

# Lecture 6: Taxes, Price Controls, and Quantity Regulations

October 1, 2024

# Overview

1. Administrative Notes
2. Ripped from headlines
3. Chapter 6: Taxes, Price Controls, and Quantity Regulations
  - 3.1 How taxes and subsidies change market outcomes
  - 3.2 Price regulations
  - 3.3 Quantity regulations

## Course Administration

1. Ripped from Headlines sign-up
2. Before Lecture 7, you must turn in summary
3. Lecture 8 is the midterm
4. Grades should be up in Blackboard
5. Ch. 6 End-of-Chapter problems posted as an assignment with no due date
6. Problem Set 6 posted as an assignment

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7. Any other questions or outstanding issues?

# 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
Halle V.	Sawyer S.
Taryn G.	Samantha C.
Amanda K.	Sarah C.

Evening, individual presentation

Finder	Presenter
Lillien S.	Nathan D.

## Today: Chapter 6

1. How taxes and subsidies change market outcomes
2. Price regulations
3. Quantity regulations

## Today: Chapter 6

1. How taxes and subsidies change market outcomes
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How markets respond when government meddles with price or price responsiveness

# Ch. 6: 1. Taxes, Subsidies and Market Outcomes



## You Levy a Tax – Who Pays?

We levy taxes with all sorts of aims. Can policy deliver aims?

## You Levy a Tax – Who Pays?

We levy taxes with all sorts of aims. Can policy deliver aims?

Study the three rules of tax incidence

1. Statutory burden of tax  $\neq$  economic incidence of tax
2. Side of the market on which tax is imposed is irrelevant to distribution of tax burdens
3. Parties with inelastic supply or demand bear taxes

Framing taken from *Public Finance and Public Policy* by Jonathan Gruber

## Types of Taxation

- specific excise tax: per unit tax
- ad valorem tax: tax that is a fixed percentage of the sale price

We will present everything with a specific excise tax. Results are equally applicable to an ad valorem tax.

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### U.S. excise tax examples

- federal tax on bows, archery equipment and arrow shafts
- gasoline
- wine, varying by type, highest on “naturally sparkling”

## Key Phrases

Incidence  $\equiv$  who pays the tax, or who “bears the burden” of the tax.

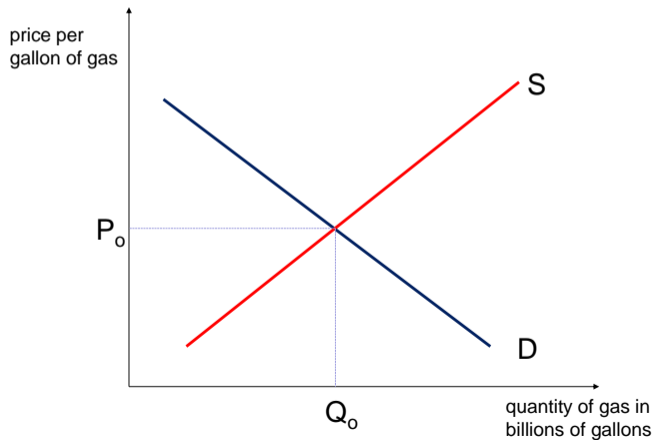
- Statutory incidence: determined by who pays the tax to the government
- Economic incidence: determined by whose economic resources change due to the tax

# Measurement of Incidence

- We measure incidence in price terms
- This assumes that changes in quantities are *de minimis*

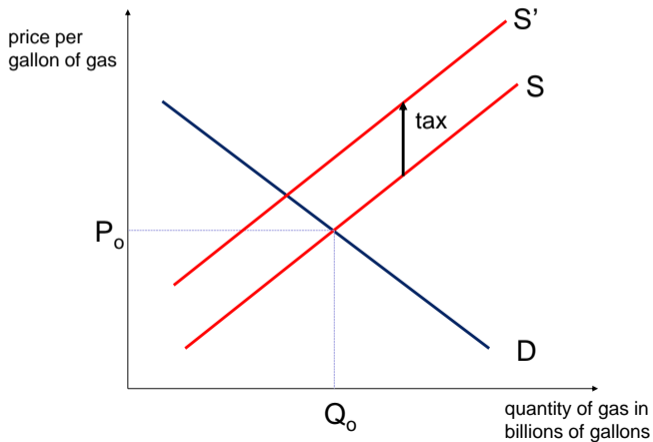
# 1. Statutory Incidence $\neq$ Economic Incidence

What Happens to Supply When you Levy a Tax on the Producer?



# 1. Statutory Incidence $\neq$ Economic Incidence

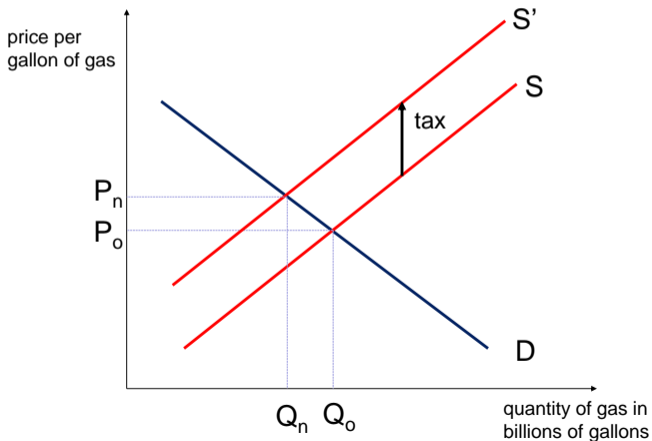
What Are the New Equilibrium Price and Quantity?





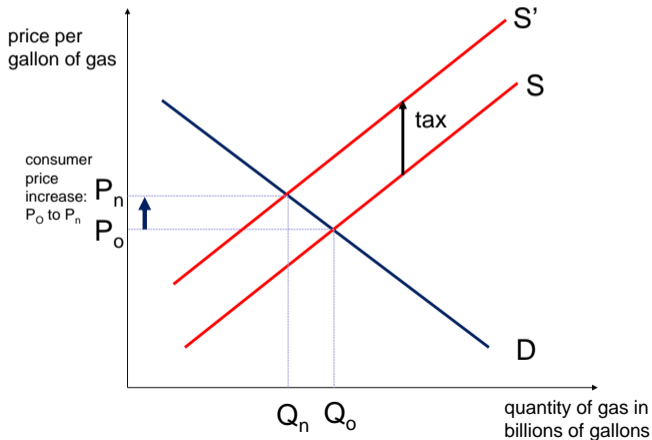
# 1. Statutory Incidence $\neq$ Economic Incidence

How Much Extra is the Consumer Paying?



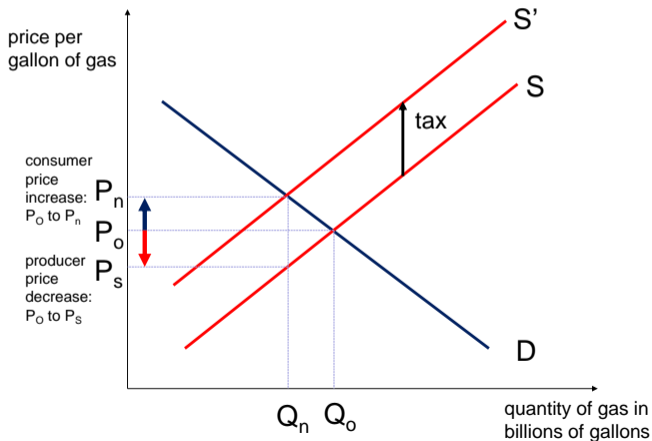
# 1. Statutory Incidence $\neq$ Economic Incidence

How Much Does the Producer Sell for? And What Does He Keep?



# 1. Statutory Incidence $\neq$ Economic Incidence

Producer and Consumer Share the Burden of the Tax



## Defining Tax Burdens

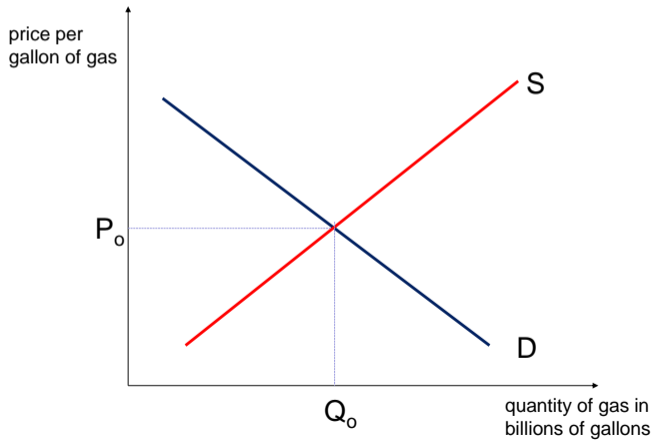
- a burden is a bad thing for producers or consumers
- burden is expressed as a positive number
- think of it as the net effect of positive and negative price changes from the tax
- from the producer and consumer viewpoint separately
- producer and consumer tax burden sum to the amount of the tax

## 2. Side of the Market on Which Tax is Imposed Irrelevant to Distribution of Tax Burden

- Suppose that the gasoline tax is levied on the consumer, not the producer
- This means you buy some gas and send a check to the government

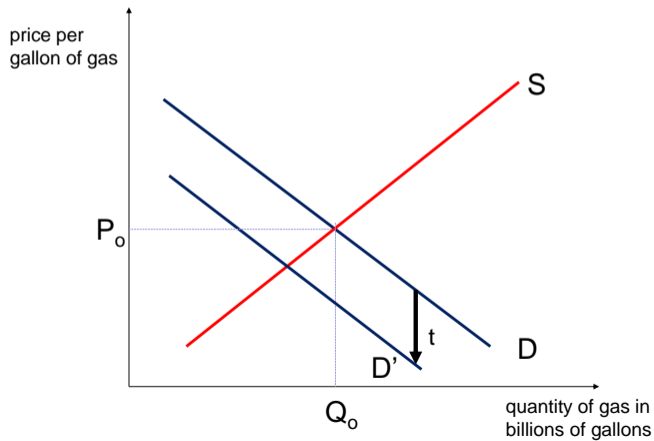
# Consumer Pays Tax

What Happens When you Levy a Tax on the Consumer?



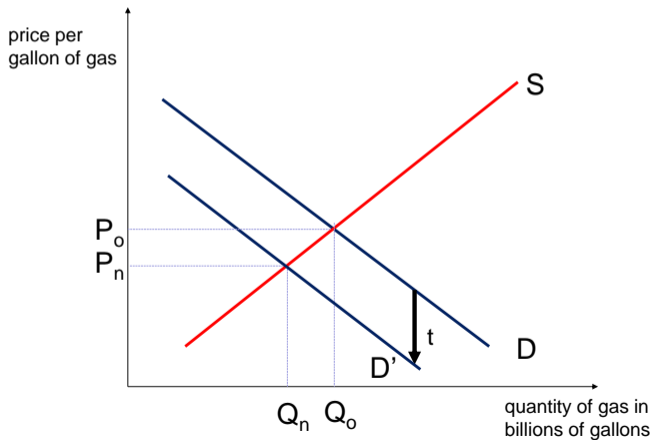
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# Consumer Pays Tax

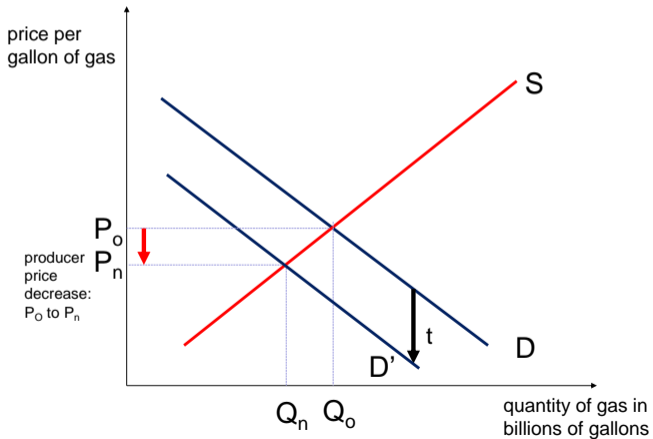
How Much Lower Price Does the Producer Suffer?





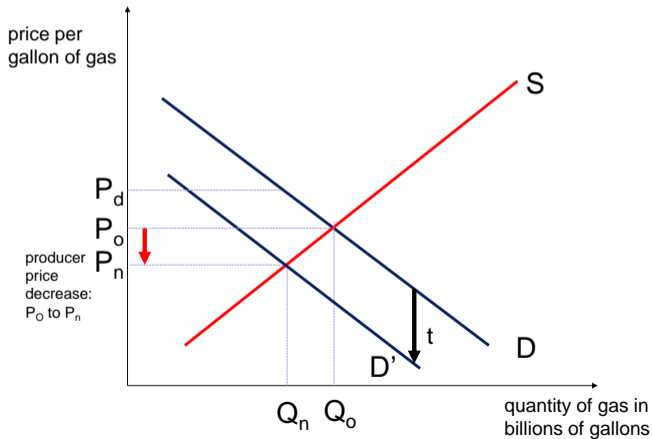
# Consumer Pays Tax

How Much Does the Consumer Pay?



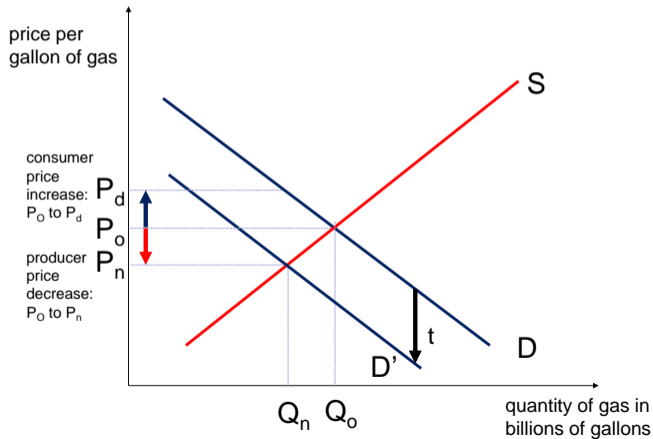
# Consumer Pays Tax

Is the Consumer Better or Worse Off?



# Consumer Pays Tax

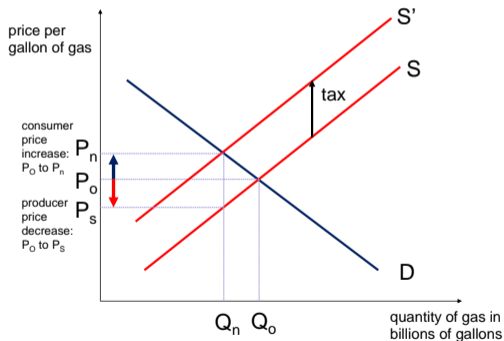
Producer and Consumer Share the Burden of the Tax



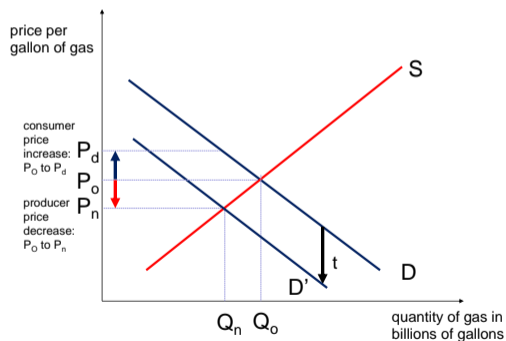
# Visual Comparison of Incidence

Statutory incidence falls on

Producers



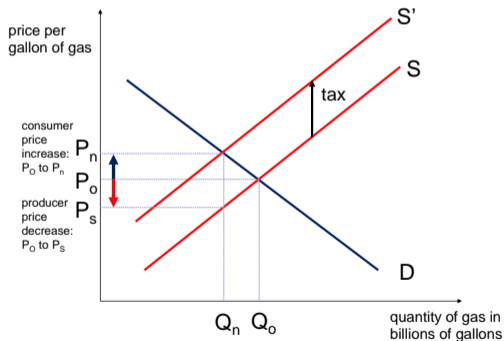
Consumers



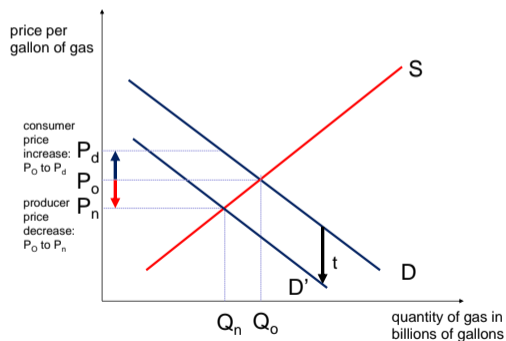
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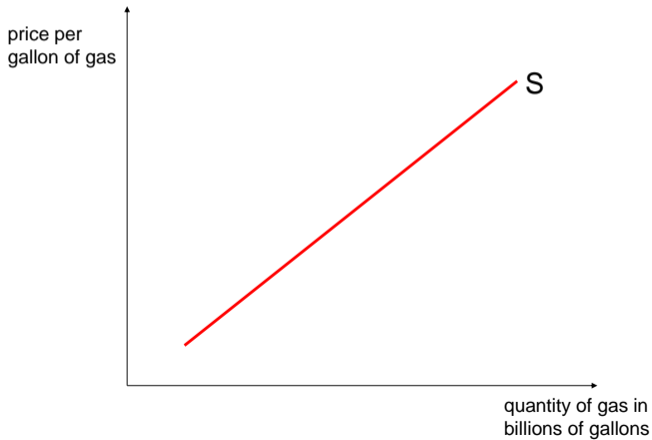
Economic incidence is the same, regardless of statutory incidence!

### 3. Inelastic Party Bears Tax Burden

- Return to statutory tax burden levied on producers
- Consider inelastic demand
- Consider elastic demand

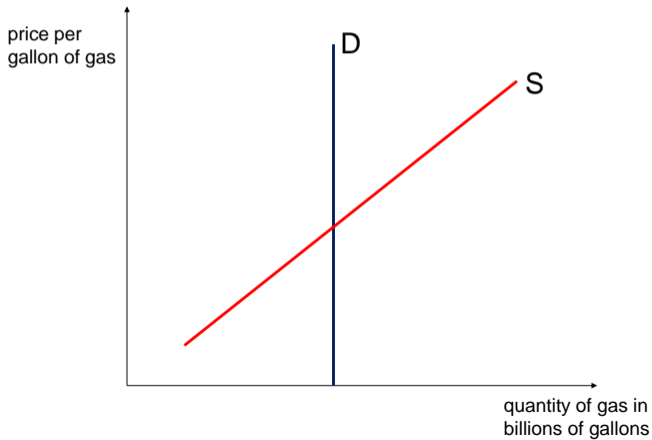
# Inelastic Demand

What Does Inelastic Demand Look Like?



# Inelastic Demand

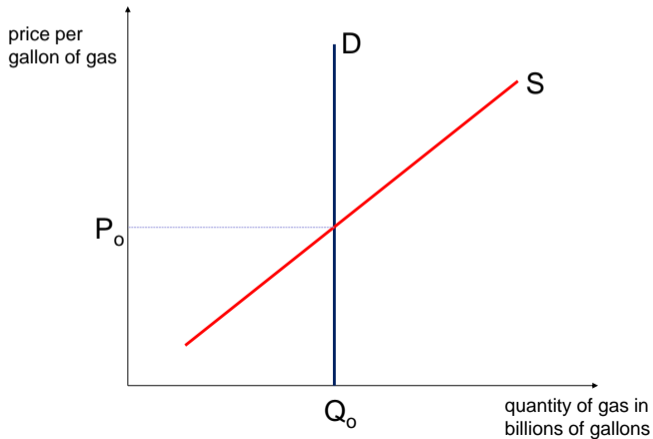
What is the Original Equilibrium  $P$  and  $Q$ ?





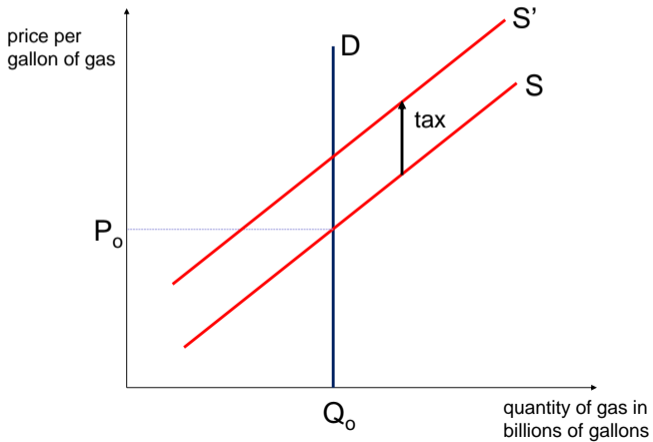
# Inelastic Demand

How Does the Tax Shift Production?



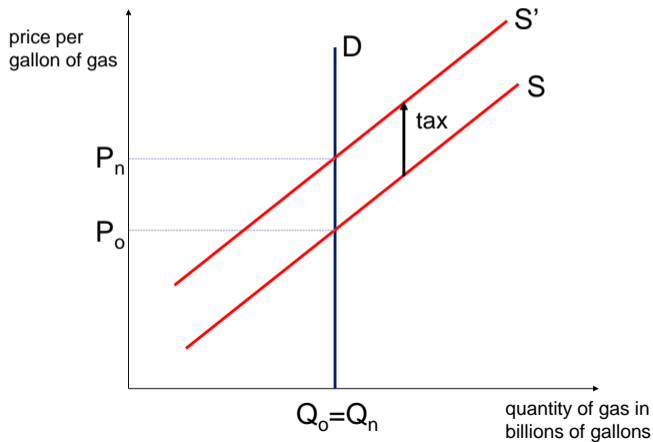
# Inelastic Demand

What Are the New Equilibrium  $P$  and  $Q$ ?



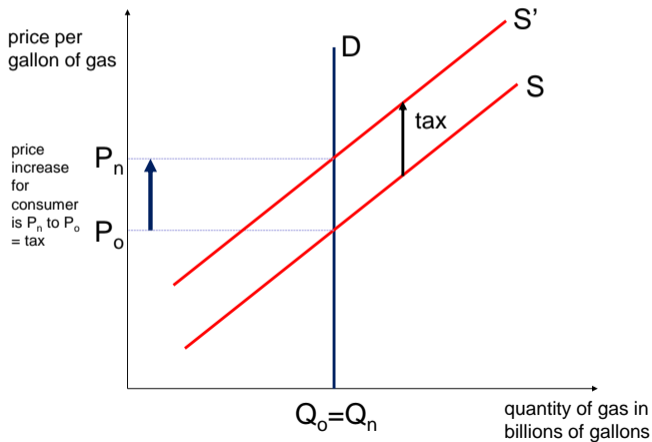
# Inelastic Demand

How Do Things Change for the Consumer?



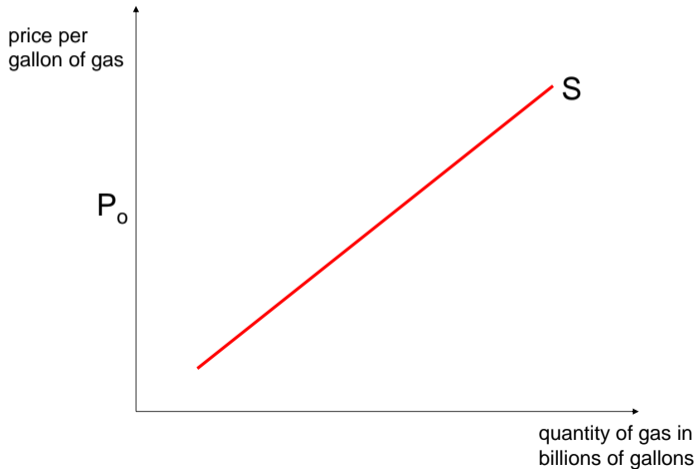
# Inelastic Demand

Consumer Cannot Run Away From Tax



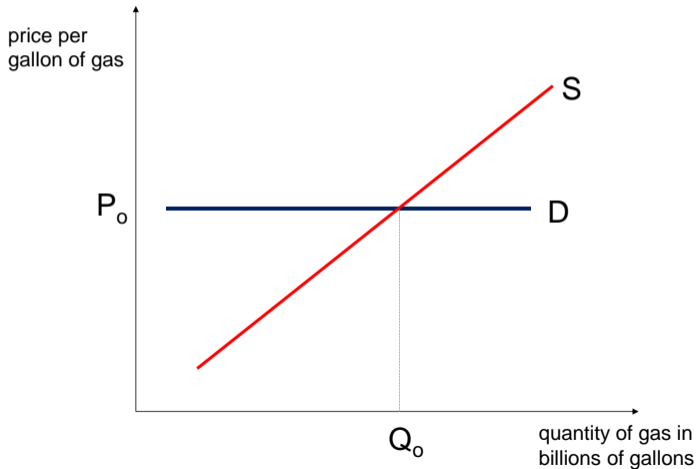
# Elastic Demand

What Does Elastic Demand Look Like?



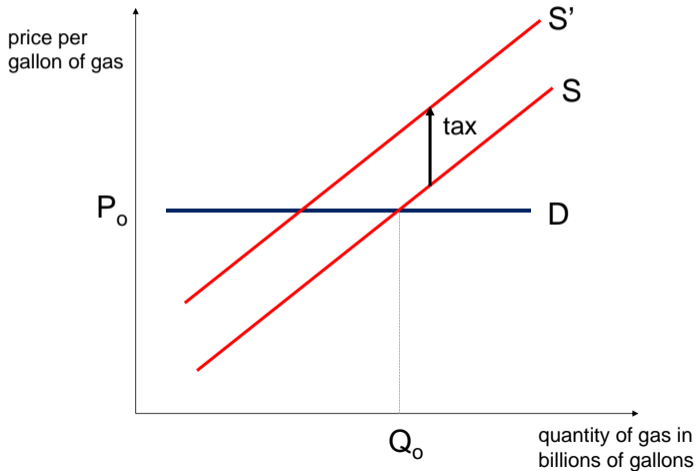
# Elastic Demand

How Does Tax on Producer Shift Supply?



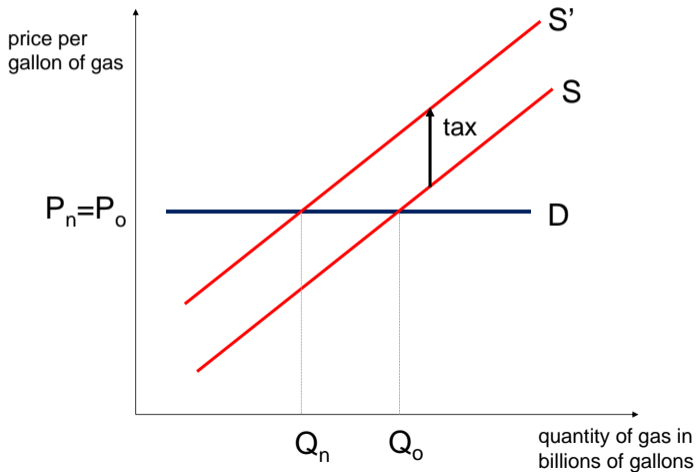
# Elastic Demand

What are the New Equilibrium  $P$  and  $Q$ ?



# Elastic Demand

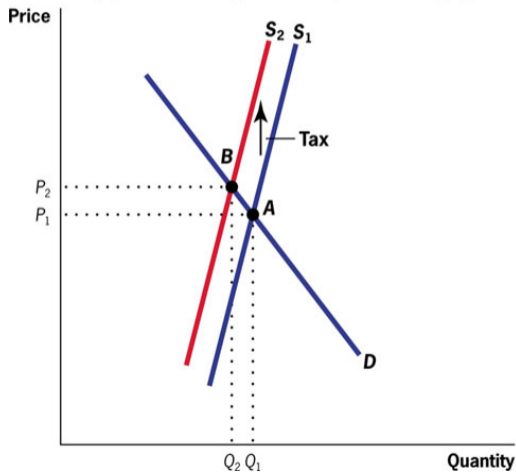
Producer Bears Entire Burden



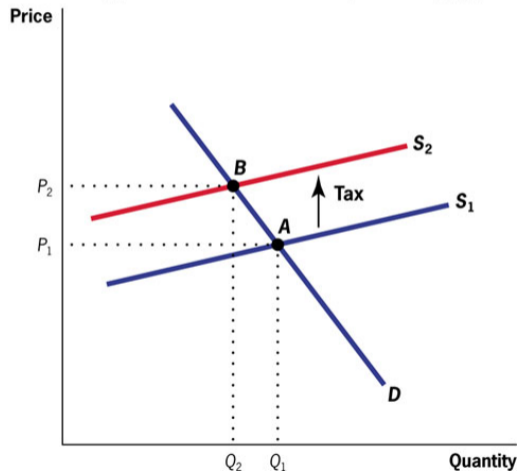


## And the Same is True for Supply

(a) Tax on steel producers (inelastic supply)



(b) Tax on sidewalk vendors (elastic supply)



## Bottom Line: More Elastic Party Pays Less of the Tax

- The more you can run away from a tax, the less of it you need to pay
- Elasticity is a measure of how much you can substitute away from a price change

# Ch. 6: 2. Price Regulation

# Price Regulations

## Two Flavors

1. Price Ceiling  $\equiv$  a regulated “highest lawful price for a good or service”
2. Price Floor  $\equiv$  a regulated “lowest lawful price for a good or service”

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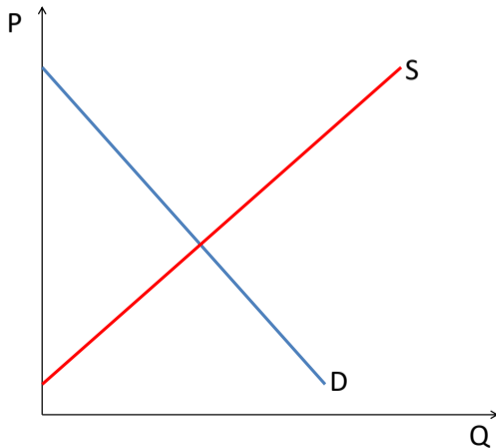
### Bottom line

- Price regulations distort market outcomes
- Some trades that would occur in equilibrium do not occur

# 1. Price Ceilings: Regulation forces $P_{ceiling} < P_{market}$

Where are equilibrium price and quantity?

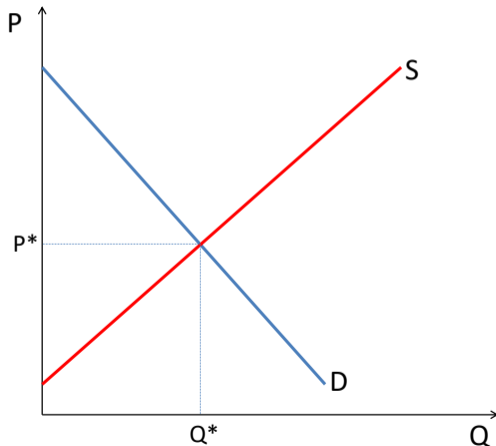
- what happens to price and quantity?
- any follow-on implications?



# 1. Price Ceilings: Regulation forces $P_{ceiling} < P_{market}$

Where should we draw price ceiling?

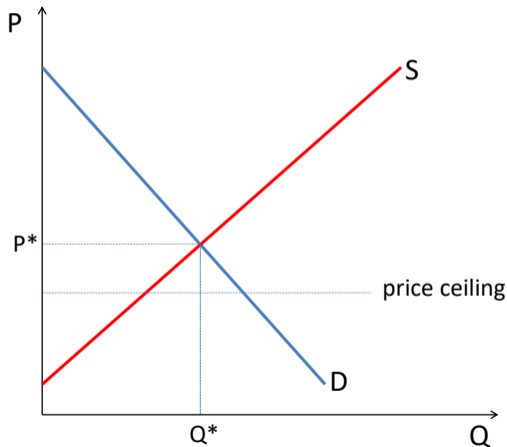
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# 1. Price Ceilings: Regulation forces $P_{ceiling} < P_{market}$

What do consumers and producers want to do?

- what happens to price and quantity?
- any follow-on implications?

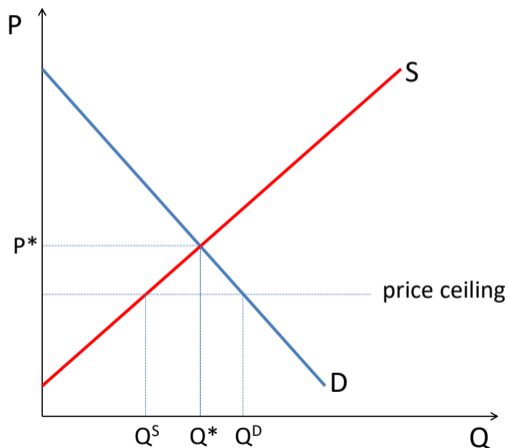




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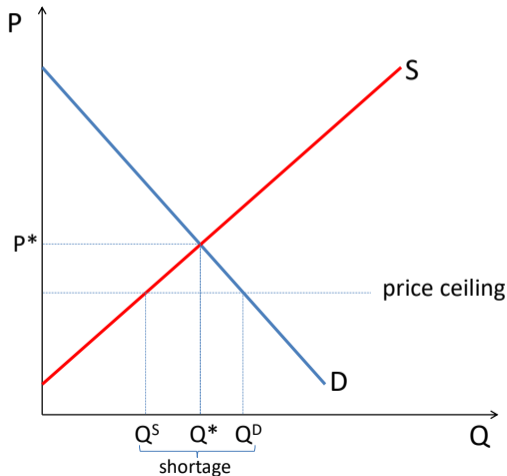
How do we describe this situation?

- what happens to price and quantity?
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# 1. Price Ceilings: Regulation forces $P_{ceiling} < P_{market}$

Shortage!



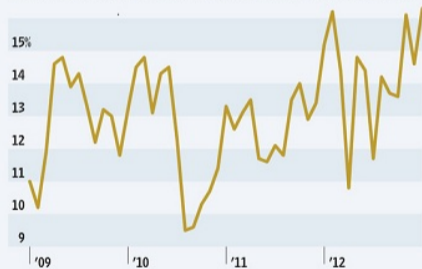
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# Should be Quite Clear to Venezuelans

Venezuelan Presidents Chavez and Maduro Respond to Inflation with Price Ceilings

## Running Low

The Venezuelan Central Bank's Scarcity Index, which measures the percentage of food and household goods missing from store shelves



The Wall Street Journal

## Policy Aside: Other Price Ceiling Examples

- Cottage cheese in Israel
  - in 2011, government removed price ceiling and prices spiked, leading to a revolt and a return of a ceiling
- Corn tortillas in Mexico
  - ceiling lifted in 1999, reimposed in 2007 amid soaring corn prices
- Other favorite examples?

## 2. Price Floors: Regulation forces $P_{\text{floor}} > P^*$

- Generally rarer than price ceilings
- Examples?

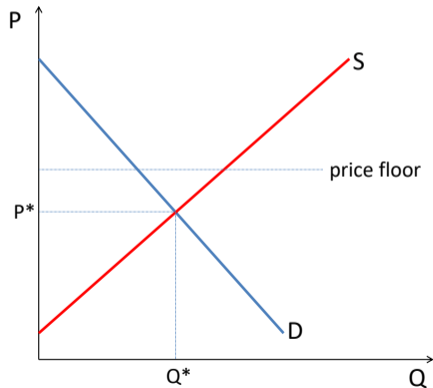
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- Generally rarer than price ceilings
- Examples?
  - minimum wage
  - alcohol in Scotland
  - gas in Shanghai
  - quite hard to come up with other good examples!

## 2. Price Floors: Regulation forces $P_{\text{floor}} > P^*$

What do consumers and producers want to do at this price?

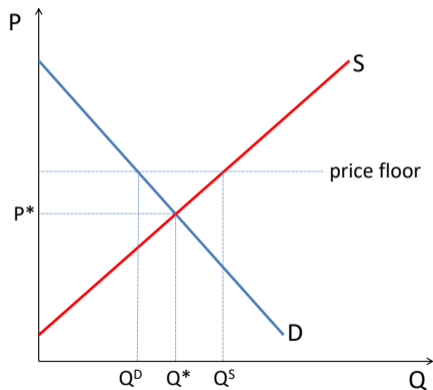
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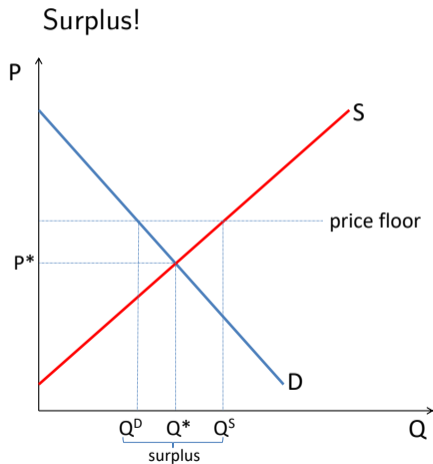
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# Ch. 5: 3. Quantity Regulation

# Quota is a Quantity Regulation

## Examples

- Taxis in NYC – destroyed by Uber
- Limits on opioid prescription
- Minimum lot size regulations limit housing production
- Maximum number of new doctors per year by US government
- Obama White House **report** on the perils of occupational licensing
- Many more in textbook....

## Quota is a Quantity Regulation

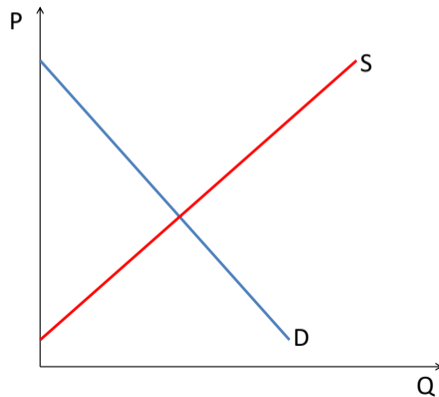
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Government regulations almost always limit quantity supplied. Without a purchase guarantee, producers never want to make more than the equilibrium quantity.

## 2. Quota: Regulation forces $Q$ above or below $Q^*$

Where are equilibrium price and quantity?

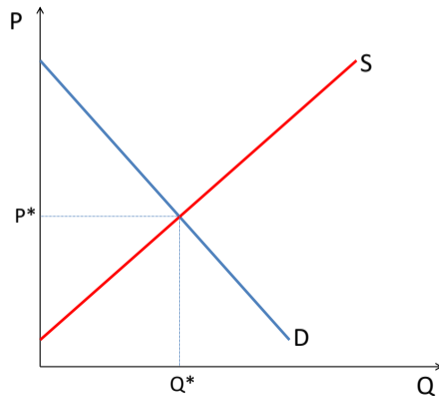


- what happens to price and quantity?
- any follow-on implications?

## 2. Quota: Regulation forces $Q$ above or below $Q^*$

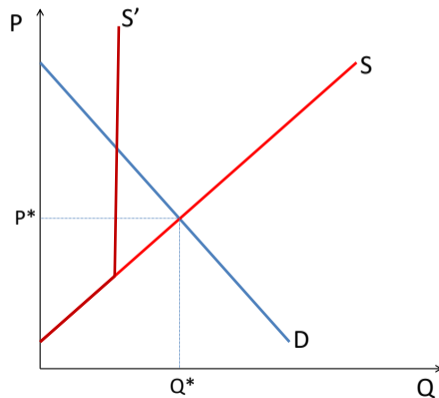
Where should we draw supply curve with quota?

- what happens to price and quantity?
- any follow-on implications?



## 2. Quota: Regulation forces $Q$ above or below $Q^*$

What is the new equilibrium price?

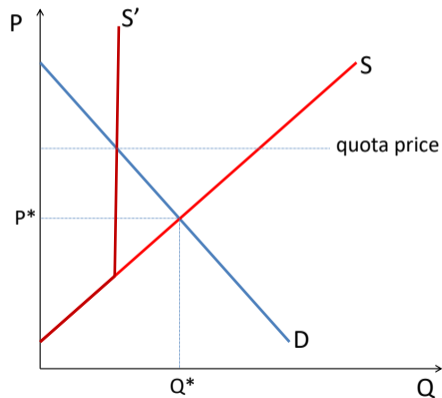


- what happens to price and quantity?
- any follow-on implications?

## 2. Quota: Regulation forces $Q$ above or below $Q^*$

And the new equilibrium quantity?

- what happens to price and quantity?
- any follow-on implications?

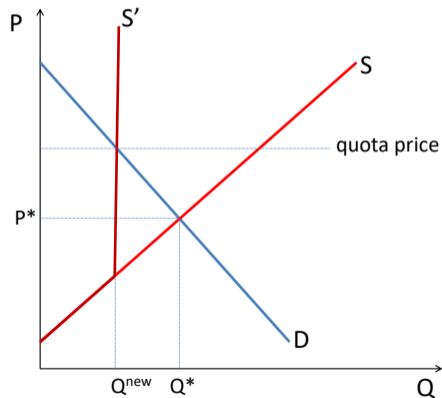




## 2. Quota: Regulation forces $Q$ above or below $Q^*$

Helps a limited number of sellers

- what happens to price and quantity?
- any follow-on implications?



## Price vs Quantity Regulations

- Ask if the policy is binding
  - is the minimum price above equilibrium price? yes → binding
  - is the maximum price below equilibrium price? yes → binding
  - is the minimum quantity above equilibrium quantity? yes → binding
  - is the maximum quantity below equilibrium quantity? yes → binding
- Find prices and quantities with tax or regulation
- Compare to regulated decisions of suppliers and demanders to market outcomes

# Recap

## What We Did

- Considered tax incidence
  - Understand who bears the incidence of the tax
  - Role of elasticity and tax incidence
  - Considerations for running away from tax
- Price regulations
  - price ceilings
  - price floors
- Quantity regulations

## For Next Class

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I will

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