Lecture 3: Supply

September 10, 2024

Overview

1. Administrative Notes
2. Ripped from headlines
3. Chapter 3: Supply
   - 3.1 Individual supply
   - 3.2 Decisions and supply
   - 3.3 Market supply
   - 3.4 What shifts supply?
   - 3.5 Shifts vs movements along supply curves

Course Administration

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   - You are responsible for being on the schedule
   - Will send last week's feedback by tomorrow
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9. Any other questions or outstanding issues?

Sunk Cost Fallacy Examples from PS 1

Reminder: What is the sunk cost fallacy?

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Clear and popular examples

- We need to keep investing in CA's high speed rail because we have already spent so much on it
- It was wrong to cancel congestion pricing in NYC, because the MTA had already spent so much on setting up the monitoring system

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- Further investment in Purple Line in Maryland, despite huge cost overruns
- "continued reliance on fossil fuels by the Biden Administration in order to keep swing voters happy at the gas pumps."

How What You're Learning is Policy-Relevant

Ripped from Headlines presentation(s)

As a reminder, next week
Send the article by Wednesday midnight for approval

Afternoon, joint presentation

Finder	Presenter
Riddhi P.	Matt W.
Emma D.	Laiba

Evening, individual presentations

Finder	Presenter
Sydney M.	Elizabeth A.
Baylee W.	Joseph F.

Today's Ripped from the Headlines

Afternoon

Finder	Presenter
Katya	Max

Evening

Finder	Presenter
Max S.	Katya F.
Rimsha A.	Yemi Fadahunsi
	Amanda K.

Today

1. Individual supply
2. Decisions and supply
3. Market supply
4. What shifts supply?
5. Shifts vs movements along supply curves

Ch. 3: 1. Individual Supply

Where We're Going

- Want to understand the role of policy tools to impact
  - individual behavior
  - prices
  - firm behavior
- To do this, we need a theory to predict how consumers and firms will respond
- $\rightarrow$ Describe actions in terms of demand and supply
- Assumptions and framework give us ability to make predictions

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- $\rightarrow$ Describe actions in terms of demand and supply
- Assumptions and framework give us ability to make predictions
- Last lecture was demand
- Today is supply
- Lecture 4 is how they interact

Understanding the Different Drivers Between Supply and Demand

Demand

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- price
- income
- prices of other goods
- your preferences or tastes
- network or congestion effects
- number of consumers in the market
- expectations

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Supply

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Supply

- price
- costs
- costs
- costs

You as a Supplier of Market Labor

What determines how many hours you are willing to supply?

You as a Supplier of Market Labor

What determines how many hours you are willing to supply?

- wage you are offered
- opportunity costs of your time: friends, family, netflix, etc
- future benefit from position
- .... and others I am sure you'll tell me

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\$2	2.5
\$1.50	don't sell
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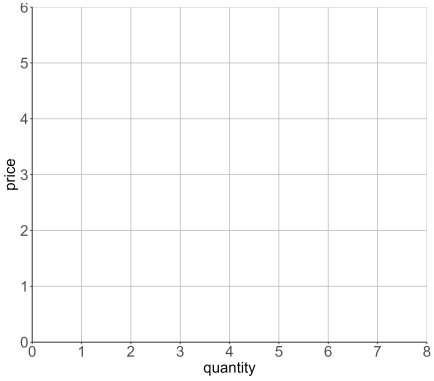
Graphing Individual Supply

- Put P on the y axis
- Put Q on the x axis
- No reason, just a rule



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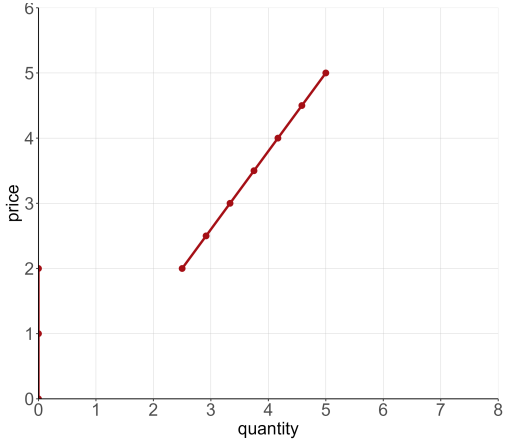
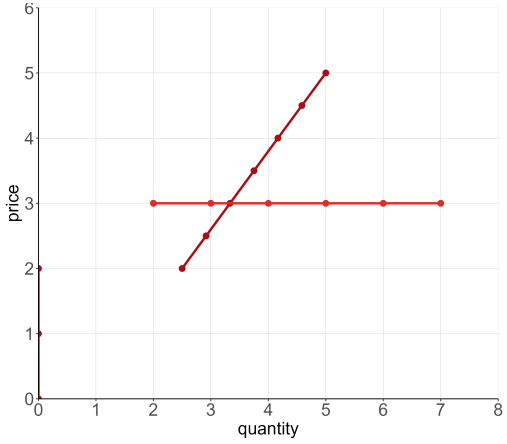


Shape of Supply Curves

1. Supply curves report on firm choice as price changes, all else held constant
2. Supply curves may be flat or slope upward
3. They **never** slope downward
   - why?



Ch. 3: 2. Individual Firm Decisions and the Supply Curve

What Price Does a Firm Charge?

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$\rightarrow$ Competitive firm charges the market price

How Much Does the Firm Choose to Supply?

- Just like consumers, firms want to supply until

  marginal benefit of supplying = marginal cost of supplying

- What is a firm's marginal cost?
  - additional cost to produce one additional unit
  - Example, please!

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- What is the firm's marginal benefit of supplying?
  - revenue it gets from selling one additional unit

All Kinds of Costs

$$\text{Total Costs} = \text{Fixed Costs} + \text{Variable Costs}$$

Fixed costs

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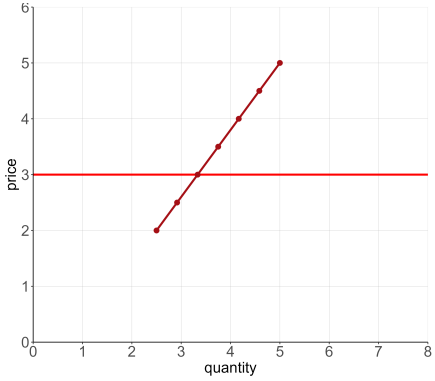
How Much Should Firms Sell to Maximize Profits?



Marginal benefits and costs in a figure

- for which Q are MB $>$ MC?

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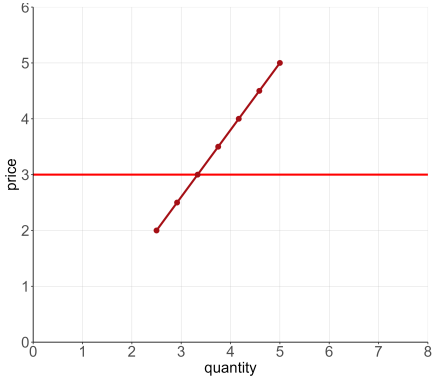

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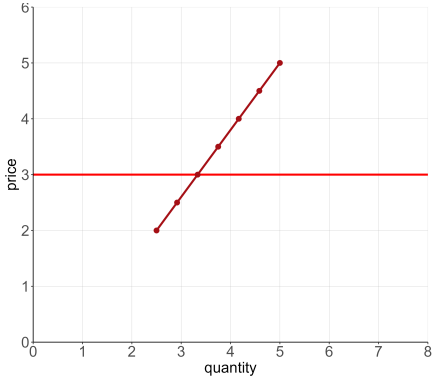

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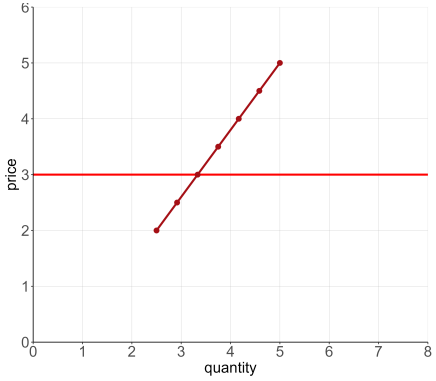

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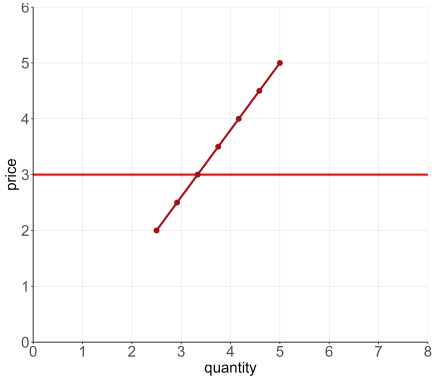

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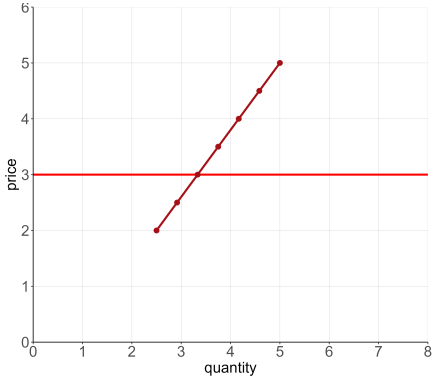

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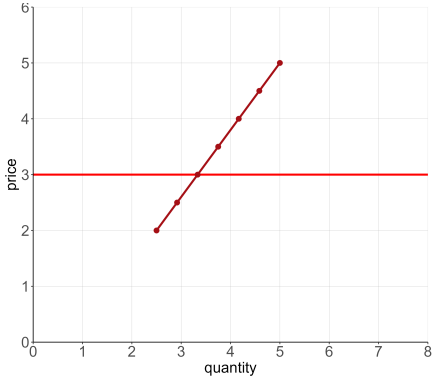

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Firm maximizes profits where MB $=$ MC

Explaining Firm's Maximization in a Different Way

- What is the marginal benefit to the firm of producing one extra unit?

Explaining Firm's Maximization in a Different Way

- What is the marginal benefit to the firm of producing one extra unit?
  - what it gets for selling that unit: the price of that last unit
  - $\rightarrow$ firm's marginal benefit $=$ price

Explaining Firm's Maximization in a Different Way

- What is the marginal benefit to the firm of producing one extra unit?
  - what it gets for selling that unit: the price of that last unit
  - $\rightarrow$ firm's marginal benefit = price
- $\rightarrow$ Perfectly competitive firm sells until marginal cost = marginal benefit (= price)

Supply Curve Defined by Marginal Costs

- Supply curve is willingness to sell
- Moving up and down supply curve shows willingness to sell
- If supply is upward sloping, firms' willingness to sell more units requires more per unit compensation
- If market is competitive, this is because as firms produce more, marginal cost increases

What Makes Marginal Costs Increase as Output Increases?

1. Diminishing marginal product $\rightarrow$ rising marginal costs
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     - short run: inputs are fixed
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2. Rising input costs $\rightarrow$ rising marginal costs
   - intuition is that supply of good inputs is limited
   - you may need to increase price you pay for these inputs if you purchase more

Policy Aside: Costs Drive Behavior

Firms' behavior driven by costs

- supply curve defined by costs

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What tools does government have to modify firm costs?

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What tools does government have to modify firm costs?

- subsidies
- taxes
- infrastructure
- regulation

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How may government indirectly modify firm costs?

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- infrastructure
- regulation

How may government indirectly modify firm costs?

- subsidy in one market spills over
- US anti-Russian oil embargo changes input costs for Indian manufacturers
- Google antitrust lawsuit helps Google competitors

Ch. 3: 3. Market Supply

Market Supply

P: Price of apples/lb	Firm 1 Q_1	Firm 2 Q_2	Firm 3 Q_3	Total Q_T
\$5	5	4.0	5.5	
\$4.50	4.58	3.9	5.2	
\$4	4.17	3.7	4.9	
\$3.50	3.75	3.4	4.5	
\$3	3.33	3.3	4.2	
\$2.50	2.9	3	3.7	
\$2	2.5	2.7	3.3	
\$1.50	2.1	2.4	2.6	
\$1	1.7	2.1	1	

Market Supply

	Firm 1	Firm 2	Firm 3	Total
P: Price of apples/lb	Q_1	Q_2	Q_3	Q_T
\$5	5	4.0	5.5	

Market Supply

	Firm 1	Firm 2	Firm 3	Total
P: Price of apples/lb	Q_1	Q_2	Q_3	Q_T
\$5	5	4.0	5.5	14.5

Market Supply

	Firm 1	Firm 2	Firm 3	Total
P: Price of apples/lb	Q_1	Q_2	Q_3	Q_T
\$5	5	4.0	5.5	14.5
\$4.50	4.58	3.9	5.2	

Market Supply

	Firm 1	Firm 2	Firm 3	Total
P: Price of apples/lb	Q_1	Q_2	Q_3	Q_T
\$5	5	4.0	5.5	14.5
\$4.50	4.58	3.9	5.2	13.6

Market Supply

P: Price of apples/lb	Firm 1 Q_1	Firm 2 Q_2	Firm 3 Q_3	Total Q_T
\$5	5	4.0	5.5	14.5
\$4.50	4.58	3.9	5.2	13.6
\$4	4.17	3.7	4.9	12.7

Market Supply

P: Price of apples/lb	Firm 1 Q_1	Firm 2 Q_2	Firm 3 Q_3	Total Q_T
\$5	5	4.0	5.5	14.5
\$4.50	4.58	3.9	5.2	13.6
\$4	4.17	3.7	4.9	12.7
\$3.50	3.75	3.4	4.5	11.7

Market Supply

P: Price of apples/lb	Firm 1 Q_1	Firm 2 Q_2	Firm 3 Q_3	Total Q_T
\$5	5	4.0	5.5	14.5
\$4.50	4.58	3.9	5.2	13.6
\$4	4.17	3.7	4.9	12.7
\$3.50	3.75	3.4	4.5	11.7
\$3	3.33	3.3	4.2	10.7

Market Supply

P: Price of apples/lb	Firm 1 Q_1	Firm 2 Q_2	Firm 3 Q_3	Total Q_T
\$5	5	4.0	5.5	14.5
\$4.50	4.58	3.9	5.2	13.6
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\$3	3.33	3.3	4.2	10.7
\$2.50	2.9	3	3.7	9.7
\$2	2.5	2.7	3.3	8.5
\$1.50	2.1	2.4	2.6	7.1
\$1	1.7	2.1	1	4.7

Market Supply

P: Price/lb	F 1 Q_1	F 2 Q_2	F 3 Q_3	Total Q_T
\$5	5	4.0	5.5	14.5
\$4.50	4.58	3.9	5.2	13.6
\$4	4.17	3.7	4.9	12.7
\$3.50	3.75	3.4	4.5	11.7
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\$1.50	2.1	2.4	2.6	7.1
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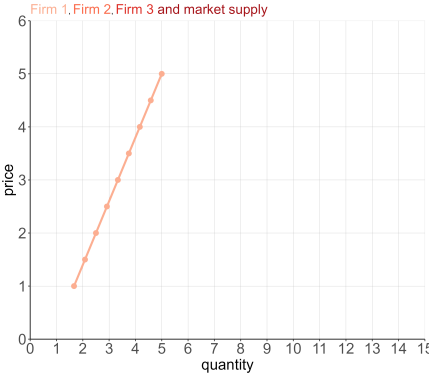
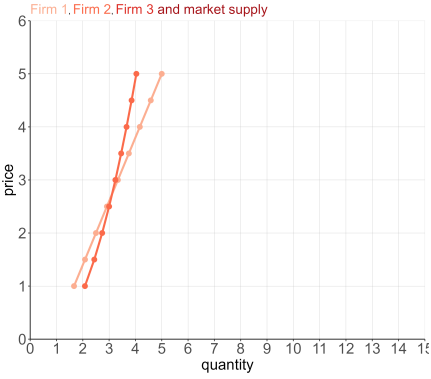


Where is Firm 2's supply?

Market Supply

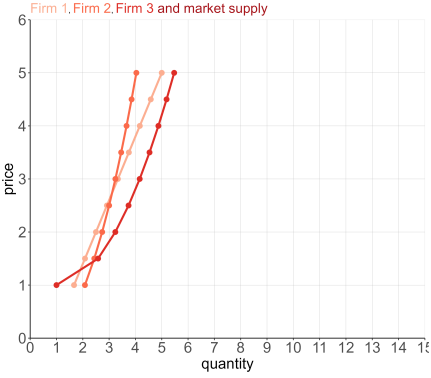
P: Price/lb	F 1 Q_1	F 2 Q_2	F 3 Q_3	Total Q_T
\$5	5.5	1.66	2.5	9.66
\$4.50	5.1	1.5	2.25	8.85
\$4	4.6	1.33	2	7.93
\$3.50	4.2	1.17	1.75	7.12
\$3	3.5	1	1.5	6
\$2.50	2.8	0.83	1.25	4.88
\$2	5	0.66	1	6.66
\$1.50	2.1	2.4	2.6	7.1
\$1	1.7	2.1	1	4.7



Where is Firm 3's supply?

Market Supply

P: Price/lb	F 1 Q_1	F 2 Q_2	F 3 Q_3	Total Q_T
\$5	5.5	1.66	2.5	9.66
\$4.50	5.1	1.5	2.25	8.85
\$4	4.6	1.33	2	7.93
\$3.50	4.2	1.17	1.75	7.12
\$3	3.5	1	1.5	6
\$2.50	2.8	0.83	1.25	4.88
\$2	5	0.66	1	6.66
\$1.50	2.1	2.4	2.6	7.1
\$1	1.7	2.1	1	4.7



Where will the market supply go?

Market Supply

P: Price/lb	F 1 Q_1	F 2 Q_2	F 3 Q_3	Total Q_T
\$5	5.5	1.66	2.5	9.66
\$4.50	5.1	1.5	2.25	8.85
\$4	4.6	1.33	2	7.93
\$3.50	4.2	1.17	1.75	7.12
\$3	3.5	1	1.5	6
\$2.50	2.8	0.83	1.25	4.88
\$2	5	0.66	1	6.66
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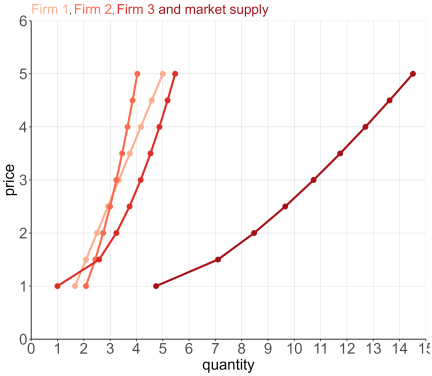
\$1	1.7	2.1	1	4.7



Market Supply Curve is Upward Sloping: Why?

1. Higher prices cause existing firms to supply more
2. Higher prices invite firms into an industry

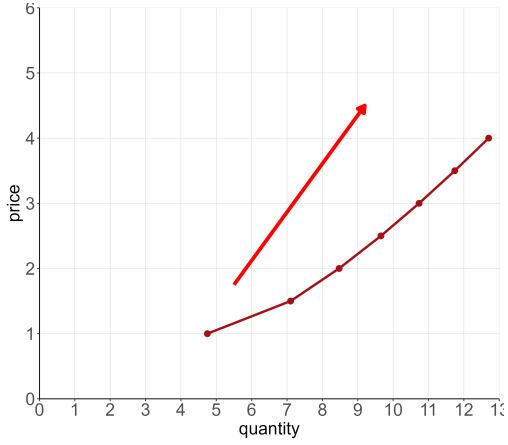
Market Supply Curve is Upward Sloping: Why?

1. Higher prices cause existing firms to supply more
2. Higher prices invite firms into an industry

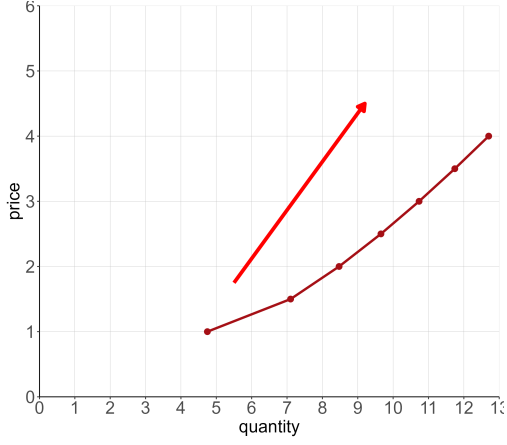
Can you think of any examples of high prices luring firms into a market?

What Causes Movement Along the Supply Curve?

What Causes Movement Along the Supply Curve?



What Causes Movement Along the Supply Curve?



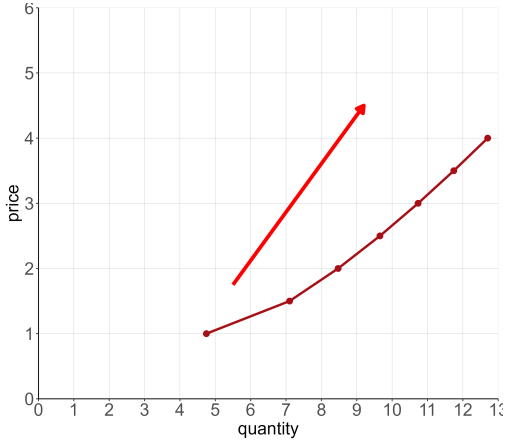
A change in price causes a **movement along the supply curve**, yielding a **change in the quantity supplied**.

Ch. 2: 4. What Shifts Supply Curves?

Before Shifting the Supply Curve

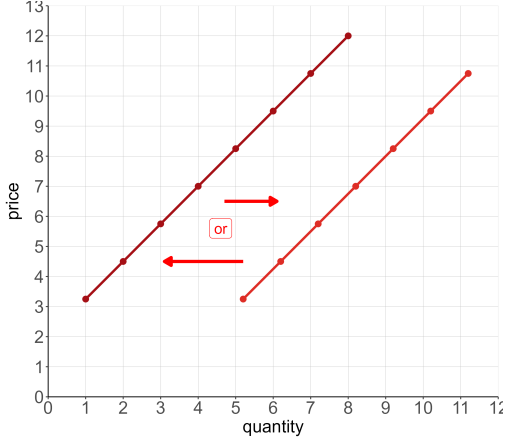
Until now

- We held everything else constant
- We asked what happened when price changes
- This is a movement **along** the supply curve



What Shifts Supply Curves?

Now: what shifts the supply curve?



What Shifts Supply Curves?

What if we don't hold everything else constant? What might change your firm's supply of apples?

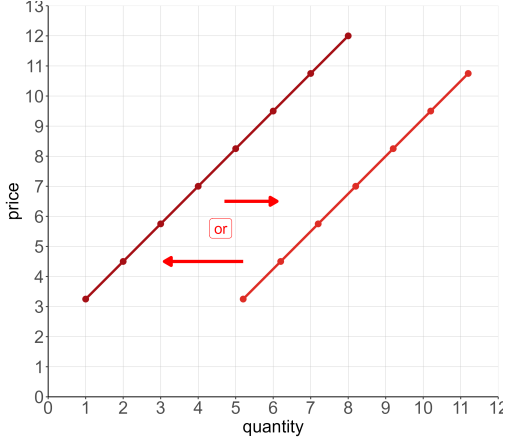
What Shifts Supply Curves?

What if we don't hold everything else constant? What might change your firm's supply of apples?

1. input prices
2. productivity and technology
3. prices of related outputs
4. expectations
5. type and number of other sellers

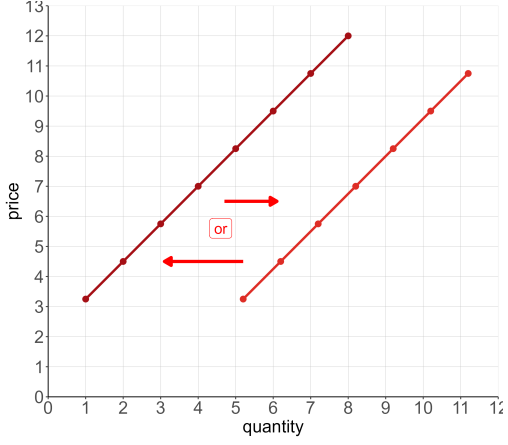
1. Change in Input Prices

Which curve has higher input prices?



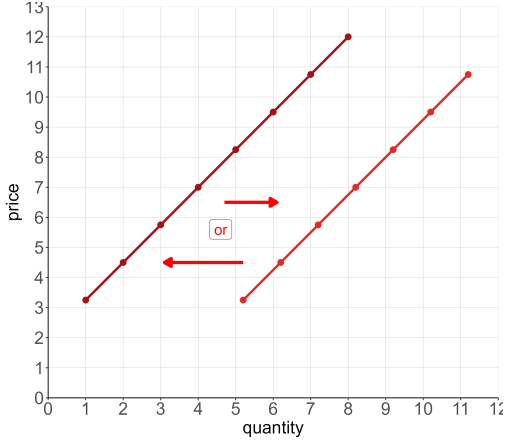
2. Which Firm Has Better Technology?

Which curve has better technology?



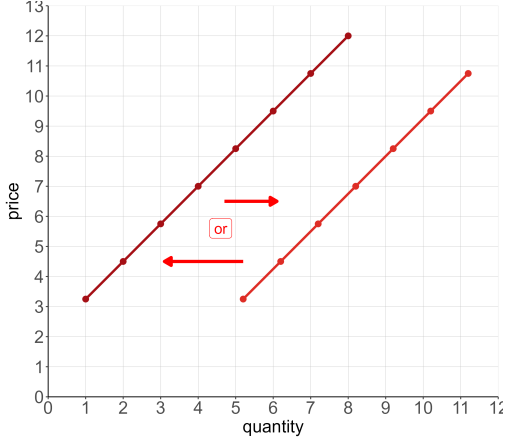
3. What Happens When Related Market Changes?

Price of apple cider collapses. What happens to supply curve for apples?



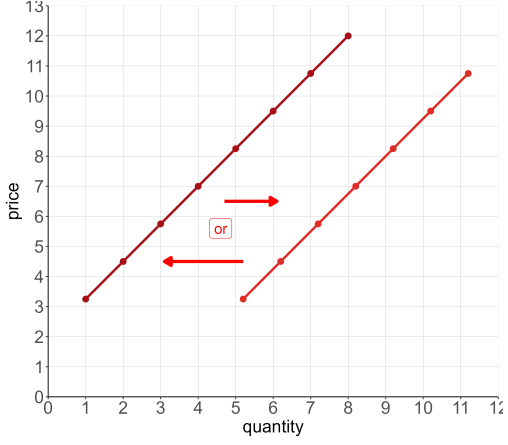
4. What Happens When Expectations Change?

Very bad rain this year, suggesting bad apple crop next year. How does supply this year respond?



5. What if the Number of Sellers Declines?

Number of apple sellers declines. What happens?



Ch. 2: 5. Recap: Shifts vs. Movements Along the Supply Curve

Recap: Shifts vs Movements

Change in Quantity Supplied

Change in Supply Itself

Recap: Shifts vs Movements

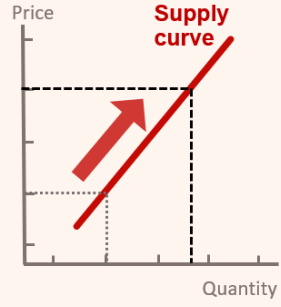
Change in Quantity Supplied

Change in Supply Itself

Recap: Shifts vs Movements

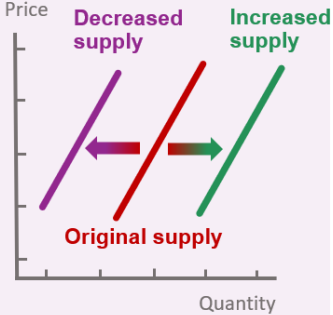
Change in Quantity Supplied

Changes in price cause changes in quantity supplied.



Change in Supply Itself

Changes in other factors cause shifts in supply.



For Next Class

- Do problem set 3
- Work with classmates, me or TA on problems
- Check Ripped from Headlines assignments
- Article finders email me by Wednesday midnight
- Read Chapter 4

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I will

- post these lecture notes on my webpage
- post link to lecture recording on Blackbolard
- anything else?