# Lecture 3

Supply, demand and government policies

Dr. Anna Kowalska-Pyzalska
Department of Operations Research (W-8)

Presentation is based on:
http://www.swlearning.com/economics/mankiw/mankiw3e/powerpoint_micro.html

## Key concepts

- Price ceiling
- Price floor
- Tax incidence…

## Supply, Demand, and Government Policies

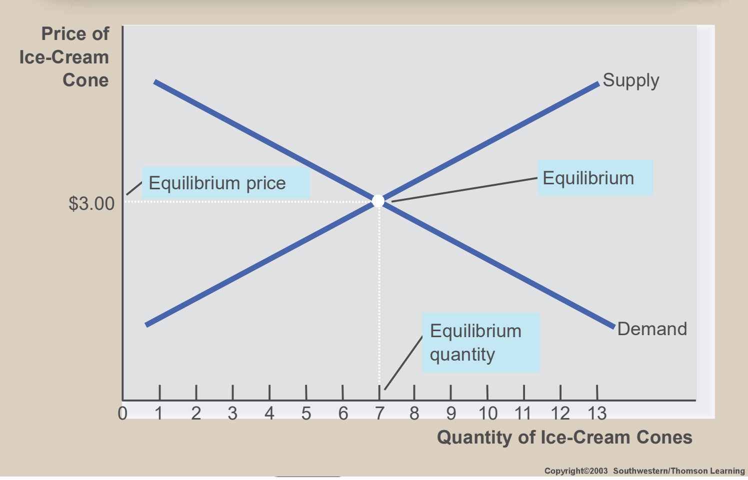
- In a free, unregulated market system, market forces establish equilibrium prices and exchange quantities.
- While equilibrium conditions may be efficient, it may be true that not everyone is satisfied.

## Control of prices…

- Are usually enacted when policymakers believe the market price is unfair to buyers or sellers.
- Result in government-created price ceilings and floors.




## Fig.1 The Equilibrium of Supply and Demand




## Whose lobbying is better?

- American Association of Ice Cream Eaters complains that the 3$ price is too high for everyone to enjoy a cone a day….
- National Organization of Ice Cream Makers complains that the 3$ price is depressing the incomes of its members…
- Each of these groups lobbies the government to pass laws that alter the market outcome by directly controlling prices.

# CONTROLS ON PRICES

*If the **sellers** lobbying is successful, the government imposes a **price floor** (min. legal price)*

*Price Floor: a legal minimum on the price at which a good can be sold.*

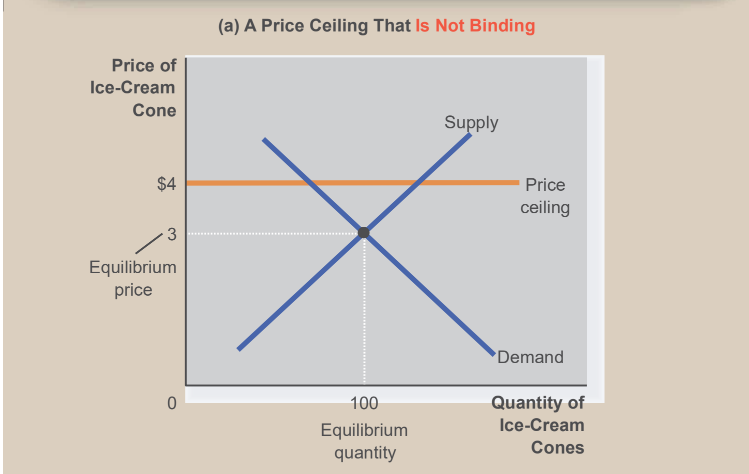
*It the **buyers** lobbying is successful ,the government imposes a **price ceiling** (max. legal price )*

*Price Ceiling: a legal maximum on the price at which a good can be sold.*

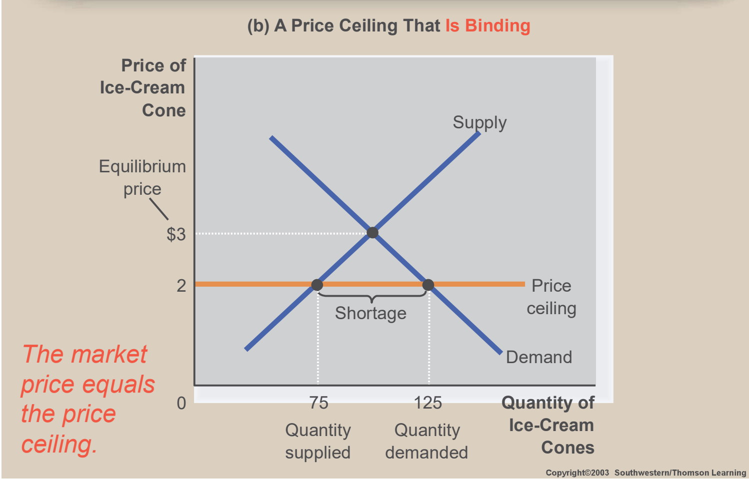
# How Price Ceilings Affect Market Outcomes

- Two outcomes are possible when the government imposes a price ceiling:
  - The price ceiling *is not* binding if set *above* the equilibrium price.
  - The price ceiling *is* binding if set *below* the equilibrium price, leading to a shortage.

## Fig. 2. A Market with a Price Ceiling




## Fig. 3 A Market with a Price Ceiling




Copyright©2003 Southwestern/Thomson Learning

# What happens next?

- When a shortage of Ice-cream develops because of price ceiling, some mechanism for rationing ice cream will naturally develop:
  - Long lines
  - Rationing ice-cream based on personal biases…

*Not all buyers benefit from this policy….*

# Conclusion

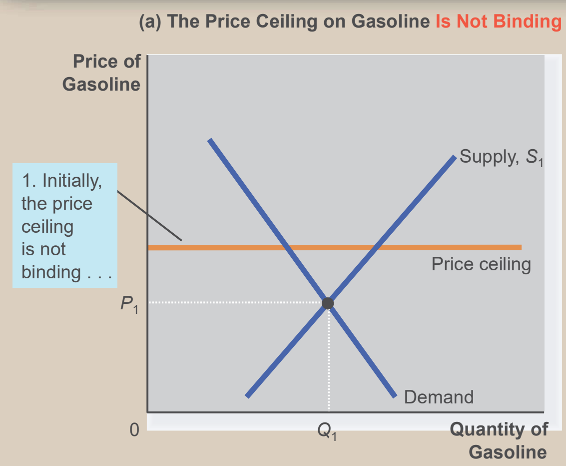
- When the governemnt imposes a binding price ceiling on a competitive market, a shortage of the good arises.
- Sellers must ration the scare good among the large number of potential buyers:
  - Dicrimination
  - Potentially unfair
  - Waste of buyers' time…

*Free markets ration good with prices…*

## CASE STUDY: Lines at the Gas Pump

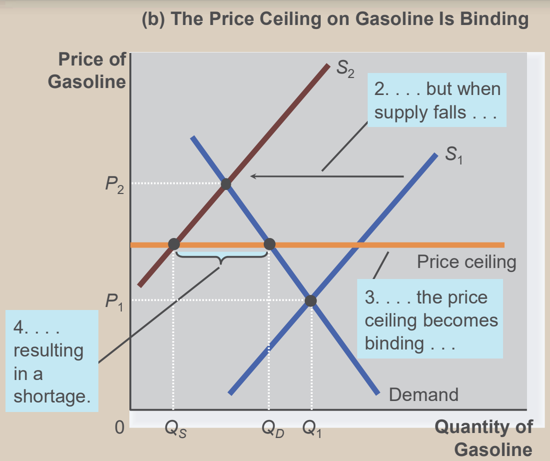
- In 1973, OPEC raised the price of crude oil in world markets.
- Crude oil is the major input in gasoline, so the higher oil prices reduced the supply of gasoline.
- What was responsible for the long gas lines?
- *Economists blame government regulations that limited the price oil companies could charge for gasoline.*

## Fig. 4. The Market for Gasoline with a Price Ceiling




Copyright©2003 Southwestern/Thomson Learning

## Fig. 5. The Market for Gasoline with a Price Ceiling



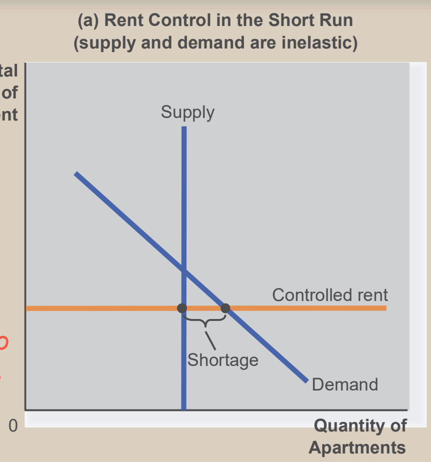

Copyright©2003 Southwestern/Thomson Learning

## CASE STUDY: Rent Control in the Short Run and Long Run

- Rent controls are ceilings placed on the rents that landlords may charge their tenants.
- The goal of rent control policy is to help the poor by making housing more affordable.
- One economist called rent control "the best way to destroy a city, other than bombing."

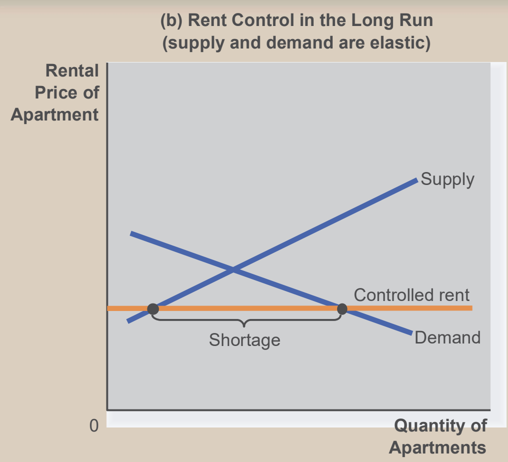

## Fig. 6. Rent Control in the Short Run and in the Long Run

*The primary effect in the short run is to reduce rents.*




Copyright©2003 Southwestern/Thomson Learning

## Fig. 7. Rent Control in the Short Run and in the Long Run




Copyright©2003 Southwestern/Thomson Learning

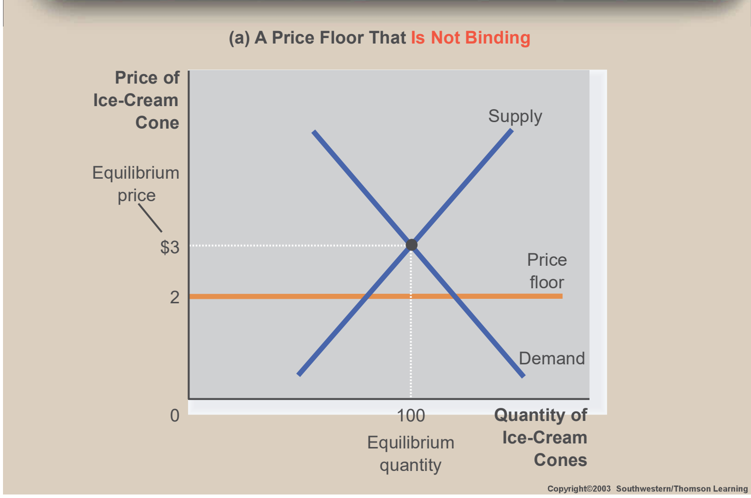
## Conclusions


- In cities with rent control, landlords use various mechanisms to ration housing:
  - They keep long waiting lists
  - Give preferences to the families with children
  - Discriminate on the basis of race
  - Some people are forced to give bribes…
- In a free market the price of housing adjusts to eliminate the shortages that give rise to undesirable landlord behavior.

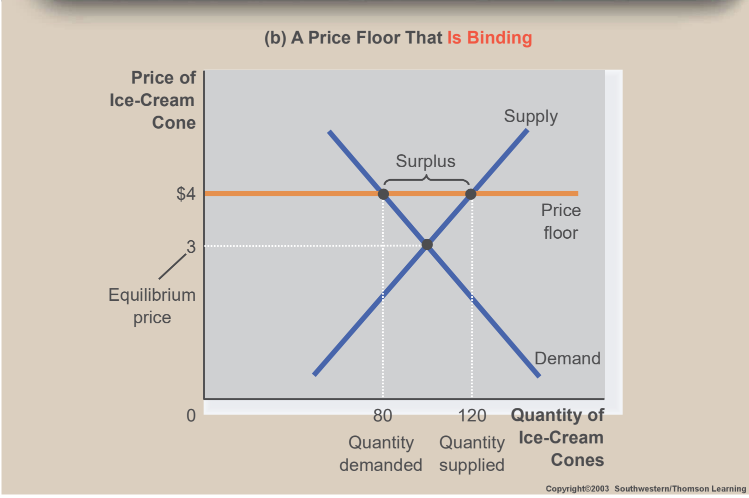
## How Price Floors Affect Market Outcomes

- When the government imposes a price floor, two outcomes are possible:
  - The price floor *is not* binding if set *below* the equilibrium price.
  - The price floor *is* binding if set *above* the equilibrium price, leading to a surplus.

## Fig. 8. A Market with a Price Floor




## Fig. 9. A Market with a Price Floor




## Example

- The government has decided that the free-market price of cheese is too low.
- Suppose the government imposes a binding **price floor** cheese market. Use the supply-and-demand diagram to show the effect of this policy on the price of cheese and the quantity of cheese sold. Is there a shortage or surplus of cheese?
- Farmers complain that the price floor has reduced their total revenue. Is this possible? Explain.
- In response to farmer's complaints, the government agrees to purchase all of the surplus cheese at the price floor. Compared to the basic price floor, who benefits from this new policy Who loses?

## Examples

- In 2011 in Belarus the government has imposed price ceilings in the bread and milk markets.
- In Ghana the government has imposed the price floor for cacao-grains bought from the farmers.
- In 2015 the project of price floor for alcohol in EU, suspended by EC
- In 2010 the price floor for imported strawberries from China
- The price floor for alcohol in Russia…

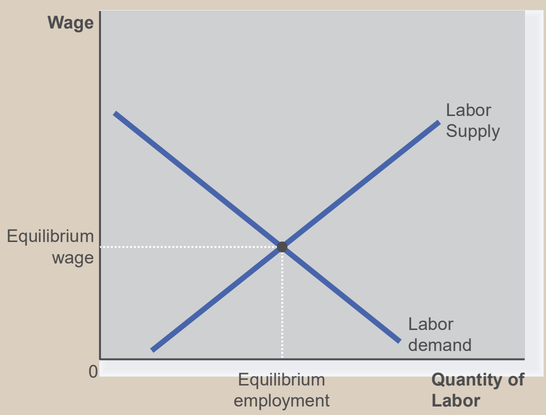
## How Price Floors Affect Market Outcomes

- A price floor prevents supply and demand from moving toward the equilibrium price and quantity.
- When the market price hits the floor, it can fall no further, and the market price equals the floor price.

## Example: the minimum wage

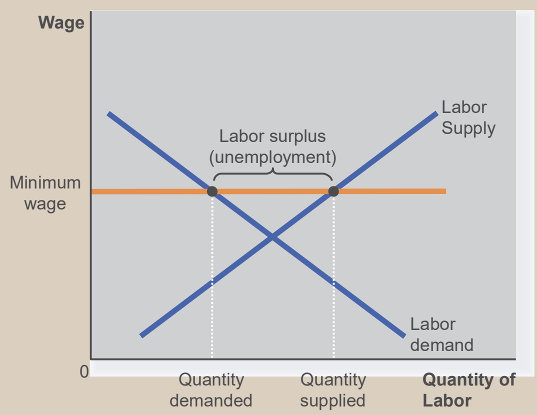
- An important example of a price floor is the minimum wage.
- Minimum wage laws dictate the lowest price possible for labor that any employer may pay.

## Fig. 10. How the Minimum Wage Affects the Labor Market



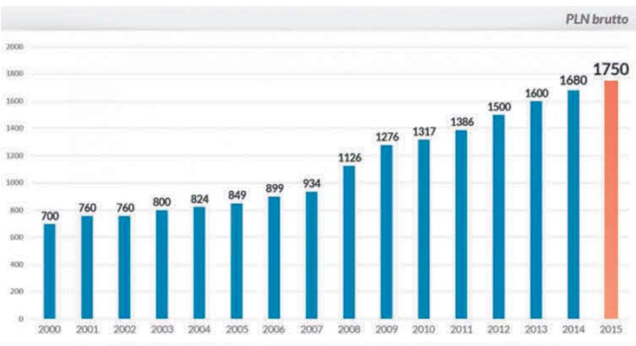

Copyright©2003 Southwestern/Thomson Learning

## Fig. 11. How the Minimum Wage Affects the Labor Market

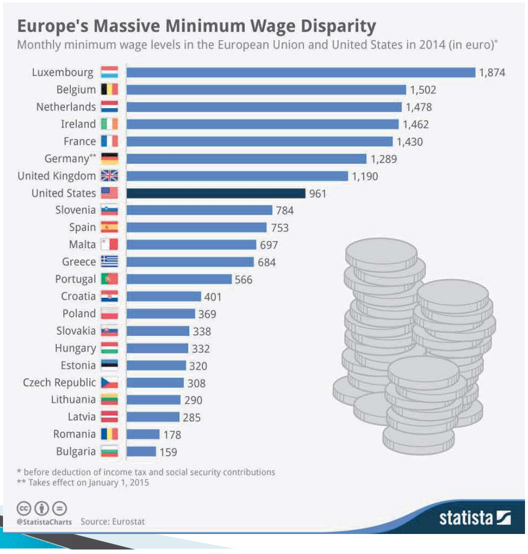


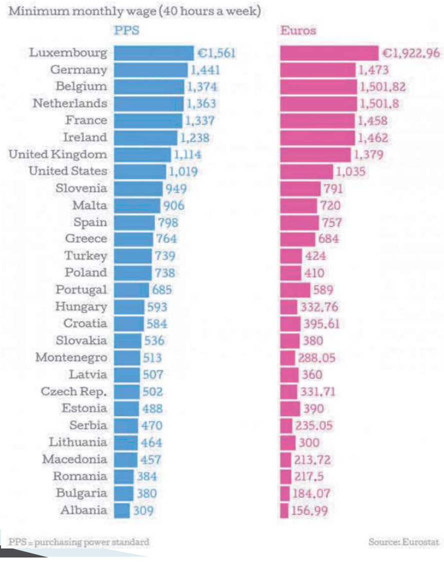

Copyright©2003 Southwestern/Thomson Learning

## Minimum wage in Poland




*http://www.tradingeconomics.com/poland/minimum-wages*





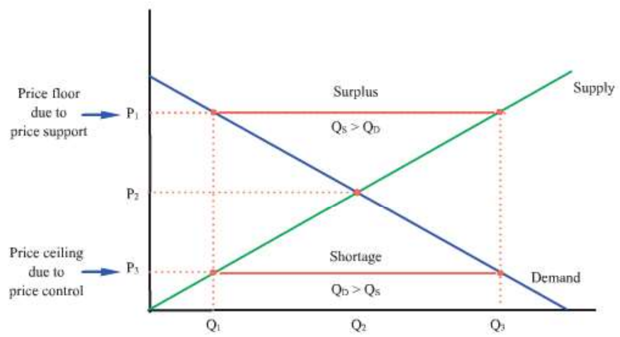

# Impact of minimum wage

- Minimum wage has its gratest impact on the market for teenage labor…
- Studies show that a 10% increase in the minimum wage depresses teenage employment between 1 and 3%.
- Minimum wage increases the number of teenagers who choose to look for jobs.

# Minimum wage: conclusions

- Some policymakers assume that a minimum wage raises the income of working poor.
- Oponents note that a high minimum wage:
  - Causes unemployment
  - Encourages teenagers to drop out of school
  - Prevents some unskilled workers from getting the on-the-job training they need
  - Is a poorly targeted policy (not all minimum-wage workers are heads of households; rest of them are teenagers working at part-time jobs)

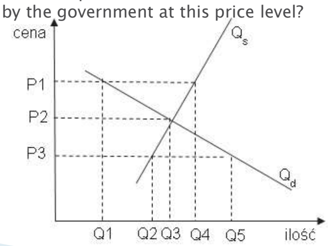
# Price floor versus price control




# Example

The supply-and-demand diagram below presents the market for eggs. Suppose the government decides to protect the producers and impose the **price floor**. The unsold amount of eggs (surplus) is bought up by the government for the agreed price.

- What would be the market price and the quantity if the government didn't impose the price floor?
- What would be the market price if the price floor were on the level of P1? Is it binding? What would be the quantity demanded at the price P1?
- How many eggs would have to been bought up by the government at this price level?
- What would be the market price if the price floor were on the level of P3? Is it binding? What would be the quantity demanded at the price P3?
- How many eggs would have to be bought up by the government at this price level?




# Conclusions of price controls

- When policymakers set prices by legal decree, they obscure the signals that normally guide the allocation of scarce resources.
- Policymakers are led to control prices because they view the market's coutcome to be unfair.
- The price controls often hurt those they are trying to help.
- Other solutions: paying a fraction of the rent for poor families, wage subsidies may raise living standards without discouraging firms from hiring workers.

Taxes…

# TAXES

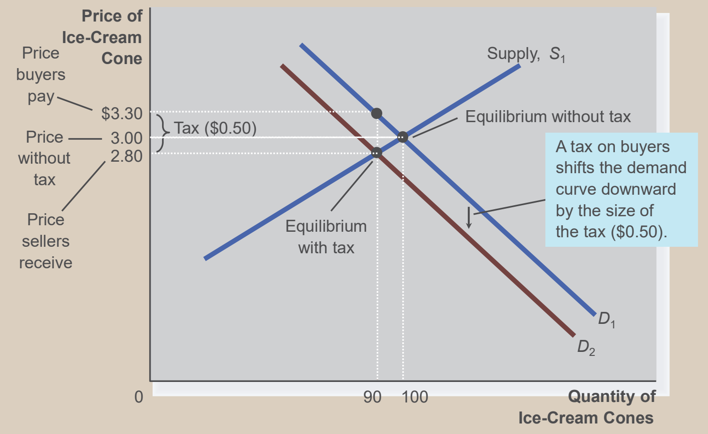
- Governments levy taxes to raise revenue for public projects.
- Let's suppose that a local governemnet decides to place a $0.50 tax on the sale of ice-cream cones….
- Both lobbying groups representing sellers and buyers argue who should pay the tax.

*When the government levies a tax on a good, who bears the burden of the tax?*

## Elasticity and tax incidence

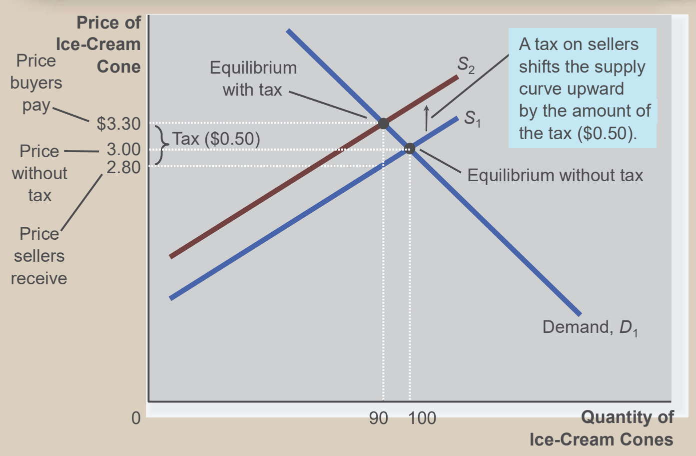
*Tax incidence is the manner in which the burden of a tax is shared among participants in a market.*

## Fig. 12. A Tax on Buyers




Copyright©2003 Southwestern/Thomson Learning

## Fig. 13. A Tax on Sellers




Copyright©2003 Southwestern/Thomson Learning

## How Taxes on Buyers and Sellers Affect Market Outcomes

- Taxes discourage market activity.
- When a good is taxed, the quantity sold is smaller.
- Tax makes sellers and buyers worse off.
- Buyers and sellers share the tax burden.

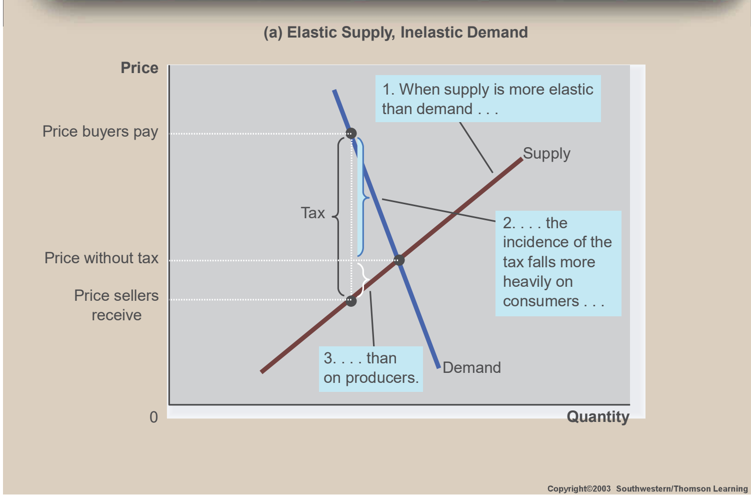
## Tax Incidence

- Tax incidence is the study of who bears the burden of a tax.
- Taxes result in a change in market equilibrium.
- Buyers pay more and sellers receive less, regardless of whom the tax is levied on.

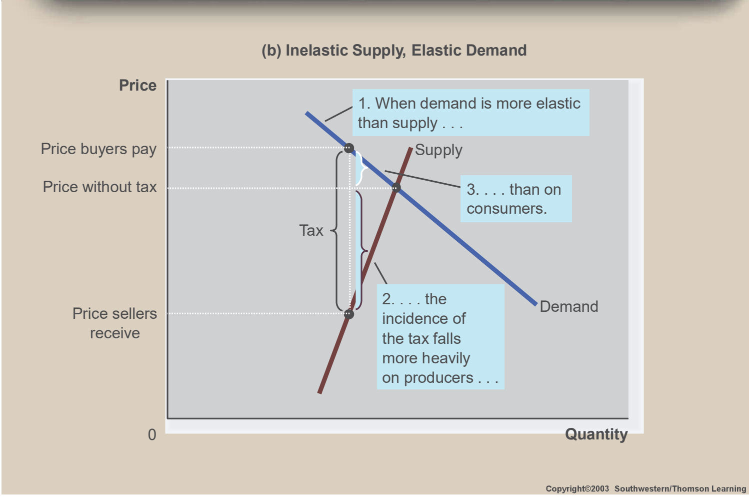
## Elasticity and tax incidence

- When a good is taxed Buyers and Sellers of the good share the burden of the tax.
- But how exactly is the tax burden divided?
- How do the effects of taxes on sellers compare to those levied on buyers?
- The answers to these questions depend on the elasticity of demand and the elasticity of supply.

## Fig. 14. How the Burden of a Tax Is Divided



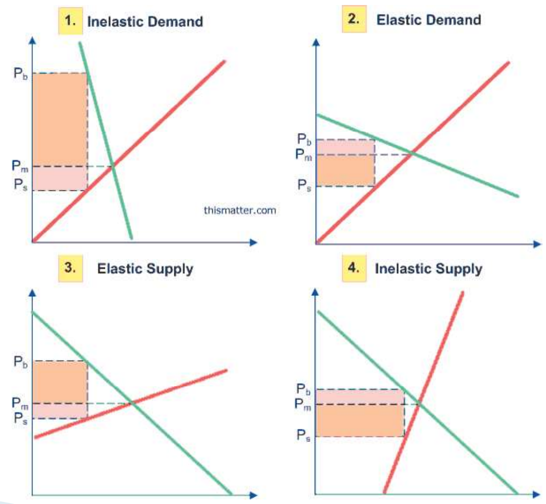

## Fig. 15. How the Burden of a Tax Is Divided

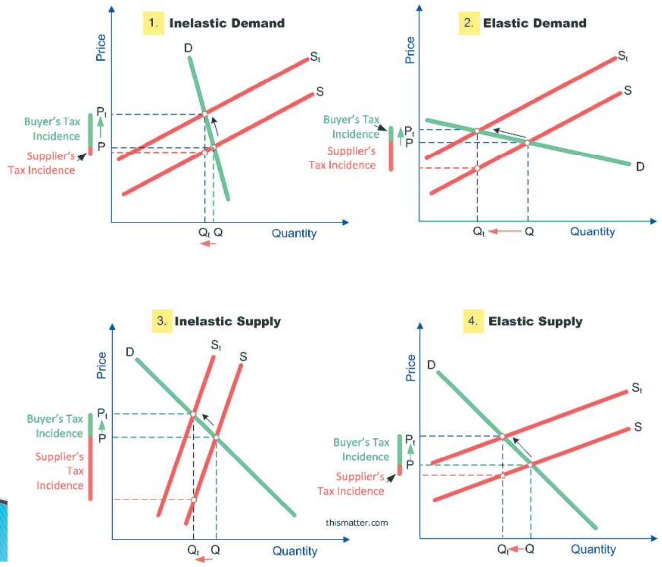



# Elasticity and tax incidence

So, how is the burden of the tax divided?

- The burden of a tax falls more heavily on the side of the market that is less elastic.






## Case study: who pays the luxury tax (in U.S. 1990–1993)?

- The goal of tax was to raise revenue from those who could afford to buy luxury goods.
- The demand for luxury goods is elastic.
- The supply of luxury goods is inelastic…

## Example

Supply and demand curves are described by the following equations respectively: $Qs=P-2$ and $Qd=-P+12$, where P is the price, Qd is demand curve, Qs is supply curve. A tax equal to 2 has been levied on buyers.

- Show on the graph the impact of the tax on the demand and supply.
- What was the equilibrium quantity before and after the tax was levied?
- What are the budget incomes from this tax?

## Example

- Congress and the president decide that the U.S. should reduce air pollution by reducing the use of gasoline. They impose a $0.50 tax for each gallon of gasoline sold.
- Should they impose this tax on producers or consumers? Explain using a supply-and-demand diagram.
- If the demand for gasoline were more elastic, would this tax be more effective or less effective in reducing the quantity of gasoline consumed? Explain using the diagram.
- Are consumers of gasoline helped or hurt by tax? Why?
- Are workers in the oil industry helped or hurt by this tax? Why?

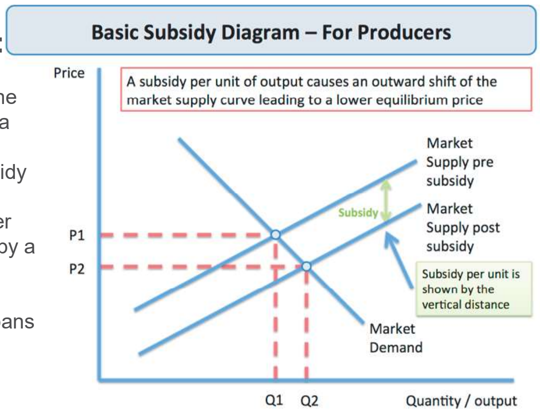

## Subsidies

- State subsidies are financed from general taxation or by borrowing
- The subsidy causes the firm's **supply curve to shift to the right**
- The amount spent on the subsidy is equal to the subsidy per unit multiplied by total output
- A **direct subsidy** to the consumer has the effect of boosting demand i.e. an outward shift of demand

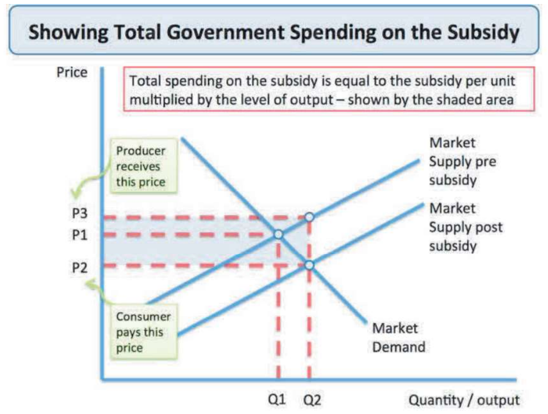
## Subsidies

**Examples:**

- A guaranteed payment on the factor cost of a product
- An input subsidy
- Government grants to cover losses made by a business
- Financial assistance (loans and grants)




## Subsidies

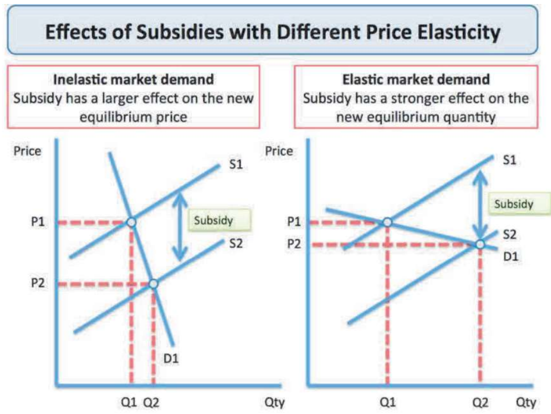



## Elasticity matters…

- To what extent will a subsidy feed through to lower prices for consumers?
- This depends on **price elasticity of demand**. The more inelastic the demand curve the greater the consumer's gain from a subsidy.
- Indeed when demand is perfectly inelastic the consumer gains most of the benefit from the subsidy since all the subsidy is passed onto the consumer through a lower price.

## Elasticity matters…

When demand is relatively price elastic, the main effect of the subsidy is to increase the equilibrium quantity traded rather than lead to a much lower market price.





## Summary

- https://www.youtube.com/watch?v=1GviwAknP08
- https://www.youtube.com/watch?v=1H5uU_6Ax_4