INTRODUCTION TO ECONOMICS

Supply: Thinking Like a Seller[a]

Martina Zweimüller
Department of Economics

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JOHANNES KEPLER
UNIVERSITY LINZ

[a]Based on Ch. 3 of "*Principles of Economics*" by Betsey Stevenson & Justin Wolfers.

Chapter Objective

To understand how businesses make selling or supply decisions.

NetPhotos/Alamy

How much would you sell your seat for?

Roadmap (1 of 5)

- **Individual Supply: What You Sell, at Each Price**

  Discover the shape of your business's individual supply curve.

- Your Decisions and Your Individual Supply Curve

  Apply the core principles to make good supply decisions.

- Market Supply: What the Market Sells

  Add up individual supply to discover market supply.

- What Shifts the Supply Curve?

  Understand what factors shift supply curves.

- Shifts versus Movements Along Supply Curves

  Distinguish between movements along a supply curve and shifts in supply curves.

An Individual Supply Curve (1 of 2)

What is an **individual supply curve?**

- An individual supply curve is a graph plotting the quantity of an item that a business plans to sell at each price.
- It summarizes a business's selling plans.
- An individual supply curve holds other things constant.

How Much Should a Firm Supply? (1 of 5)

What is BP's individual supply curve?
(How much gasoline is BP willing to supply at each price?)

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How Much Should a Firm Supply? (2 of 5)

Memo

TO: All department heads—Refining, Retail, and Logistics units
FROM: Shannon David, Business planning division
SUBJECT: Gasoline Supply Plans

This memo summarizes the production and sales plans that we agreed upon in last week's planning summit. Specifically, we decided:

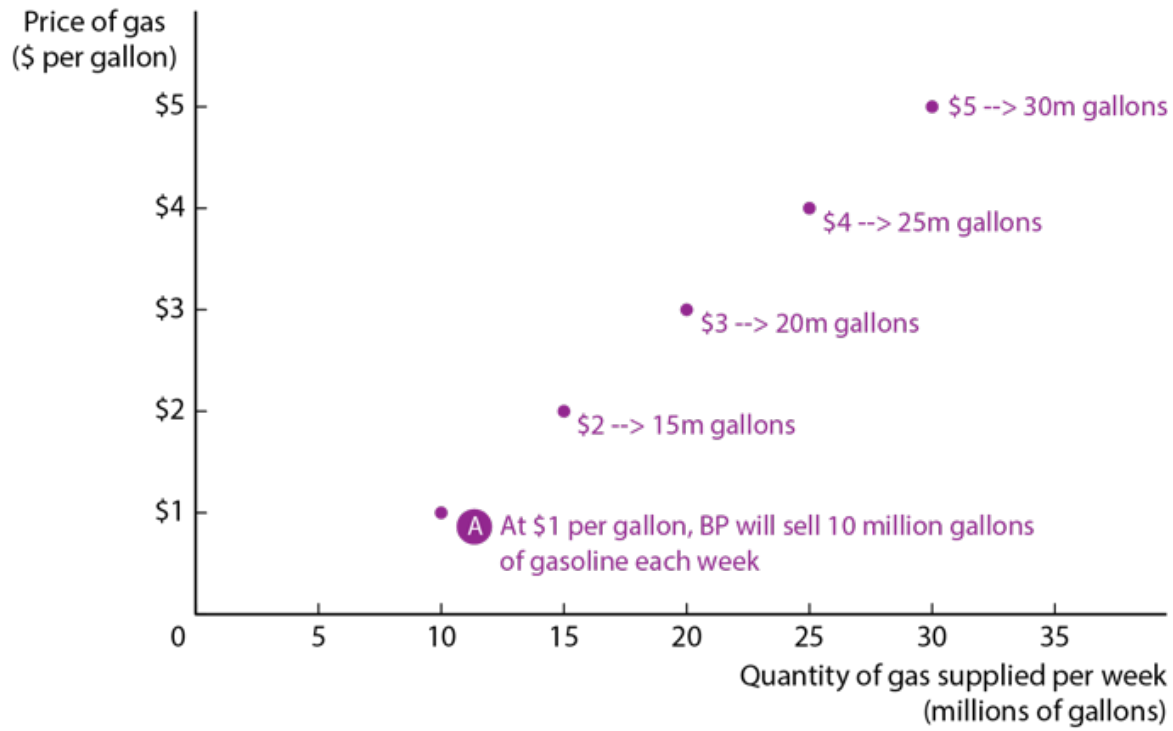
- If the gas price is $1 per gallon, we will produce 10 million gallons per week.
- If the gas price is $2 per gallon, we will produce 15 million gallons per week.
- If the gas price is $3 per gallon, we will produce 20 million gallons per week.
- If the gas price is $4 per gallon, we will produce 25 million gallons per week.
- If the gas price is $5 per gallon, we will produce 30 million gallons per week.
- If the gas price is below $1 per gallon, all production will shut down, so we will produce zero gallons per week.

Please use these numbers as the basis for setting next year's plans for your division. These production and sales plans are based on our current understanding of market conditions, which may change; if so, we will revisit these numbers.

How Much Should a Firm Supply? (3 of 5)

BP's Individual Supply Curve:
How much gasoline is it willing to supply at each price?

Ⓐ When the price is $1 per gallon, BP plans to sell just 10 million gallons per week. An individual supply curve also illustrates how the quantity a business will supply changes as the price changes. If the price rises to $2 per gallon, the quantity supplied will rise to 15 million gallons per week, and at a price of $3 per gallon, it will rise to 20 million gallons, and so on.



How Much Should a Firm Supply? (4 of 5)

BP's Individual Supply Curve:
How much gasoline is it willing to supply at each price?

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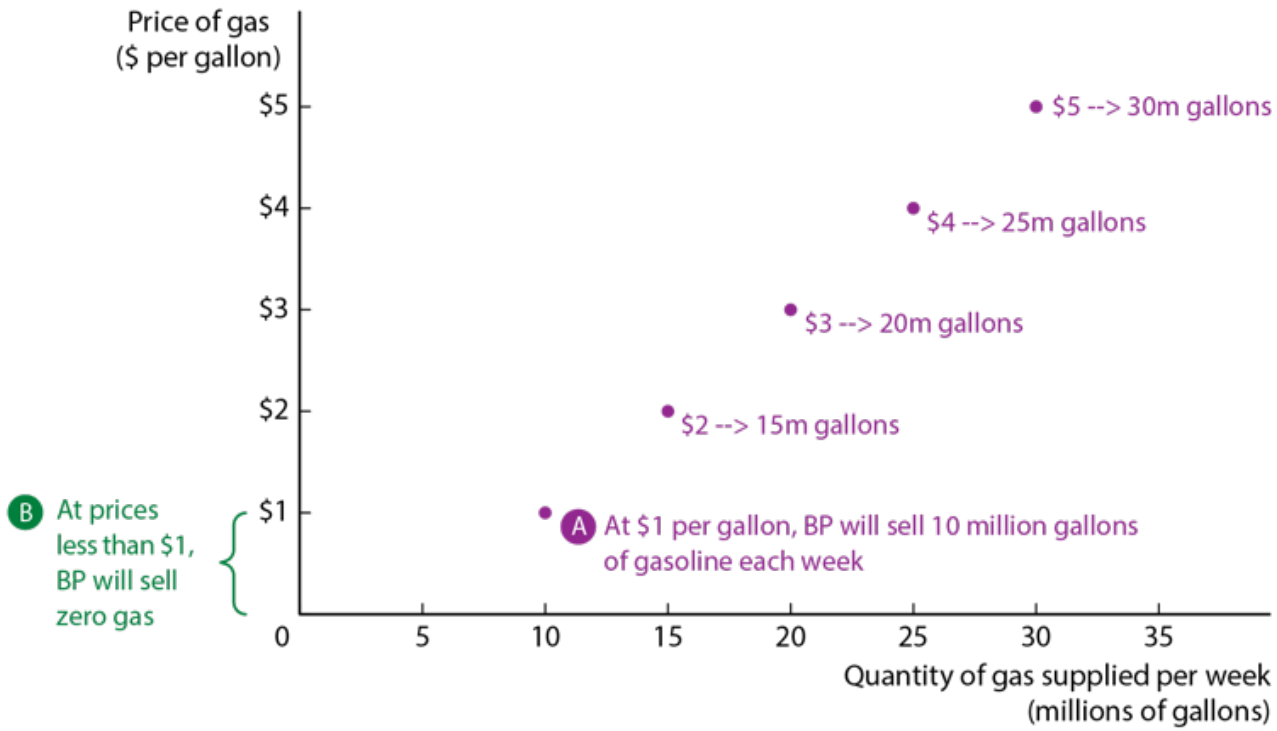
B At very low prices—below $1 per gallon—BP will stop producing gas, and so the quantity supplied is zero.



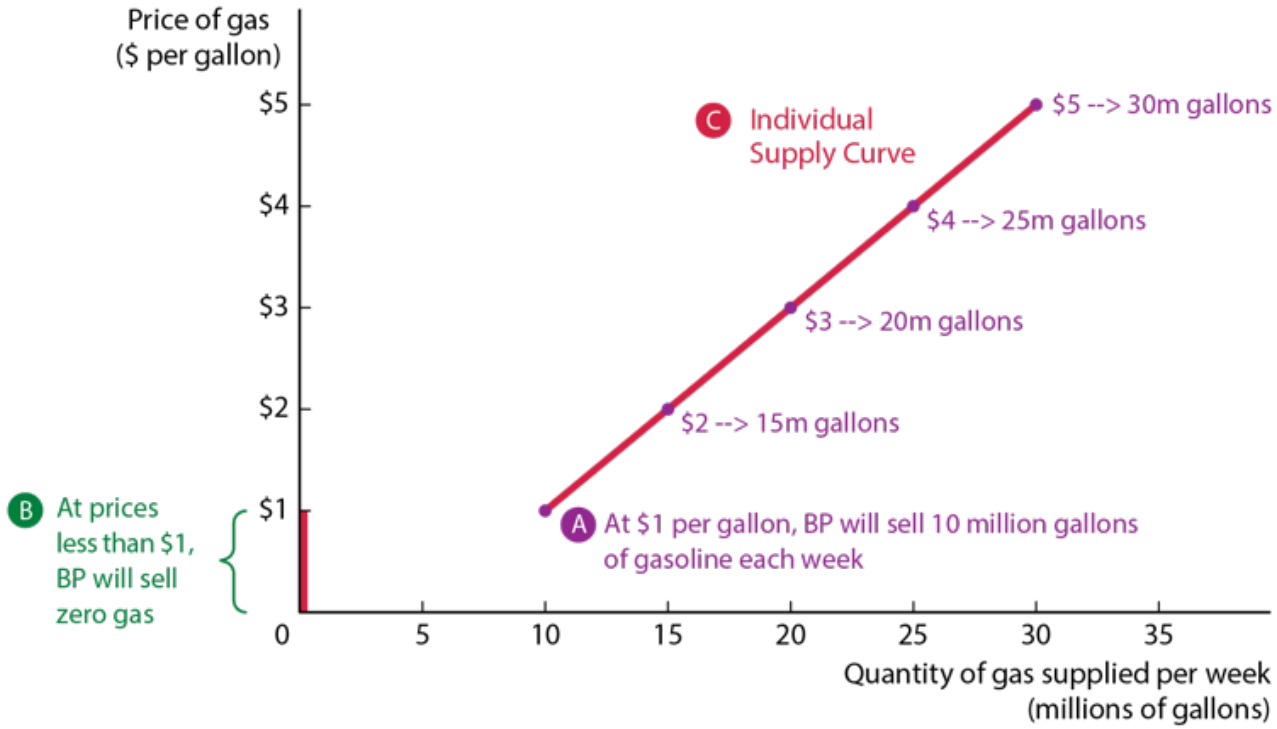
How Much Should a Firm Supply? (5 of 5)

BP's Individual Supply Curve:
How much gasoline is it willing to supply at each price?

A When the price is $1 per gallon, BP plans to sell just 10 million gallons per week. An individual supply curve also illustrates how the quantity a business will supply changes as the price changes. If the price rises to $2 per gallon, the quantity supplied will rise to 15 million gallons per week, and at a price of $3 per gallon, it will rise to 20 million gallons, and so on.

B At very low prices—below $1 per gallon—BP will stop producing gas, and so the quantity supplied is zero.

C The individual supply curve shows the quantity of gas that BP is willing to sell, at each price. It is an upward-sloping curve: the higher the price, the higher the quantity supplied.



What Is Your Individual Supply Curve?

Panel A: Amazon Textbook Buyback Survey

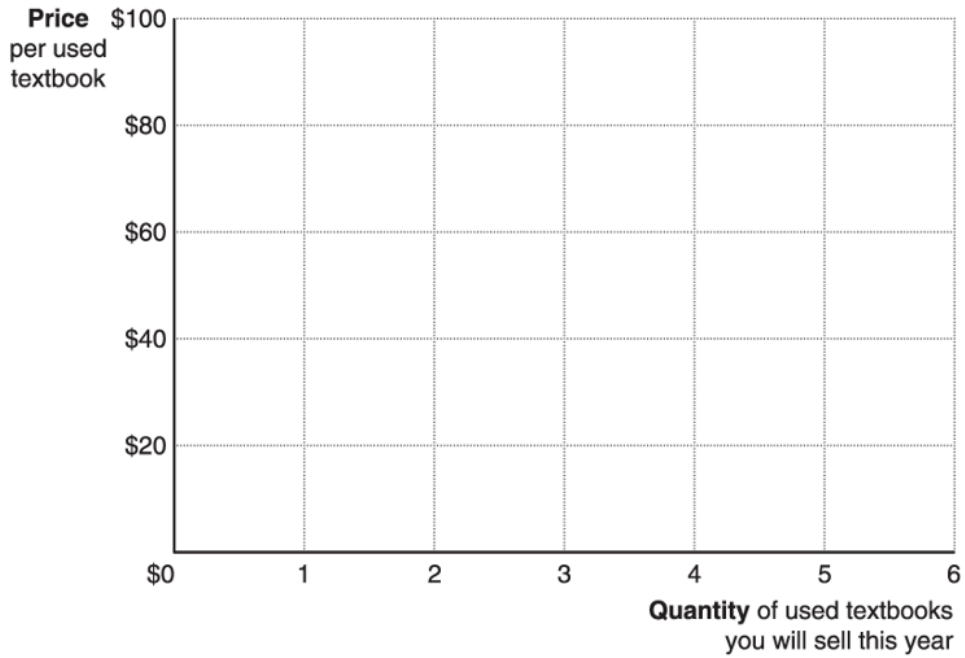
Amazon is interested in understanding how many of your used textbooks you will sell at the end of the year. Other things being equal, how many of your current textbooks do you expect to sell?

Price of used textbooks	Quantity of used textbooks you will sell this year
If the price is $5 per book	
If the price is $10 per book	
If the price is $20 per book	
If the price is $40 per book	
If the price is $60 per book	
If the price is $80 per book	
If the price is $100 per book	

Panel B: Your Individual Supply Curve

How many used textbooks are you willing to sell at each price?

To graph your individual supply curve, plot the data from your responses to the Amazon Textbook Buyback Survey.

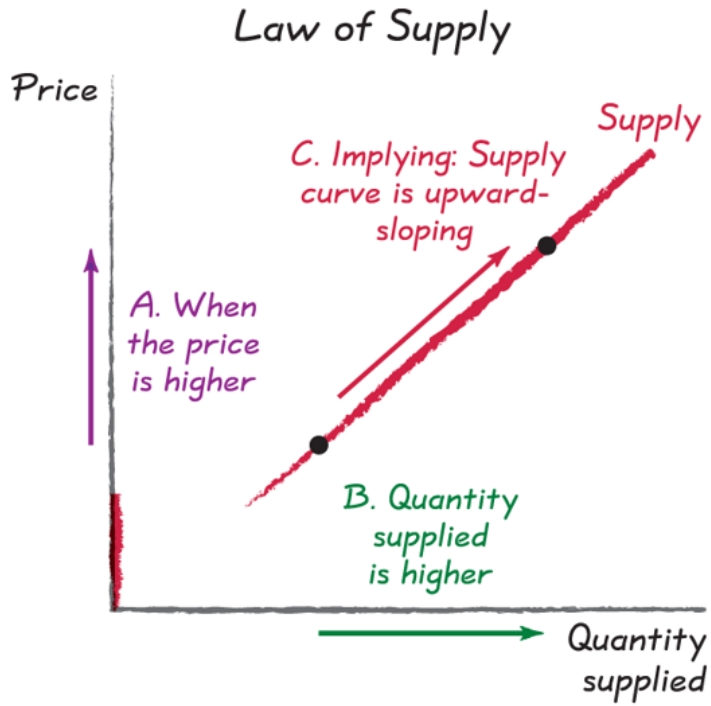


An Individual Supply Curve (2 of 2)

- Notice that the individual supply curve is upward-sloping.
- Does this make sense?
  - If each item brings a higher price, selling more would bring more profit!
  - Therefore, individual supply curves are upward-sloping.
  - This relationship is called the **law of supply.**

The Law of Supply

- What is the **law of supply?**
  - The law of supply is the tendency for the quantity supplied to be higher when the price is higher.
  - This law means that supply curves are upward-sloping because the higher the price, the higher the quantity supplied.



Stevenson/Wolfers, *Principles of Economics*, 1e,

Discussion Questions

- You are the suppliers of labor. What happens to the number of hours you are willing to work as the wage rises?
- How does this illustrate the law of supply?

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Your tutor is a supplier—of academic help.

Practice Question (1 of 5)

Suppose that when the price is $10, a deli is willing to sell 200 sandwiches. If the price falls to $8, how many sandwiches would the deli be willing to sell?

1. 400
2. 300
3. 200
4. 100

Practice Question (1 of 5)

Suppose that when the price is $10, a deli is willing to sell 200 sandwiches. If the price falls to $8, how many sandwiches would the deli be willing to sell?

1. 400
2. 300
3. 200
4. 100 **CORRECT**

Roadmap (2 of 5)

- Individual Supply: What You Sell, at Each Price

  Discover the shape of your business's individual supply curve.

- **Your Decisions and Your Individual Supply Curve**

  Apply the core principles to make good supply decisions.

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  Add up individual supply to discover market supply.

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Your Decisions and Your Individual Supply Curve

How do firms decide what quantity to produce at each price?

- For now, the market is perfectly competitive.
- Determine what quantity to produce at each price by using the core principles:
  - the marginal principle.
  - the cost-benefit principle.
  - the opportunity cost principle.
  - the interdependence principle.

Perfectly Competitive Markets (1 of 3)

- What is a perfectly competitive market?
  - All firms in the industry sell an identical good.
  - There are many buyers and many sellers, each of whom is small relative to the size of the market.

Perfectly Competitive Markets (2 of 3)

Why are we using a perfectly competitive market?

- The characteristics of perfectly competitive markets have important implications for a firm's price-setting strategy.
- Perfectly competitive firms are **price-takers:**
  - A **price-taker** is an actor who charges the market price.
  - A price-taker's actions do not affect the market price.

Perfectly Competitive Markets (3 of 3)

- Are all markets perfectly competitive?
  - No!
  - If a market has only a few buyers or sellers, then they may have market power (they may be able to influence the price).
- However, having firms behave as price-takers simplifies the analysis.
- For now, focus on perfectly competitive firms.

Discussion Question (1 of 2)

What is an example of a market that is perfectly competitive (or close to it)?

Choosing the Best Quantity to Supply (1 of 4)

What are the core principles we use to determine the best quantity to supply at each price?

- The marginal principle
- The cost-benefit principle
- The opportunity cost principle
- The interdependence principle

Choosing the Best Quantity to Supply (2 of 4)

The marginal principle

- Decisions about quantities are best made incrementally.
- Should I supply one more unit?

Choosing the Best Quantity to Supply (3 of 4)

The cost-benefit principle

- Decisions depend on the balance of marginal benefits and marginal costs.
  - What is the marginal benefit of producing one more unit (what is the money that you will get for one more unit)?
  - What is the marginal cost of producing one more unit (what is the extra cost for producing one more unit)?
- Produce one more unit if the marginal benefit exceeds the marginal cost.

Choosing the Best Quantity to Supply (4 of 4)

The opportunity cost principle

- When determining the marginal cost, you should compare the cost of production to its next best option – *not* producing.
- Marginal cost *does* include **variable costs** . . .
  - **Variable costs** are those costs that vary with the quantity of output, such as labor and raw materials.
- . . . but does *not* include **fixed costs**.
  - **Fixed costs** don't vary when the quantity of output changes, they are incurred regardless of level of output.

Discussion Question (2 of 2)

Think about your most recent job.

- What were the company's **fixed costs**?
- What were the company's **variable costs?**

Choosing the Best Quantity to Supply (1 of 2)

The interdependence principle

- The best choice depends on your other choices, the choices others make, changes in other markets, and expectations about the future.
- For now, we are holding these factors constant.

Applying the Core Economic Principles to Your Supply Decisions

Principle	The Idea	Applying the Principle
The marginal principle	Decisions about quantities are best made incrementally. Break "how many" questions into a series of smaller, or marginal, decisions.	Should I supply one more gallon of gas?
The cost-benefit principle	Costs and benefits are the incentives that shape decisions. You should evaluate the full set of costs and benefits of any choice, and only pursue those whose benefits are at least as large as their costs.	Is the price you get for the extra gallon of gas at least as large as the marginal cost? If so, then yes, you want to supply it.
The opportunity cost principle	The true cost of something is the next best alternative you must give up to get it. Your decisions should reflect this opportunity cost, rather than just the out-of-pocket financial costs.	Ask, "Or what?" If my business weren't producing this gas, how else could we use our resources? This principle helps you figure out what to count as marginal costs.
The interdependence principle	Your best choice depends on your other choices, the choices others make, developments in other markets, and expectations about the future. When any of these factors change, your best choice might change.	"Holding other things constant" means we'll put aside these other factors for now and will return to them later.

Choosing the Best Quantity to Supply (2 of 2)

How do we put the core principles together to determine the quantity supplied?

1. How many units should I supply?
2. Should I sell one more unit (marginal principle)?
3. Selling one more unit depends on price versus marginal cost (cost-benefit principle).
4. Calculate the marginal cost (opportunity cost principle).
5. If the price is greater than the marginal cost, sell one more unit!

The Rational Rule for Sellers in Competitive Markets (1 of 4)

The Rational Rule for Sellers in Competitive Markets:

Sell one more item if the price is greater than (or equal to) the marginal cost.

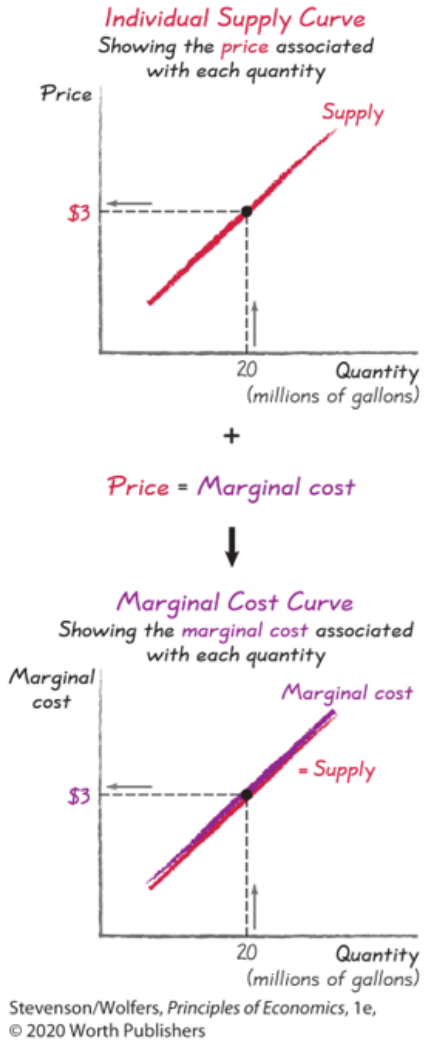
The Rational Rule for Sellers in Competitive Markets (2 of 4)

- Should sellers continue to sell if the price is less than the marginal cost? Why?
- At what point is profit maximized?
- To maximize profits, keep applying the Rational Rule for Sellers, continuing to produce until

$$\text{Price} = \text{Marginal cost}$$

The Rational Rule for Sellers in Competitive Markets (3 of 4)

The Rational Rule for Sellers in Competitive Markets (4 of 4)



Stevenson/Wolfers, *Principles of Economics*, 1e,

Why is your supply curve also your marginal cost curve?

- If you are maximizing profit, you will always keep selling until price equals marginal cost.
- The supply curve, therefore, shows the quantity sold at every price, which is also the marginal cost!

Why Is Your Supply Curve Upward-Sloping?

- The supply curve is upward-sloping because of increasing marginal costs.
- As you increase the quantity you produce, the marginal cost of producing an extra unit rises because of the following:

1. **Diminishing marginal product** leads to rising marginal costs.
   - **Diminishing marginal product:** The marginal product of an input declines as you use more of that input.
2. Rising input costs also lead to rising marginal costs.

Practice Question (2 of 5)

Suppose a shoe store has fixed costs of $100. Its marginal cost for the first pair of shoes is $10, for the second is $20, and for the third is $30. How many shoes will it supply if the price is $20?

1. three pairs
2. two pairs
3. one pair
4. zero pairs

Practice Question (2 of 5)

Suppose a shoe store has fixed costs of $100. Its marginal cost for the first pair of shoes is $10, for the second is $20, and for the third is $30. How many shoes will it supply if the price is $20?

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2. two pairs **CORRECT**
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From Individual to Market Supply

What is the **market supply curve?**

- The market supply curve is a graph plotting the total quantity of an item supplied by the entire market, at each price.
- Market supply is the sum of the quantity supplied by each individual seller.

How Much Does a Market Supply? (1 of 5)

What is the market supply curve for gasoline in the United States?

(How much gasoline are *all* the sellers willing to supply, *in total*, at each price?)

How Much Does a Market Supply? (2 of 5)

- The market contains 100 sellers.
- All sellers are identical.
- All sellers have the same supply schedule as BP (see the memo).

Memo

TO: All department heads—Refining, Retail, and Logistics units
FROM: Shannon David, Business planning division
SUBJECT: Gasoline Supply Plans

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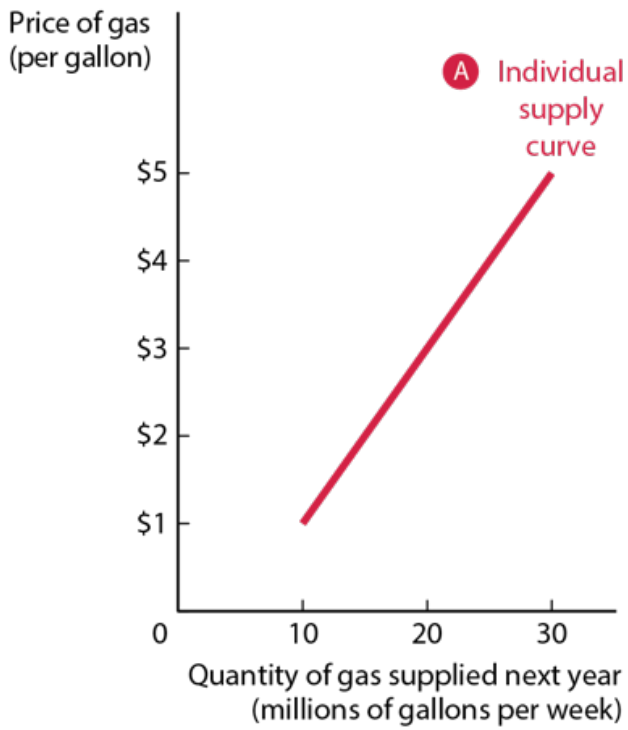
How Much Does a Market Supply? (3 of 5)

A Market supply plots the total quantity supplied across all sellers, at each price. Individual supply curve refers to the quantity an individual firm will supply at each price. Plotting these numbers yields the individual supply curve.



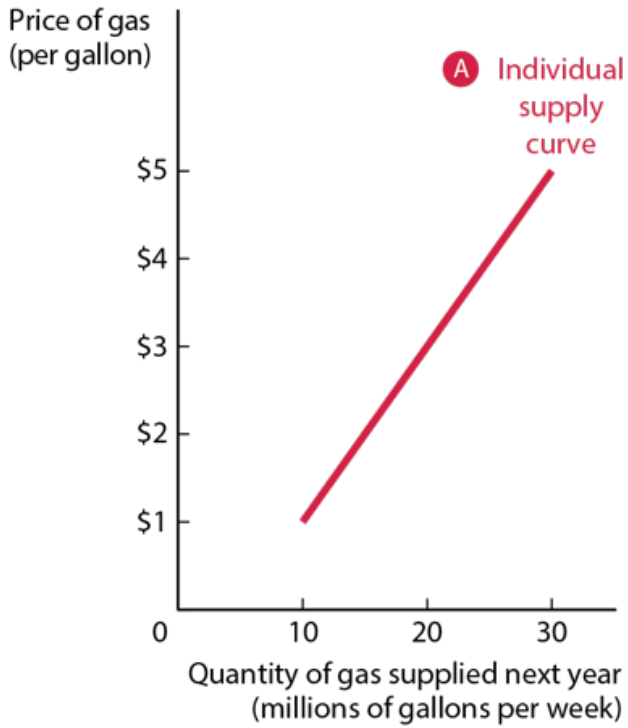
A Individual supply

Price (per gallon)	Quantity supplied by an individual business (millions of gallons per week)	Number of sellers in the market	Total quantity supplied (millions of gallons per week)
$5	30		
$4	25		
$3	20		
$2	15		
$1	10		

How Much Does a Market Supply? (4 of 5)

A Market supply plots the total quantity supplied across all sellers, at each price. Individual supply curve refers to the quantity an individual firm will supply at each price. Plotting these numbers yields the individual supply curve.

B The market consists of 100 similar suppliers, and so the total quantity supplied by the market at any given price will be 100 times larger.



Price (per gallon)	A Individual supply: Quantity supplied by an individual business (millions of gallons per week)	x	B Number of suppliers: Number of sellers in the market	Total quantity supplied (millions of gallons per week)
$5	30	x	100	
$4	25	x	100	
$3	20	x	100	
$2	15	x	100	
$1	10	x	100	

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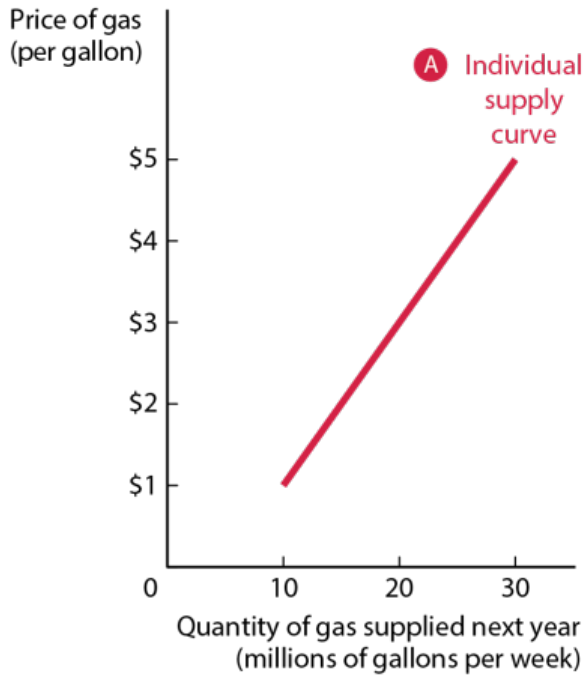
How Much Does a Market Supply? (5 of 5)

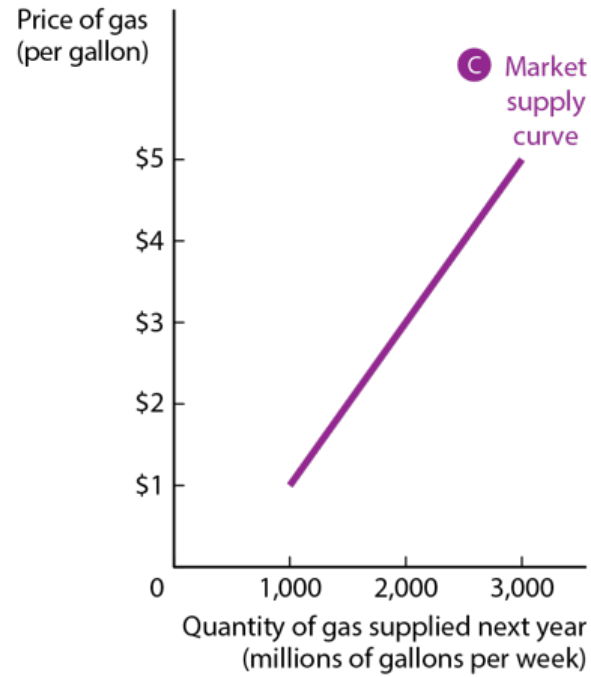
A Market supply plots the total quantity supplied across all sellers, at each price. Individual supply curve refers to the quantity an individual firm will supply at each price. Plotting these numbers yields the individual supply curve.

B The market consists of 100 similar suppliers, and so the total quantity supplied by the market at any given price will be 100 times larger.

C Plotting the market at each price yields the market supply curve.



	A Individual supply	x	B Number of suppliers	=	C Market supply
Price (per gallon)	Quantity supplied by an individual business (millions of gallons per week)		Number of sellers in the market		Total quantity supplied (millions of gallons per week)
$5	30	x	100	=	3,000
$4	25	x	100	=	2,500
$3	20	x	100	=	2,000
$2	15	x	100	=	1,500
$1	10	x	100	=	1,000



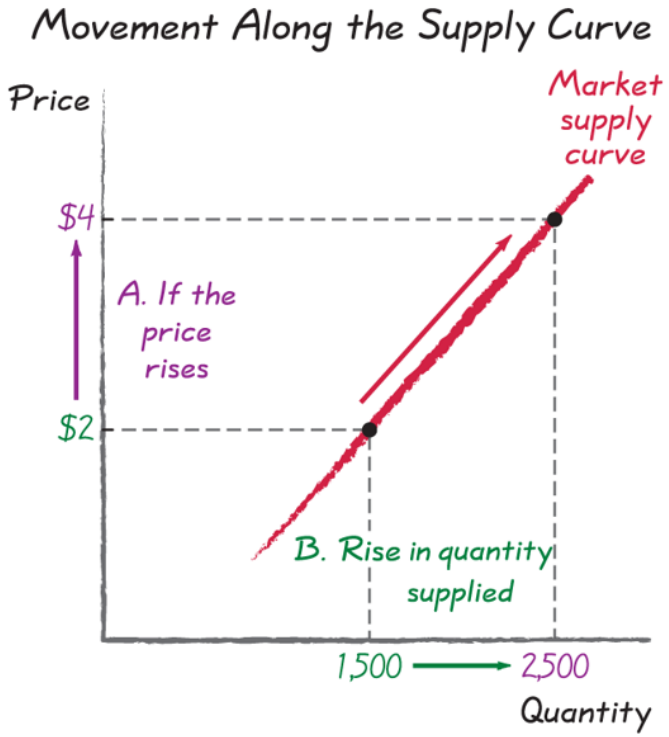
The Market Supply Curve Is Upward-Sloping.

Why do market supply curves slope upward (why do they follow the law of supply)?

- A higher price leads individual businesses to supply a larger quantity.
- A higher price means more businesses are supplying their goods and services.
- A lower price means fewer businesses are doing so.

Movement Along the Supply Curve

- **Movement along the supply curve:** A price change causes movement from one point on a fixed supply curve to another point on the same curve.
- **Change in the quantity supplied**: The change in quantity associated with movement along a fixed supply curve.



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Practice Question (3 of 5)

Suppose the shoe store from the previous question is one of 100 identical shoe stores. What is the market quantity supplied if the price is $20? Remember that the marginal cost for the first pair of shoes is $10, for the second pair is $20, and for the third pair is $30.

1. 300 pairs
2. 200 pairs
3. 100 pairs
4. 2 pairs

Practice Question (3 of 5)

Suppose the shoe store from the previous question is one of 100 identical shoe stores. What is the market quantity supplied if the price is $20? Remember that the marginal cost for the first pair of shoes is $10, for the second pair is $20, and for the third pair is $30.

1. 300 pairs
2. 200 pairs **CORRECT**
3. 100 pairs
4. 2 pairs

Roadmap (4 of 5)

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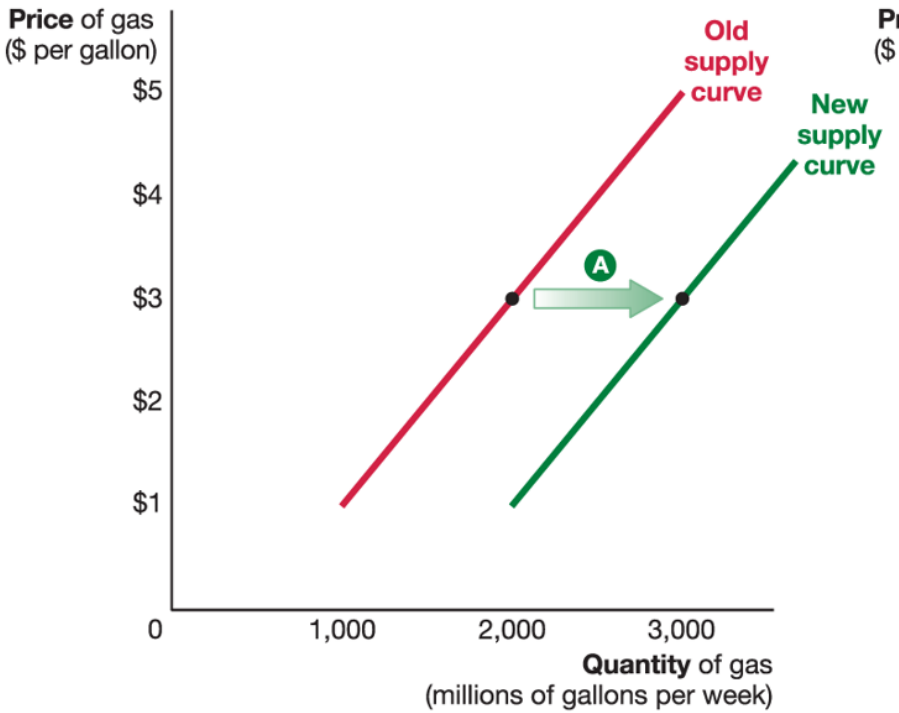
What Shifts the Supply Curve? (1 of 3)

- **The interdependence principle** tells us that seller's choices depend on many other factors other than price and when those factors change, so might their supply decisions.
- **Shift in the supply curve**: A movement of the supply curve itself.
  - **Increase in supply**: A shift of the supply curve to the right.
  - **Decrease in supply**: A shift of the supply curve to the left.

What Shifts the Supply Curve? (2 of 3)

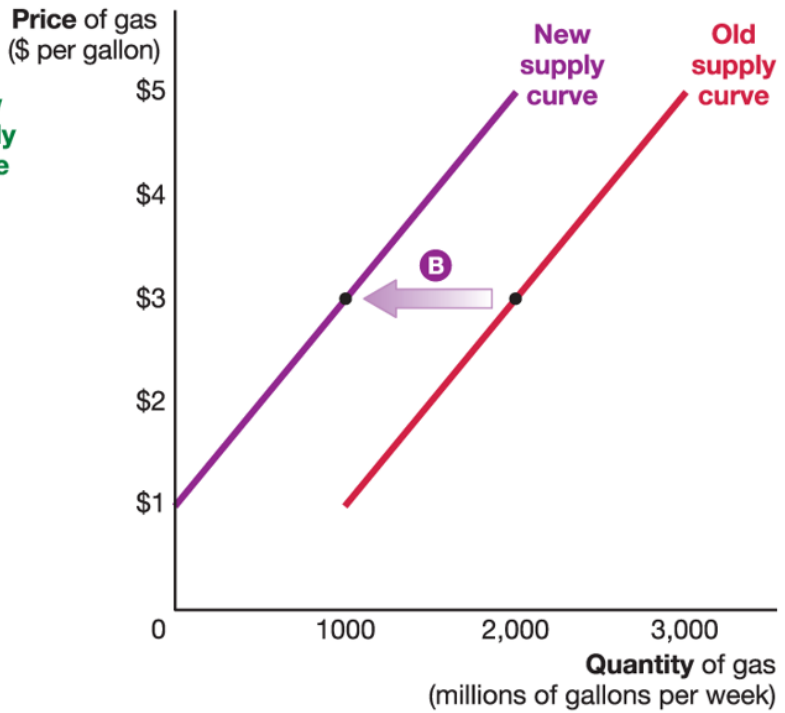
Panel A: An Increase in Supply

A An **increase in supply shifts the supply curve to the right**, leading to a higher quantity supplied at each and every price.



Panel B: A Decrease in Supply

B A **decrease in supply shifts the supply curve to the left**, leading to a lower quantity supplied at each and every price.



What Shifts the Supply Curve? (3 of 3)

- The following shift individual AND market supply curves:
  1. input prices.
  2. productivity and technology.
  3. prices of related outputs.
  4. expectations.
- The following shifts ONLY the market supply curve:
  1. the type and number of sellers.

Supply Shifter 1: Input Prices

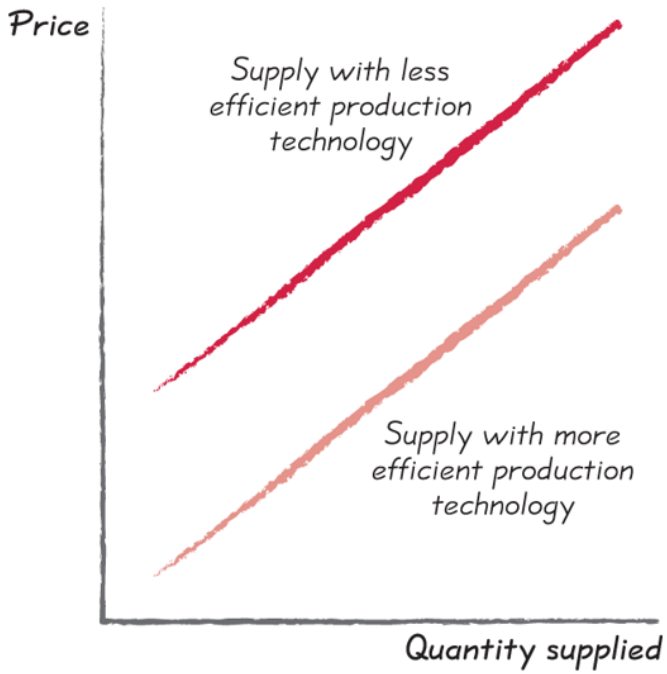
- **Interdependence principle:** Choices other businesses make affect your decisions.
  - When your suppliers change the prices of your inputs, they change your marginal costs.
  - This will shift your supply curve.
- *Example of input*: wages paid to a worker

Stevenson/Wolfers, *Principles of Economics*, 1e,

Supply Shifter 2: Your business's Productivity and Technology

- **Productivity growth**: Growth that occurs when businesses figure out how to produce more output with fewer inputs.
  - Productivity growth is often driven by **technological change**.

- *Examples of technological change*: the invention of new types of machinery, the adoption of new management techniques



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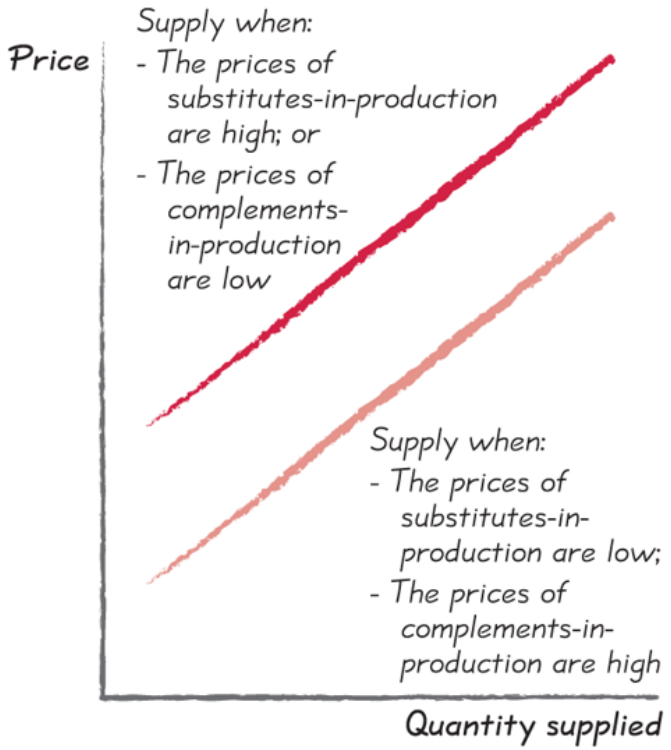
Supply Shifters – Discussion Questions

- Look at the smartphone you are using. How much did you pay for it?
- Do you remember what a cell phone looked like 10 years ago? How much did a typical cell phone cost 10 years ago?
- Name a few changes in production technology in cell phone production.

Supply Shifter 3: Prices of Related Outputs

As a supplier, your decisions are interdependent because there are many different lines of businesses you can engage in.

- **Substitutes-in-production:** Alternative uses of your production capacity.
- **Complements-in-production:** Goods that are made together.



Stevenson/Wolfers, *Principles of Economics*, 1e,

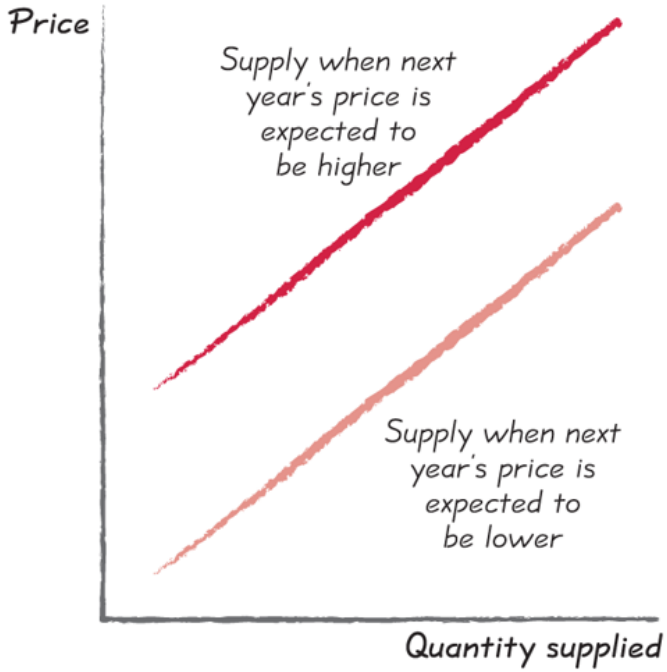
Supply Shifters – Discussion Questions

- Suppose you are the owner and operator of a trendy burger joint.
  - Besides burgers, name a few items that you can also serve in your restaurant.
  - Are they substitutes or complements in production for you?

Supply Shifter 4: Expectations

Your decisions are linked through time.

- For example, in the short run, if you expect the price of your products to rise next year, you can increase your profits by storing them and selling them next year.
- This will decrease your supply this year.

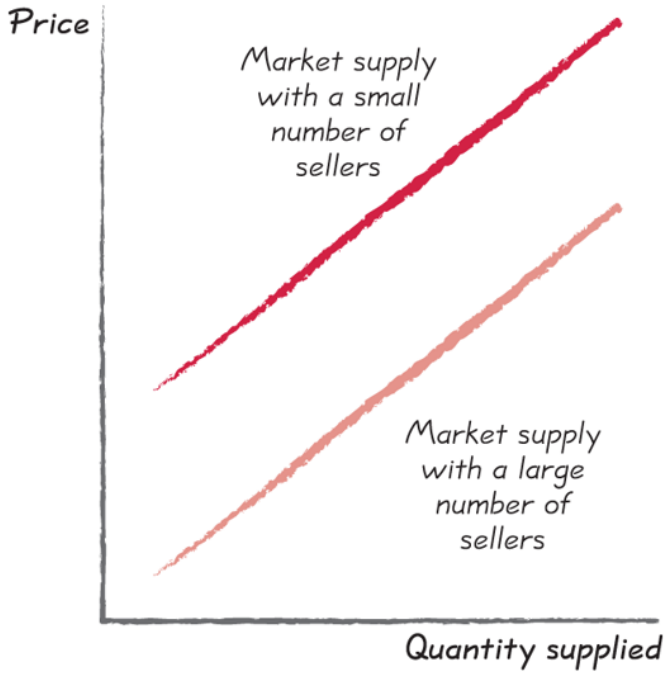


Stevenson/Wolfers, *Principles of Economics*, 1e,

Supply Shifter 5: The Type and Number of Sellers

Because the entry and exit decisions of businesses are driven by expected future profits, any factor that changes expected future profits will change the number of suppliers in the market.

- If new businesses enter the market, supply increases.
- If businesses shut down, supply decreases.



Stevenson/Wolfers, *Principles of Economics*, 1e,

Practice Question (4 of 5)

Which of the following would cause an **increase** in supply?

1. The number of sellers falls.
2. The profit of a substitute-in-production rises.
3. The input prices fall.
4. The expected price next year rises.

Practice Question (4 of 5)

Which of the following would cause an **increase** in supply?

1. The number of sellers falls.
2. The profit of a substitute-in-production rises.
3. The input prices fall. **CORRECT**
4. The expected price next year rises.

Roadmap (5 of 5)

- Individual Supply: What You Sell, at Each Price

  Discover the shape of your business's individual supply curve.

- Your Decisions and Your Individual Supply Curve

  Apply the core principles to make good supply decisions.

- Market Supply: What the Market Sells

  Add up individual supply to discover market supply.

- What Shifts the Supply Curve?

  Understand what factors shift supply curves.

- **Shifts versus Movements Along Supply Curves**

  Distinguish between movements along a supply curve and shifts in supply curves.

Shifts versus Movements Along Supply Curves (1 of 7)

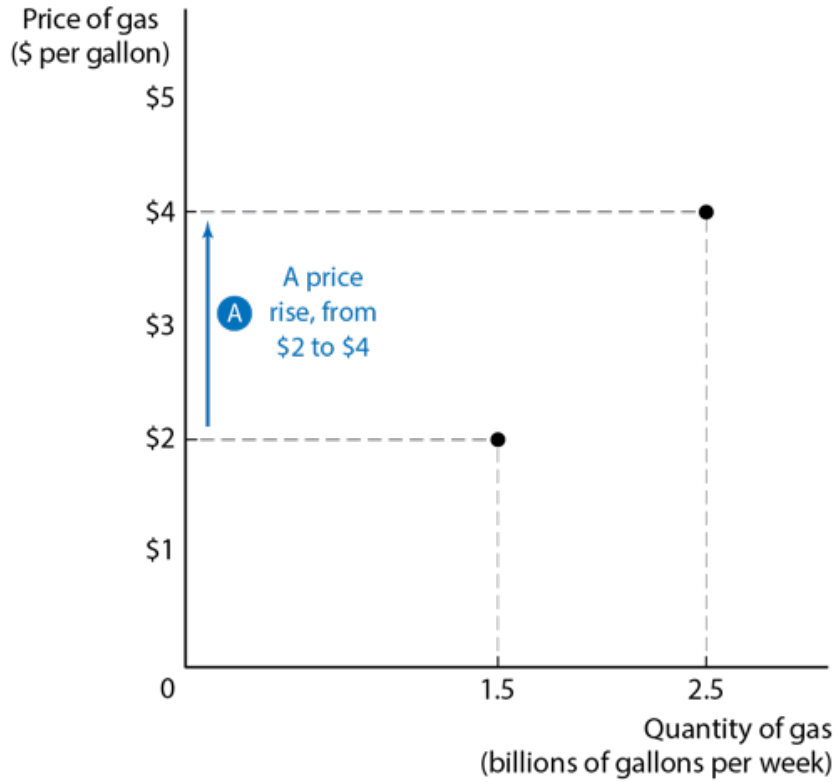
When do we *shift* a supply curve, and when do we *move along* it?

- **A simple rule of thumb:**
  - When the price changes: you're thinking about a movement along the supply curve.
  - When other factors change: you need to think about shifts in the supply curve.

Shifts versus Movements Along Supply Curves (2 of 7)

Panel A: When the Price Changes:
Movement Along the Supply Curve

A A change in price, from $2 to $4 per gallon.



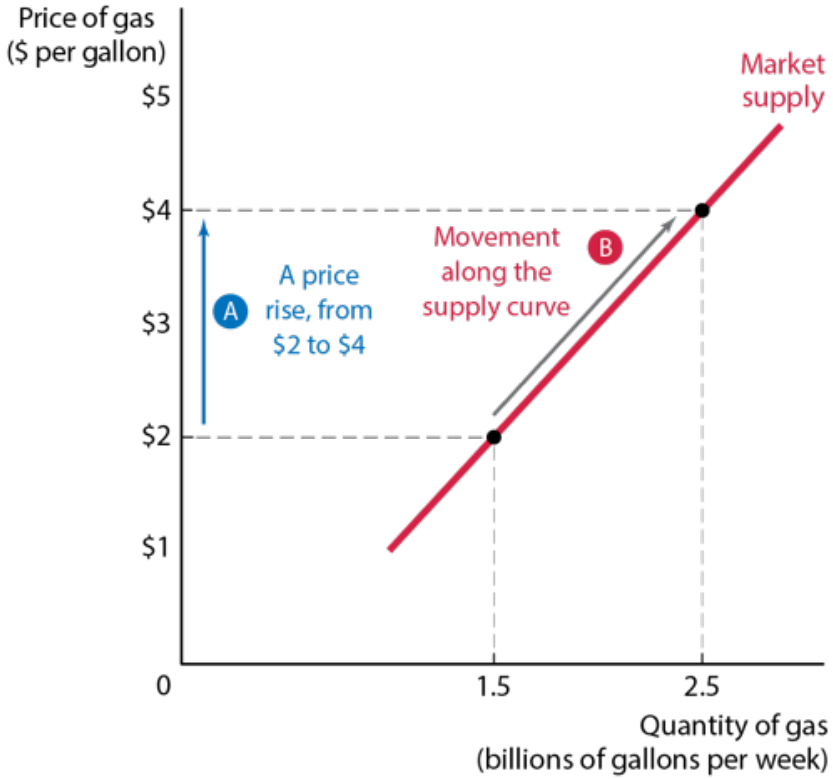
Shifts versus Movements Along Supply Curves (3 of 7)

Panel A: When the Price Changes:

Movement Along the Supply Curve

A A change in price, from $2 to $4 per gallon.

B Causes a movement along the supply curve.



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Shifts versus Movements Along Supply Curves (4 of 7)

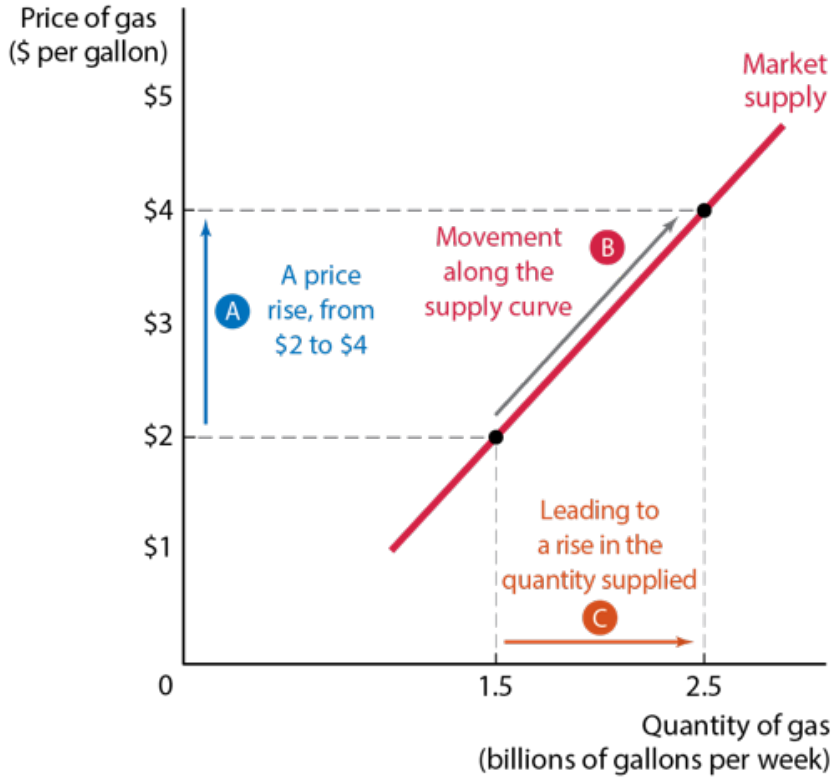
Panel A: When the Price Changes:

Movement Along the Supply Curve

A A change in price, from $2 to $4 per gallon.

B Causes a movement along the supply curve.

C Leading to a change in the quantity supplied, raising the quantity supplied from 1.5 to 2.5 billion gallons per week.

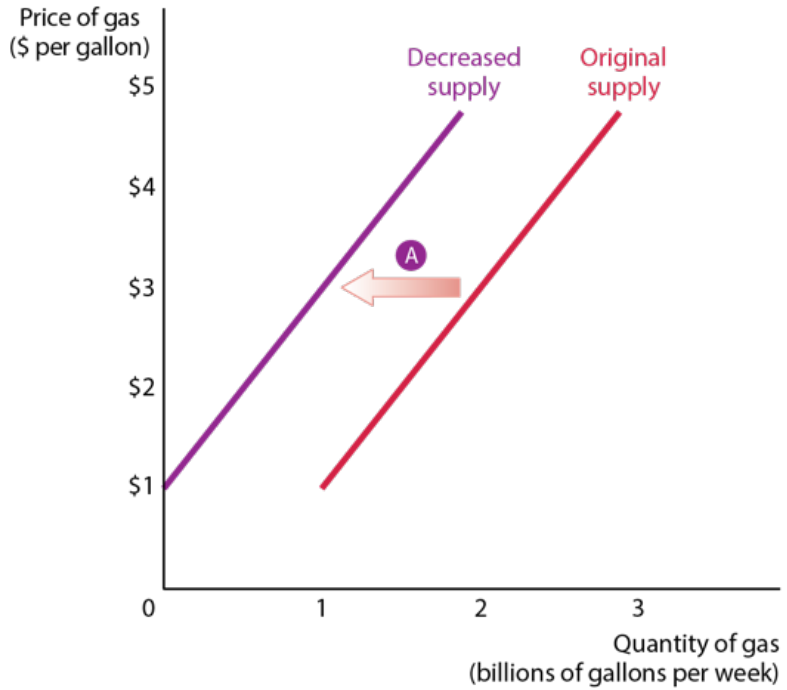


Shifts versus Movements Along Supply Curves (5 of 7)

Panel B: When Other Factors Change:

Shifts in the Supply Curve

A A decrease in supply shifts the supply curve to the left, decreasing the quantity at each and every price.



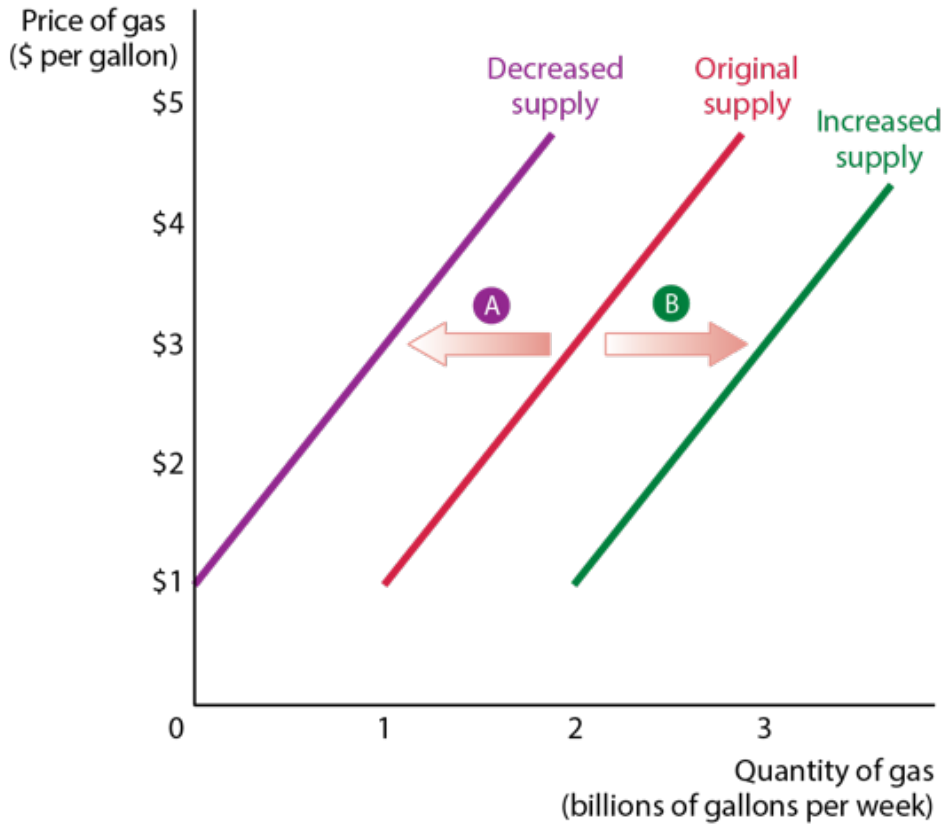
Shifts versus Movements Along Supply Curves (6 of 7)

Panel B: When Other Factors Change:

Shifts in the Supply Curve

A A decrease in supply shifts the supply curve to the left, decreasing the quantity at each and every price.

B An increase in supply shifts the supply curve to the right, increasing the quantity at each and every price.

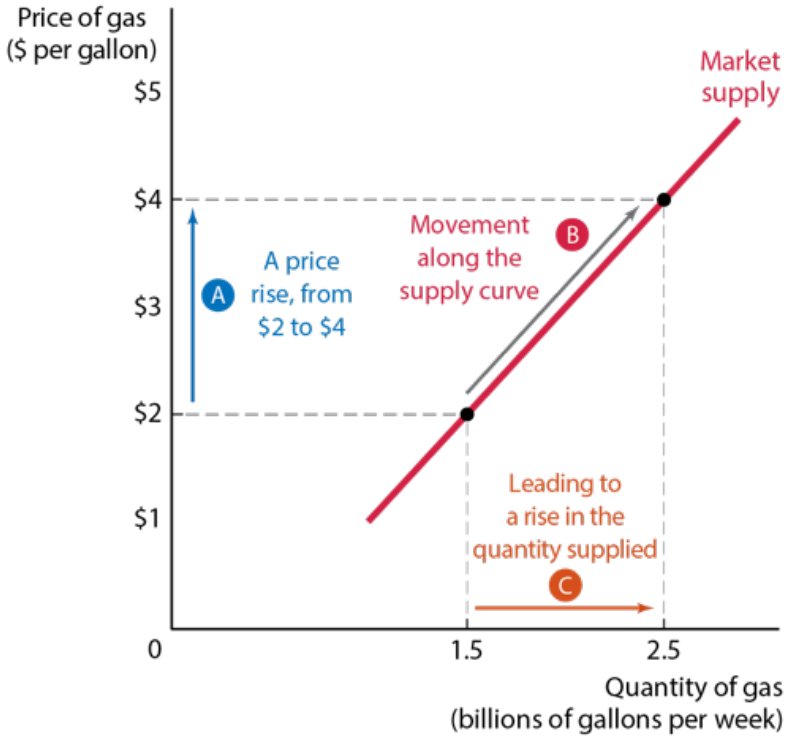


Shifts versus Movements Along Supply Curves (7 of 7)

Panel A: When the Price Changes:

Movement Along the Supply Curve

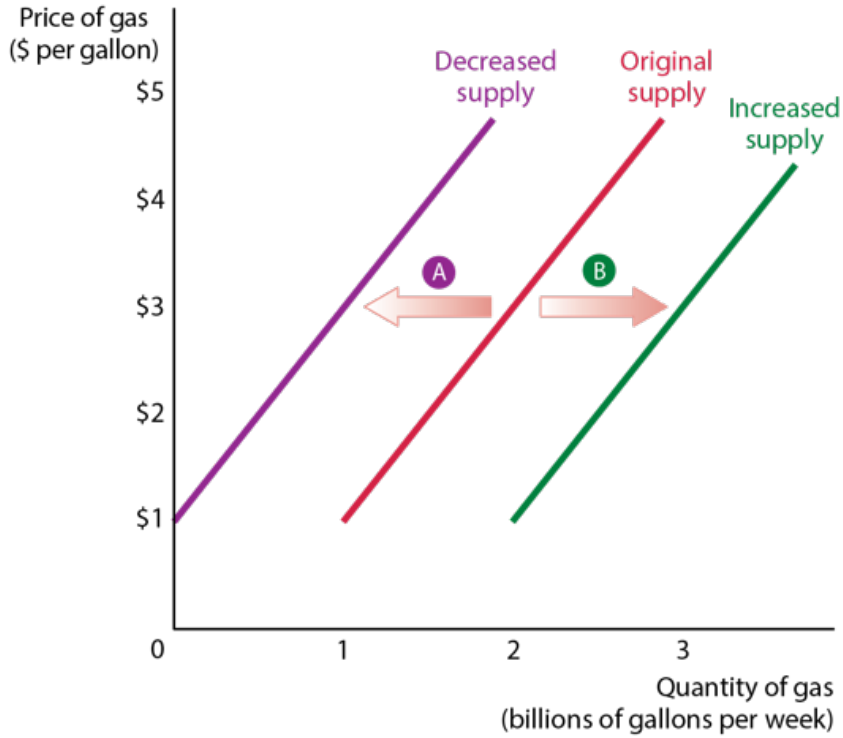
- (A) A change in price, from $2 to $4 per gallon.
- (B) Causes a movement along the supply curve.
- (C) Leading to a change in the quantity supplied, raising the quantity supplied from 1.5 to 2.5 billion gallons per week.



Panel B: When Other Factors Change:

Shifts in the Supply Curve

- (A) A decrease in supply shifts the supply curve to the left, decreasing the quantity at each and every price.
- (B) An increase in supply shifts the supply curve to the right, increasing the quantity at each and every price.



Practice Question (5 of 5)

You own and operate a trendy burger joint. You notice that instead of charging $15 for your basic burger, you can charge $18. What's going to happen to your supply of basic burgers?

1. Your supply of burgers shifts to the right.
2. Your supply of burgers remains the same.
3. Your quantity supplied of burgers increases.
4. Your supply of burgers shifts to the left. Who's going to pay that much for a burger?

Practice Question (5 of 5)

You own and operate a trendy burger joint. You notice that instead of charging $15 for your basic burger, you can charge $18. What's going to happen to your supply of basic burgers?

1. Your supply of burgers shifts to the right.
2. Your supply of burgers remains the same.
3. Your quantity supplied of burgers increases. **CORRECT**
4. Your supply of burgers shifts to the left. Who's going to pay that much for a burger?

Discussion Question

- How are supply and demand similar?
- How are supply and demand different?

The Parallels Between Demand and Supply

	Demand	Supply
Your objective	Maximize economic surplus, which is the difference between the benefit you get and the price you pay.	Maximize profits, which is the difference between your revenues and your costs.
To decide on your quantity, follow the:	Rational Rule for Buyers: Buy one more item if the marginal benefit exceeds (or is equal to) the price.	Rational Rule for Sellers in Competitive Markets: Sell one more item if the price exceeds (or is equal to) the marginal cost.
Implying that:	Your demand curve is your marginal benefit curve.	Your supply curve is your marginal cost curve.
Curve slopes	Demand curves slope down. Because of diminishing marginal benefit.	Supply curves slope up. Because of increasing marginal cost.
The market	The market demand curve is the sum of the quantity each individual consumer demands, at each particular price.	The market supply curve is the sum of the quantity each individual business supplies, at each particular price.
A rise in price causes	A movement along the demand curve, reducing the quantity demanded.	A movement along the supply curve, raising the quantity supplied.
A fall in price causes	A movement along the demand curve, raising the quantity demanded.	A movement along the supply curve, reducing the quantity supplied.
Curves are shifted by	Shifts in demand curves are caused by changes in: • Income • Preferences • Prices of substitutes or complements • Expectations • Congestion or network effects • The type and number of consumers (shifts market demand only) . . . and not by a change in market price.	Shifts in supply curves are caused by changes in: • Input prices • Productivity and technology • Prices of substitutes-in-production and complements-in-production • Expectations • The type and number of sellers (shifts market supply only). . . and not by a change in market price.

Key Takeaways

- Individual supply is the quantity an individual is willing to sell at each price, holding everything else constant.
- Individual supply is determined using the core principles of marginal cost, cost-benefit, opportunity cost, and interdependence.
- Rational sellers produce the quantity at which price equals marginal cost. The market supply is the sum of individual supplies at each price.
- Changes in price lead to movements along the supply curve; changes in factors other than price shift the supply curve.