

PART 2

How Markets Function

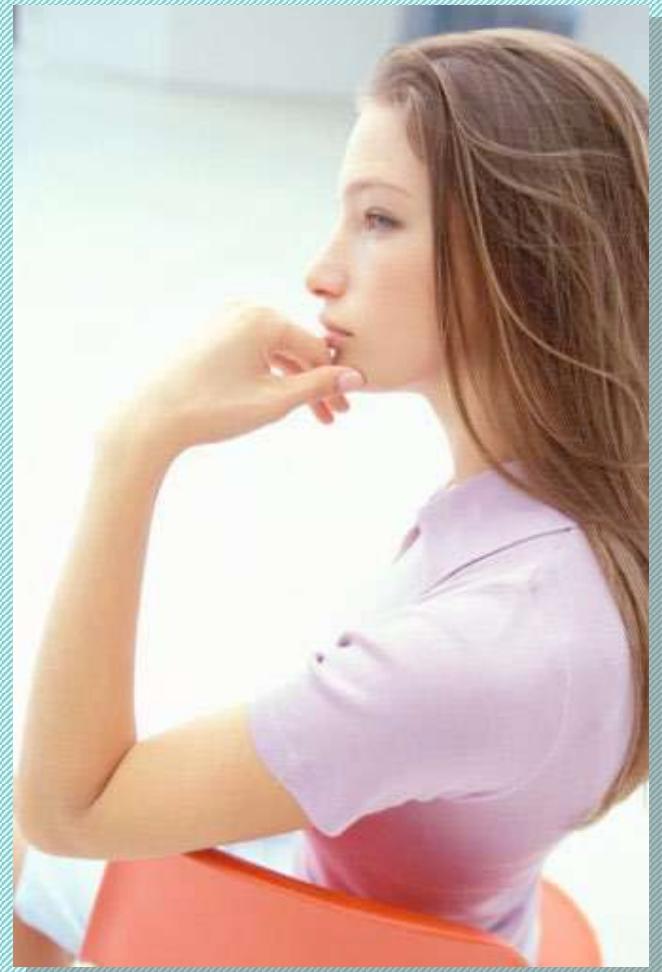
PRINCIPLES OF

Microeconomics

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Chapter 8: Supply, Demand, and Government Policy



Chapter 8: Supply, Demand, and Government Policy

- The economy is governed by two laws: the law of supply and demand and government policies.
- In this chapter, we will explore the interaction between these laws.
- Price controls and taxes are common in different markets, and their effects are frequently debated by the press and policymakers. Economic knowledge helps in understanding these policies.
- In this chapter, we will use supply and demand tools to analyze the effects of these policies.

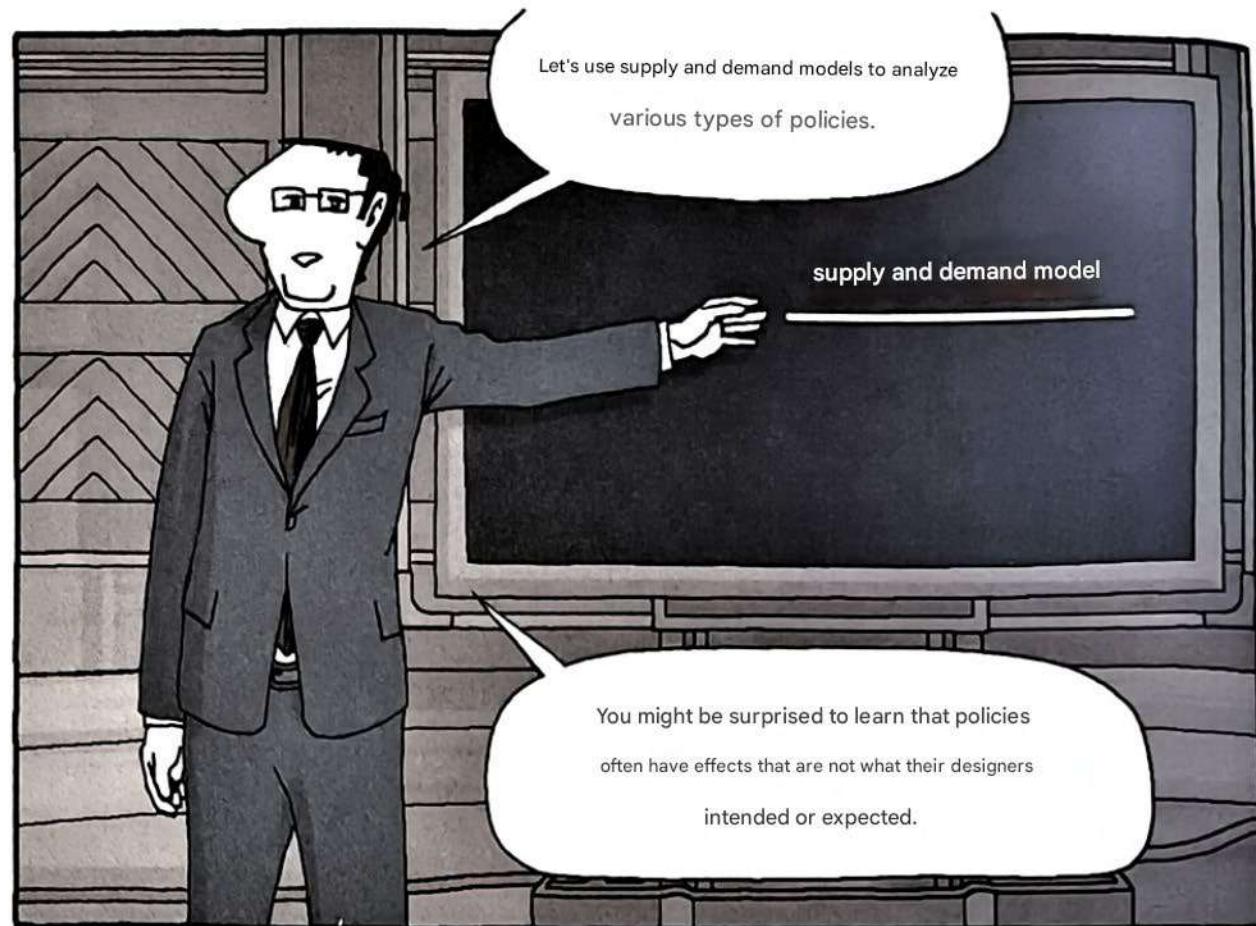
Chapter 8: Supply, Demand, and Government Policy

- Price control

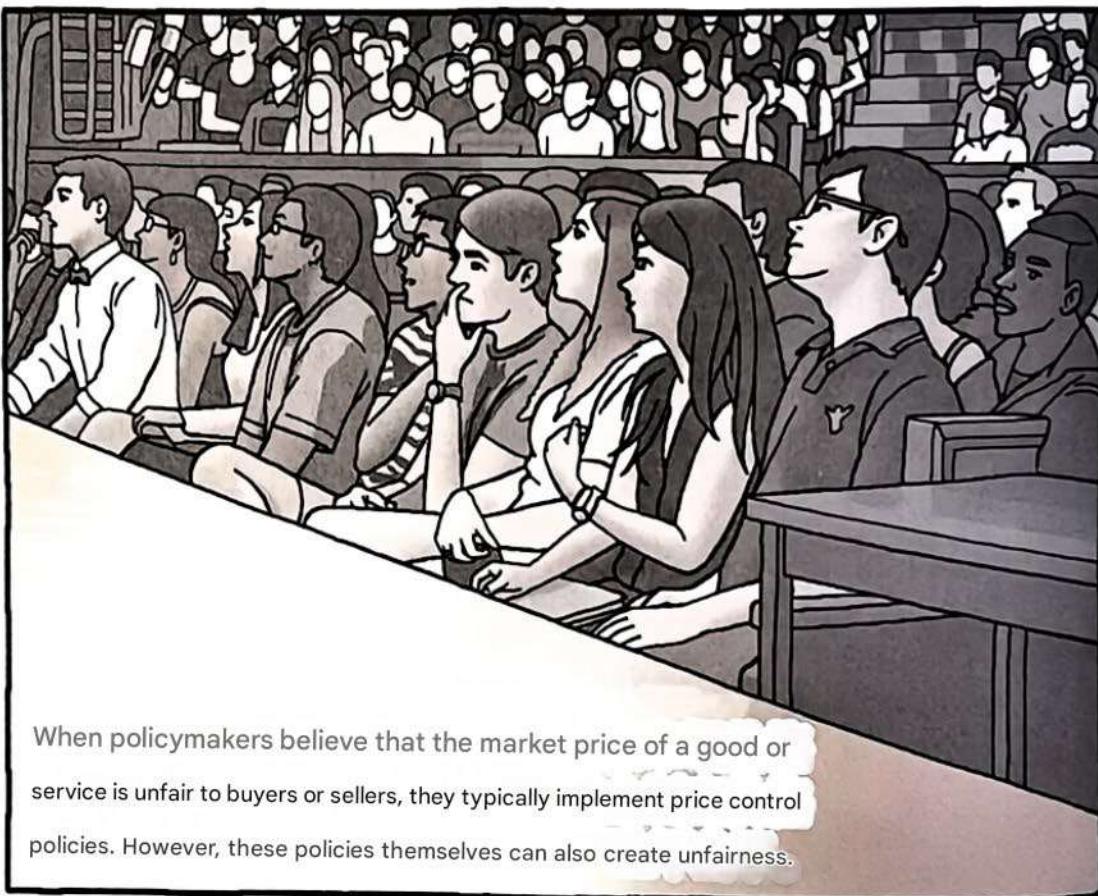
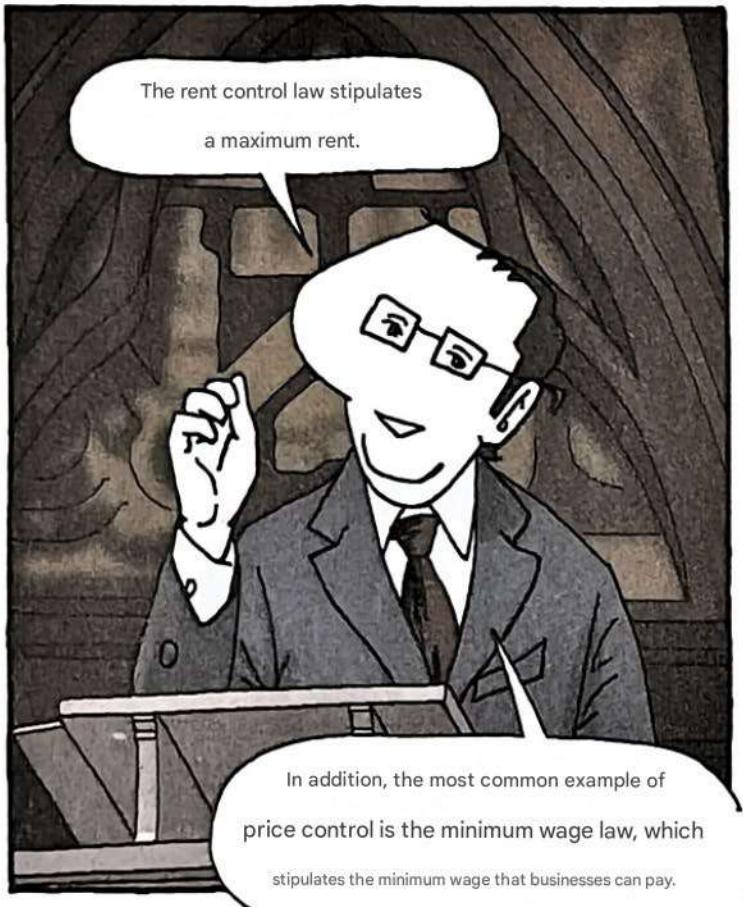
- Taxation

Supply, Demand, and Government Policy

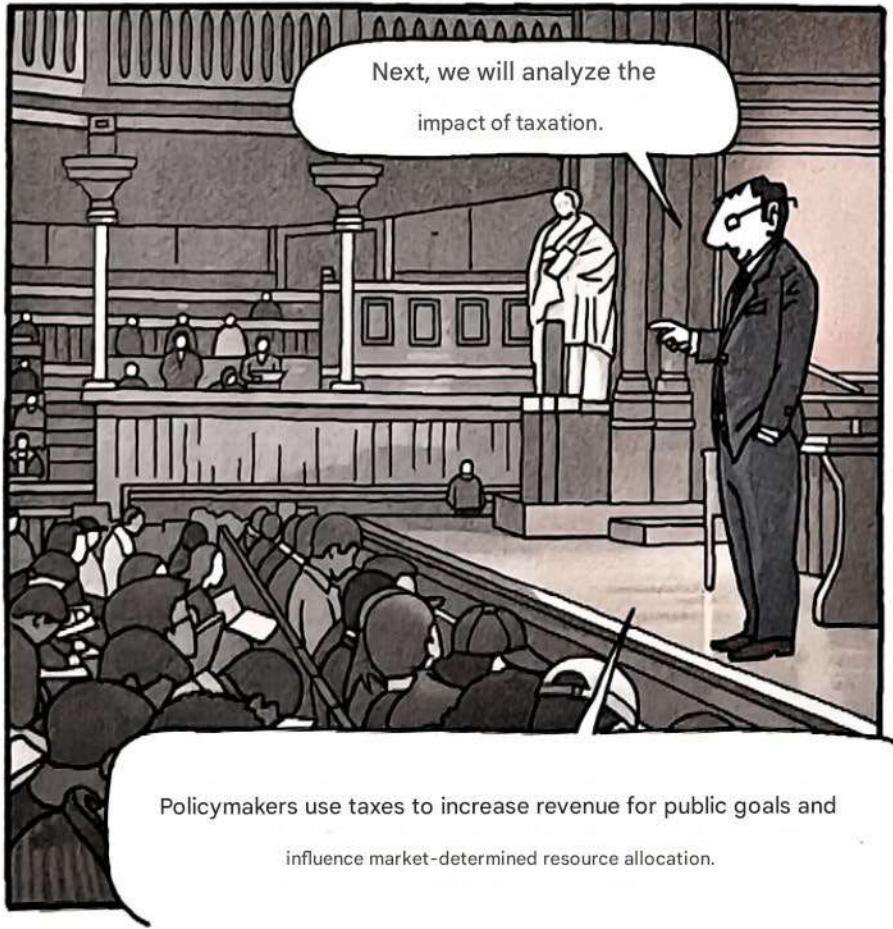
supply, demand
and policy



Supply, Demand, and Government Policy

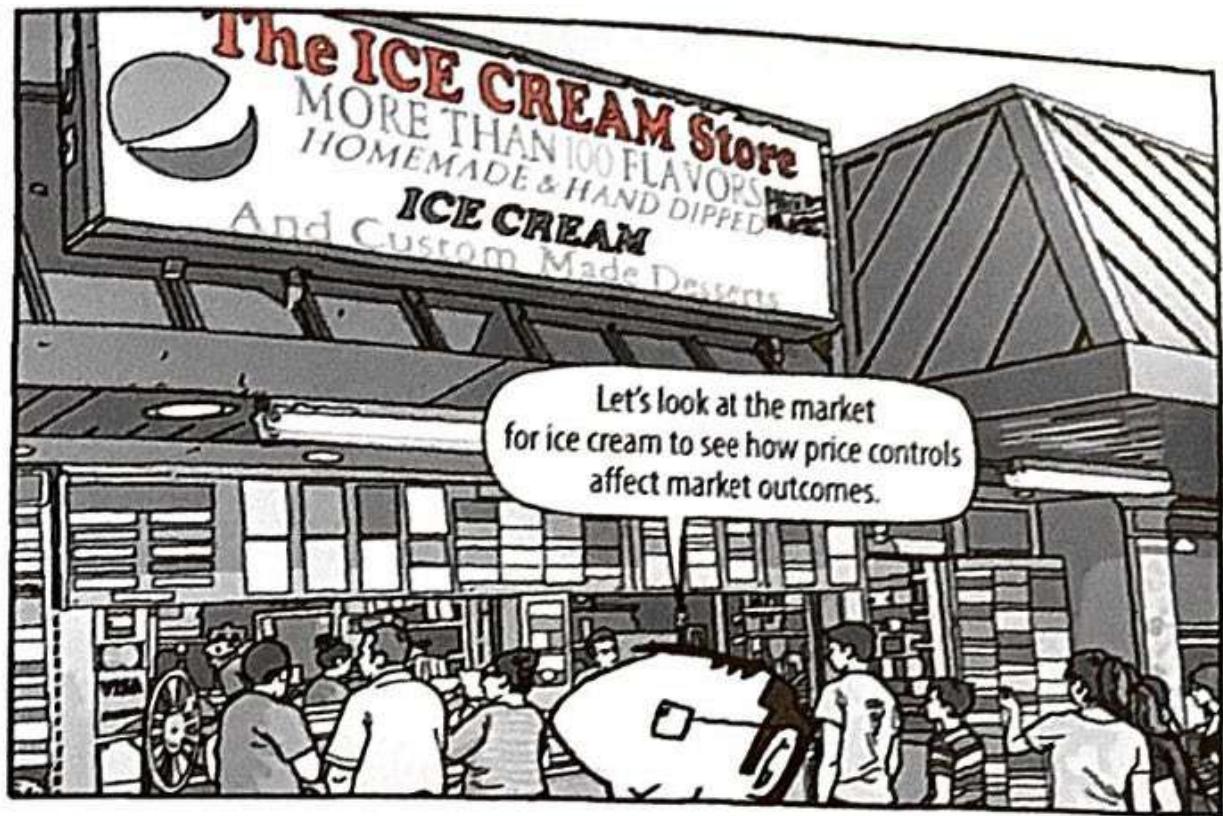


Supply, Demand, and Government Policy



Price control

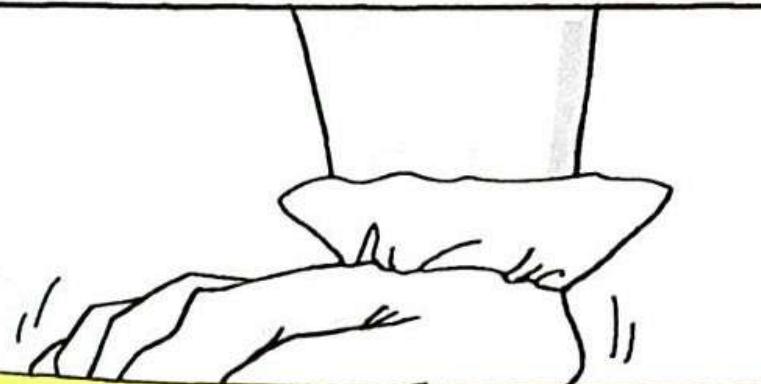
Price Controls



If ice cream is sold in a market free of government regulation, the price of ice cream adjusts to balance supply and demand. Let's suppose that the equilibrium price is \$3 per ice cream.

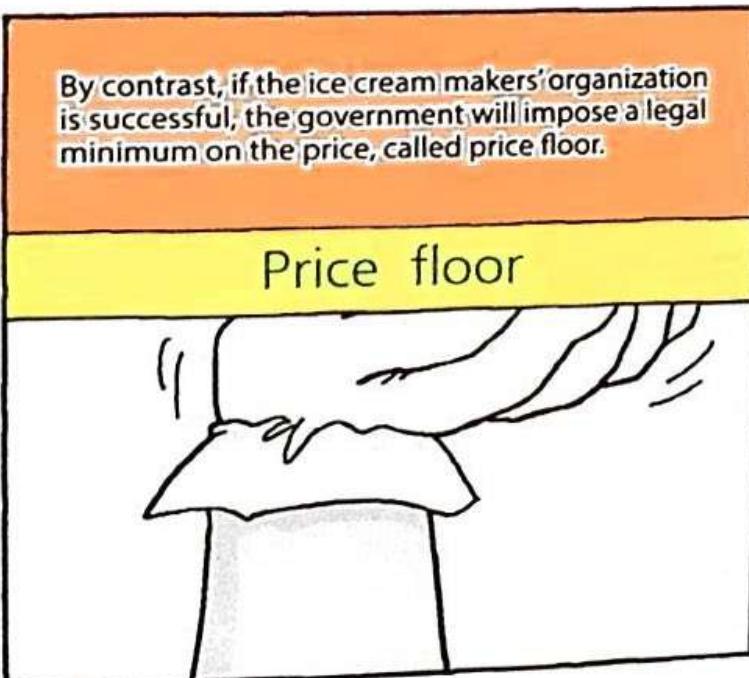


Of course, some people may not be happy with the price. Because buyers of any good always want a lower price while sellers want a higher price.



If the consumer association is successful in its lobbying, the government will impose a legal maximum on the price at which ice cream can be sold, and the legislated maximum is called a price ceiling.

By contrast, if the ice cream makers' organization is successful, the government will impose a legal minimum on the price, called price floor.



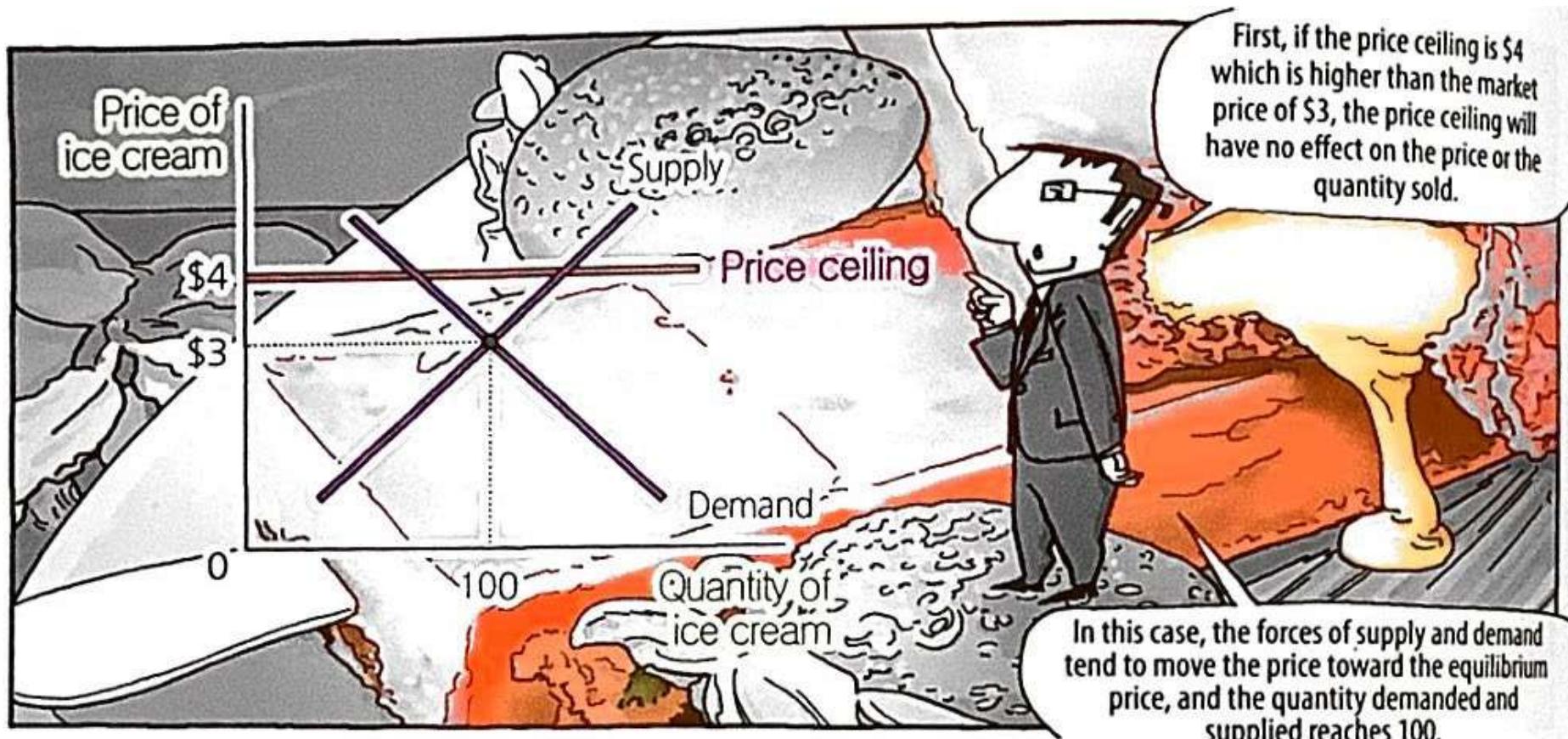
Price control

When the government imposes a price cap on the ice cream market, driven by consumer complaints or campaign donations,

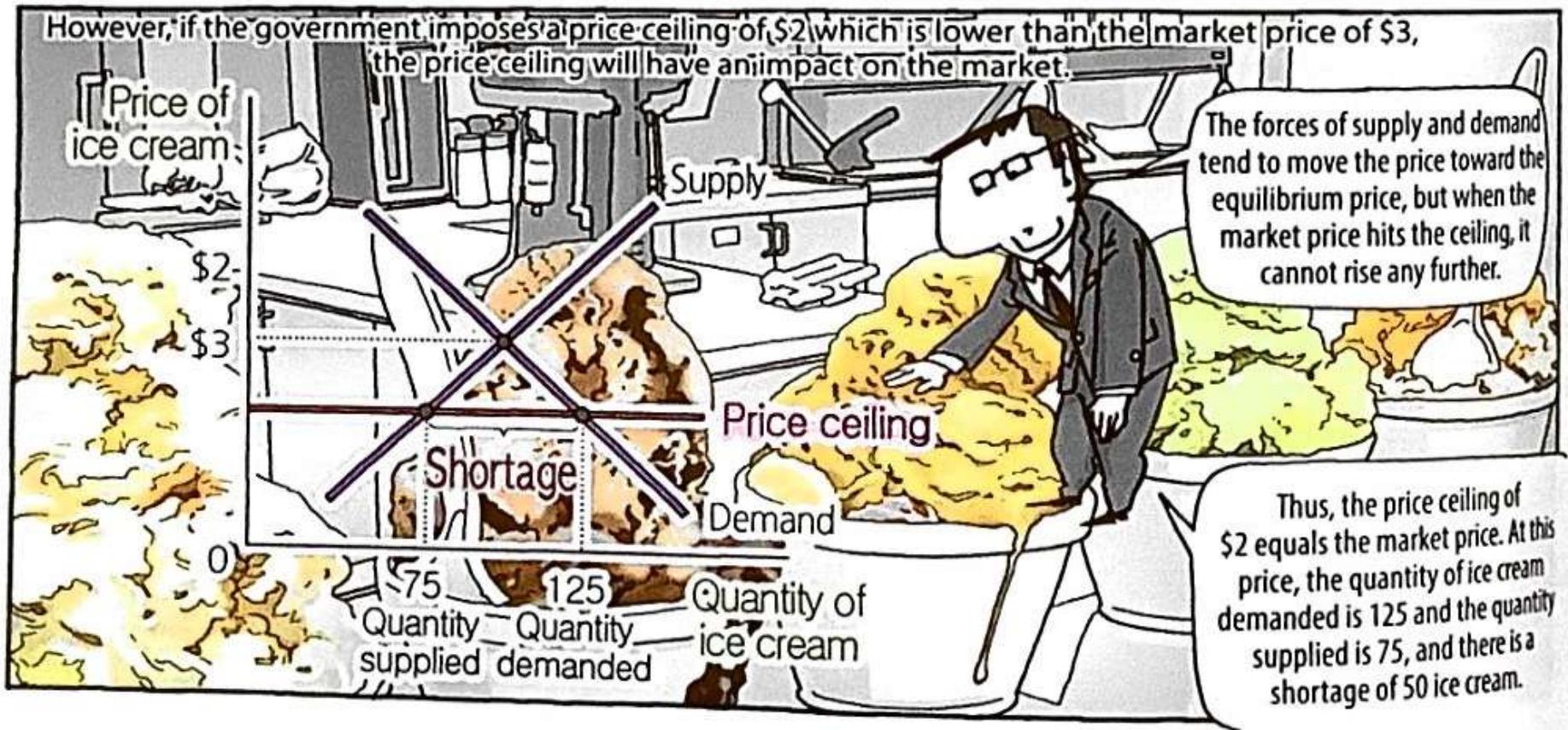
There are two possible outcomes: the statutory maximum price may be higher than the market price or lower than the market price.



Price control



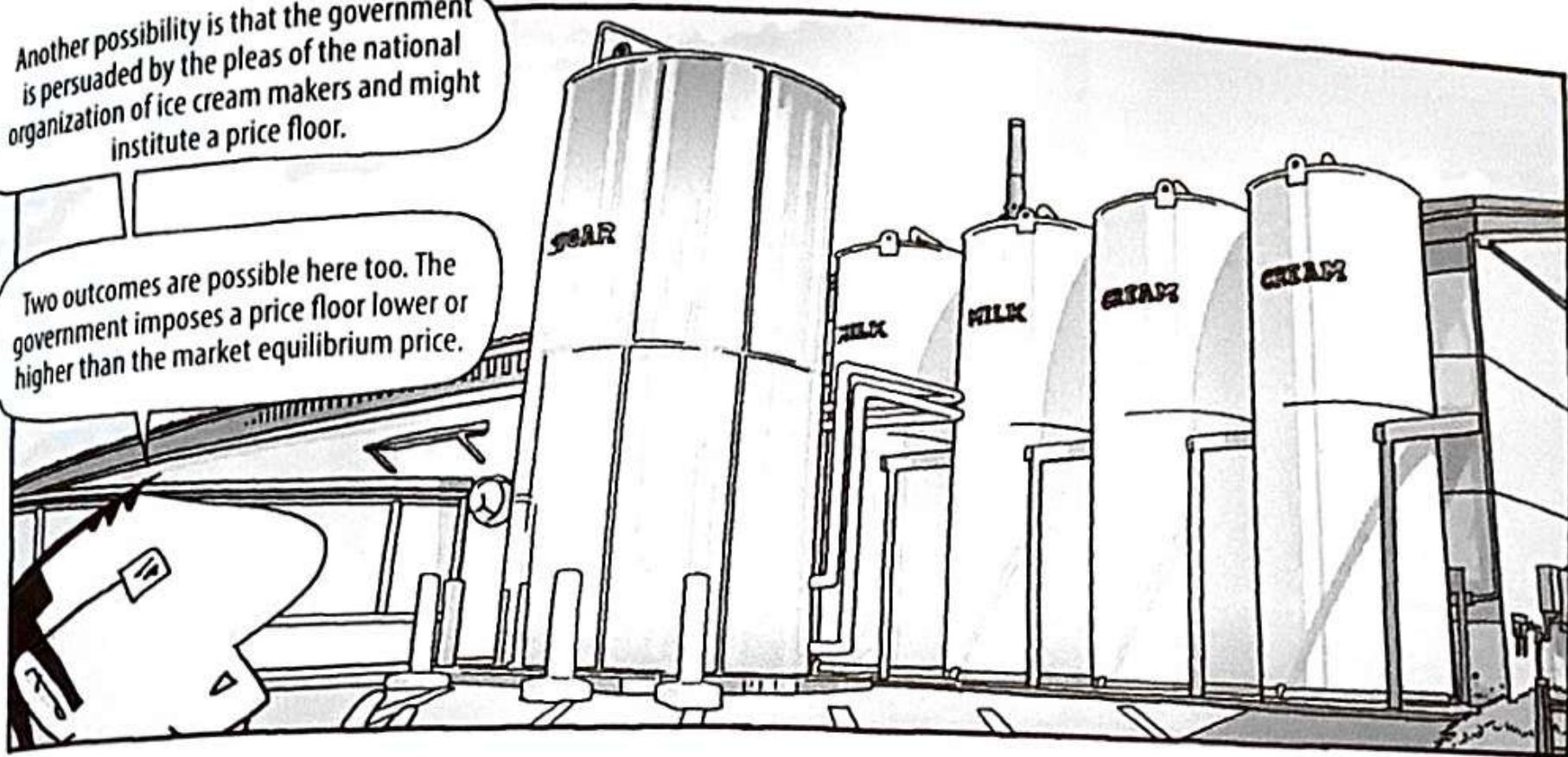
Price control



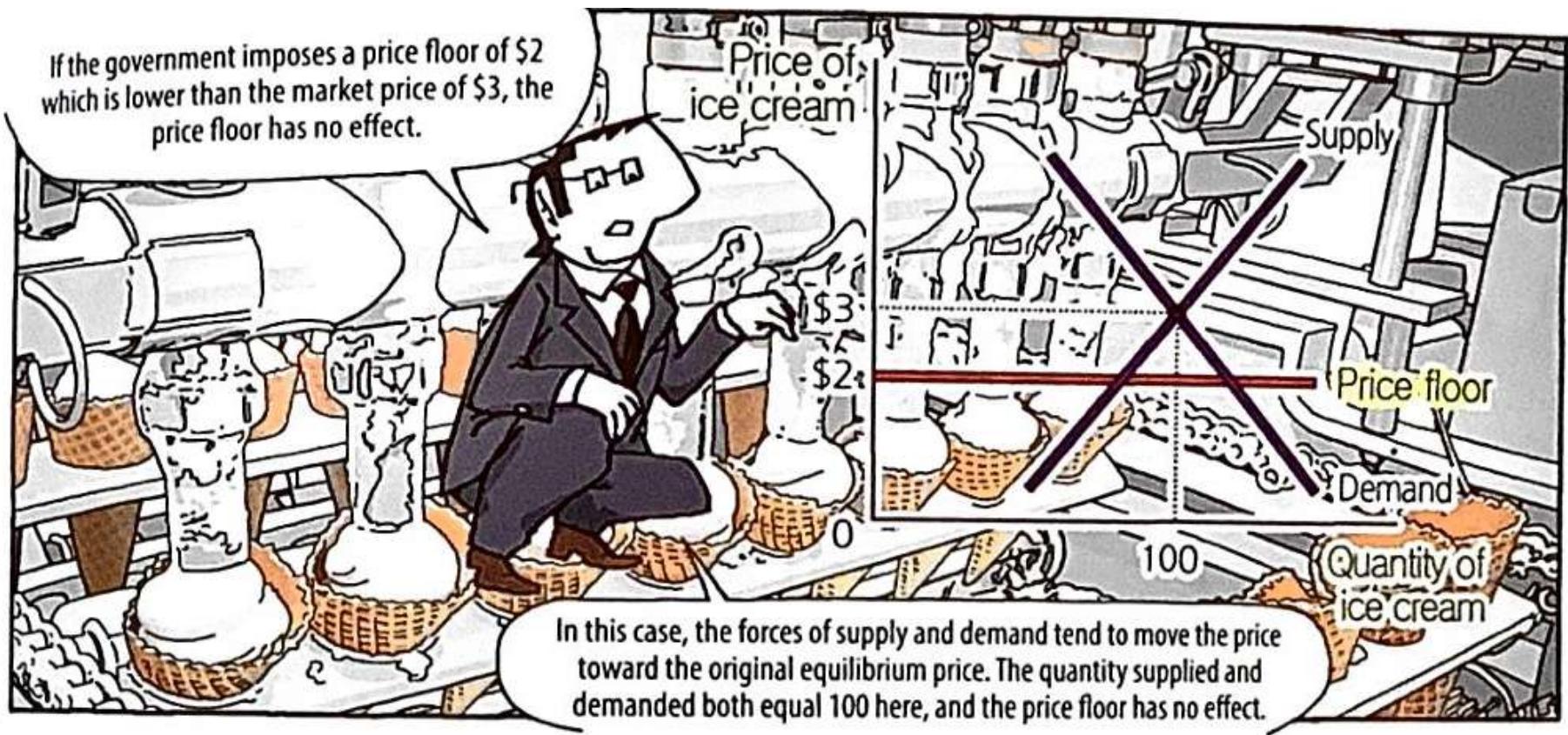
Price control

Another possibility is that the government is persuaded by the pleas of the national organization of ice cream makers and might institute a price floor.

Two outcomes are possible here too. The government imposes a price floor lower or higher than the market equilibrium price.



Price control

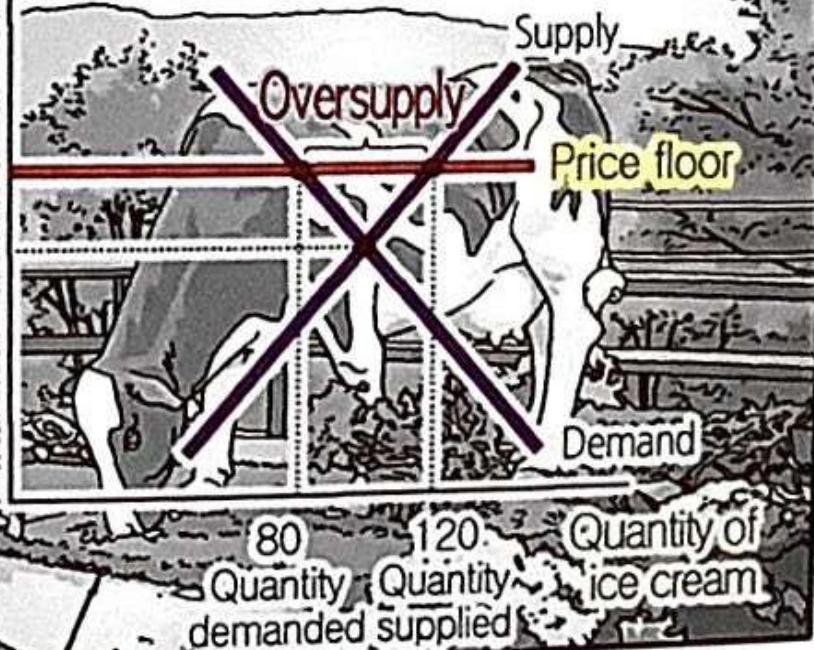


Price control

On the contrary, if the government imposes a price floor of \$4, which is above the equilibrium price of \$3, the price floor will have an impact on the market.

The forces of supply and demand tend to move the price toward the equilibrium price, but when the market price hits the floor, it cannot fall any further.

Therefore, the market price equals the floor price. At this floor price, the quantity of ice cream demanded is 80 and the quantity supplied is 120, which in turn leads to a surplus of 40 ice cream.



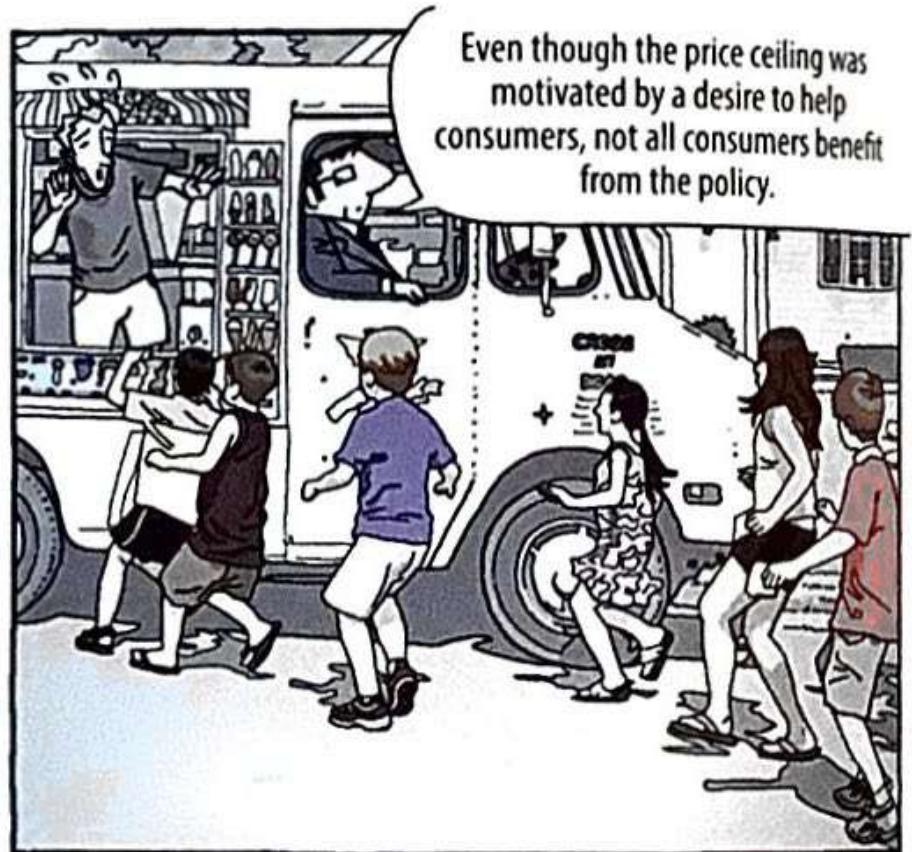
Price control

When ice cream becomes scarce due to this price cap, some ice cream rationing mechanism will naturally emerge.



Based on a first-come, first-served principle, the seller may sell ice cream to those who are willing to arrive early and wait in line.

Price control



Price control

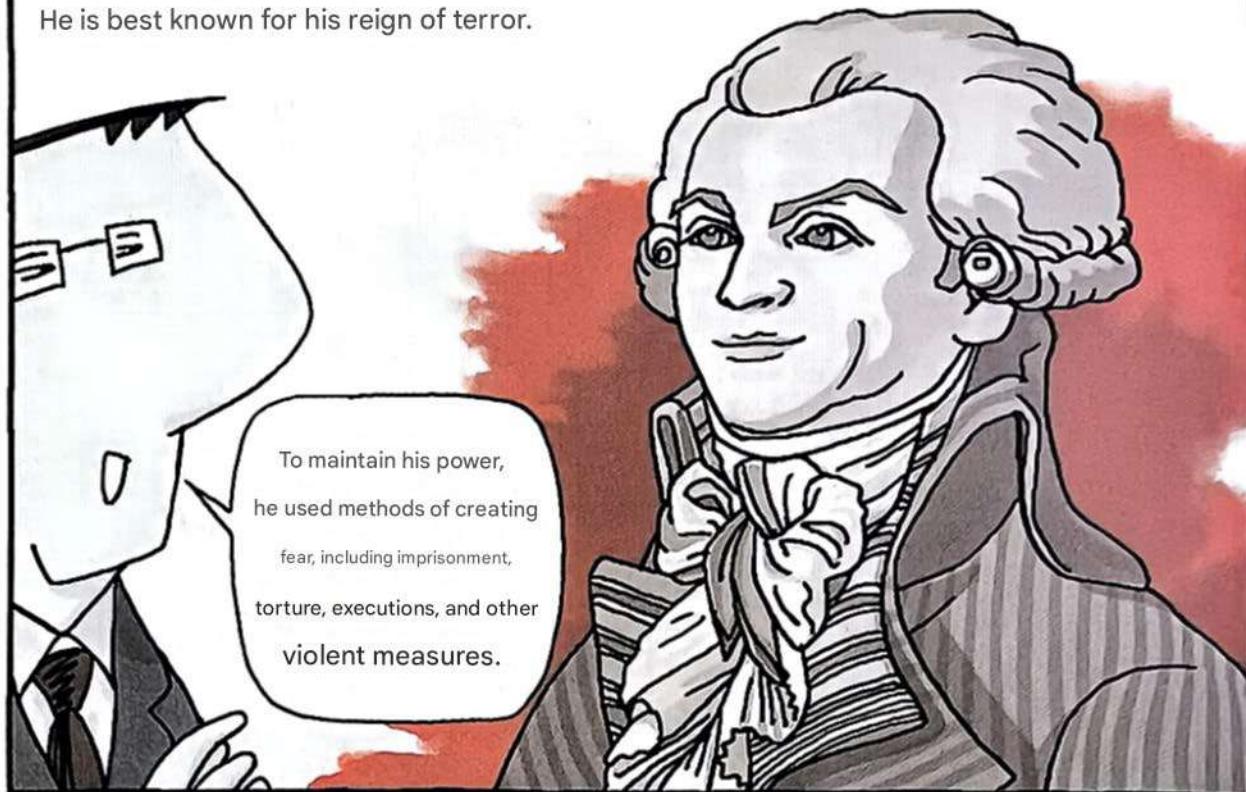
Some buyers enjoy privileges or will queue up to buy ice cream at a lower price, but other buyers don't get ice cream at all.



Robespierre's Milk

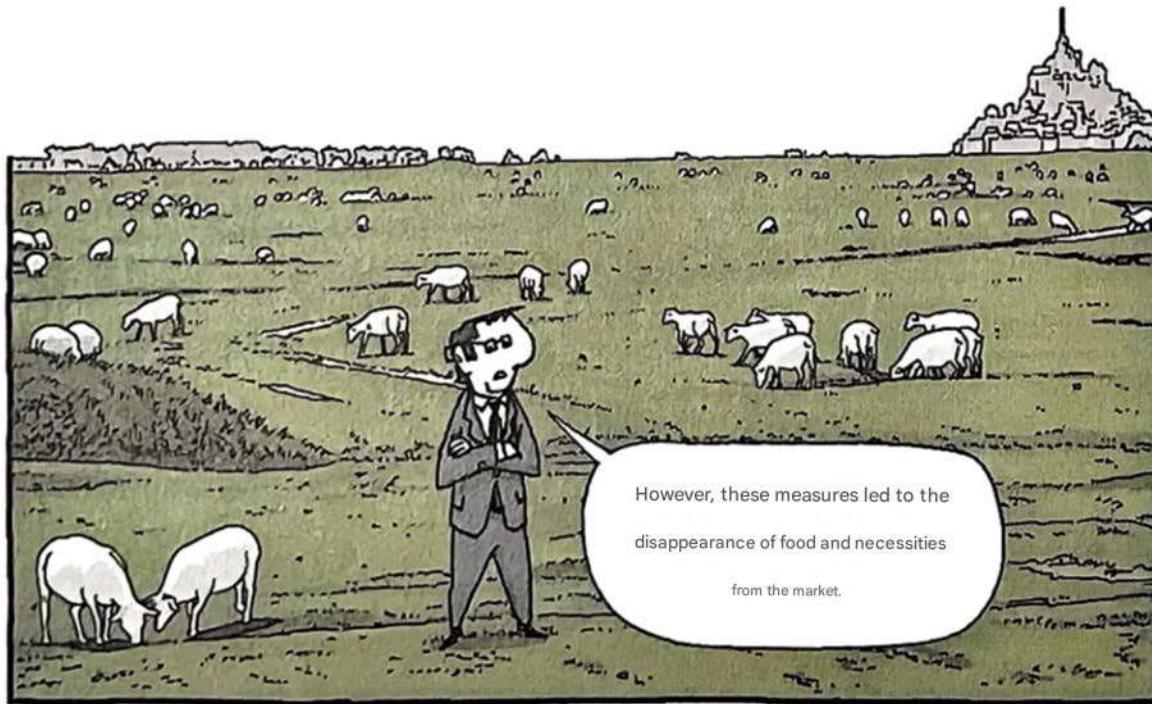
Robespierre's Milk

Robespierre was a political revolutionary who led the French Revolution and ruled France from 1793. He is best known for his reign of terror.

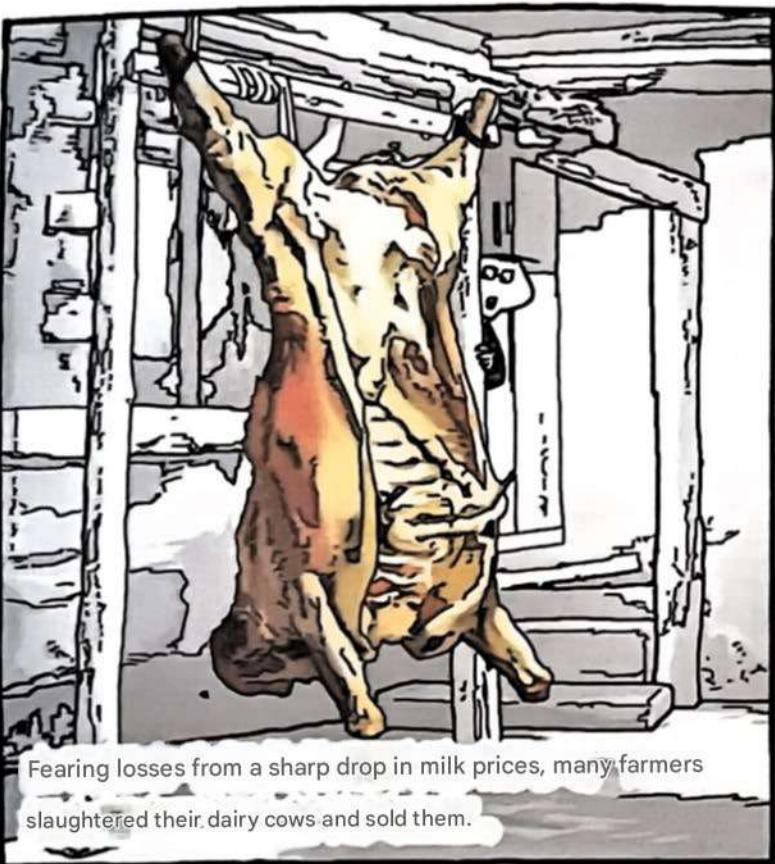


Robespierre's Milk

He imposed maximum prices on a range of necessities, including agricultural products, and inflammatoryly claimed that inflation was caused by merchants.



Robespierre's Milk

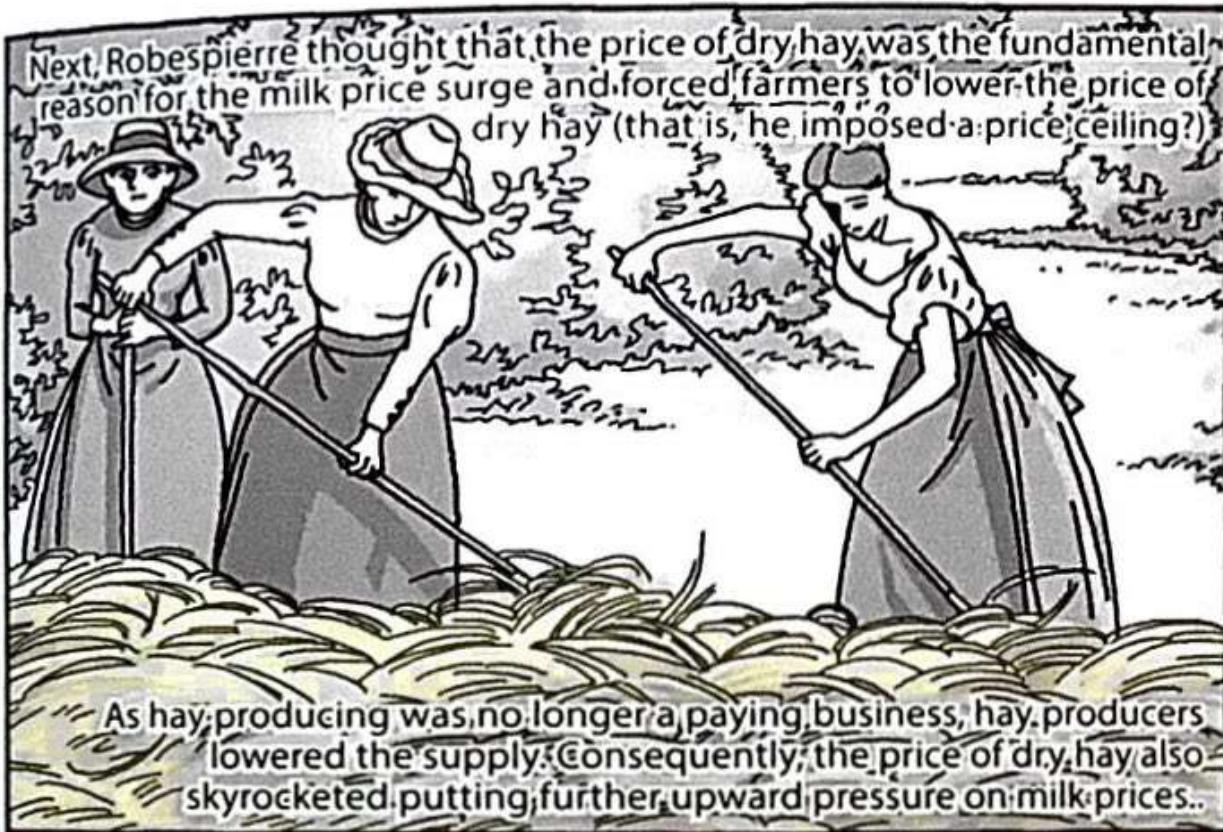


Fearing losses from a sharp drop in milk prices, many farmers slaughtered their dairy cows and sold them.

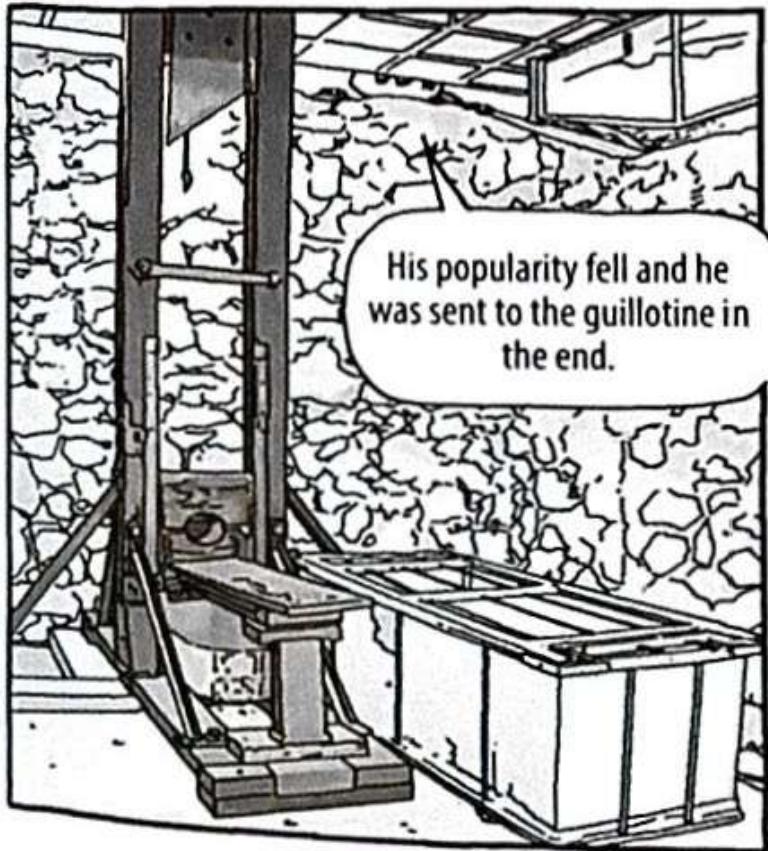


With the disappearance of dairy cows, the milk supply has decreased significantly, and milk prices have soared.

Robespierre's Milk



Robespierre's Milk



When the price ceiling is below the market equilibrium, the quantity demanded exceeds the quantity supplied, and this causes a shortage.



Nixon's price control

Nixon's Price
Controls



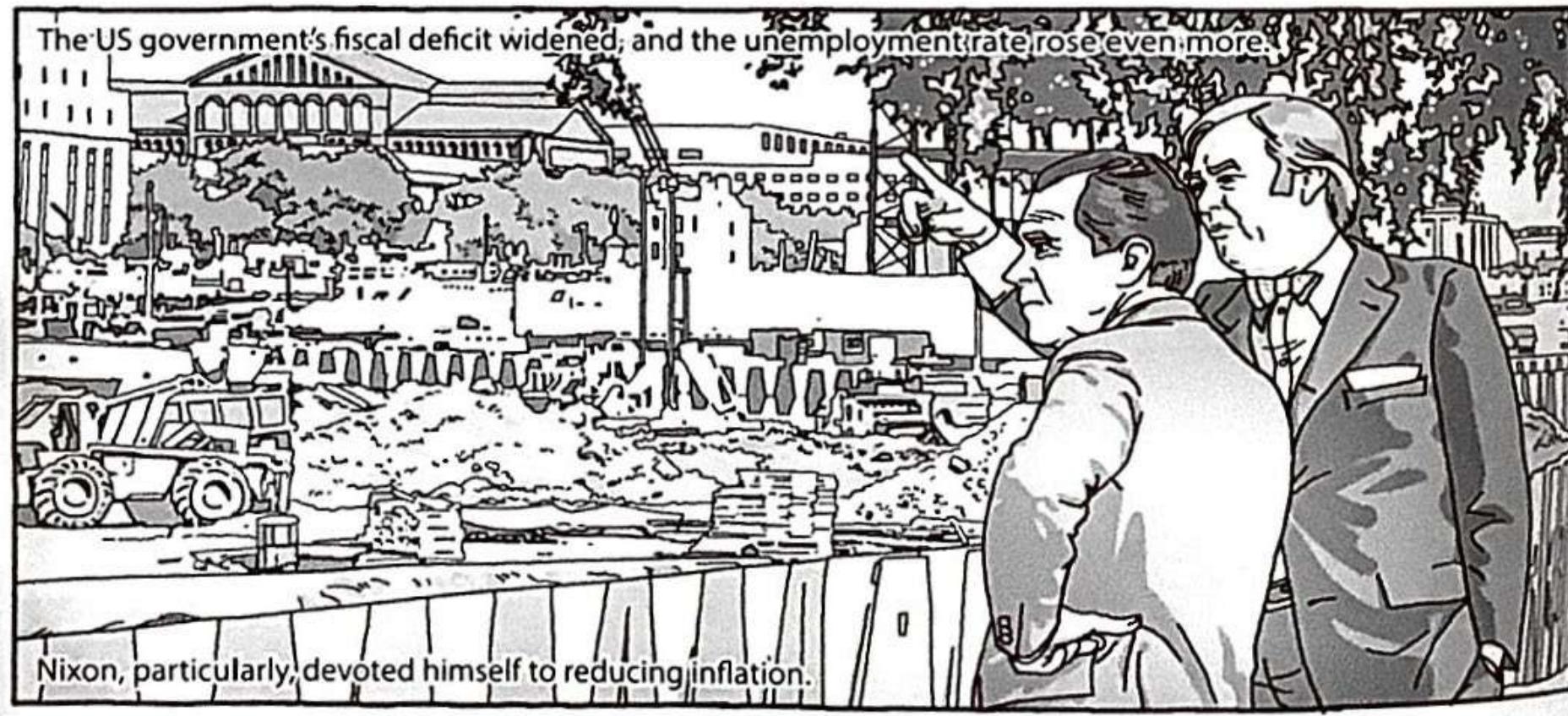
Richard Nixon is
the 37th president of
the United States, holding
office from 1969 to 1974.

Nixon's price control

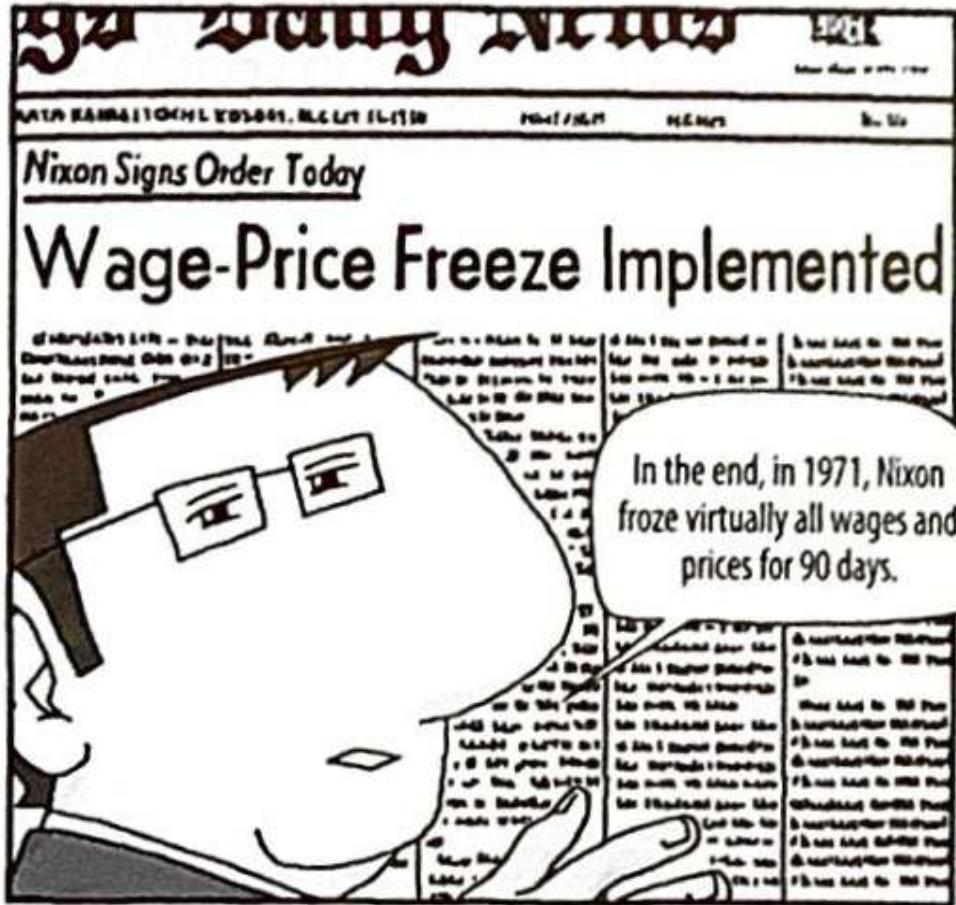
Around the time Nixon took office, inflation
and the need to raise money for the Vietnam
War plunged the United States into a period
of economic turmoil.



Nixon's price control



Nixon's price control



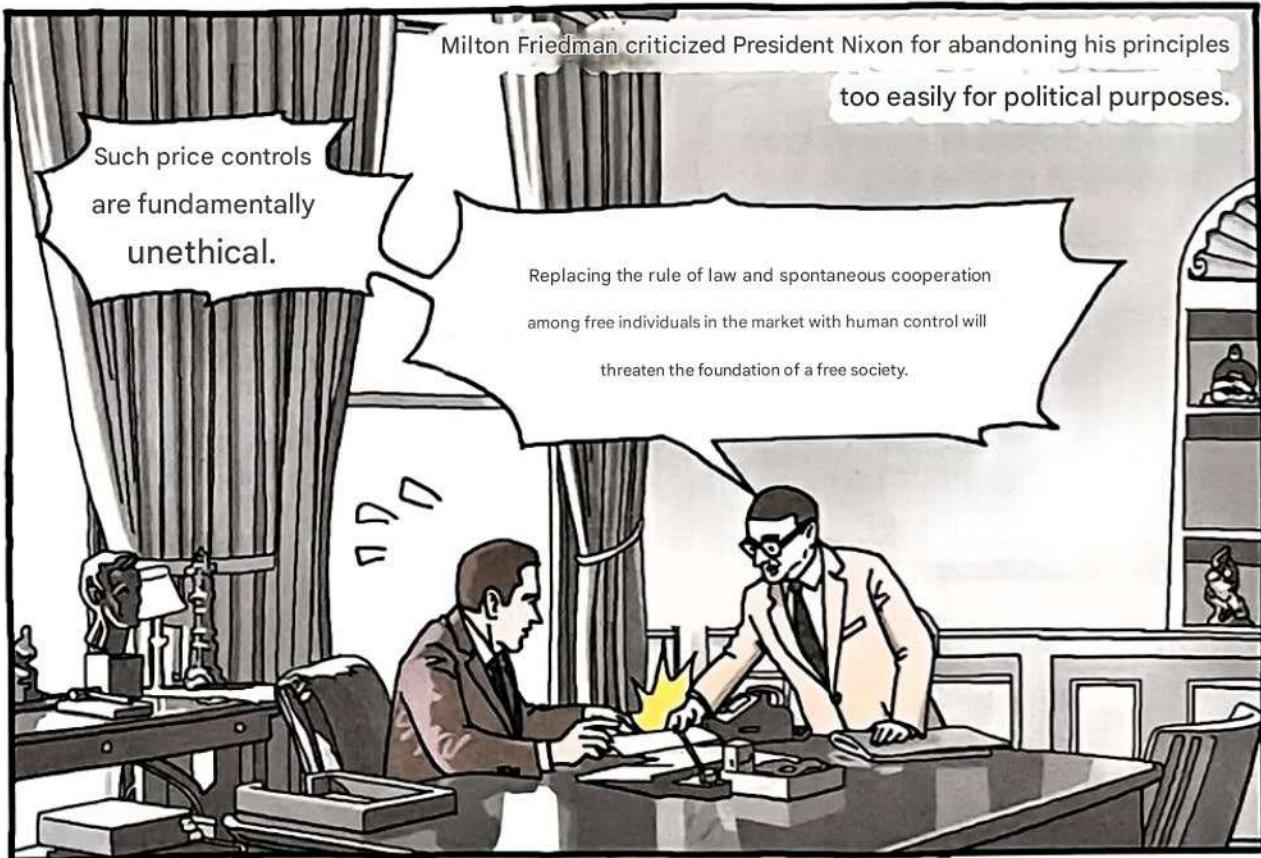
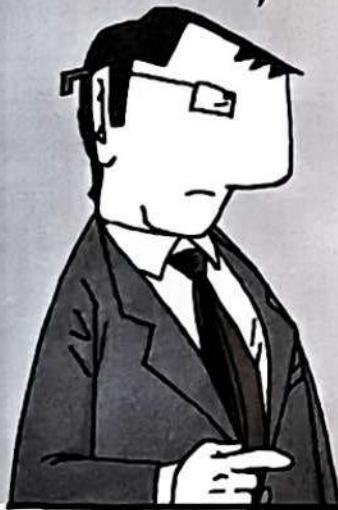
Nixon's price control

Within the limits of the law, he repeatedly and forcibly froze price caps until 1974.

Such price controls are fundamentally unethical.

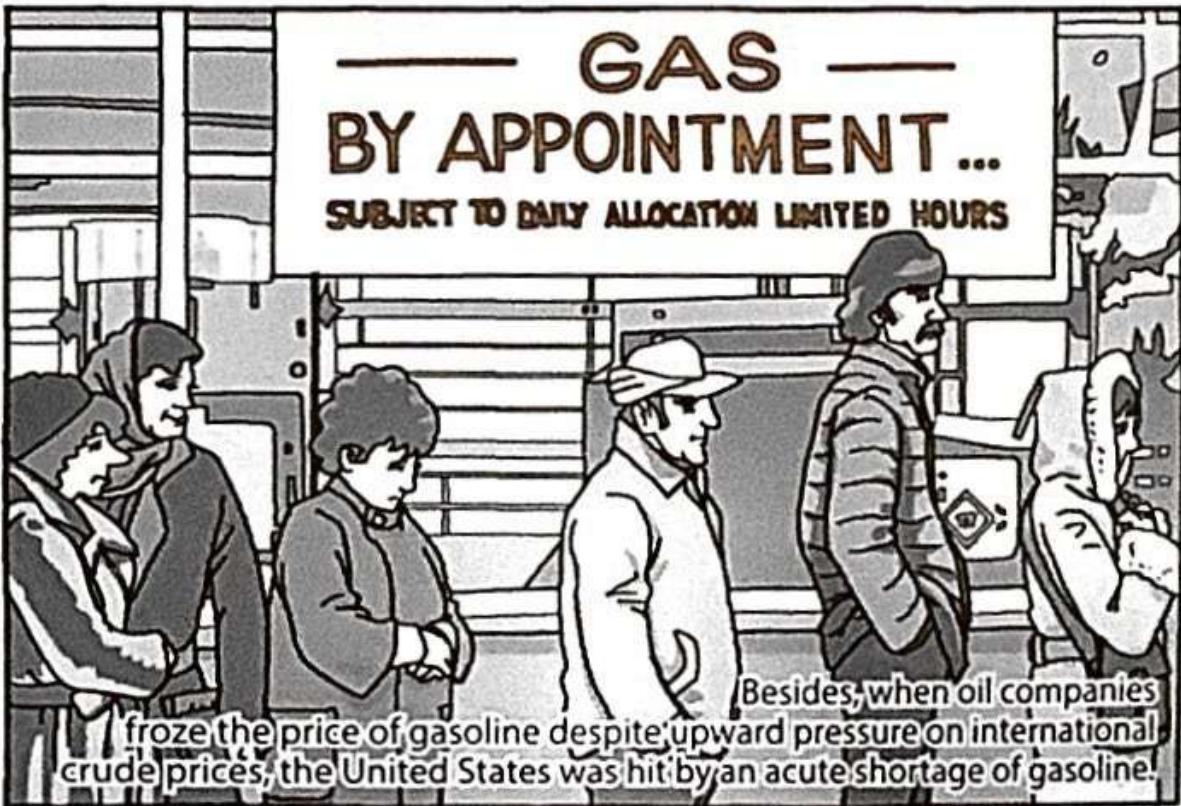
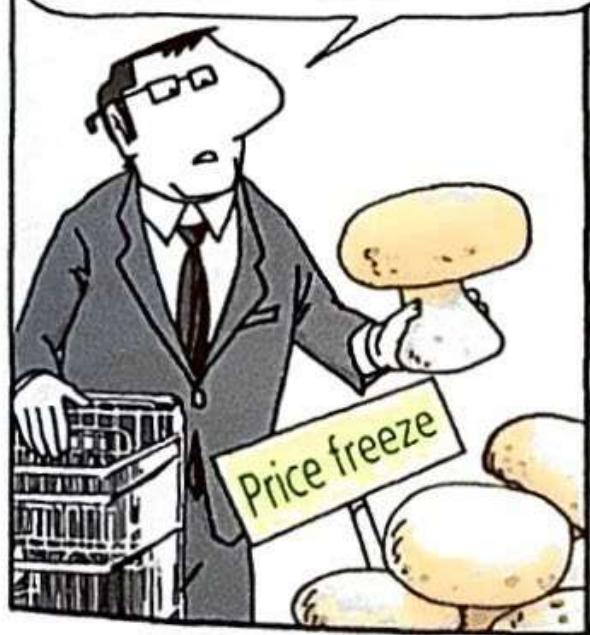
Milton Friedman criticized President Nixon for abandoning his principles too easily for political purposes.

Replacing the rule of law and spontaneous cooperation among free individuals in the market with human control will threaten the foundation of a free society.

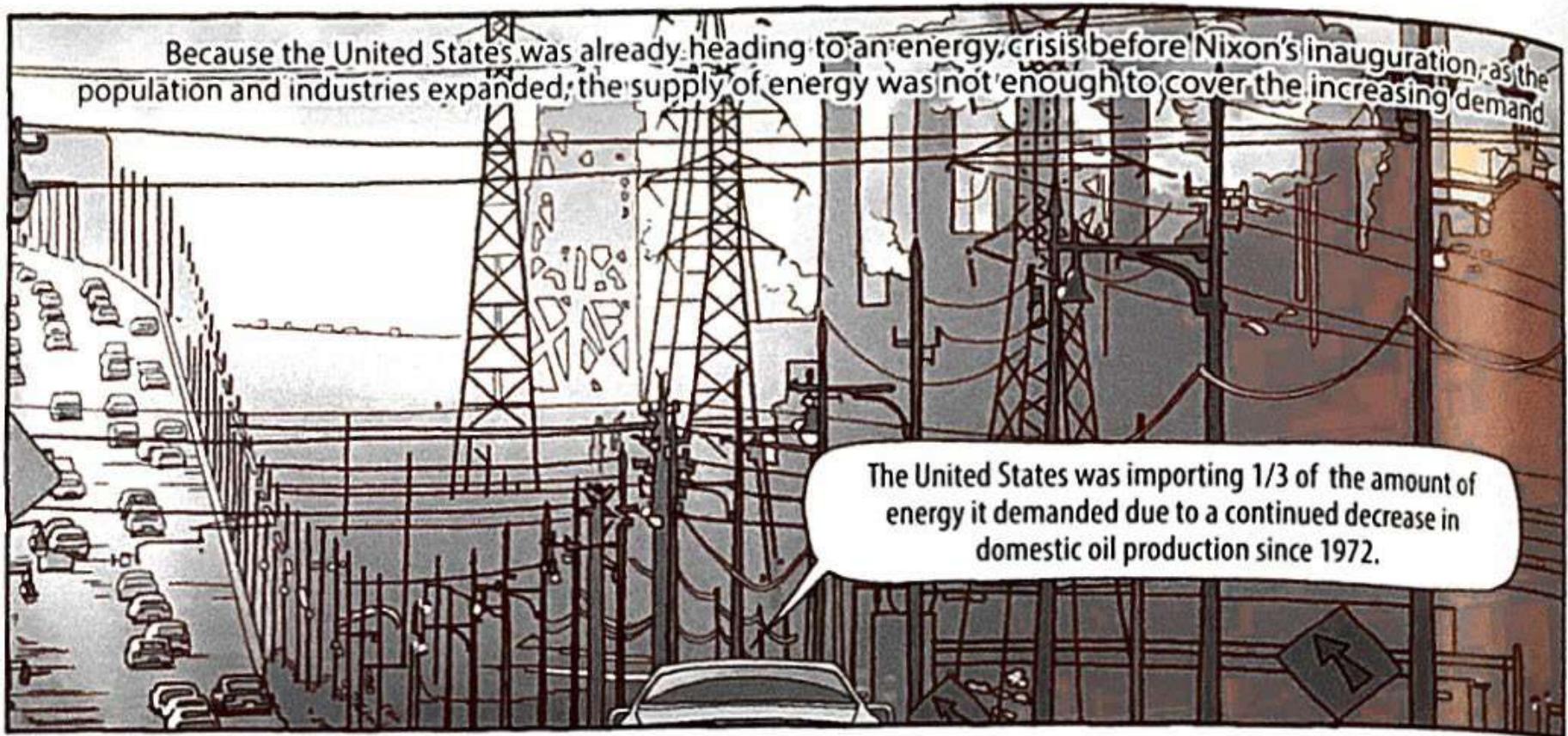


Nixon's price control

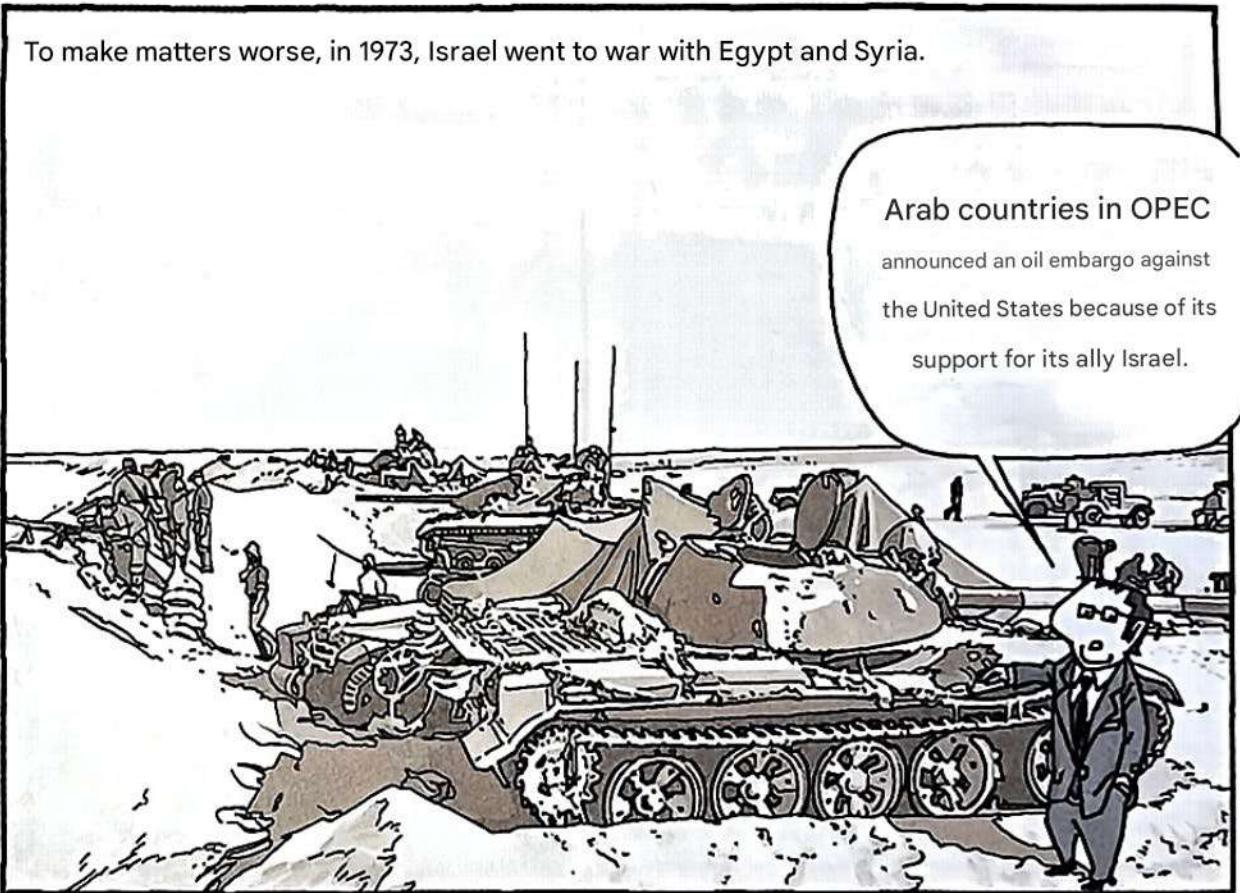
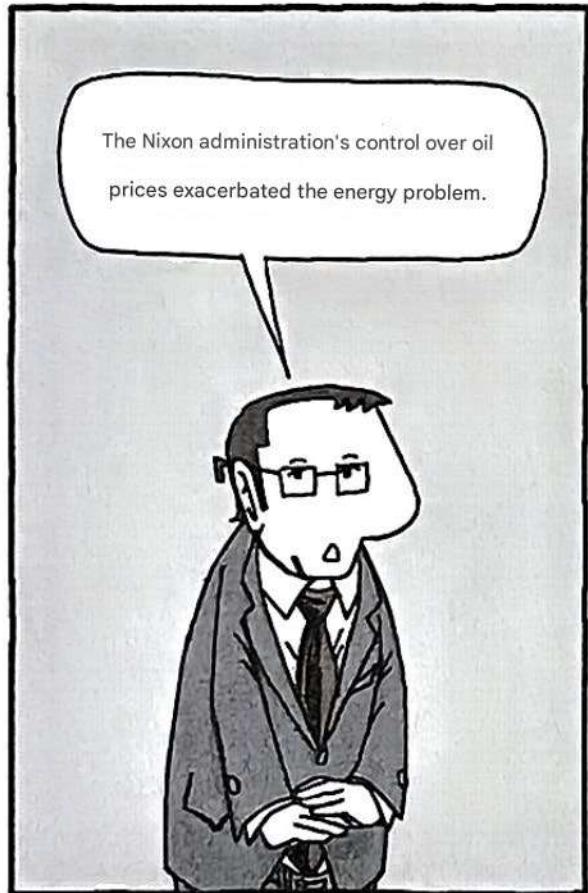
The measure started to show adverse effects. Companies were reluctant to produce products. Notably, the shortage of food was severe.



Nixon's price control



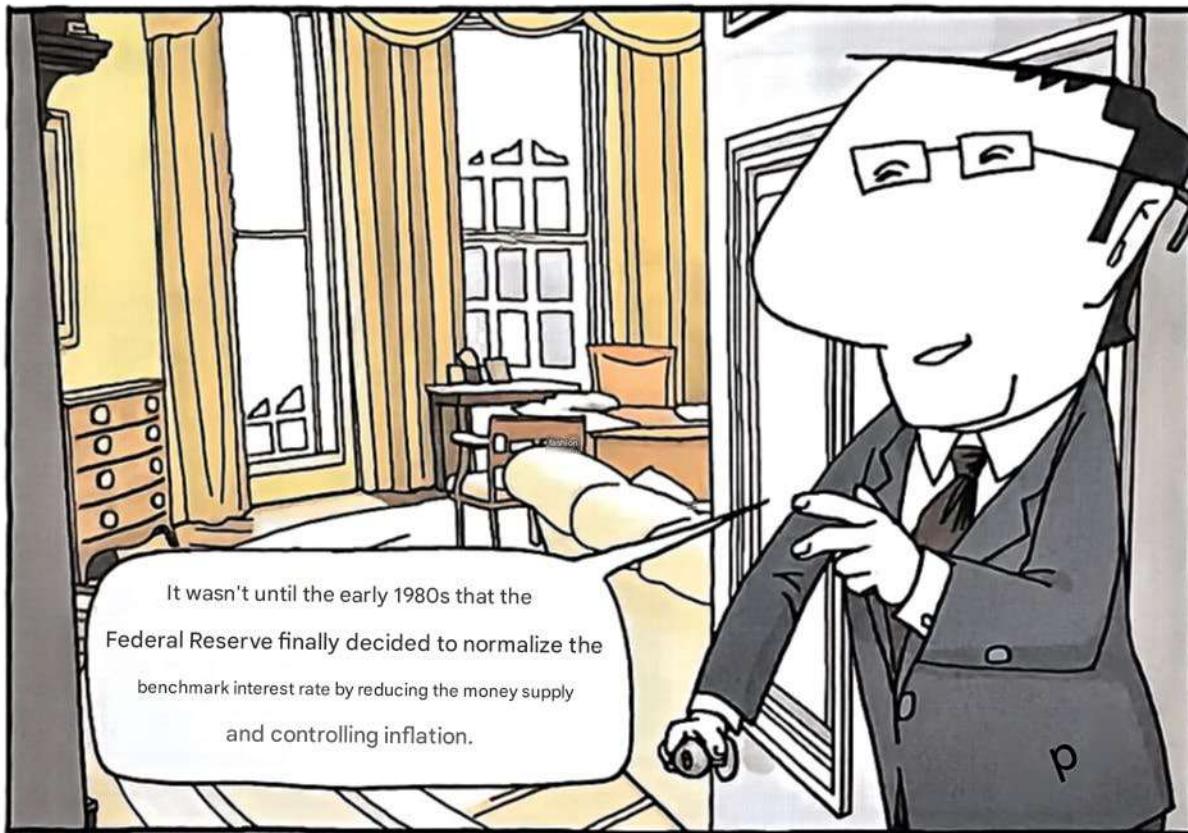
Nixon's price control



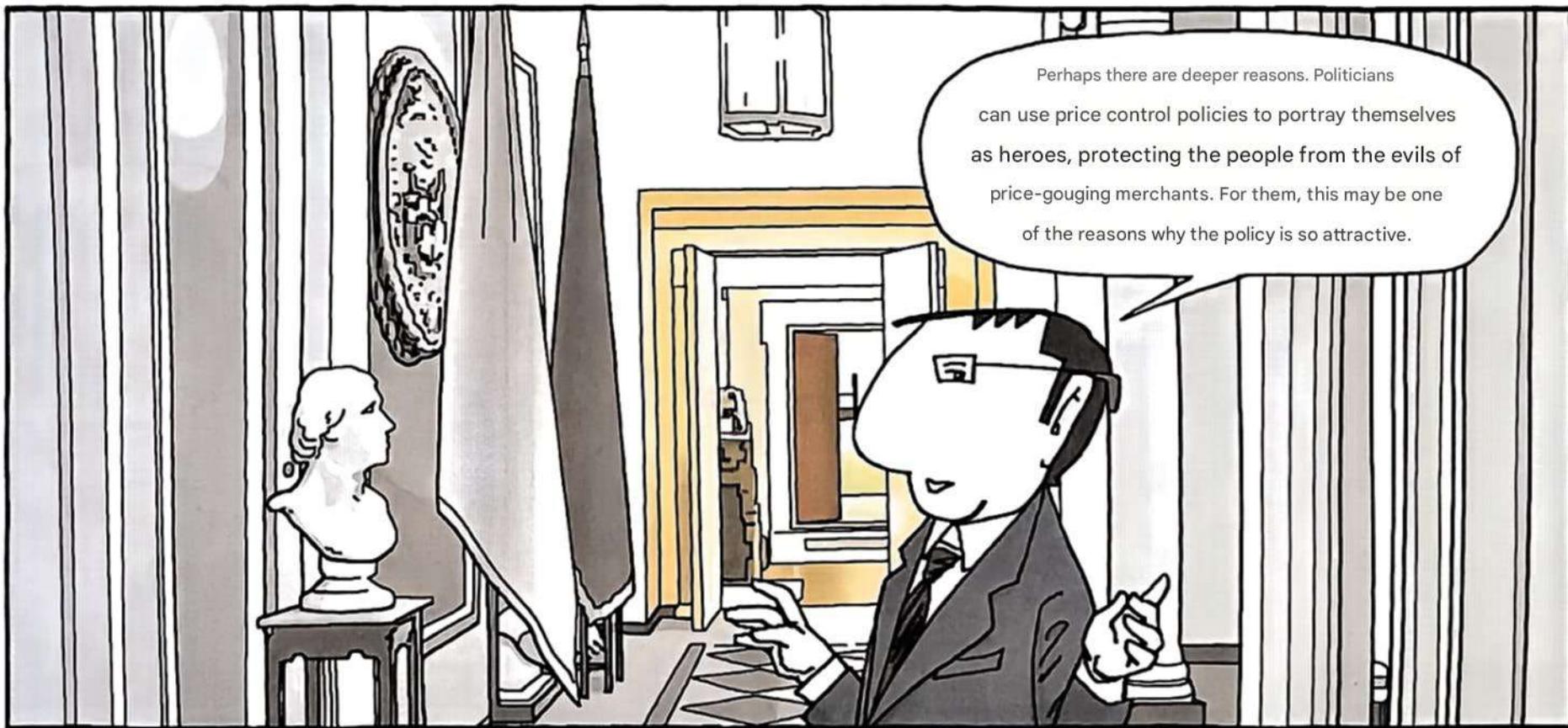
Nixon's price control



Nixon's price control



Nixon's price control



Perhaps there are deeper reasons. Politicians can use price control policies to portray themselves as heroes, protecting the people from the evils of price-gouging merchants. For them, this may be one of the reasons why the policy is so attractive.

Nixon's price control



Minimum wage

minimum wage

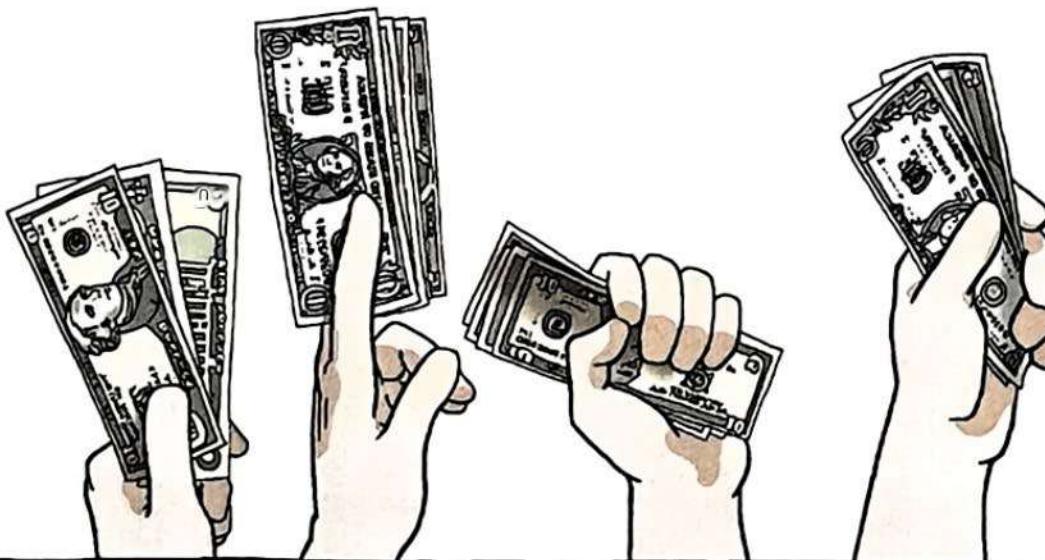
The U.S. Congress passed the Fair Labor Standards Act in 1938, which established minimum wage standards for the first time.

A prime example of a price floor is the minimum wage.

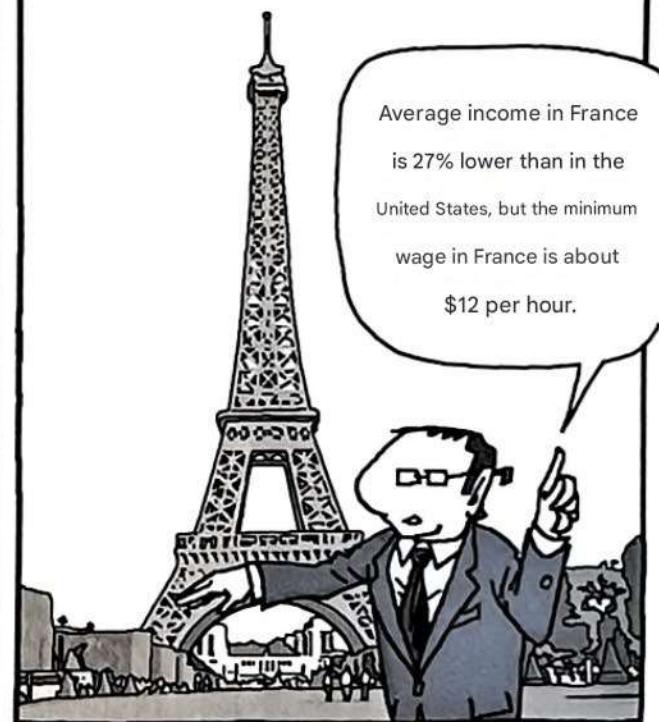


Minimum wage

Currently, the federal minimum wage is \$7.25 per hour, which has remained unchanged since 2009. However, each state can set its own minimum wage, which may differ from the federal level.



Most European countries also have minimum wage laws.



Minimum wage

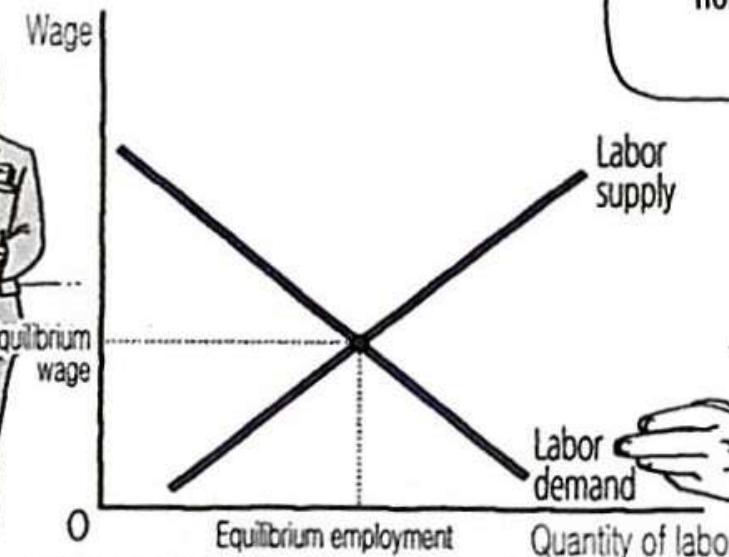
To examine the effects of a minimum wage, let's have a look at the market for labor.

Mark Your Calendars!!

THE BIG APPLE
JOB FAIR

Information
about the
CUNY Graduate
and Professional
Programs Fair

EMPLOYERS

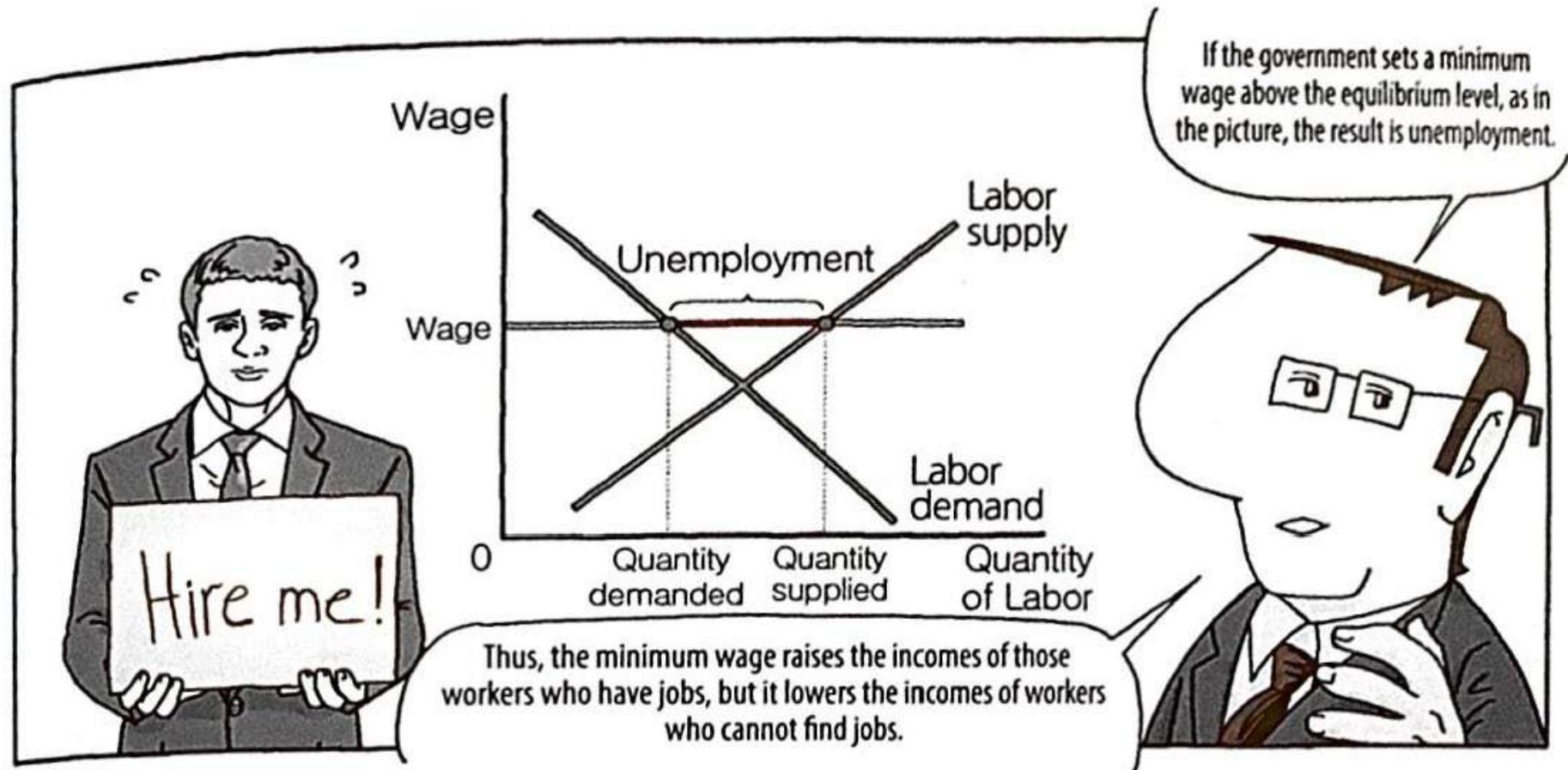


If the government does not intervene, the wage normally adjusts to balance labor supply and labor demand.



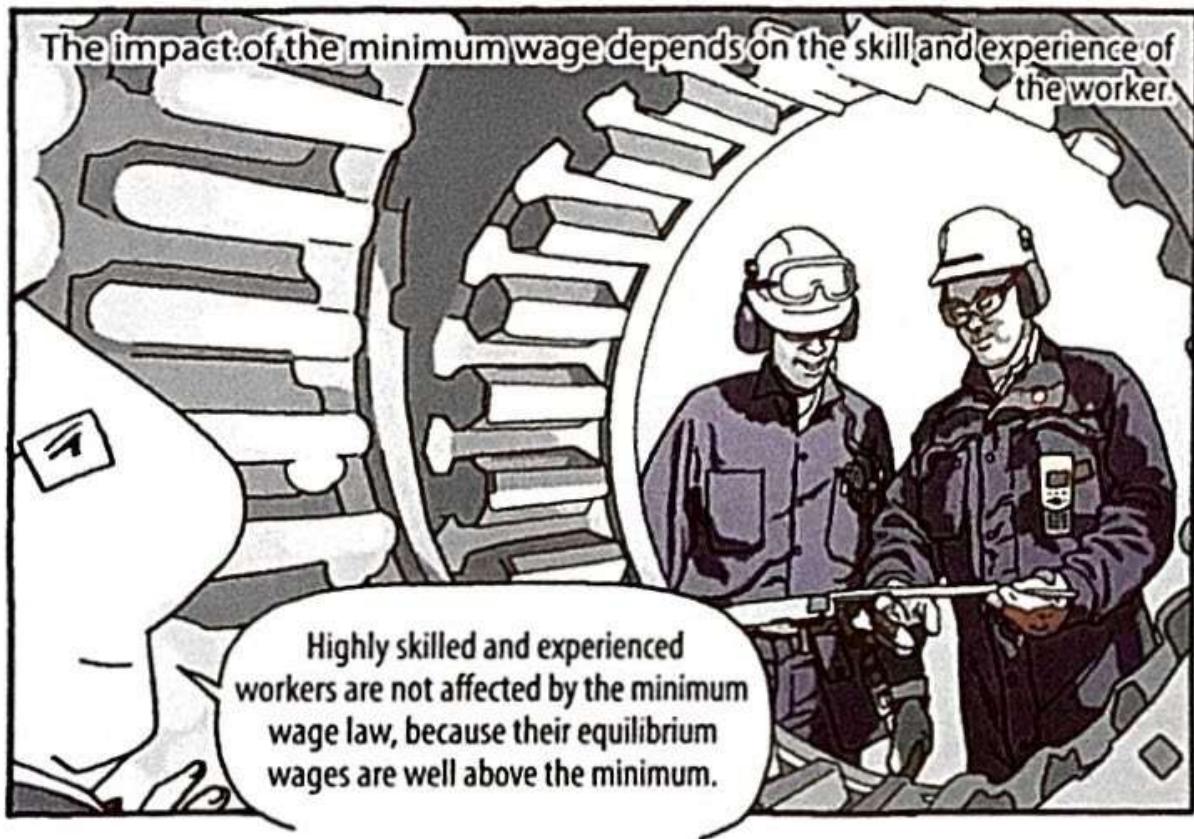
The labor market, which, like all markets, can be analyzed using the principles of market demand and supply. Workers determine the supply of labor, and firms determine the demand.

Minimum wage

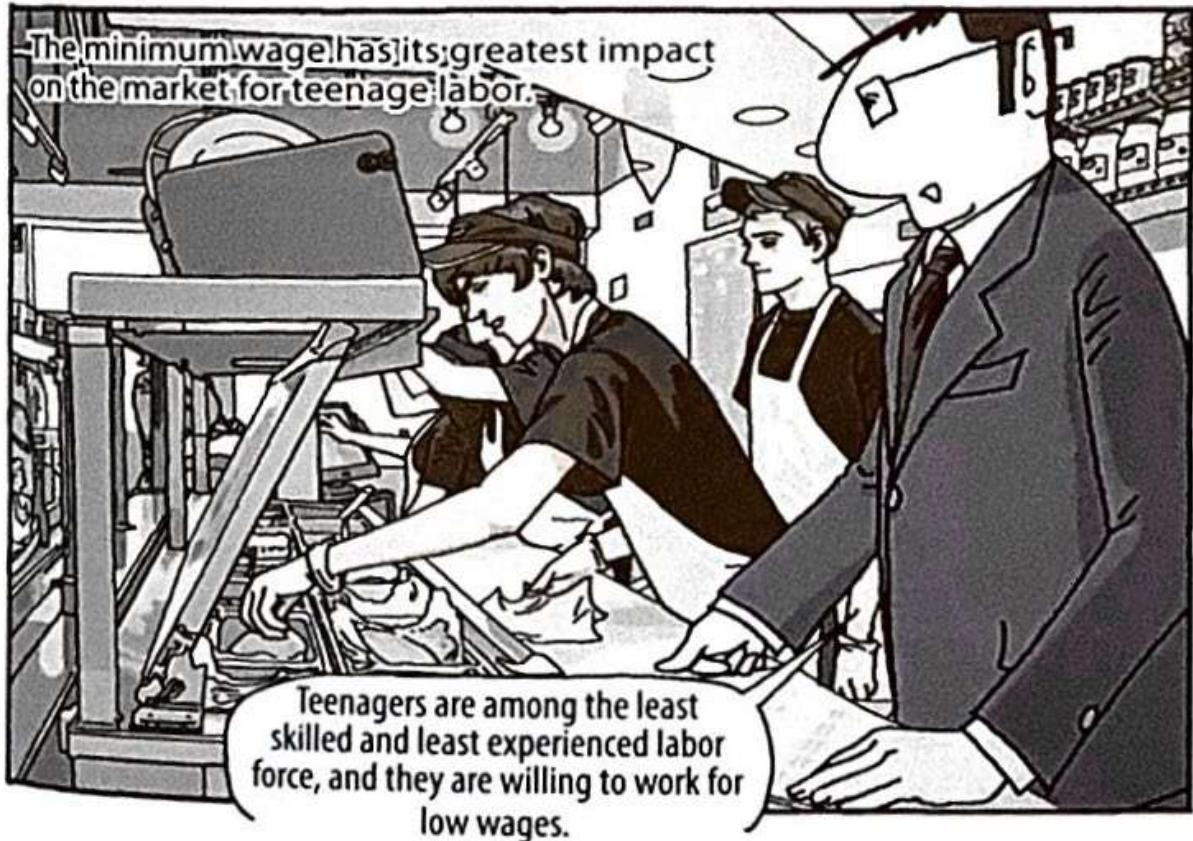


Minimum wage

We have to keep in mind that the economy contains not a single labor market but many labor markets consisting of different types of workers.



Minimum wage



Many economists have studied how minimum wage laws affect the teenage labor market.

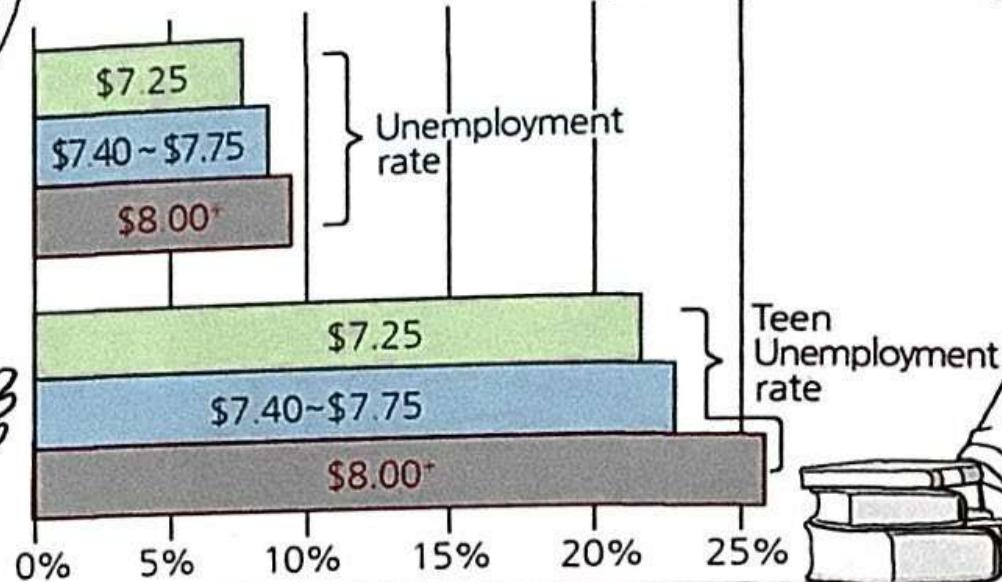


Minimum wage

Although there is some debate about how much the minimum wage affects employment, in many cases, a 10 percent increase in the minimum wage depresses teenage employment between 1 and 3 percent.

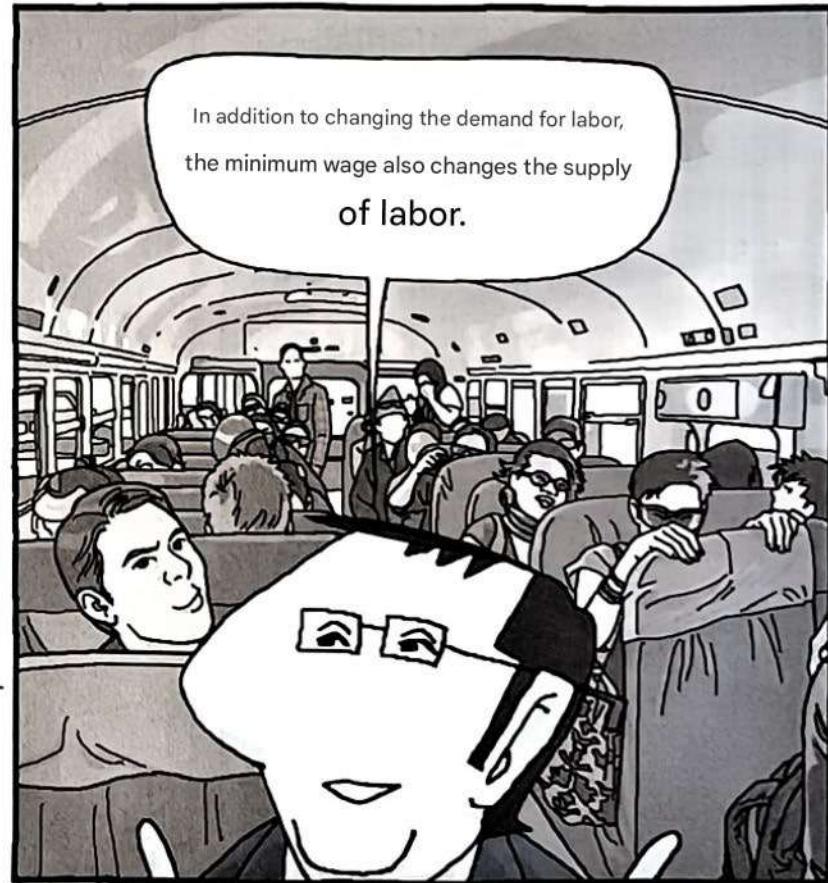
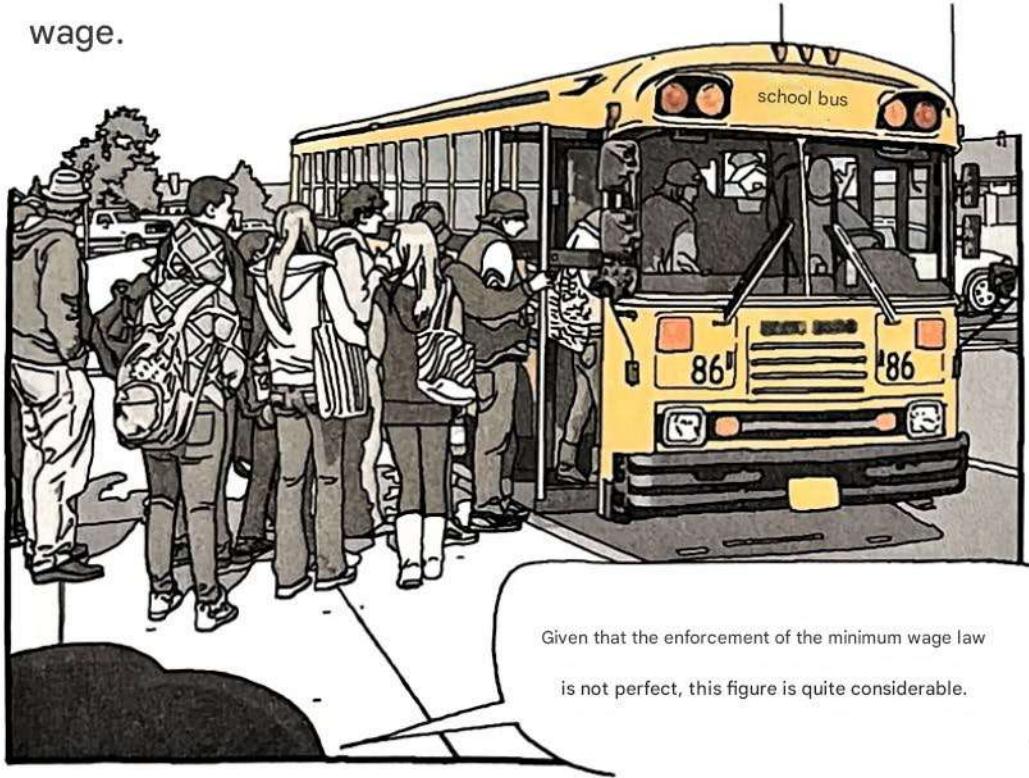
Researchers compared the changes in minimum wage over time with the changes in teenage employment.

United States Unemployment and Teen Unemployment by State Minimum Wage, 2011

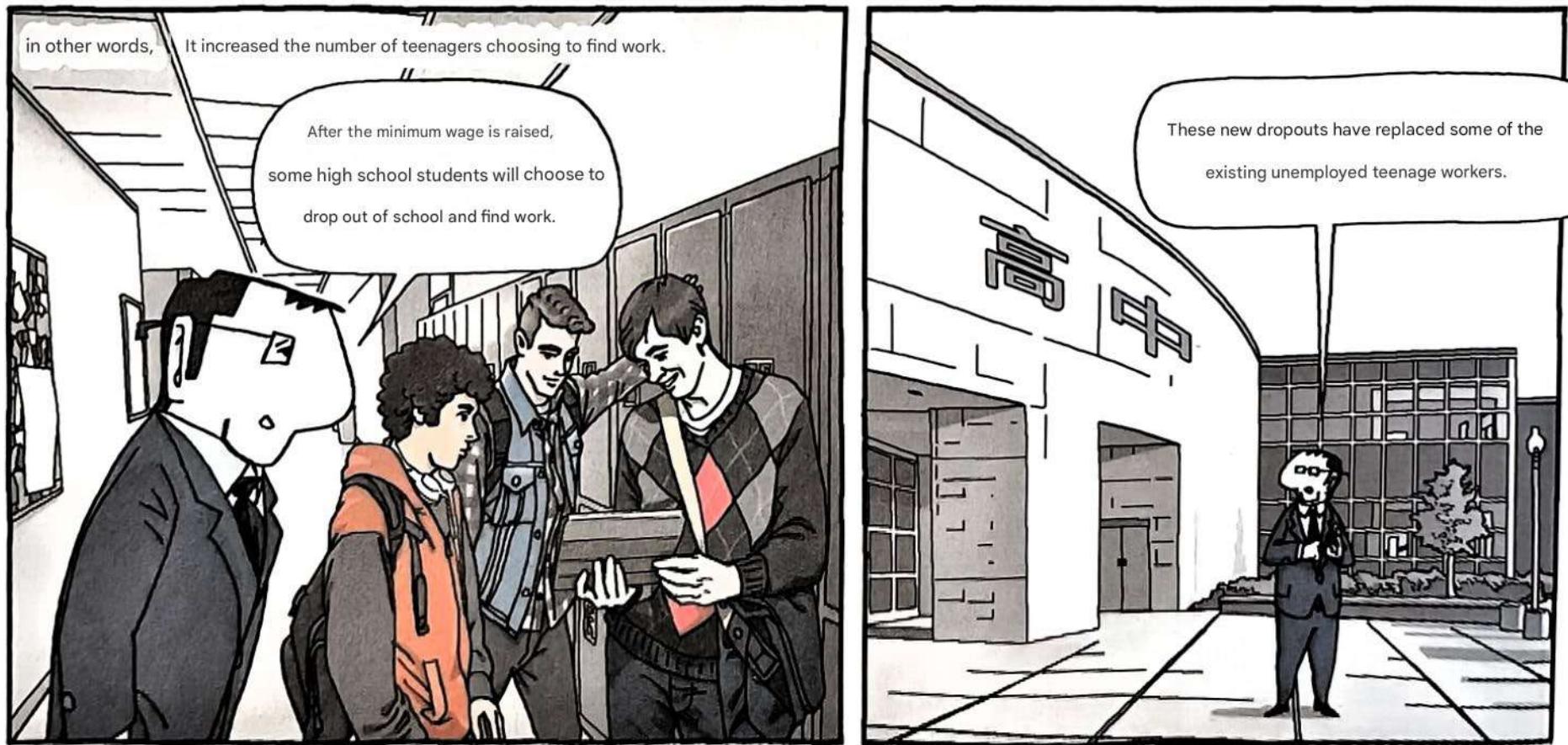


Minimum wage

A 10% increase in the minimum wage did not raise the average wage for teenagers by 10%. The legal change did not directly affect teenagers whose wages were already well above the minimum wage.

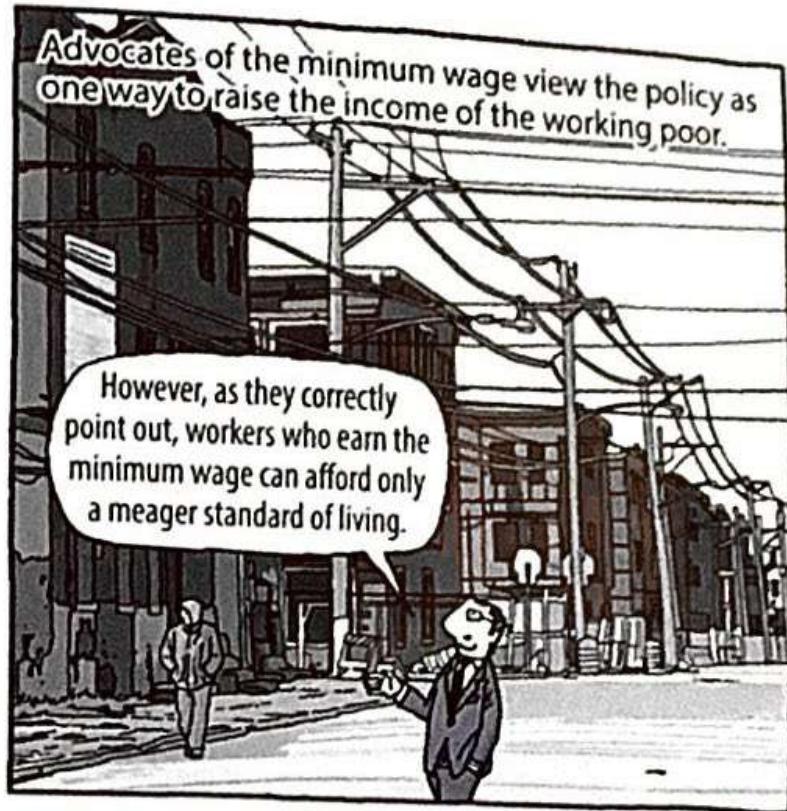
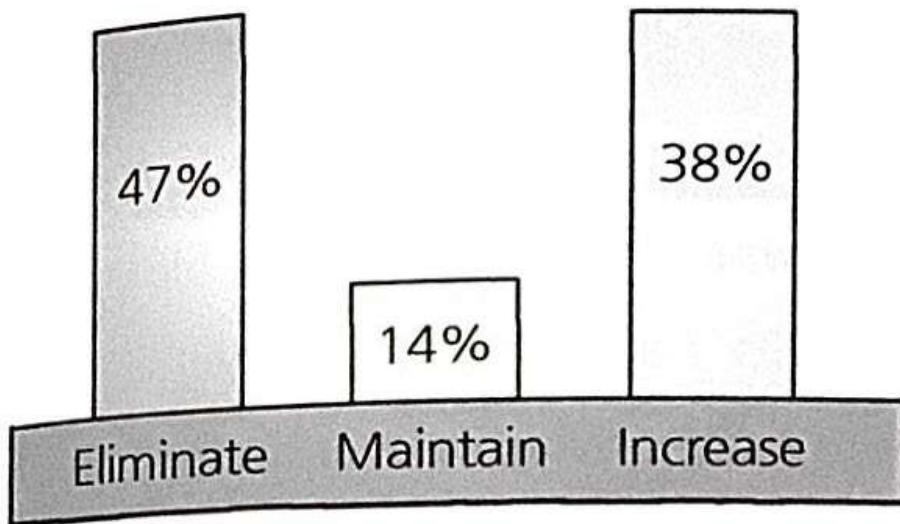


Minimum wage



Minimum wage

Considering the overall influence of the minimum wage, economists are evenly divided on the issue. The graph below shows the result of a survey conducted in 2006 among economists who had PhDs.



Minimum wage

For example, when the minimum wage is \$7.25 per hour, working 40 hours per week for a year, two adults receiving the minimum wage would have a total annual income of only \$30,160.



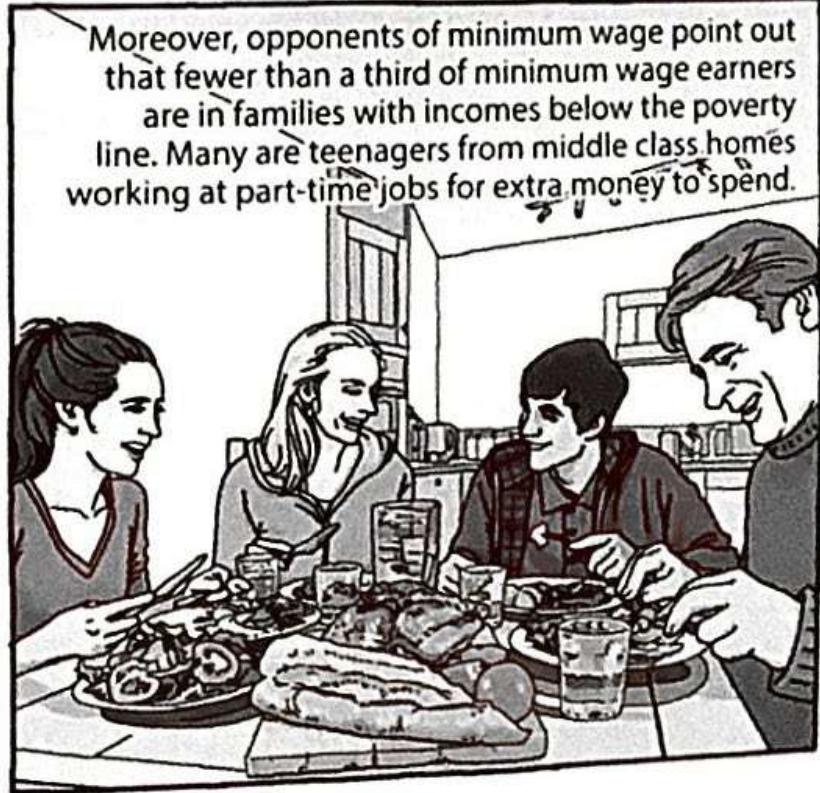
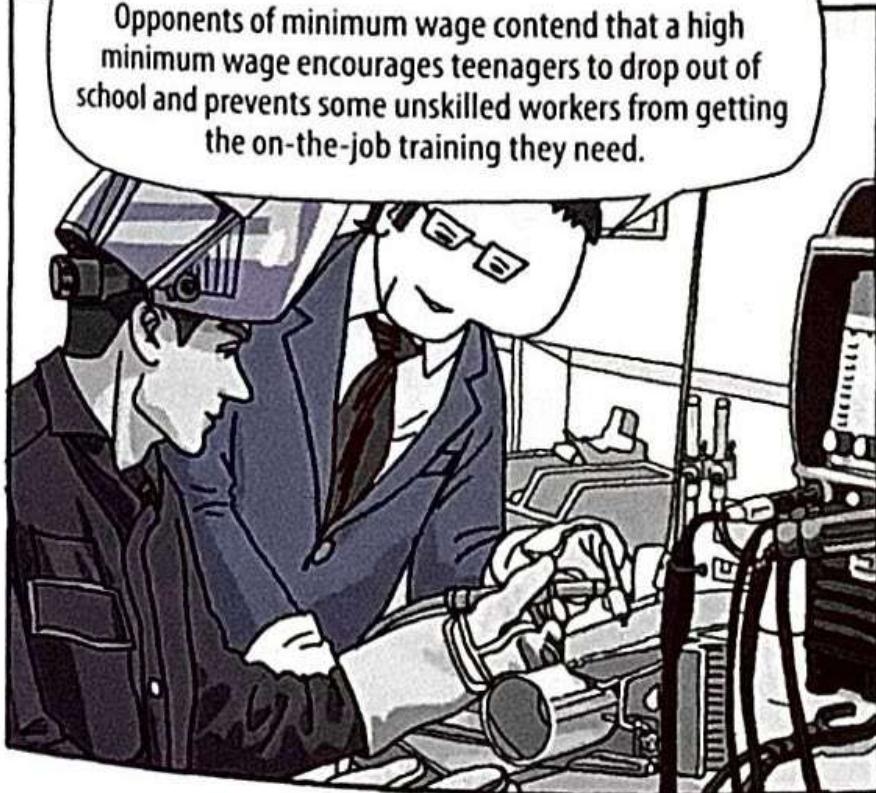
Many supporters of the minimum wage acknowledge some negative impacts, including unemployment, but consider these to be negligible. Taking all factors into account, they conclude that a higher minimum wage brings more benefits than harm.



Minimum wage

Opponents of minimum wage contend that a high minimum wage encourages teenagers to drop out of school and prevents some unskilled workers from getting the on-the-job training they need.

Moreover, opponents of minimum wage point out that fewer than a third of minimum wage earners are in families with incomes below the poverty line. Many are teenagers from middle class homes working at part-time jobs for extra money to spend.



SUMMARY



- A price ceiling is a legally mandated maximum price at which a good can be sold. A common example of a price ceiling is rent control.
- If the price ceiling is higher than the market equilibrium price, the forces of supply and demand tend to move the price toward the initial equilibrium, while the price ceiling has no effect.
- If the price ceiling is lower than the market average price, the price ceiling actually affects the market. At this price, demand exceeds supply.

SUMMARY



- When the government sets a binding price ceiling in a highly competitive market, goods become scarce, and sellers must ration the scarce goods among a large number of potential buyers.
 - Rationing mechanisms developed under price ceilings are rarely desirable.
 - Long queues are inefficient because they waste buyers' time.
 - Seller biases lead to discrimination, which is both inefficient and potentially unfair, because the goods may not necessarily flow to the buyer who gives the highest valuation.

SUMMARY



- A price floor is a legally mandated minimum price at which a good can be sold; a key example is the minimum wage.
- If the price floor is below the market equilibrium price, supply and demand forces will generally drive the price towards the equilibrium price, and the price floor has no effect.

SUMMARY



- If the price floor is above the market equilibrium price, then the price floor exerts a binding effect on the market. Supply and demand forces will generally drive the price towards the equilibrium price, and when the market price reaches the floor, it will not fall further. At this point, the price floor equals the market price. At this price level, supply exceeds demand, and some sellers are unable to sell their products. Therefore, a binding price floor will lead to surplus. The surplus caused by a price floor can also trigger the unpleasant practice of rationing.

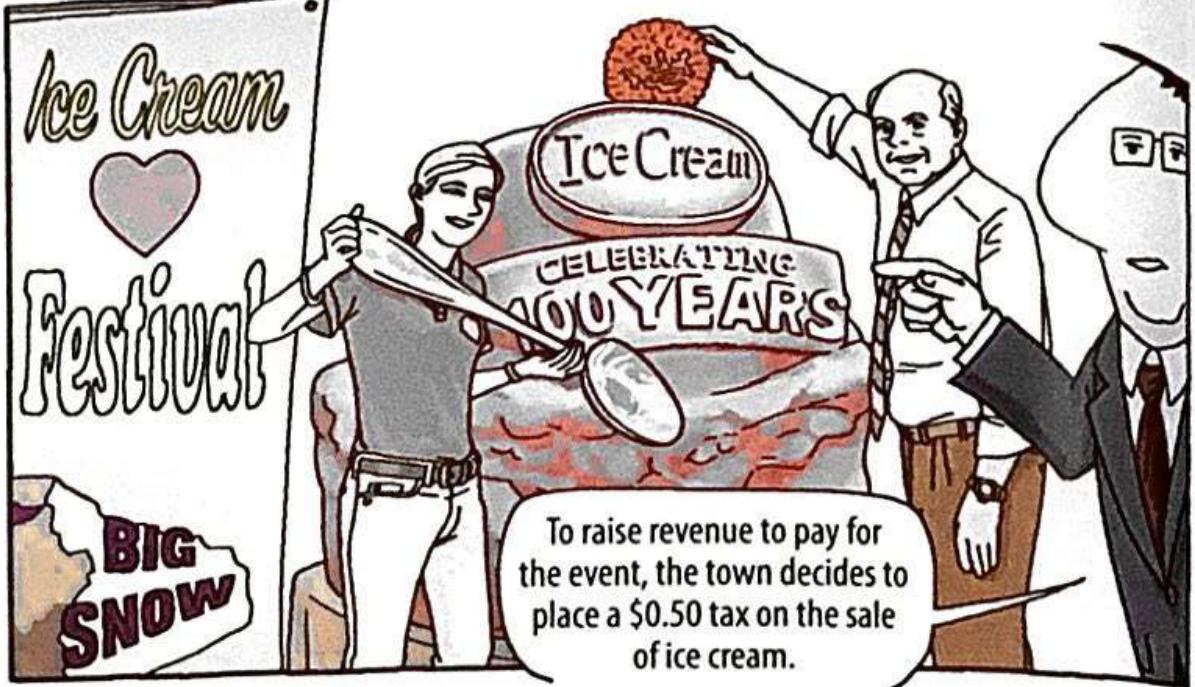
Chapter 8: Supply, Demand, and Government Policy

- Price control
- **Taxation**

Taxation

Taxes

Let us imagine that a local government decides to hold an annual ice cream festival—with a parade, fireworks, and speeches by town officials.



Taxation

The Ice Cream Consumers Association claims that ice cream sellers should pay this tax.



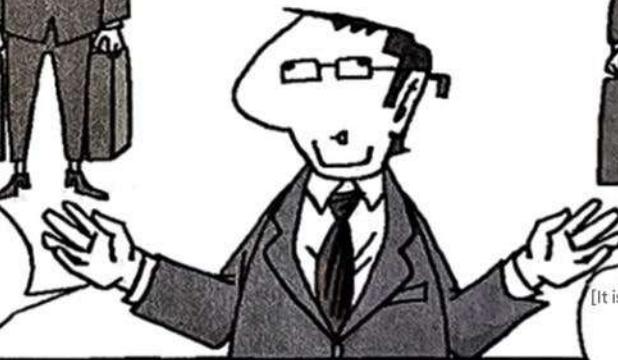
However, ice cream manufacturers' organizations claim that ice cream buyers should pay this tax.

consumer association



manufacturer organization

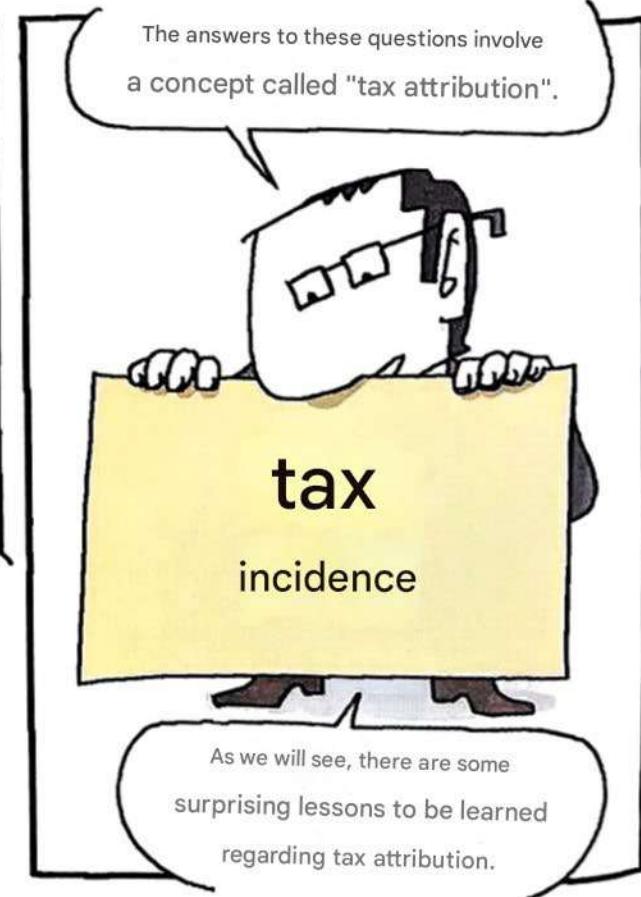
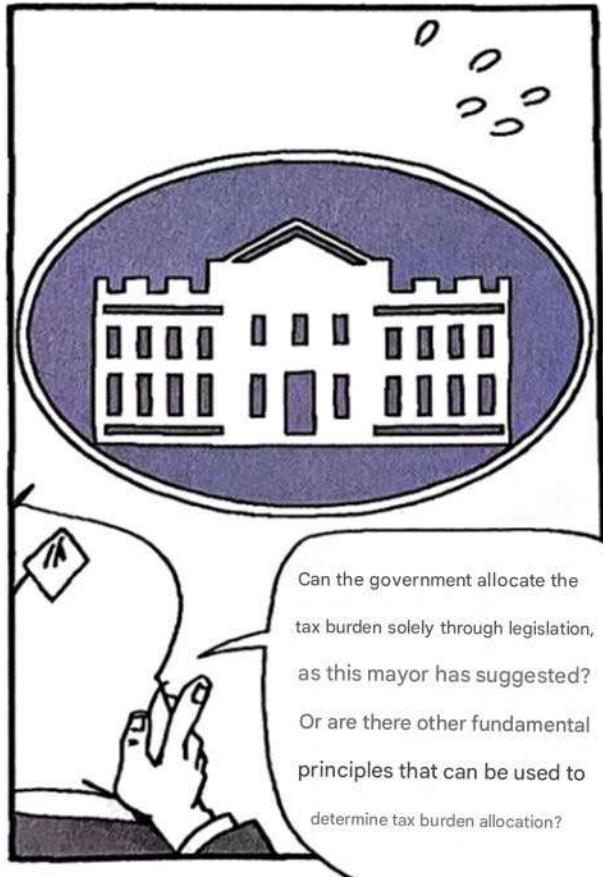
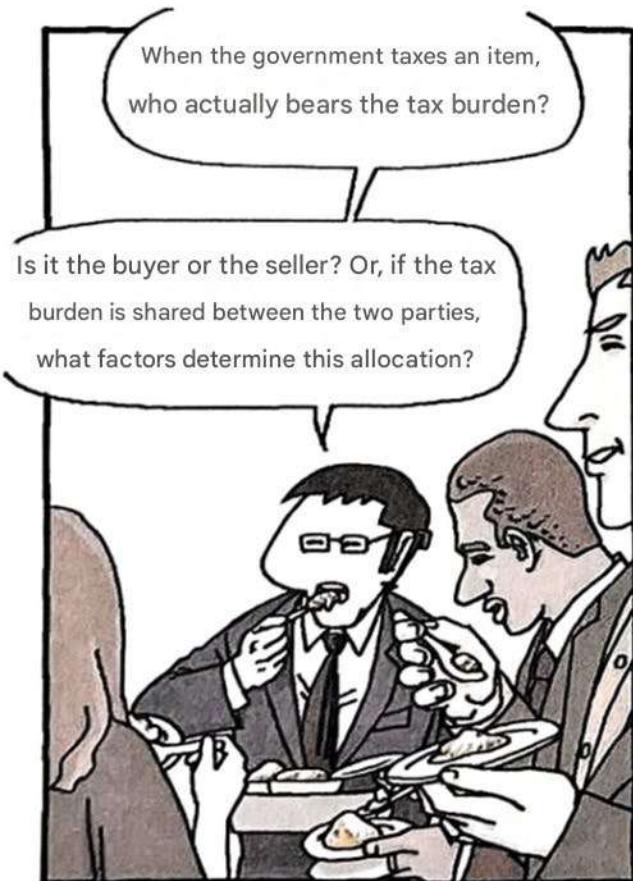
The mayor hopes that both sides can reach a compromise.



[It is suggested that the buyer pay half of the tax

and the seller pay the other half.]

Taxation



Can Congress allocate the burden of payroll taxes?

Can Congress
Distribute the
Burden of a Payroll
Tax?

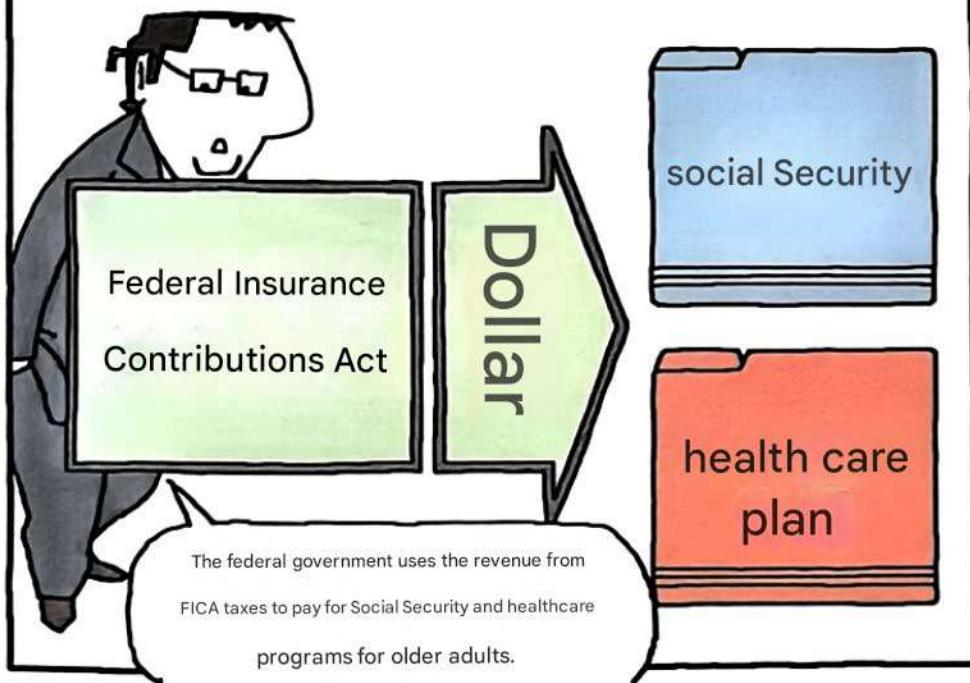
If you have ever received a paycheck, you have probably noticed that taxes were deducted from the amount you earned.

SUPERB MARKET, 1 PINE STREET, NEWTON, USA 54321				EARNINGS STATEMENT			
EMPLOYEE NAME:	SOCIAL SEC. #	HIRE DATE	DEPT.	WORKS	IN MTH	PERIOD	
RITA RYAN	123-45-4321	00111	2605	05/08	05/21	05/21	
INCOME	RATE	MONTHS	CURRENT TOTAL	REDUCTIONS	CURRENT TOTAL	YEAR-TO-DATE	
GROSS WAGES	15	80	1200.00	FICA MED TAX	17.40	52.20	
				FICA SS TAX	74.40	223.20	
				FEDERAL TAX	150.10	450.30	
				STATE TAX	0.00	0.00	

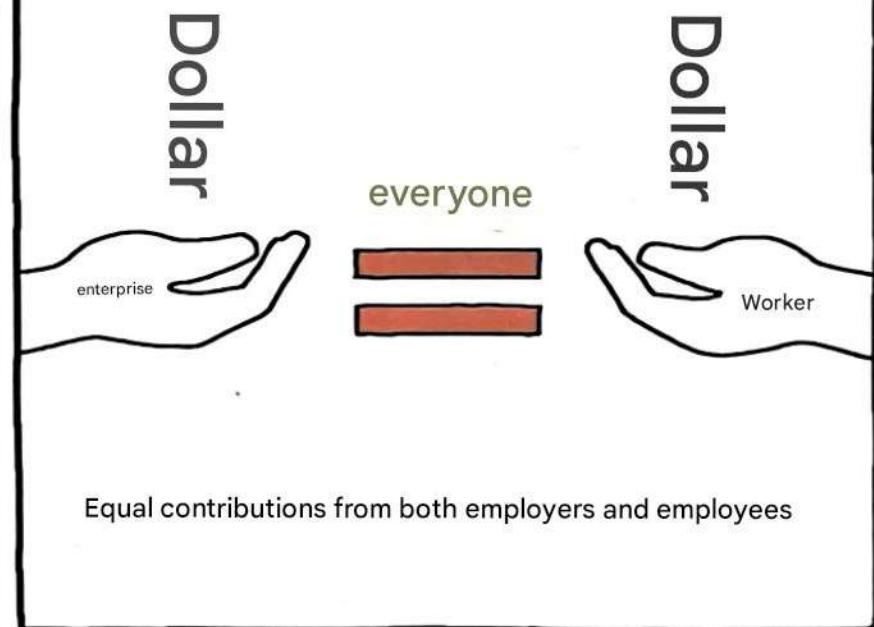
One of these taxes is imposed by the Federal Insurance Contributions Act (FICA).

Can Congress allocate the burden of payroll taxes?

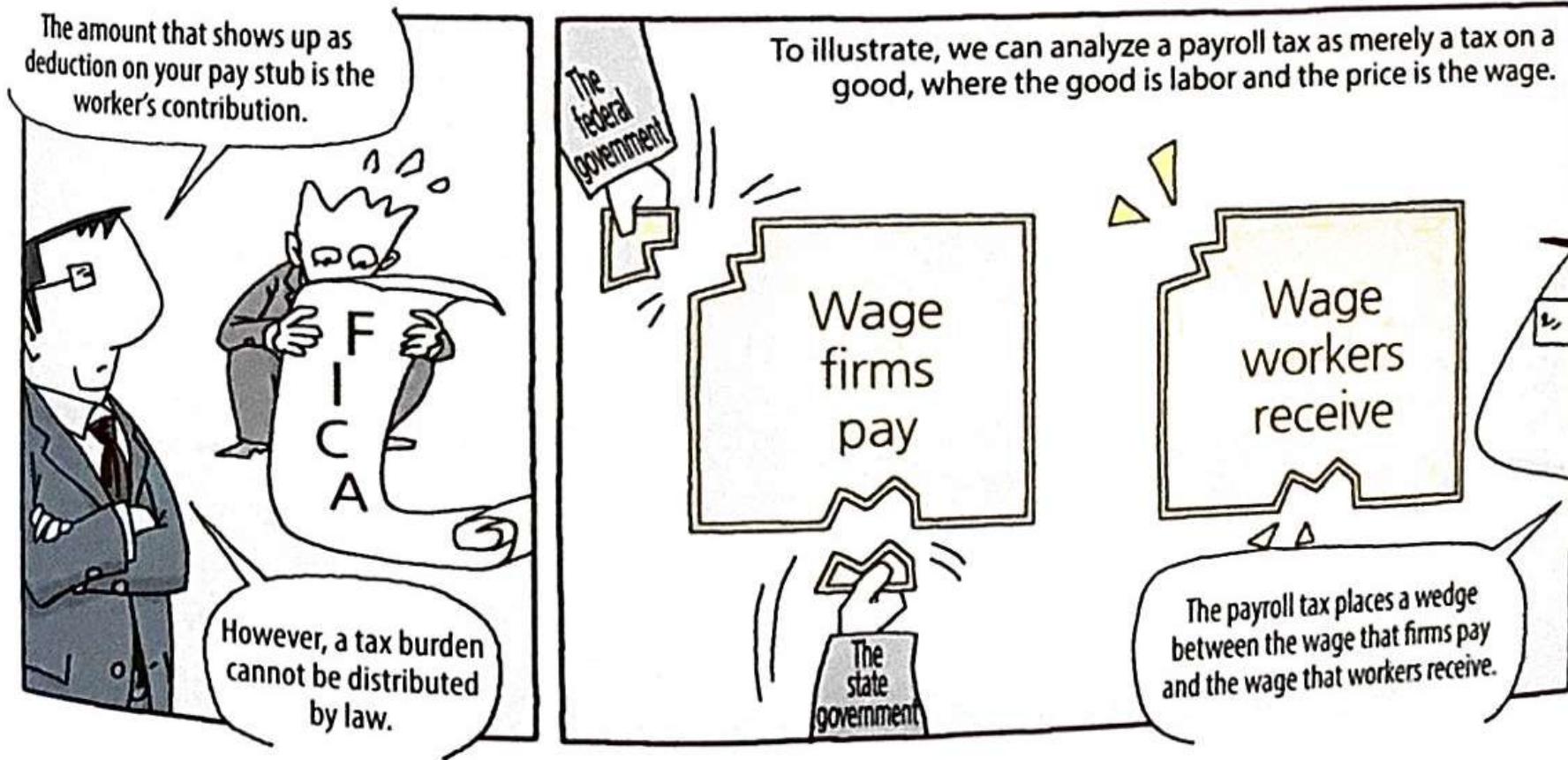
FICA tax is an example of a payroll tax, which is levied on the wages paid by businesses to their workers. In 2013, the average worker's total FICA tax accounted for 15.3% of their income.



Congress passed this legislation in an attempt to force a split in the tax burden: half to businesses and half to workers.



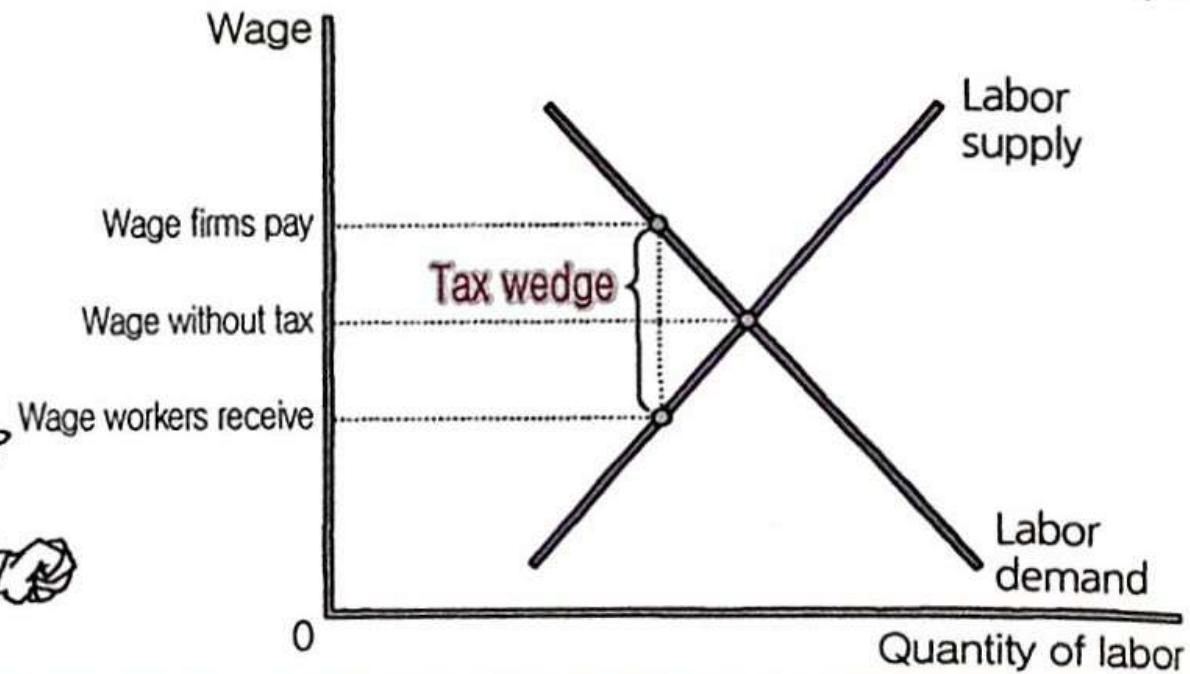
Can Congress allocate the burden of payroll taxes?



Can Congress allocate the burden of payroll taxes?

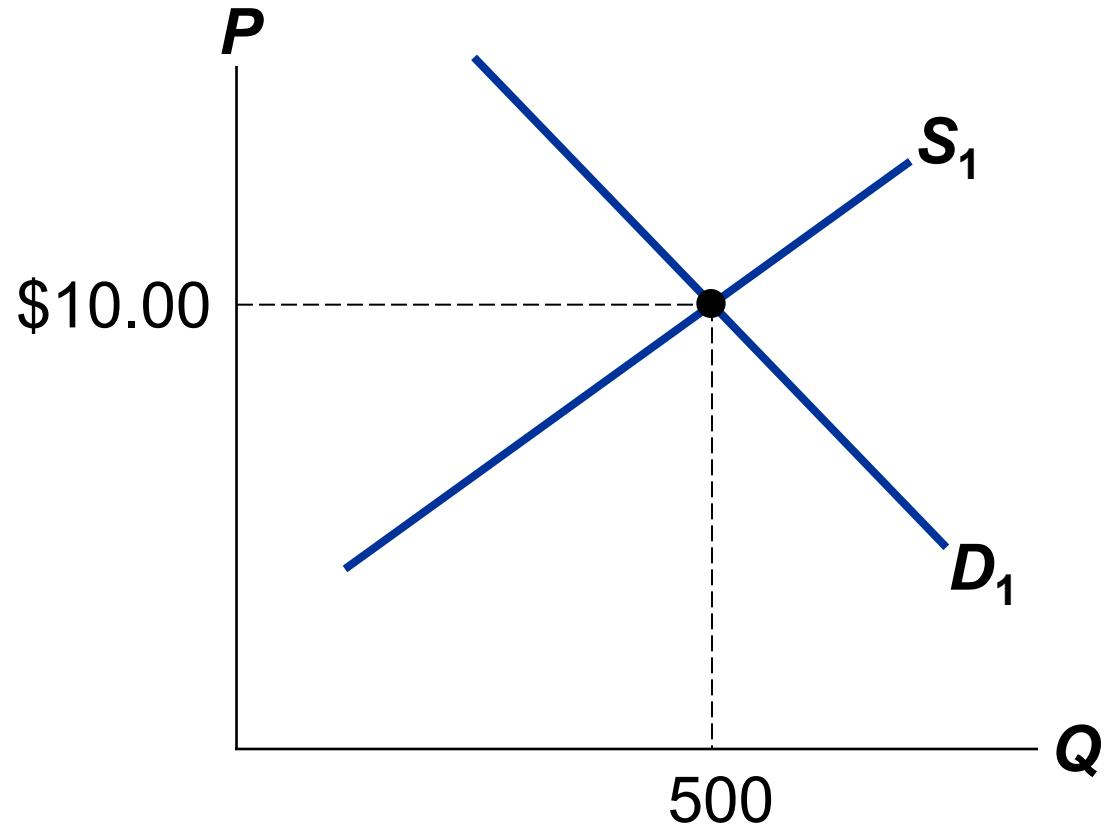
In the end, workers and firms share the burden of the tax, as the legislation requires.

When a payroll tax is enacted, the wage received by workers falls, and the wage paid by firms rises.



A Tax on Buyers

Eq'm
w/o tax



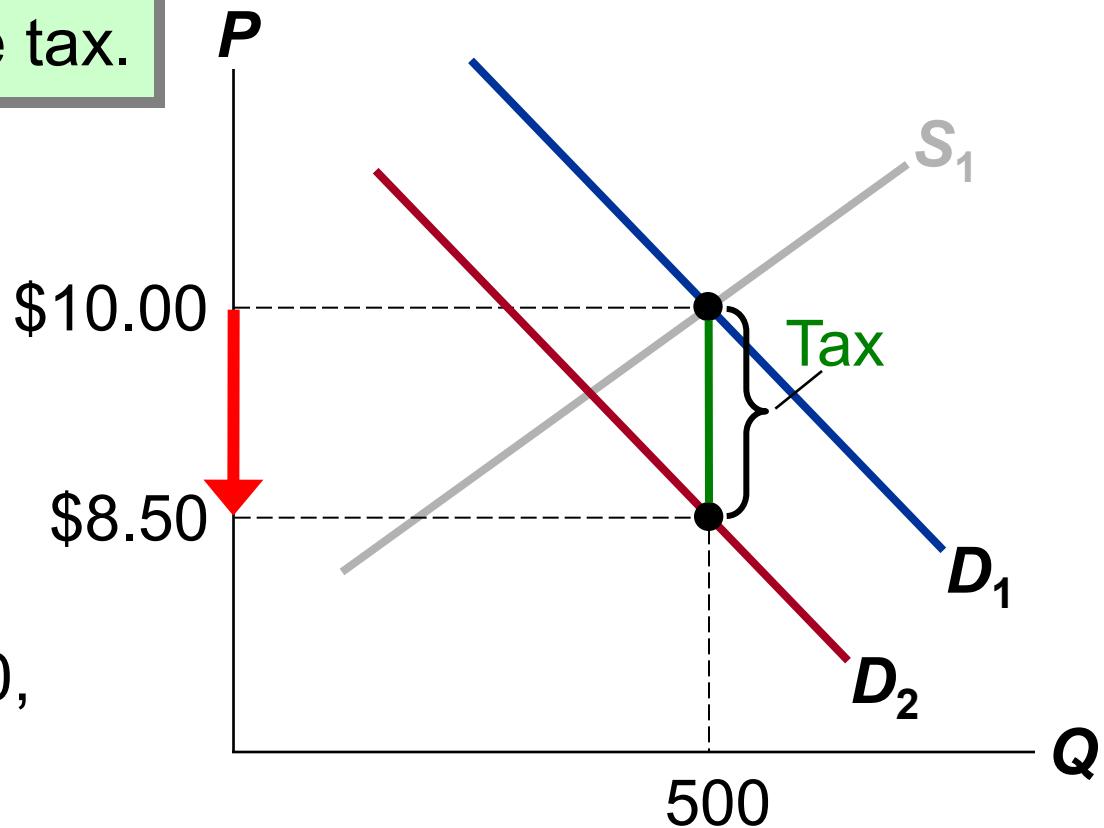
A Tax on Buyers

Hence, a tax on buyers shifts the D curve down by the amount of the tax.

P would have to fall by \$1.50 to make buyers willing to buy same Q as before.

E.g., if P falls from \$10.00 to \$8.50, buyers still willing to purchase 500 pizzas.

Effects of a \$1.50 per unit tax on buyers



A Tax on Buyers

New eq'm:

$$Q = 450$$

Sellers
receive

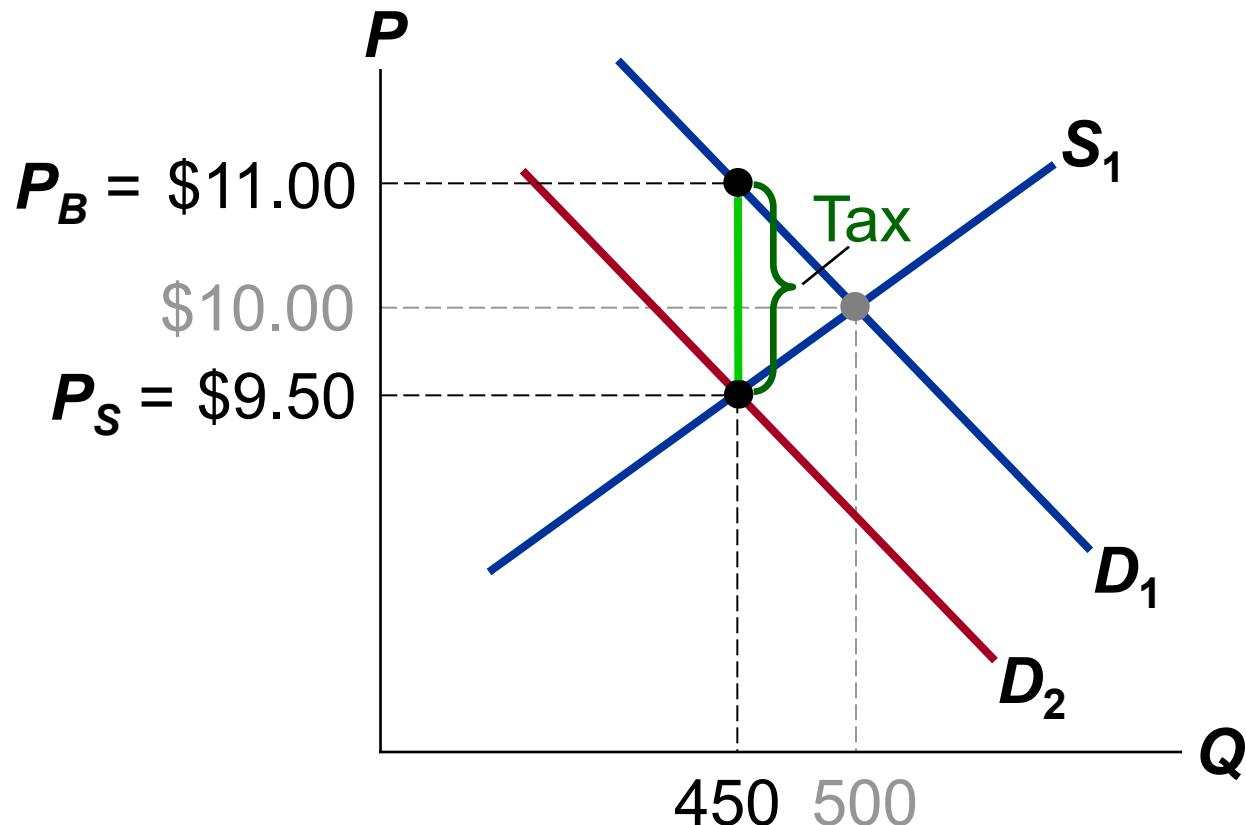
$$P_s = \$9.50$$

Buyers pay

$$P_B = \$11.00$$

Difference
between them
 $= \$1.50 = \text{tax}$

Effects of a \$1.50 per
unit tax on buyers

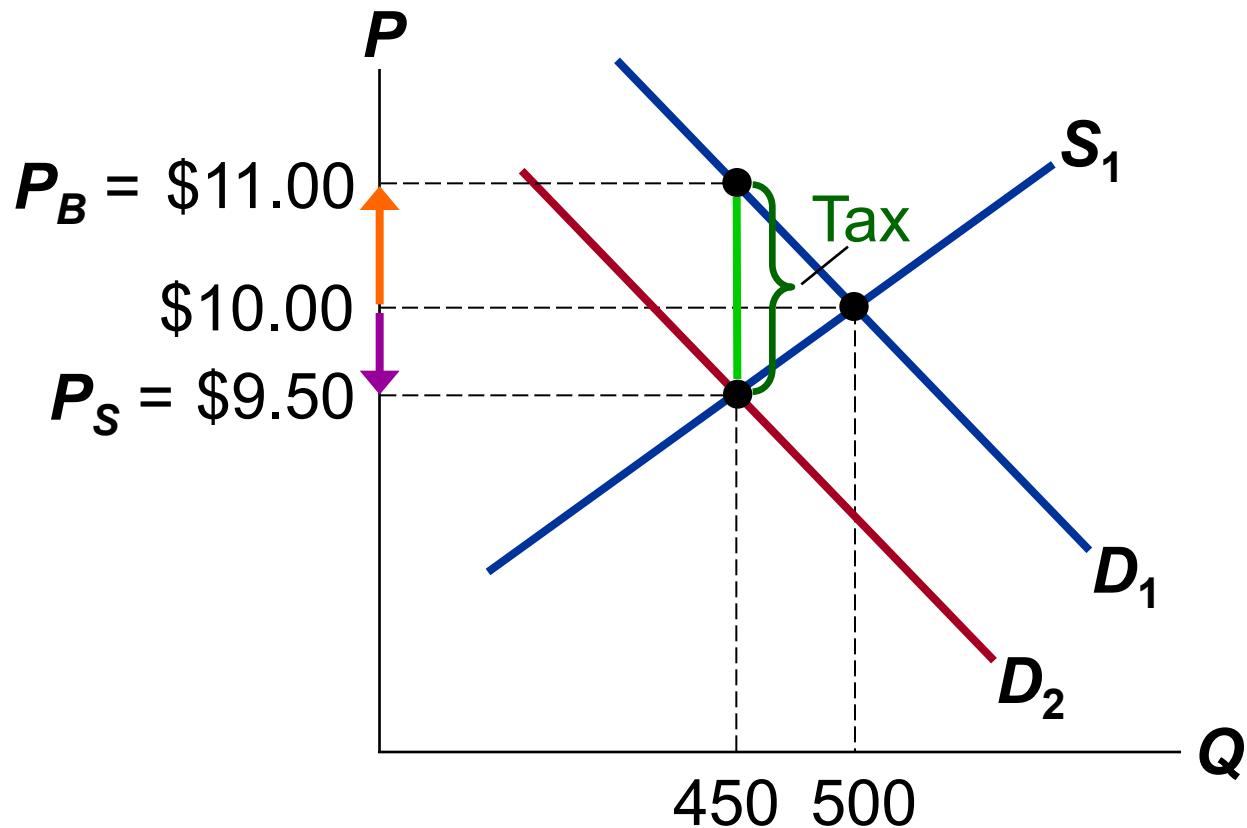


The **Incidence** of a Tax:

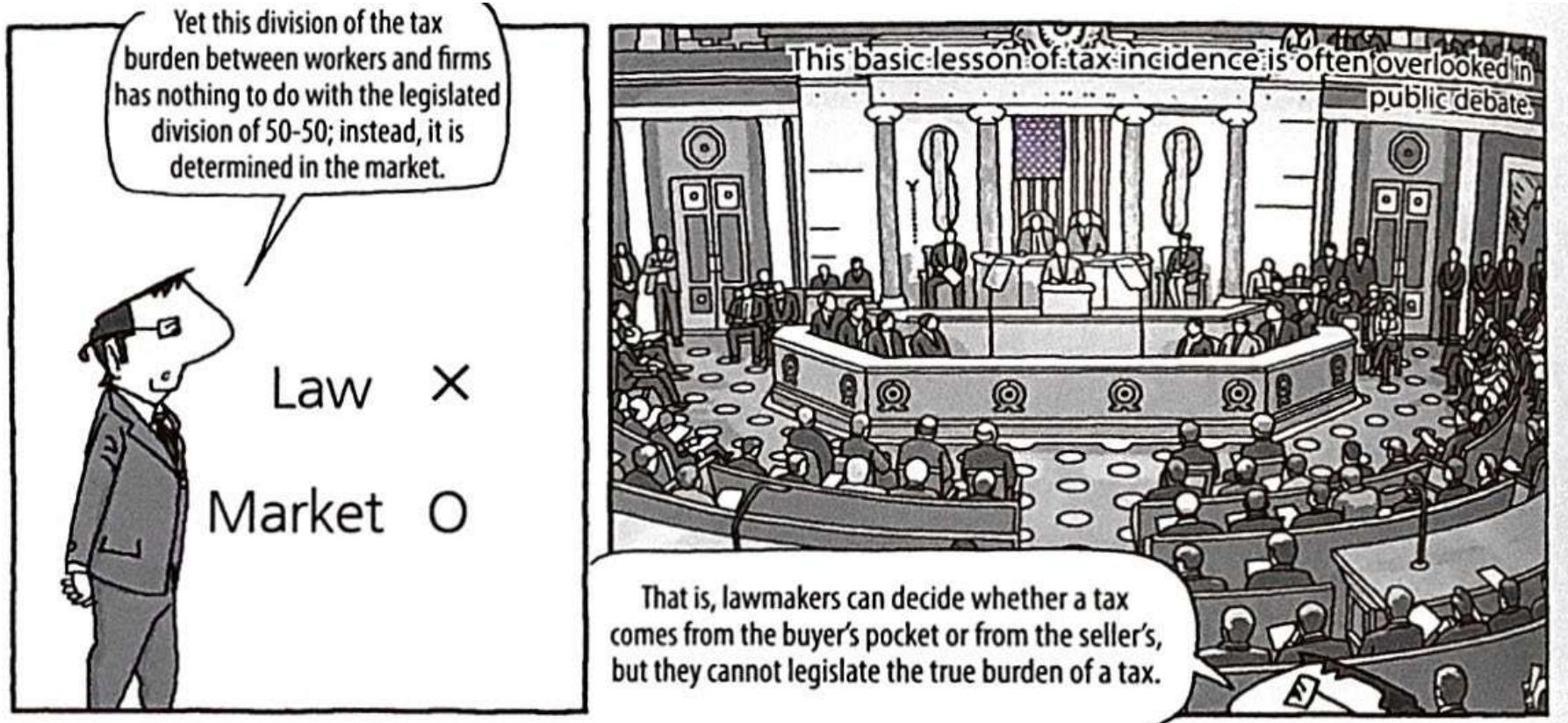
how the burden of a tax is shared among market participants

In our example,

buyers pay \$1.00 more,
sellers get \$0.50 less.

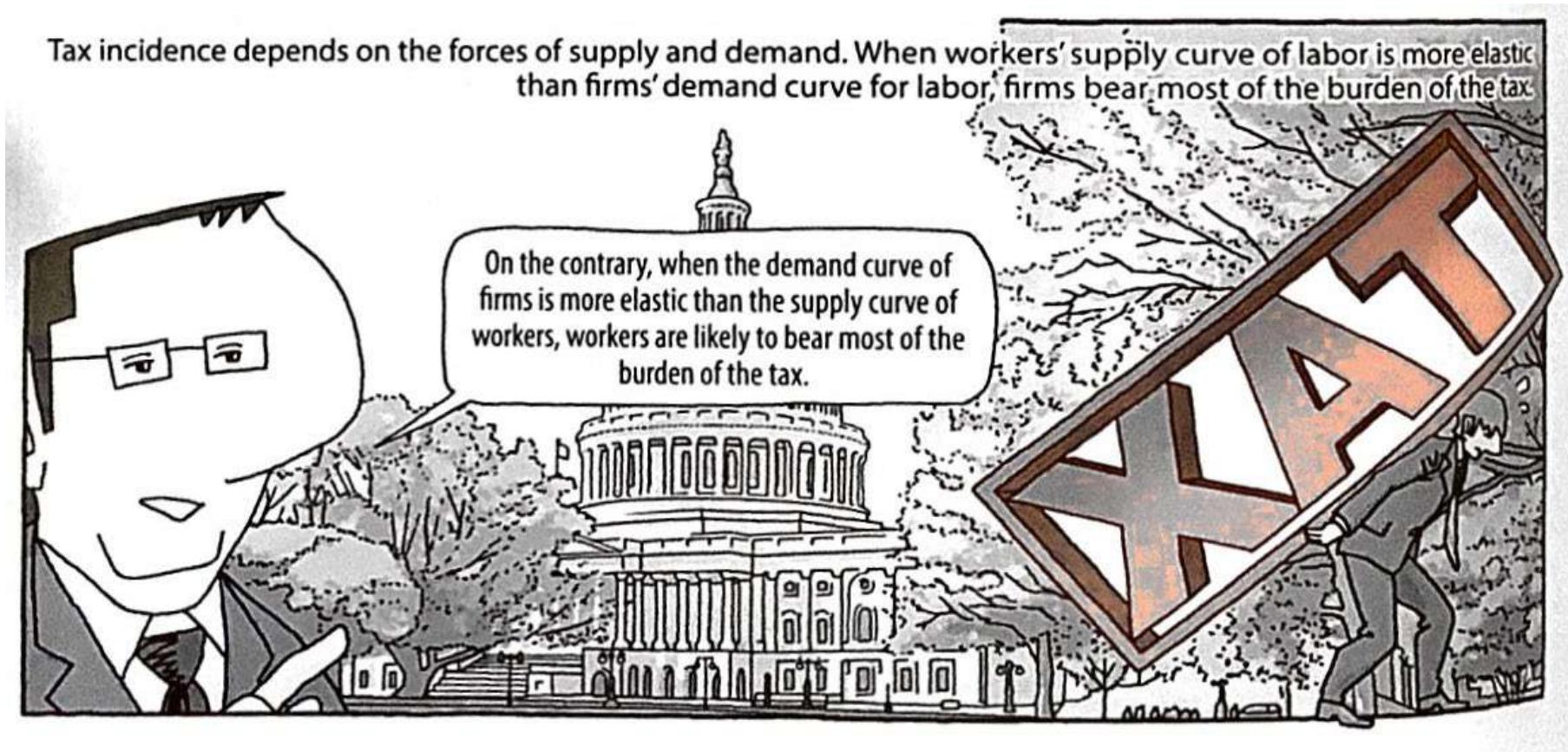


Can Congress allocate the burden of payroll taxes?



Can Congress allocate the burden of payroll taxes?

Tax incidence depends on the forces of supply and demand. When workers' supply curve of labor is more elastic than firms' demand curve for labor, firms bear most of the burden of the tax.



The tax burden falls more heavily on the less elastic party in the market. Elasticity measures the willingness of a buyer or seller to leave the market when conditions become unfavorable. When taxes are levied, the less elastic party cannot easily leave the market and therefore must bear a greater tax burden.

Who pays the luxury tax

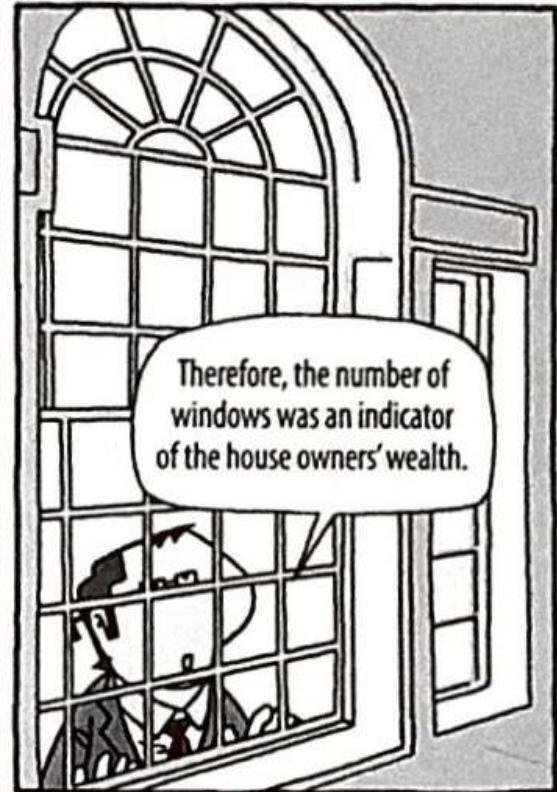
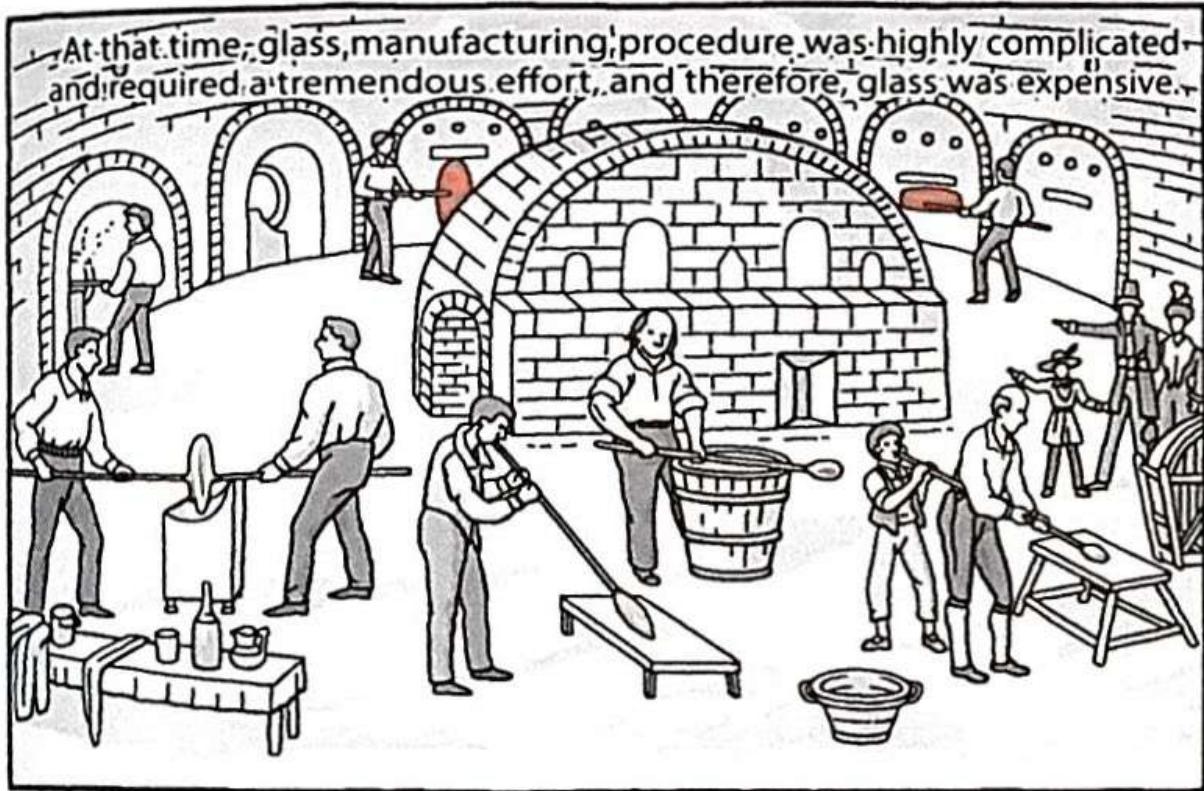
Who pays
luxury tax

In 1696, King William III of England levied a "window tax" to supplement the nation's finances.

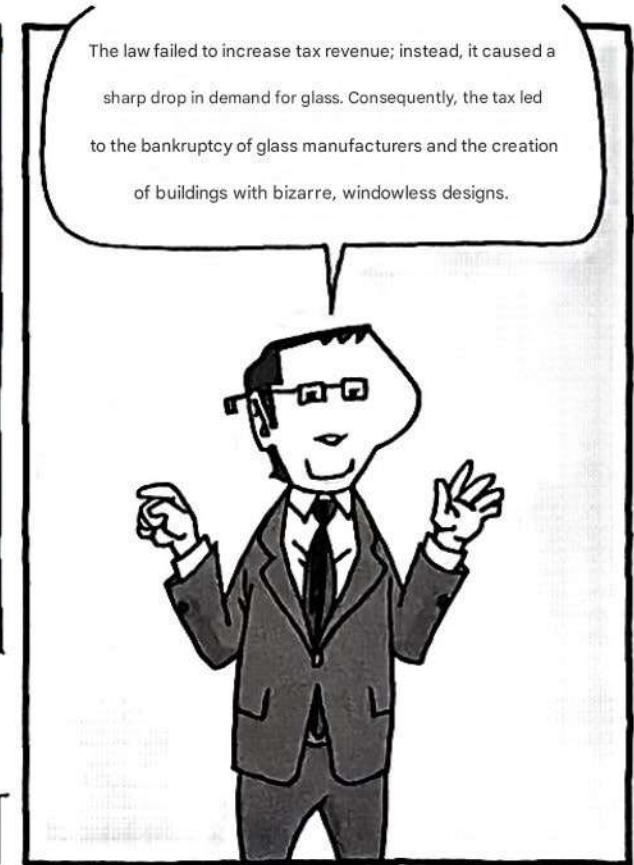
According to this law, property owners with more than six windows should pay additional taxes based on the number of windows in their property.



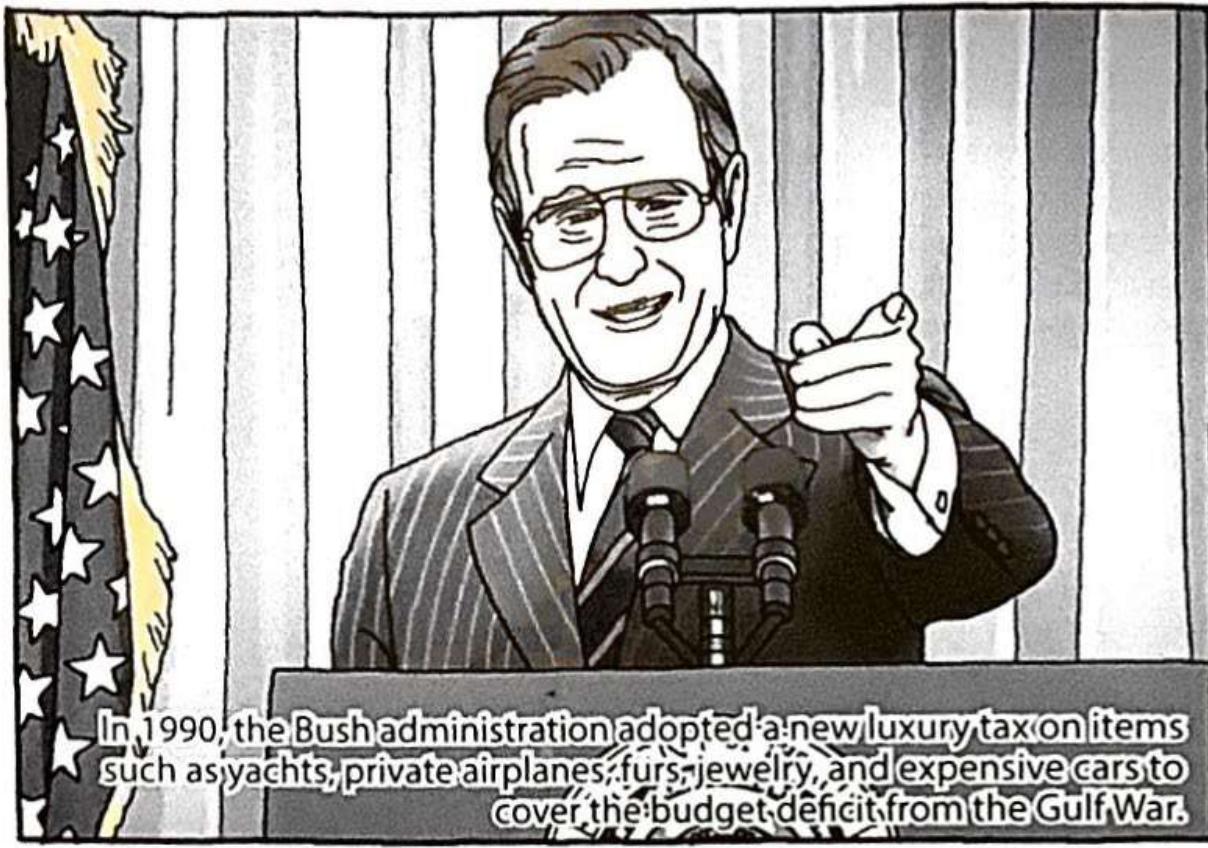
Who pays the luxury tax



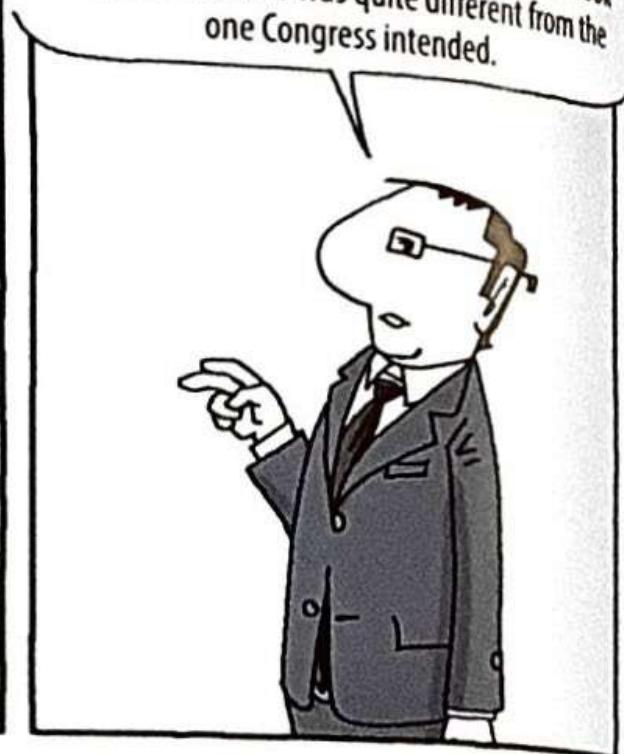
Who pays the luxury tax



Who pays the luxury tax



Yet, when the forces of supply and demand took over, the outcome was quite different from the one Congress intended.



Who pays the luxury tax

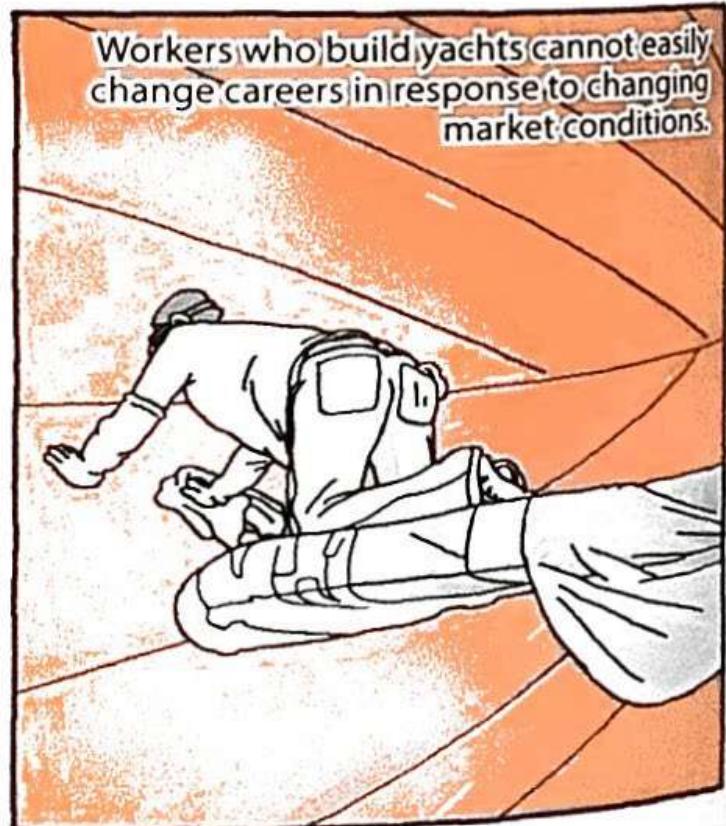
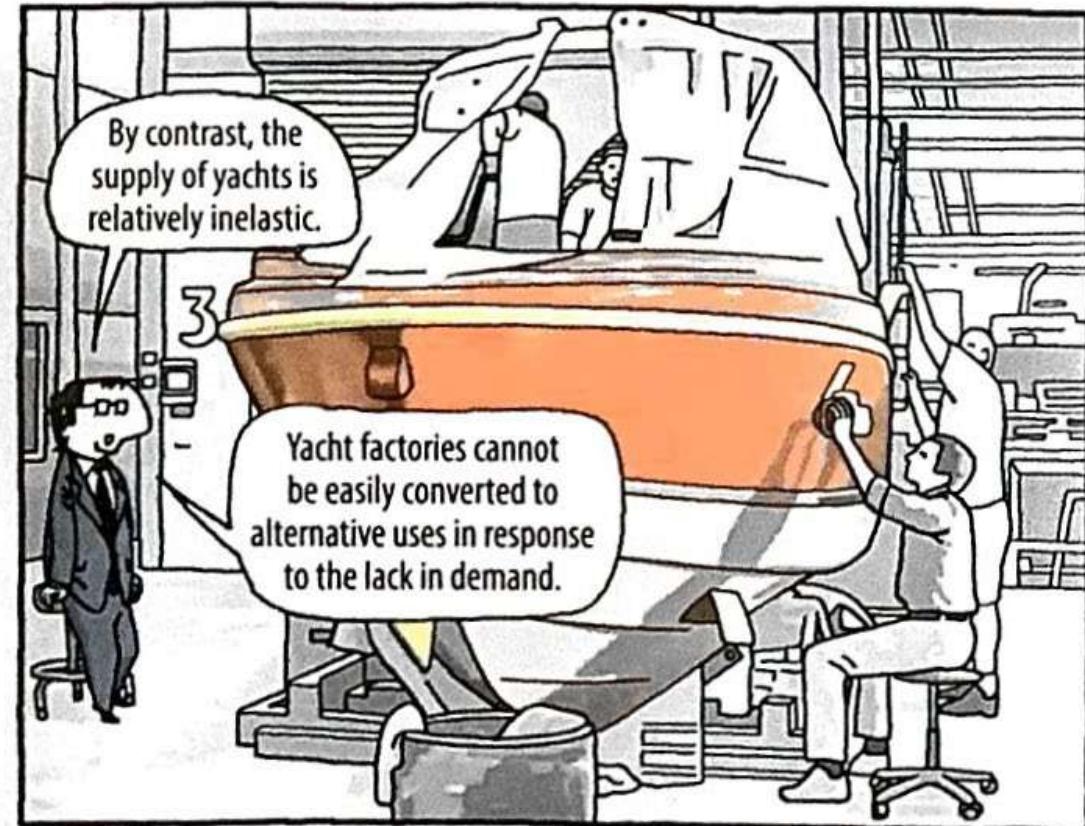
For example, consider the market for yachts.

The demand for yachts is quite elastic.

Millionaires can easily not buy a yacht, and instead

use the money to buy a bigger house
take a European vacation, or leave a larger
bequest to their heirs.

Who pays the luxury tax

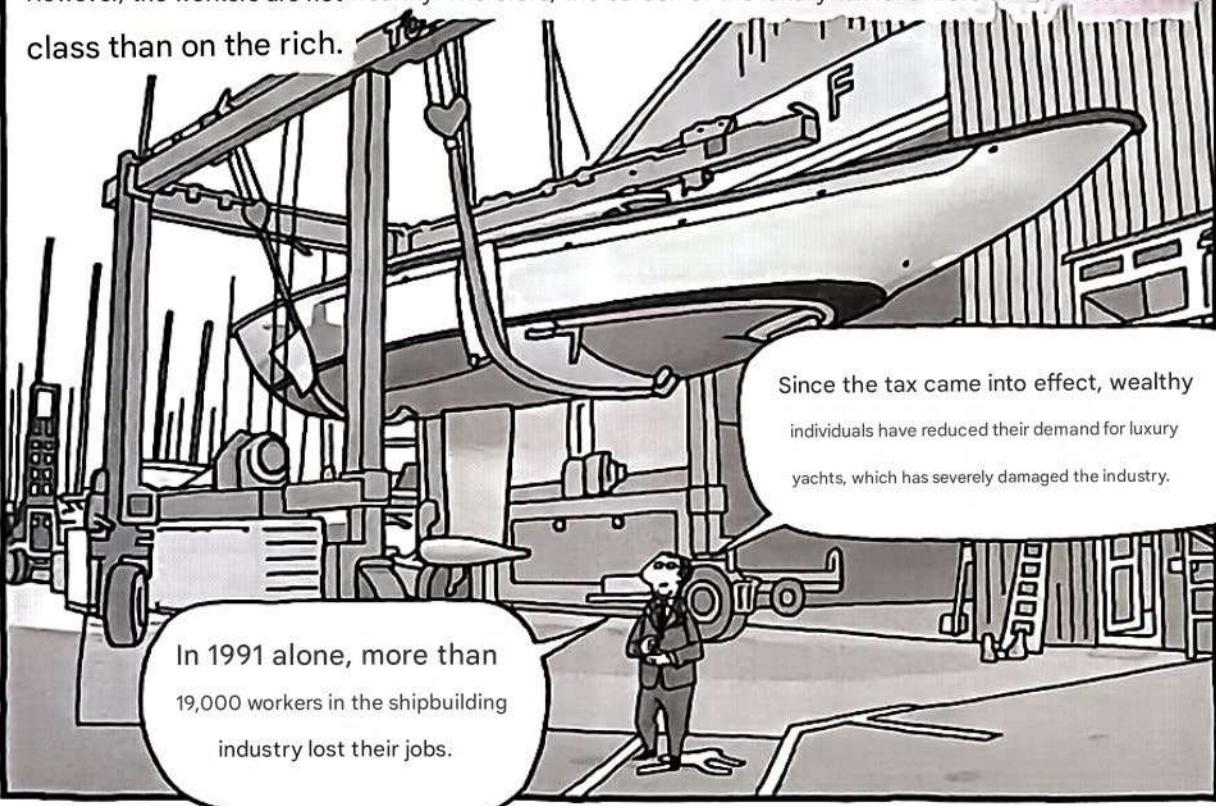


Who pays the luxury tax



Who pays the luxury tax

However, the workers are not wealthy. Therefore, the burden of the luxury tax falls more on the middle class than on the rich.



luxury tax



The U.S. government implemented austerity measures on the luxury goods industry, resulting in a tax increase of only \$30 million, far below the initial expectation of \$500 million.

Who pays the luxury tax

Luxury goods suppliers made their congressional representatives clearly aware of the economic difficulties they were experiencing.

Congress then repealed most of the luxury tax in 1993.

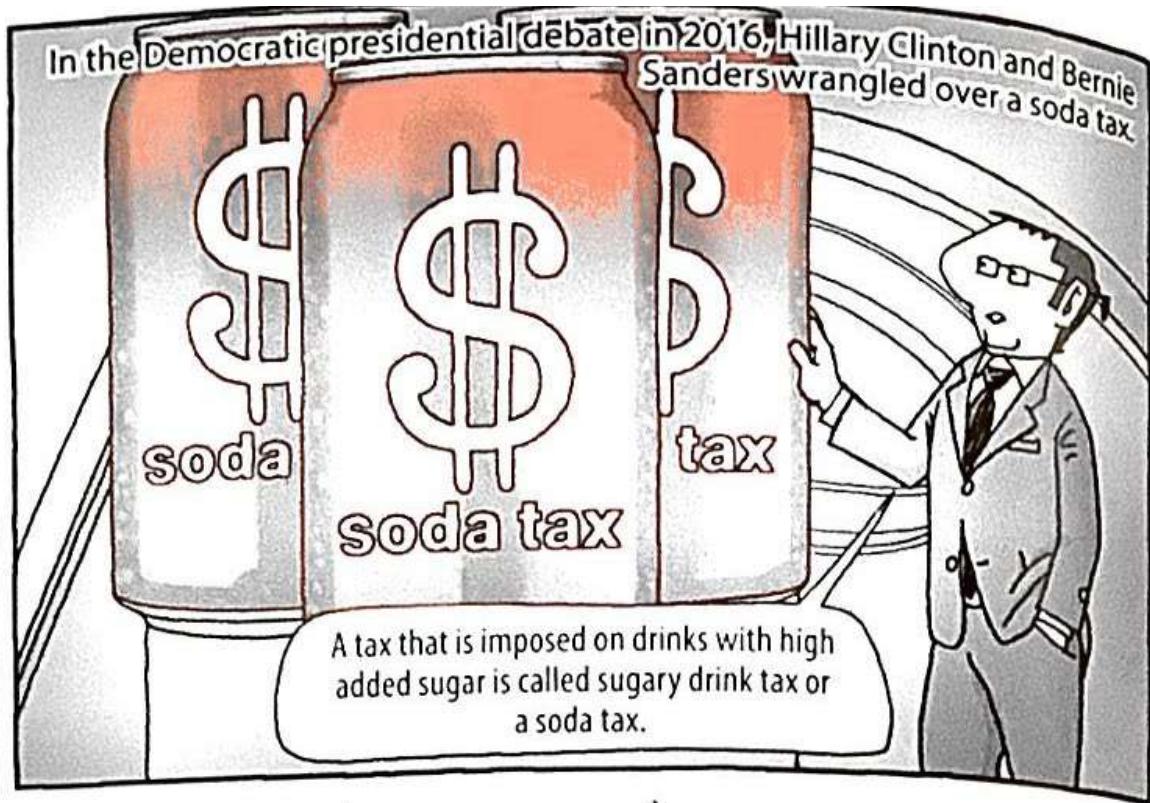
The policy ignored the economic principle of tax attribution, which ultimately had a negative impact.

Luxury taxes are a prime example of how governments have failed to consider the price elasticity of demand for luxury goods from buyers.



Debate about the soda tax

Debates over
a Soda Tax



Debate about the soda tax

How can someone who doesn't care about people's health become a presidential candidate?

Why do low-income groups bear a heavier tax burden?

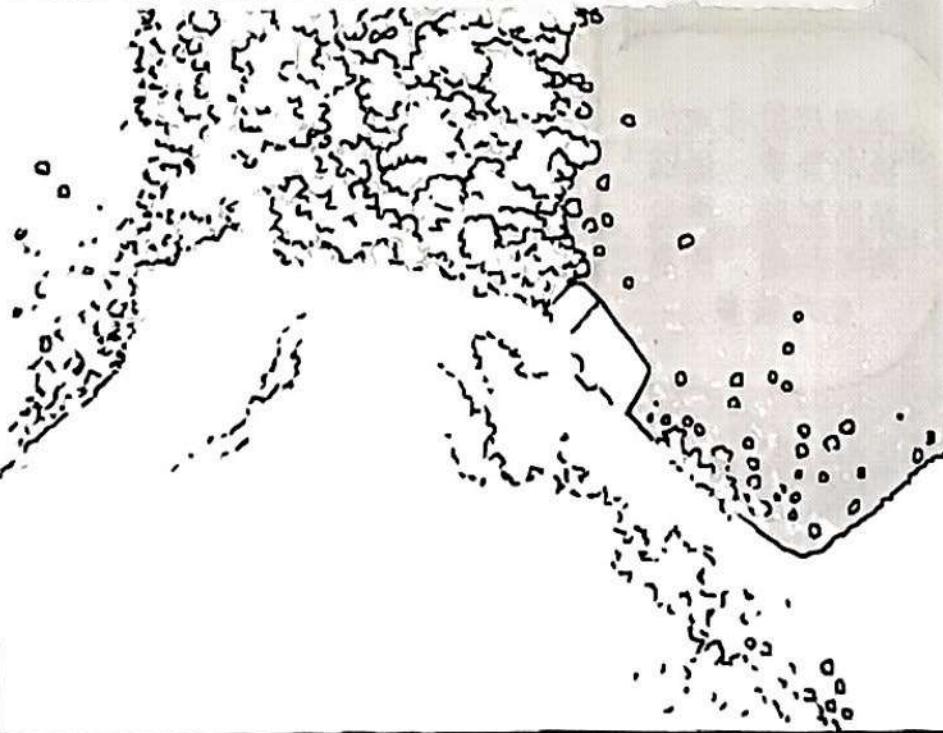
This is a way to reduce consumption while promoting a healthy lifestyle.

Sanders claims that taxing sugary drinks would "disproportionately impact low-income Americans" because low-income people drink more soda.

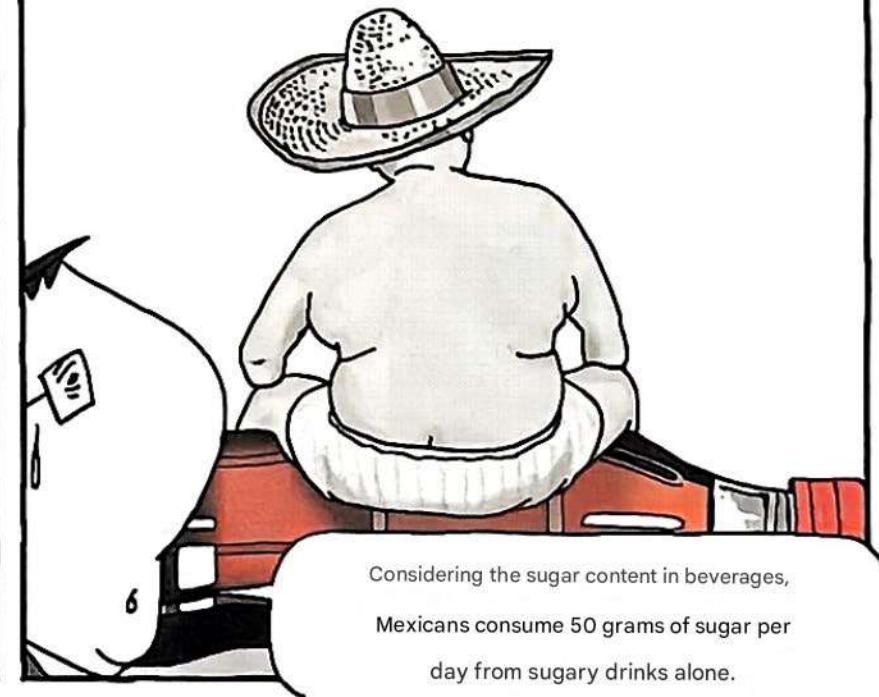
Increased taxes could also enable low-income Americans to live healthier lives.

Debate about the soda tax

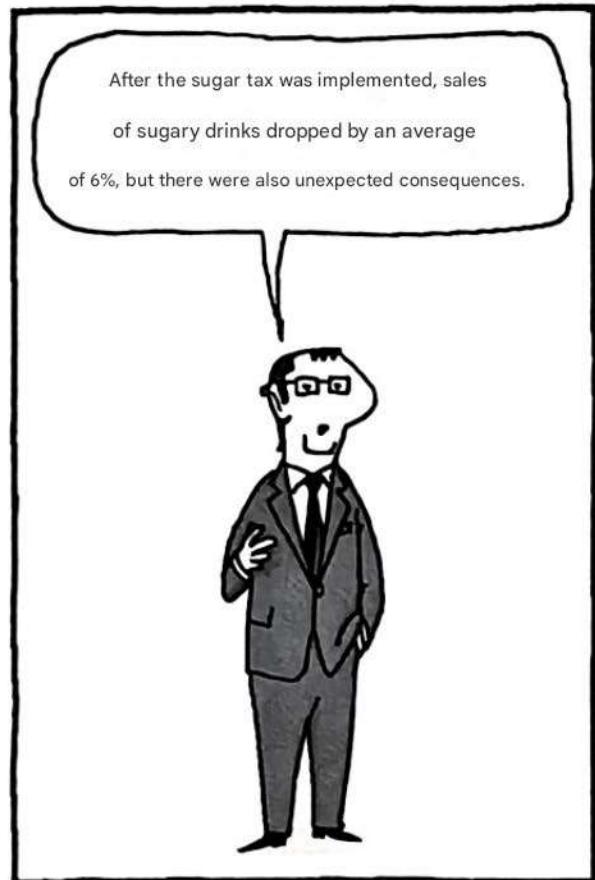
Mexico is one of the world's most obese countries, and in January 2014 it passed a "sugar tax" that levies a tax of 1 peso per liter of sugary drinks.



According to a survey, Mexicans drink an average of 176 liters of sugary drinks per year, which means they consume an average of 500 milliliters of sugary drinks per day.



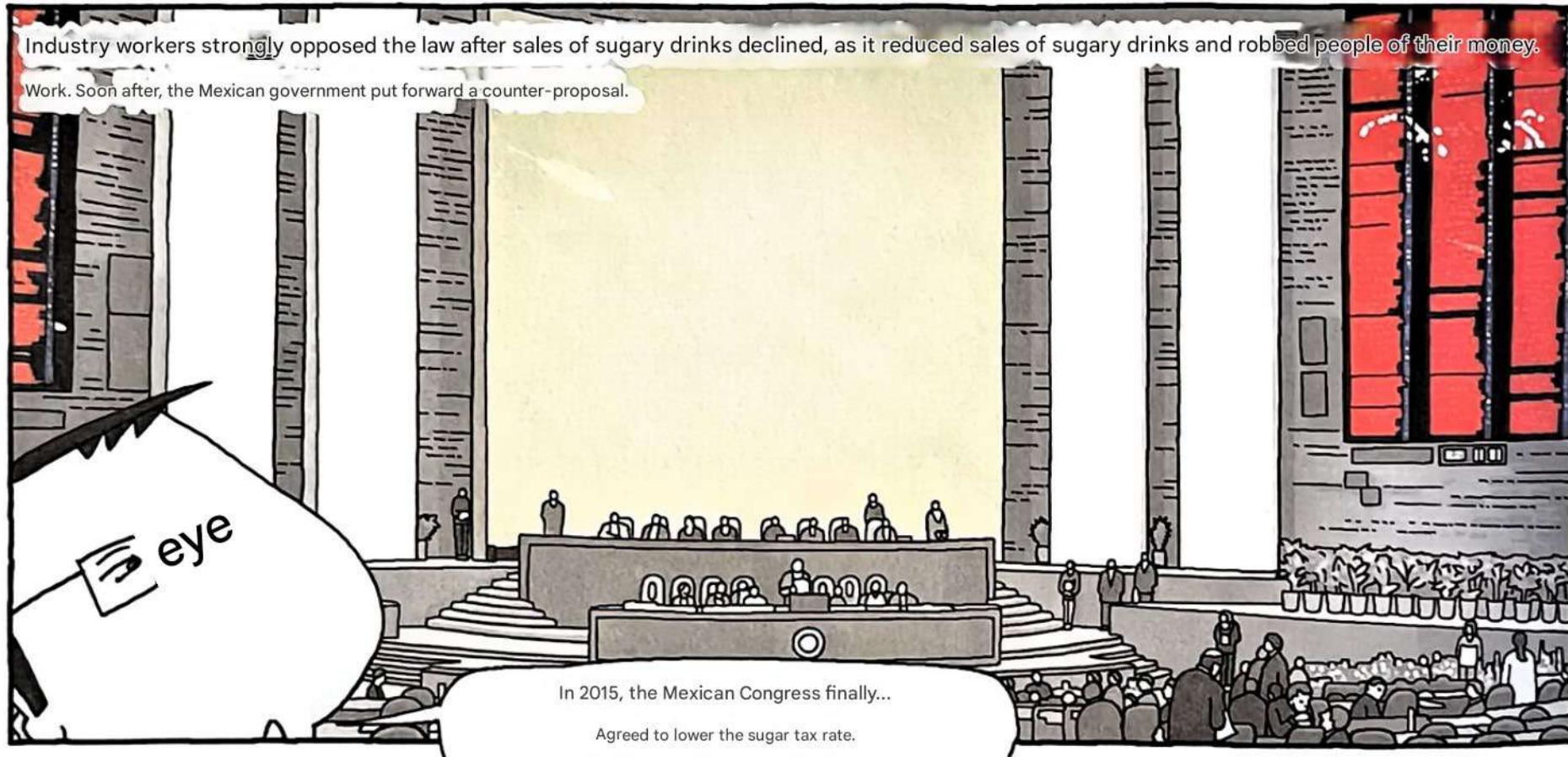
Debate about the soda tax



The decline in sales of sugary drinks has dealt a heavy blow to sugarcane growers.

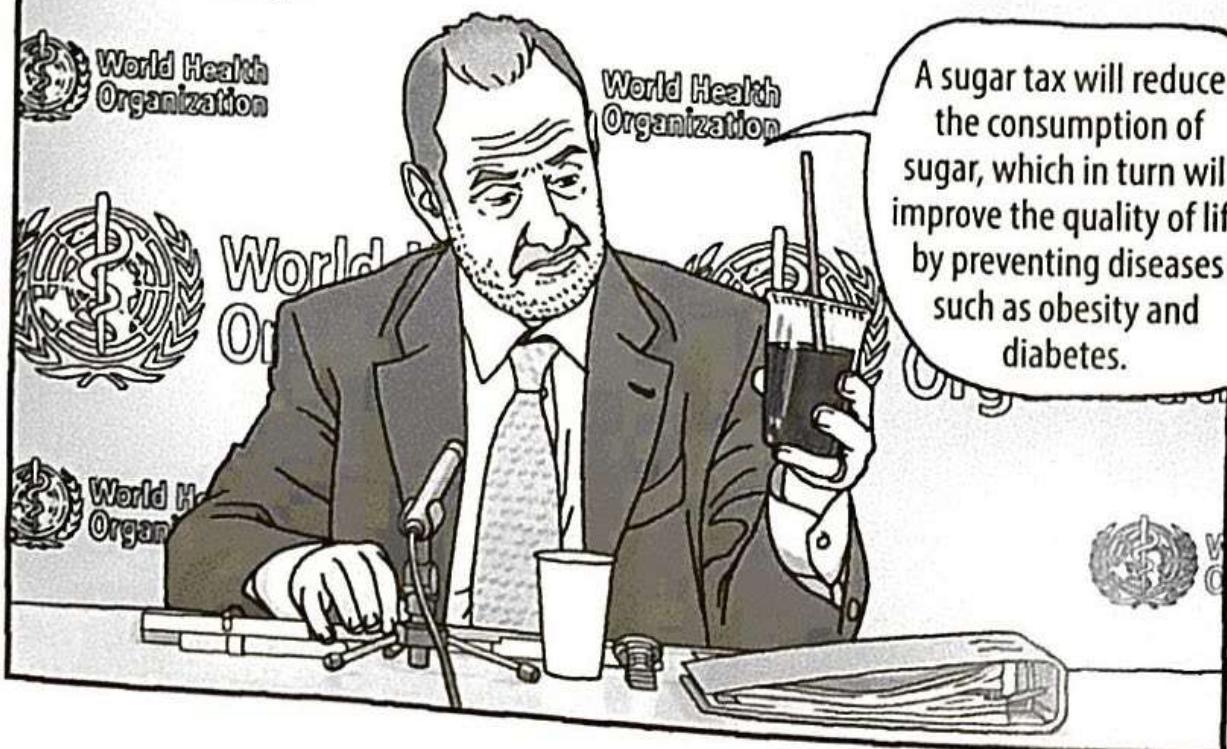


Debate about the soda tax

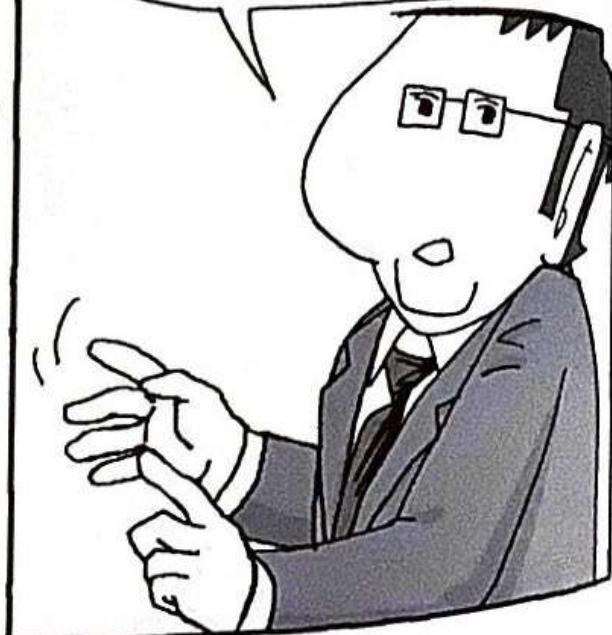


Debate about the soda tax

In 2016, on "World Obesity Day", the World Health Organization declared war on sugar and urged countries to a 20% "sugar tax" on sugary beverages.



However, some food industry participants and consumer organizations are claiming that there is no clear correlation between the price of sugary drinks and dietary habits.



SUMMARY



- When the government taxes a good, who actually bears the tax burden?
 - Is it the person who buys the good, or the person who sells it?
 - Or, if the buyers and sellers share the tax burden, what factors determine how that burden is distributed?
 - Can the government simply allocate the tax burden through legislation, or are there more fundamental market principles that determine the sharing of the burden?
- Economists refer to this topic as tax incidence. When the government taxes a good, the equilibrium quantity decreases. In other words, taxing a good reduces the size of the market for that good.

SUMMARY



- **How Does Taxing Sellers Affect Market Outcomes?**
- First, let's analyze the situation of taxing sellers using the following three steps:
 - Step 1: Since buyers are not taxed, the quantity demanded remains the same at any given price level.
 - Step 2: Because taxing sellers increases production and distribution costs, the quantity supplied decreases at every price level. The supply curve shifts to the left, or equivalently, upwards.
 - Step 3: When a tax is imposed on sellers, a new equilibrium is formed, resulting in a higher equilibrium price and a lower equilibrium quantity. Because sellers sell less and buyers buy less, the tax shrinks the size of the market.

SUMMARY



- **Although the seller pays all the taxes to the government, the tax burden is shared between the buyer and the seller. Because the market price increases after the introduction of the tax, the buyer pays more for the item than they would without the tax; therefore, the tax makes the buyer worse off. The seller receives a higher price from the buyer than before, but after paying the taxes, they retain less than they did before the tax. Therefore, the tax also makes the seller worse off.**

SUMMARY



- **How Taxes on Buyers Affect Market Outcomes**
- **Now consider a tax levied on the buyers of a good.**
 - Step 1: Because the tax is levied on buyers, the supply curve is unaffected: at any given product price level, sellers have the same incentive to supply the product to the market. Conversely, buyers now have to pay the price to the seller in addition to paying the tax to the government. Therefore, the tax shifts the demand curve for the product.
 - Step 2: Next, we determine the direction of the shift. Because the tax on buyers reduces the attractiveness of purchasing the product, at every price level, buyers demand less of the product. Therefore, the demand curve shifts to the left, or equivalently, downwards.
 - Step 3: Due to the tax, both the initial equilibrium price and quantity decrease, and the market size shrinks. The tax burden is again shared between buyers and sellers. Sellers receive a lower price for their product; buyers pay a lower market price to sellers than before, but the effective price increases, including the additional tax they have to pay.

SUMMARY



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SUMMARY



- Taxing sellers and taxing buyers are equivalent. In both cases, the tax drives a wedge between the price paid by the buyer and the price received by the seller. This wedge between the buyer's price and the seller's price is the same whether the tax is levied on the buyer or the seller. In both cases, this wedge shifts the relative positions of the supply and demand curves. When a new equilibrium is reached, both buyers and sellers share the tax burden. The only difference between taxing sellers and taxing buyers is who hands the money over to the government.

思考题

1. When the government imposes a binding price floor, it causes:
 - a. The supply curve to shift to the left.
 - b. The demand curve to shift to the right.
 - c. A shortage of the good.
 - d. A surplus of the good.

思考题

2. In a market with a binding price ceiling, an increase in the ceiling will cause the quantity supplied to _____, the quantity demanded to _____, and the _____ to decrease.
- a. increase, decrease, surplus
 - b. decrease, increase, surplus
 - c. increase, decrease, shortage
 - d. decrease, increase, shortage

思考题

3. Imposing a \$1 tax per unit on consumers of a particular good is equivalent to:
- a. Imposing a \$1 tax per unit on the producers of the good
 - b. Providing a \$1 subsidy per unit to the producers of the good
 - c. Imposing a price floor that raises the price of the good by \$1 per unit
 - d. Imposing a price ceiling that raises the price of the good by \$1 per unit

思考题

4. Which of the following would increase supply, decrease demand, and raise the price paid by consumers?
- a. Implementing a binding minimum price
 - b. Removing a binding maximum price
 - c. Imposing a tax on producers
 - d. Abolishing a tax on producers

思考题

5. Which of the following would increase both supply and demand, and lower the price paid by consumers?
- a. Implementing a binding minimum price
 - b. Removing a binding maximum price
 - c. Imposing a tax on producers
 - d. Abolishing a tax on producers

思考题

6. When an item is taxed, the tax burden falls primarily on consumers if _____.
- a. the tax is levied on consumers
 - b. the tax is levied on producers
 - c. supply is inelastic and demand is elastic
 - d. supply is elastic and demand is inelastic

思考题

7. If the government imposes a \$500 tax on luxury cars, will the price paid by consumers increase by more than \$500, less than \$500, or exactly \$500? Please explain.

思考题

8. At Fenway Park, the home stadium of the Boston Red Sox, seating is limited to 39,000. Therefore, the number of tickets sold is fixed at this number. The city of Boston saw a golden opportunity to increase revenue and imposed a \$5 tax on each ticket. Boston sports fans, a famously civic-minded group, dutifully paid the \$5 tax on each ticket. Please draw a clearly labeled graph or table to illustrate the impact of the tax. Who bears the burden of the tax—the team owners, the fans, or both? Why?