

# Demand and Supply, Market Equilibrium

PA 393K/G

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Fall 2020

# This Week's Class

1. Setup
2. Demand
3. Supply
4. Market Equilibrium

# Fun Stuff We'll Cover

1. Shifters of Demand
2. Shifters of Supply
3. Shifts vs. Slides
4. Solving for Market Equilibrium

# Outline for Lecture

- What is a competitive market & how is it defined by supply & demand?
- What are supply & demand curves? How are these curves derived from a schedule?
- How do changes in underlying conditions result in a change in equilibrium and how can that change be represented by Supply & Demand?
- How can we reconcile changes in outcomes with the underlying forces that determine them?:  
Causality

# Relation to Course Objectives

**Objective 1:** Describe the effect of economic forces on market outcomes using market diagrams and linear systems of equations. These outcomes include prices, quantities, government revenues/expenditures, efficiency and equity.

# Setup

# Markets

market: place where buyers and sellers come together to exchange goods and services.

## Examples:

1. Farmer's Market
2. eBAY
3. Federal/State Health Insurance Marketplaces

# Competitive Markets

competitive market: a kind of market where actions of individual buyers and sellers have no noticeable impact on the price at which goods are bought and sold

**When might this be the case and when might it not?**

# Setting up the market diagram

This class we will orient ourselves to the market diagram. It's easiest to think of this diagram to start in terms of its constituent parts:

1. Demand curve
2. Supply curve
3. Demand & supply shifters
4. Market equilibrium, price, & quantity
5. Changes that occur when demand and/or supply curves shift



# Demand curve

- The demand curve tells us **how much the quantity that consumers demand will change as the price of the same good varies**
- Textbook example: gasoline prices
- The first video will show us how to draw a demand curve for water



# The LAW OF DEMAND

- The last video showed us the general relationship that as prices rise, we typically see the demand for goods fall
  - This is called the "LAW OF DEMAND" because it is a pretty much universal part of marketplaces
  - We will explore the issue of **how much** demand changes when its price rises. In some cases a lot, others a little.

# Ceteris Paribus

The graph of demand we drew in the video is "fake data"

If we tried to do this with real data, we'd run into a problem:

- things other than prices are changing at the same time (costs of providing water, income, temperature, etc.)
- A key aspect to understand the relationship between variables is whether we are able to measure the relationship (here between price and quantity demanded) keeping all else the same
  - In latin **ceteris paribus**
  - This turns out to be super important for drawing policy-relevant conclusions and relates to a recurrent theme this semester:
  - **How do we draw causal inferences from observational data?**

# Shifts in Demand

The *ceteris paribus* assumption allows us to then ask about how things change when some of those relevant underlying characteristics do change, such as

- incomes go up
- people move to town
- preferences for water use change

As it turns out, each of these factors may change the demand for a good even if the price is high or if it is low.

How will this look in our market diagram?: [shift of demand curve](#)

When we say "[demand goes up](#)" or "[demand went down](#)": shift (up or down) of the demand curve

We'll explore this in the next video...

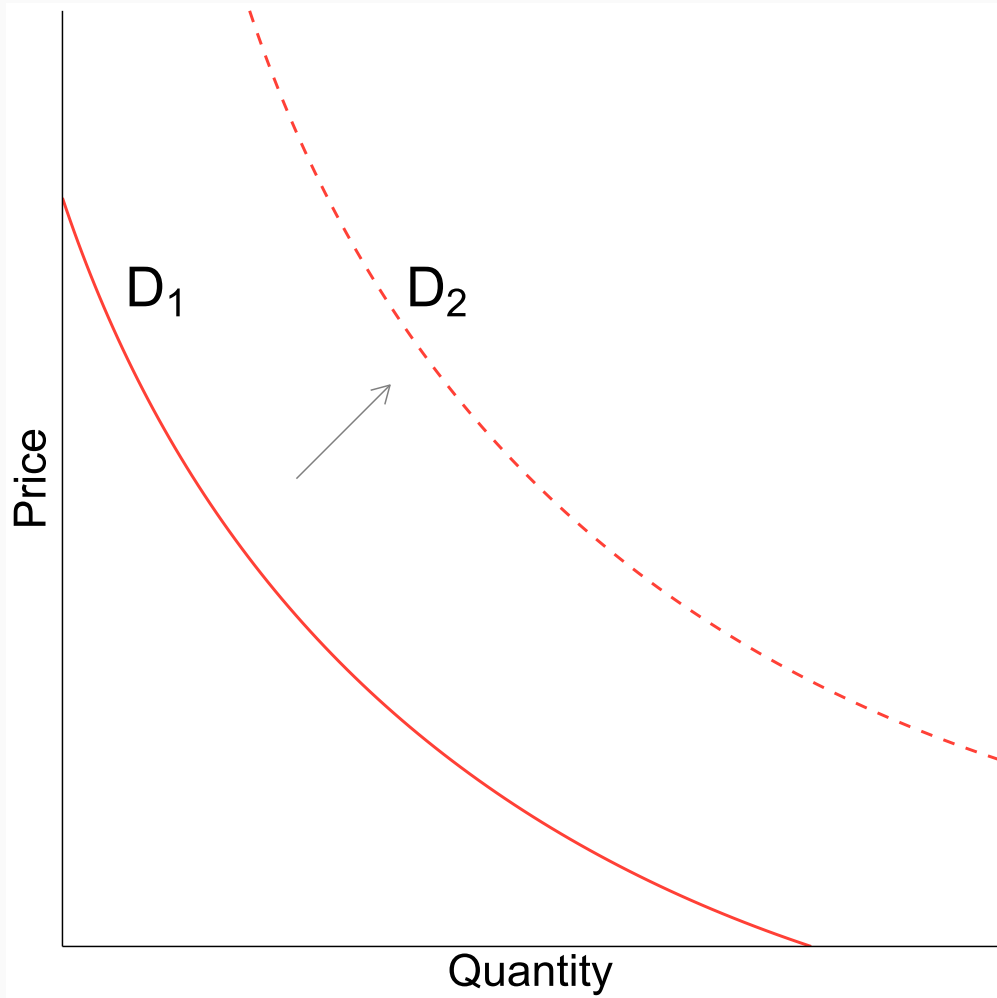


# Shifts vs. Slides

Key message here once we understand shifts in demand:

- shifts are a change in the quantity demanded **for all price levels**
- distinct from: a change in the particular quantity demanded: movement along the curve or a "slide"
- When we say demand for KitKats went up: **shift up in demand curve**
- When we say lower prices for KitKats lowered demand: **movement along the demand curve**
- **Bottom Line: Price changes DO NOT result in shifts**

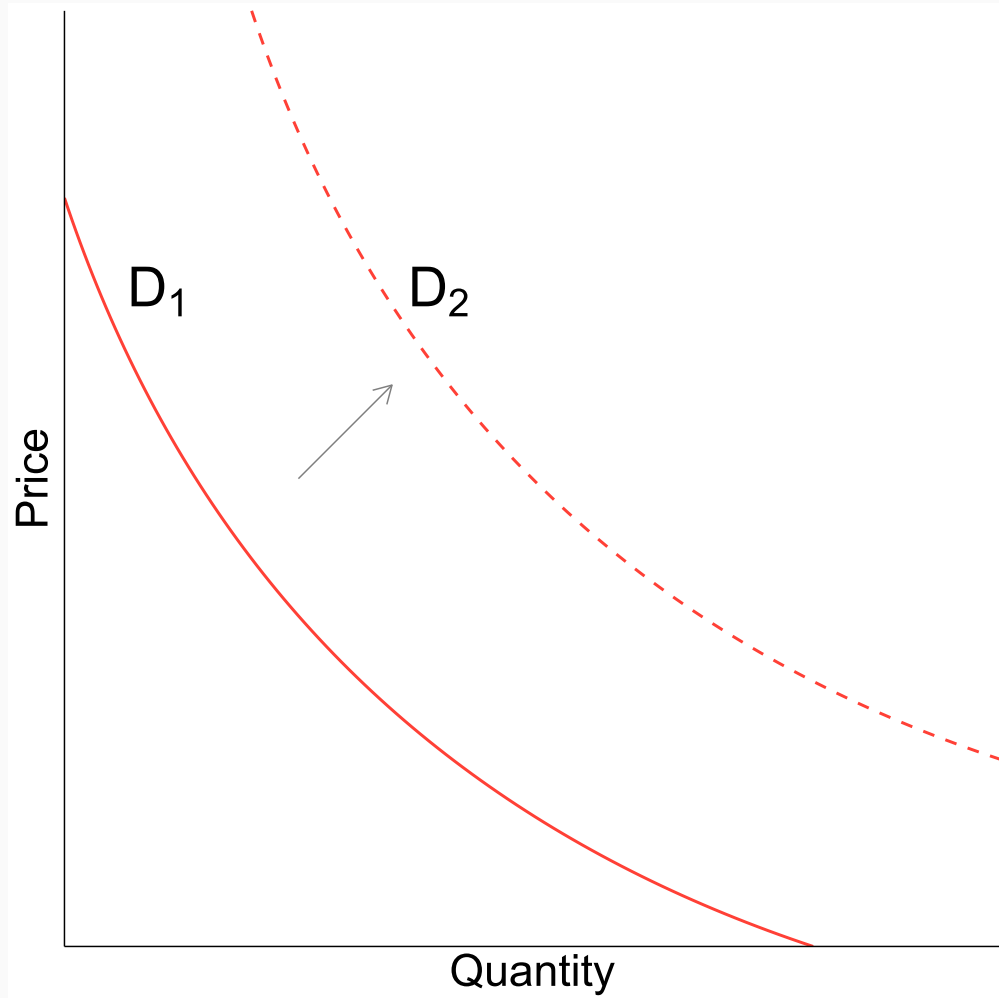
# What causes a demand shift?



- $\Delta$  Price of related good (e.g., demand for cars when price of gasoline  $\uparrow$ )

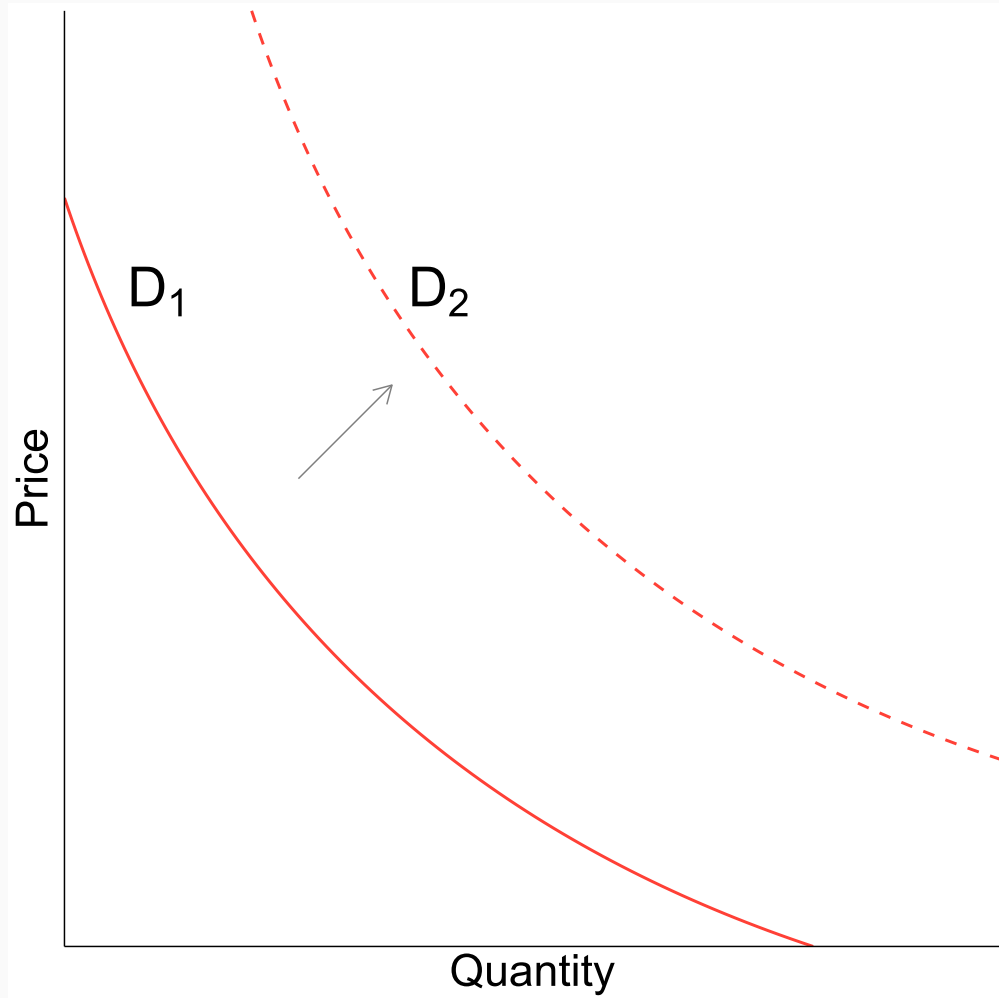


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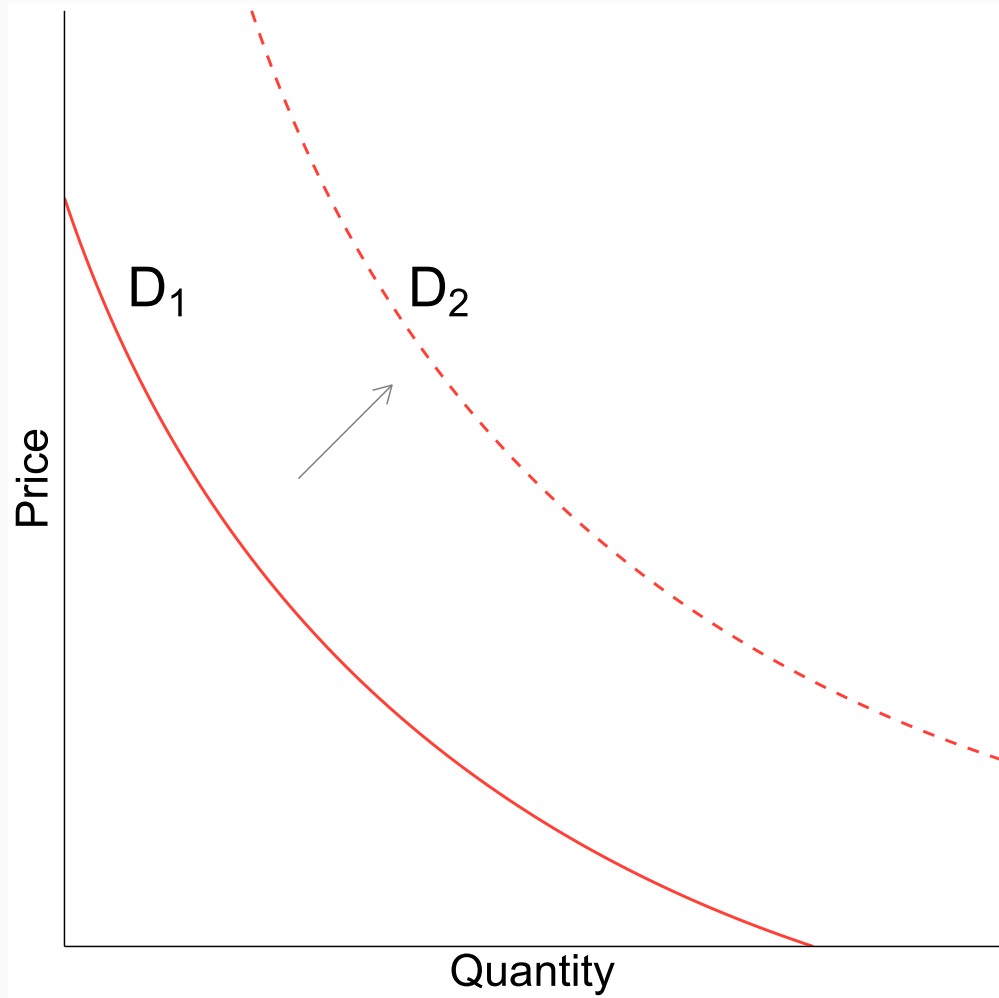
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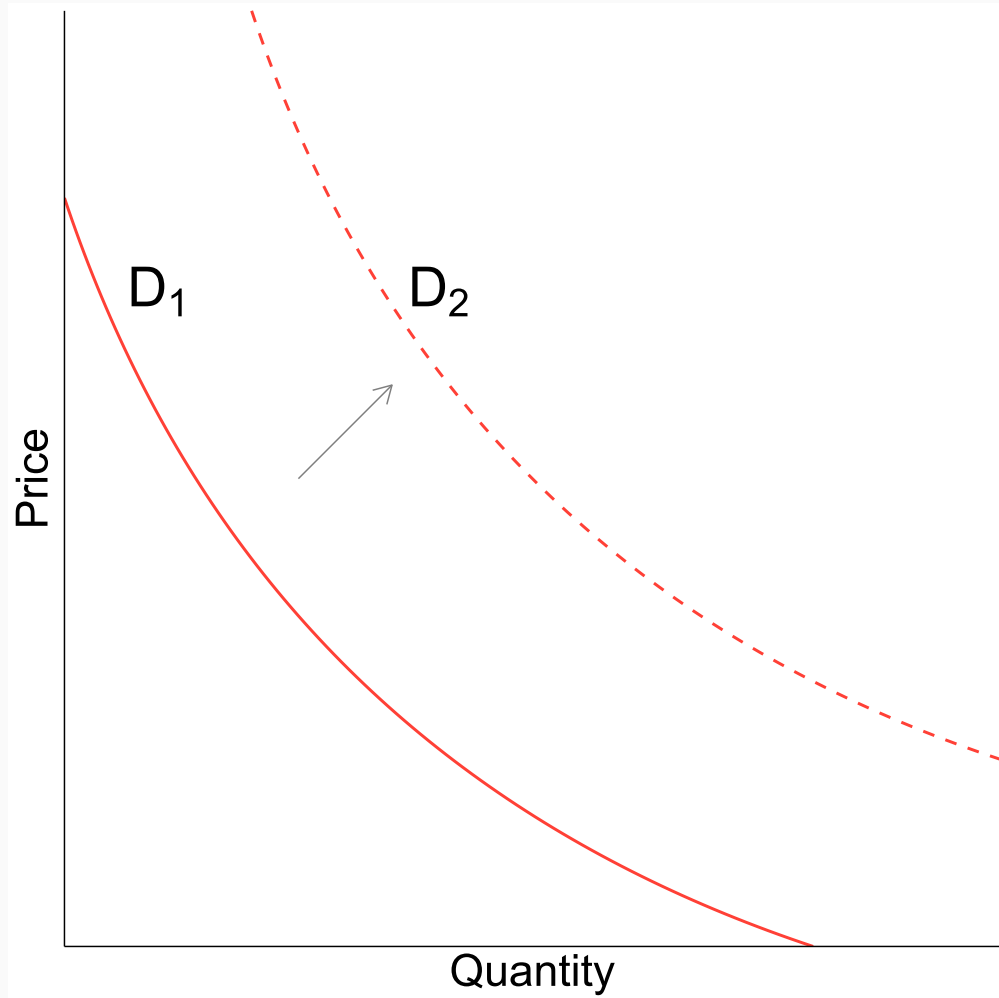
- $\Delta$  Price of related good
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  - $\Delta$  in preferences

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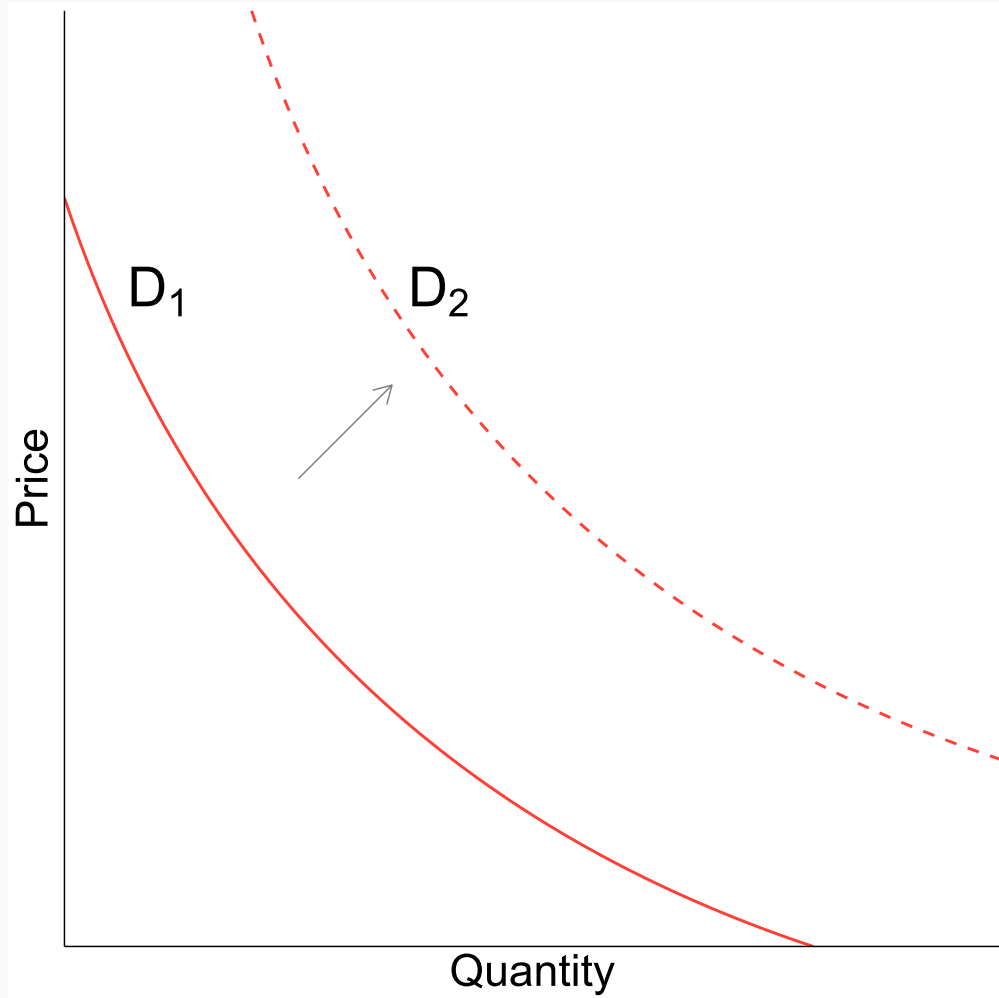
- $\Delta$  Price of related good
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  - $\Delta$  in expectations

# What causes a demand shift?



- $\Delta$  Price of related good
  - $\Delta$  Income
  - $\Delta$  in preferences
  - $\Delta$  in expectations
  - $\Delta$  in the number of consumers

# What causes a demand shift?



- $\Delta$  Price of related good
  - $\Delta$  Income
  - $\Delta$  in preferences
  - $\Delta$  in expectations
  - $\Delta$  in the number of consumers

Let's go through these one-by-one...

# Price of related good or service

Generally, **two options**. When price of a related good or service (e.g., gasoline) goes up (or down):

1. Quantity demanded of good in question (e.g., cars) **goes up**

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1. Quantity demanded of good in question (e.g., bus trips) **goes up**  $\Rightarrow$  **Substitute**
2. Quantity demanded of good in question (e.g., cars) **goes down**  $\Rightarrow$  **Complement**





# Changes in Income

- for many goods: income goes up  $\Rightarrow$  consumption of good goes up: **normal good**
- for some goods: income goes up  $\Rightarrow$  consumption of good goes down: **inferior good**

# Changes in Preferences

- How desirable goods are changes with preferences:
  - clothes
  - food
  - air conditioning
  - etc.

# Changes in expectations

- Often demand for a good will change **in expectation** of something in the future



# Change in num. of consumers

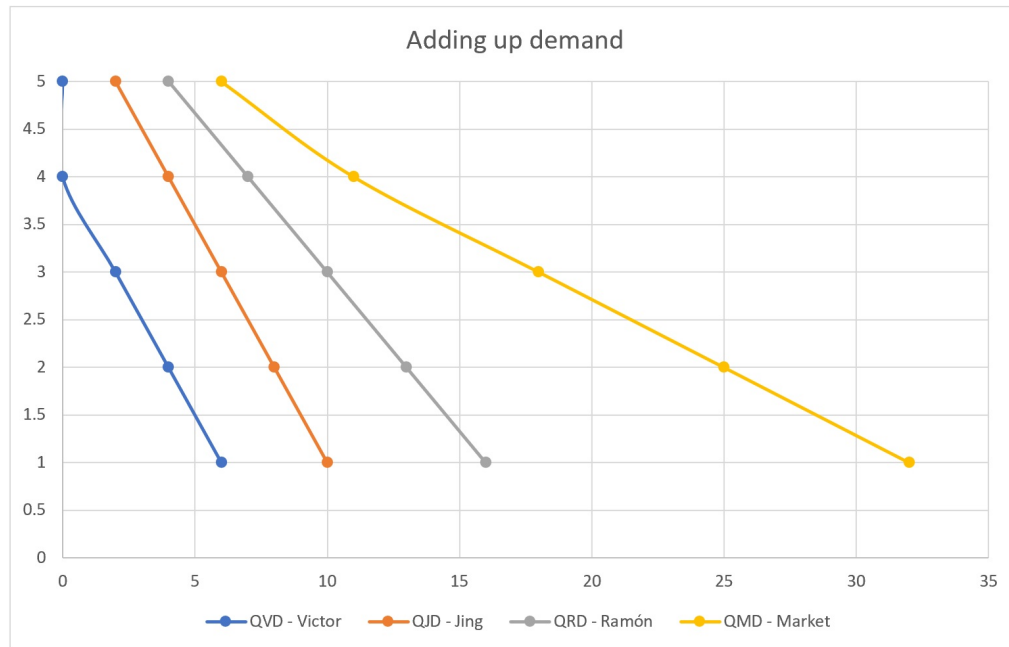
More participants in a market  $\Rightarrow$  more is demanded

The next video will show you an example of how to add up demand curves...



# Adding up demand curves

Price	$Q_V^D$ - Victor	$Q_J^D$ - Jing	$Q_R^D$ - Ramón	$Q_M^D$ - Market
1	6	10	16	32
2	4	8	13	25
3	2	6	10	18
4	0	4	7	11
5	0	2	4	6



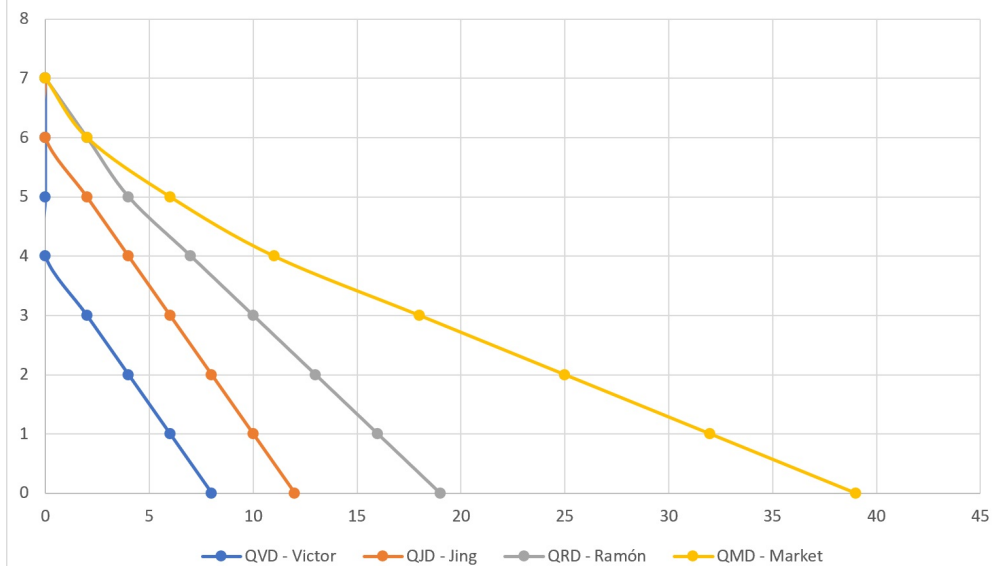
- I didn't like the way that drawing looked in the video, so I made a visualization so you can see it better:
  - Notice what happens with the slope of the market demand curve as well as Victor's demand at a price above 4
  - It's actually helpful to extend the graph a bit to consider what happens when the price goes to 0 or above 5...

# Extending the lines...

Price  $Q_V^D$  - Victor  $Q_J^D$  - Jing  $Q_R^D$  - Ramón  $Q_M^D$  - Market

0	8	12	19	39
1	6	10	16	32
2	4	8	13	25
3	2	6	10	18
4	0	4	7	11
5	0	2	4	6
6	0	0	2	2
7	0	0	0	0

Adding up demand - Extending the curves



Here you can see really clearly what is going on with the slope of the market curve:

- As the price rises, consumers drop out of the market (Victor at \$4, Jing at 6 and Ramón at 7)
- This makes the slope of the market curve steeper
- When it's only Ramón left (Price > \$6), his demand curve is the only one left...



# Supply!

Let's return to water...

Surely those supplying water (bottled water suppliers?) respond to prices as well, but how?

At the end of the day, they have to cover costs

Perhaps there will be profit after selling a bottle of water at the market price, but it depends on the cost to produce it

- more on this during weeks 6-7 of the course!

We will also explore "hidden costs" later this semester, which economists call **opportunity costs**

- main idea here: the value of something may be what you give up to get it



# Adding up supply curves

it turns out this is very much like adding up demand curves, just with upward-sloping curves.

we'll explore this more in the problem set!

# Shifts in supply

- $\Delta$  input prices (capital, labor)
- $\Delta$  prices of related goods or services
- $\Delta$  in technology
- $\Delta$  expectations
- $\Delta$  number of producers

# Market Equilibrium

We are now going to put together supply & demand and ask how that yields

- Equilibrium Quantity where:  $Q^D = Q^S$
- A single equilibrium Price:  $P^*$

Then we are going to ask what happens to equilibria when we experience shifts in supply and/or demand



# Solving for market equilibria

Finally, to build on our math skills from last week, we are going to spend time in lecture this week learning how to solve for market equilibria from a system of linear supply and demand equations

Until then, take care!

