / prices

- ❖ Expect higher future ~~pro~~ prices
  - ⇒ Buy more today
  - ⇒ shift right
- ❖ Expect lower future prices
  - ⇒ Buy less today
  - ⇒ shift left

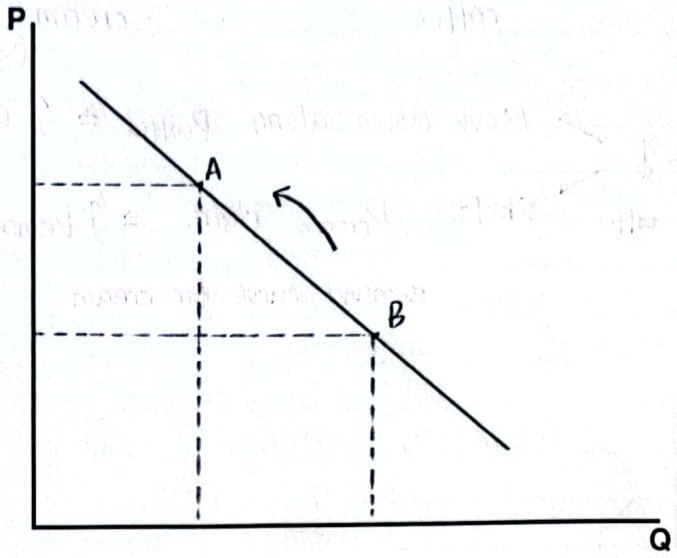
⑤ Price of related good

- ❖ substitudes : goods that are used for the same purpose

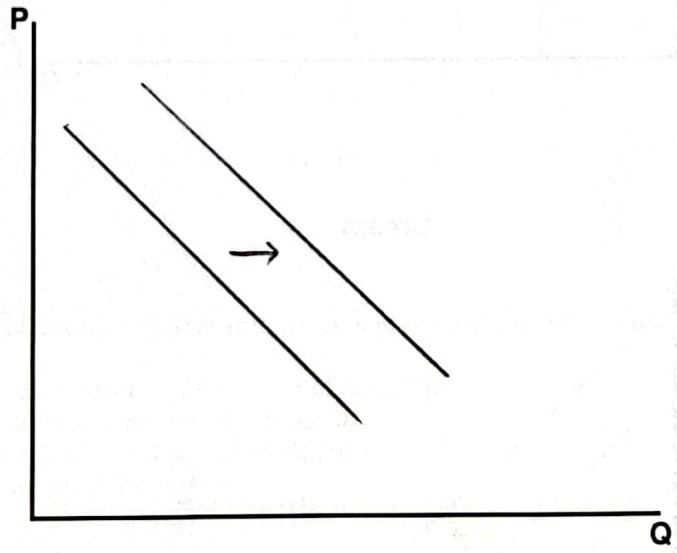
(e.g., coke and pepsi)

$P_{coke}$ ↑ price of coke
- → Move up along $D_{coke}$ ⇒ ↓ $Q^D$ of coke (quantity demanded)
- → Shift $D_{pepsi}$ right ⇒ ~~↑ $Q^D$ of~~ ↑ Demand for pepsi

**Coke**




**Pepsi**



❖ complements : goods used together

(e.g., coffee and cream)

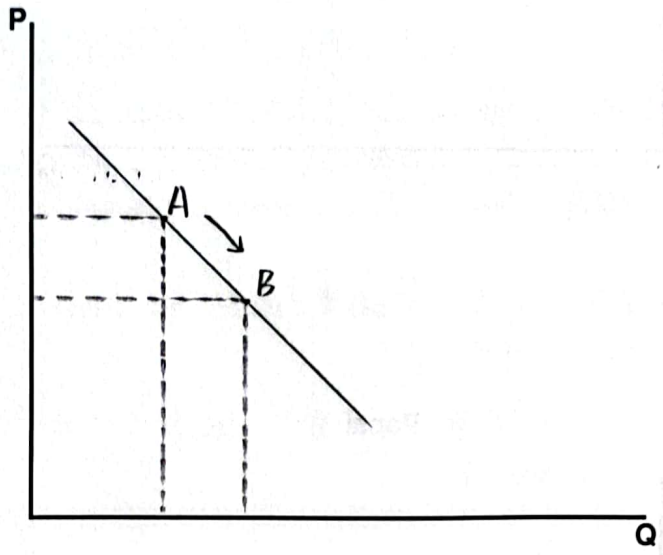
Quantity Demanded

$P_{coffee}\downarrow$ → Move down along $D_{coffee} \Rightarrow \uparrow Q^D$ of coffee

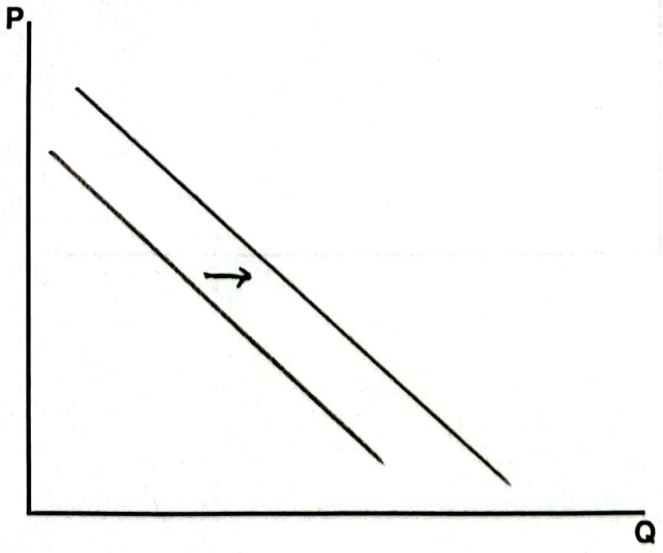
price of coffee ↓ → Shift $D_{cream}$ right $\Rightarrow \uparrow$ Demand for cream

demand curve for cream

**Coffee**




**Cream**



➢ In general, when the price of one good goes up, the quantity demanded of itself goes down and the ~~co~~ demand for its substitudes increases, while the demand for its complements lowers; when the price of one good falls, the quantity demanded of itself rises and the demand for its complements is higher, while the demand for its substitudes drops.

*Exercise 1*

B Which of the following will NOT shift the current demand curve for a good?

A. A change in the expected future price of this good.
B. A change in the current price of this good.
C. A change in the price of the substitute good.
D. A change in consumer income.

*Exercise 2*

C Which of the following would increase the demand of Dell laptops?

A. HP laptop price decreases.
B. Dell issue coupons for laptops.
C. Dell reduces the prices for laptop mice and printers.
D. None of the above.

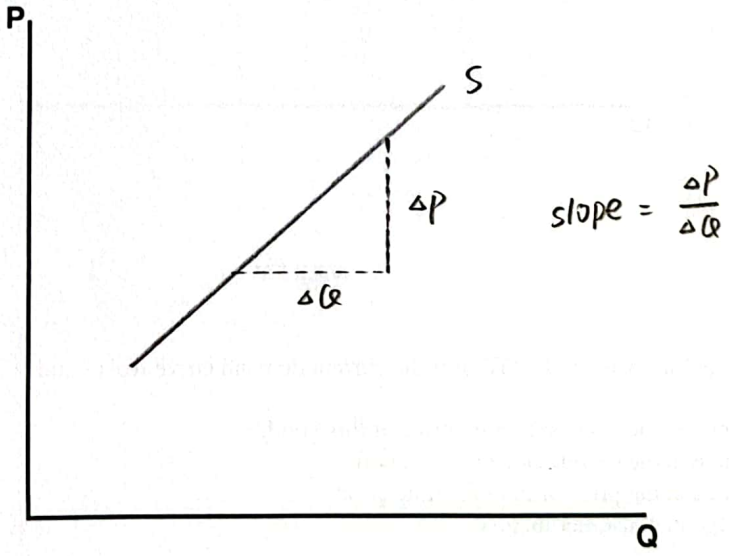
**Part III**

**Supply**

- **Quantity Supplied ($Q^S$)** – The amount of a good or service that a firm is willing and able to sell at a given price, ceteris paribus.
- **Supply (S)** – A relationship between the price of an item and the quantity supplied.
- **Law of Supply** – Holding everything else constant (ceteris paribus condition), an increase in the price of an item will increase its quantity supplied; and a decrease in the price of an item will decrease its quantity supplied.

Price ↑ ⇒ $Q^S$ ↑ , Price ↓ ⇒ $Q^S$ ↓

- The law of supply reveals that the supply curve is upward-sloping.




slope = $\frac{\Delta P}{\Delta Q}$

- **Change in Quantity Supplied vs. Change in Supply**
  - Change in quantity supplied → Movement along the line:
    Either up or down caused by changes in own-price (labeled on the vertical axis).
  - Change in supply → Shift the entire line:
    Either left or right caused by changes in variables not labeled on the axes (supply shifters).

➢ Rule of Thumb

- ❖ Increase of ~~Dem~~ Supply → shift right
- ❖ Decrease of Supply → shift left

▪ **Supply Shifters**

① Technology

- ❖ Better Technology
  - ⇒ ↓ cost of production
  - ⇒ shift S (supply curve) right

② Input prices

- ❖ Higher Input prices
  - ⇒ Higher cost of production
  - ⇒ shift S left
- ❖ ↓ Input prices
  - ⇒ ↓ cost of production
  - ⇒ shift S right

③ Number of sellers for the product

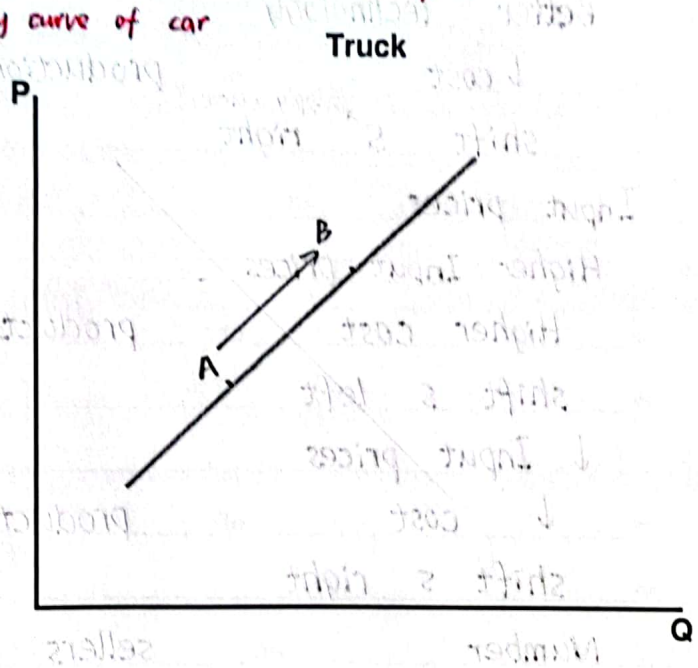
- ❖ Higher number of sellers
  - ⇒ shift S right
- ❖ ↓ number of sellers
  - ⇒ shift S left

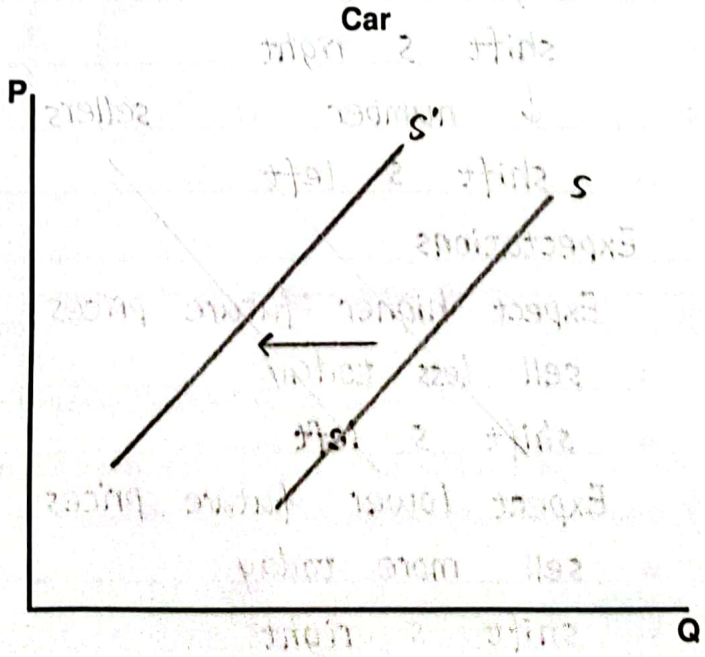
④ Expectations

- ❖ Expect higher future prices
  - ⇒ sell less today
  - ⇒ shift S **left**
- ❖ Expect lower future prices
  - ⇒ sell more today
  - ⇒ shift S right

⑤ substitutes in production
(e.g., cars and trucks)

↑ $P_{Truck}$
- Move up along $S_{Truck}$ ⇒ ↑ Quantity supplied of truck
  (supply curve of truck)
- Shift $S_{car}$ left ⇒ ↓ supply of car
  (supply curve of car)



*Exercise 3*

A When an industry's raw material costs increase, other things remaining the same,

A. the supply curve shifts to the left. ✓
B. the supply curve shifts to the right. \
C. output increases regardless of the market price and the supply curve shifts upward. \
D. output decreases and the market price also decreases.

*Exercise 4*

B Which of the following events will cause a leftward shift in the supply curve of gasoline?

A. A decrease in the price of gasoline. \
B. An increase in the wage rate of refinery workers. \
C. A decrease in the price of crude oil. ✓
D. An improvement in oil refining technology. \
E. All of the above.