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CHAPTER 4

Government in the Market: Price Controls, Taxes, and Subsidies

The same supply-and-demand diagrams, now with a policy added, and the new outcome read straight off the graph.

What this chapter covers



4.2–4.3 Controls

- Price ceilings & shortages
- Price floors & surpluses
- The minimum wage as a floor



4.4–4.5 Taxes & subsidies

- Tax incidence: who really pays
- Elasticity & the burden
- Subsidies: the mirror image



4.6–4.7 Evidence

- Case: does rent control help?
- Empirical: the minimum wage & jobs

THE BIG IDEA

When a government caps a price, sets a floor, taxes, or subsidizes, we add the policy to the supply-and-demand diagram and given by the new outcome.

4.1

Introduction

- Berlin's rent freeze, 2020
- A federal minimum wage fixed since 2009
- Taxes on every pack, gallon, and bottle

4.1 INTRODUCTION

Three ways government touches a price



Berlin, 2020

The city froze rents on ~1.5 million apartments; the court struck it down 14 months later as listings fell sharply.



Minimum wage

The U.S. federal floor has been \$7.25/hour since July 2009, while some cities push above \$16.



Taxes everywhere

Every pack of cigarettes, gallon of gas, and bottle of soda carries a tax that changes its price.

THE PLAN

In Chapters 2 and 3 prices were set by supply and demand alone. Here a government intervenes, and the tools are exactly the diagrams we already built.

4.2

Price Ceilings

- A legal maximum price
- When a ceiling binds
- The shortage it creates
- How the good gets rationed instead

4.2 PRICE CEILINGS

A legal maximum price

■ Price ceiling

A legal maximum price. It matters only if it is set below the equilibrium price, in which case we call it binding.

THE SETUP

Return to the coffee market of Chapter 2: equilibrium price \$5, equilibrium quantity 70 million pounds. Suppose the government, hoping to make coffee affordable, caps the price at \$3.

4.2 PRICE CEILINGS

A binding ceiling creates a shortage

■ At a \$3 ceiling

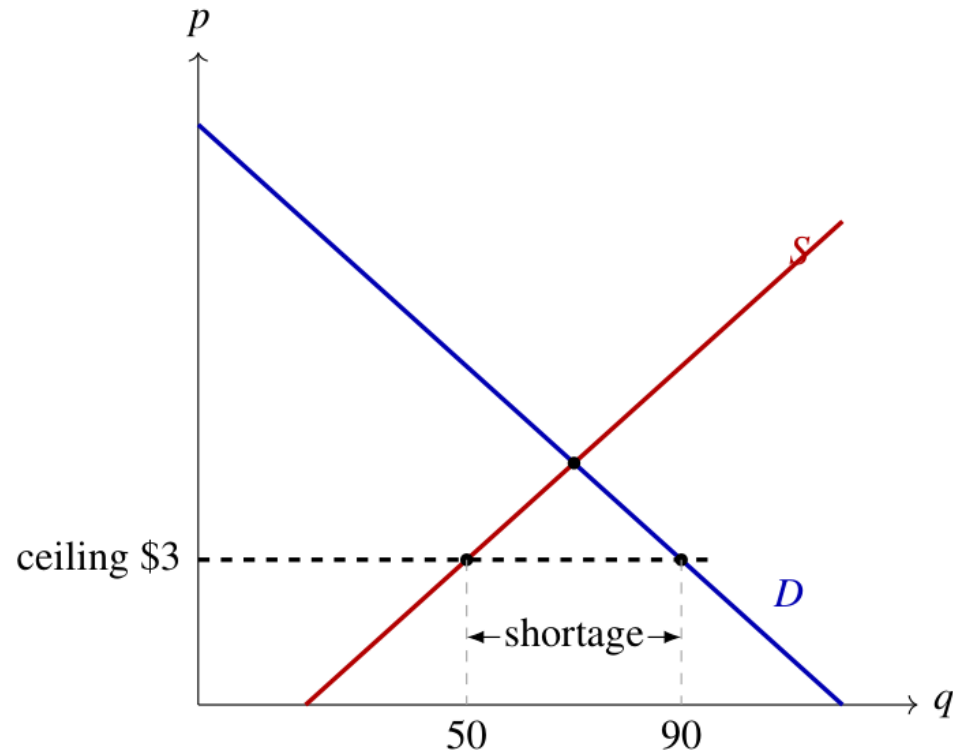
Buyers want 90 million pounds, but sellers offer only 50 million. The ceiling creates a shortage of 40 million pounds that cannot disappear, the price is forbidden to rise.

WHAT ACTUALLY TRADES

With the price held below equilibrium, the quantity actually traded is the smaller of the two: the 50 million pounds sellers are willing to supply.

4.2 PRICE CEILINGS

The ceiling, drawn



- The ceiling sits below the \$5 equilibrium, so it binds.
- Quantity demanded (90) exceeds quantity supplied (50): a gap of 40 million.
- Only 50 million pounds change hands.

Figure 4.1 A binding price ceiling below the equilibrium price creates a persistent shortage.

4.2 PRICE CEILINGS

When price can't ration, something else must



Lines

Long queues, as at U.S. gas stations under the 1970s price controls.



Waiting lists

Stockholm's rent-controlled apartments carry waits measured in years.



Favoritism & side payments

Sellers choose whom to serve; illegal side payments appear.



Lower quality

Facing excess demand, sellers have little reason to maintain the good.

We examine the most studied price ceiling, rent control, in Section 4.6.

4.3

Price Floors

- A legal minimum price
- When a floor binds
- The surplus it creates
- The minimum wage as a price floor

4.3 PRICE FLOORS

A legal minimum price

■ Price floor

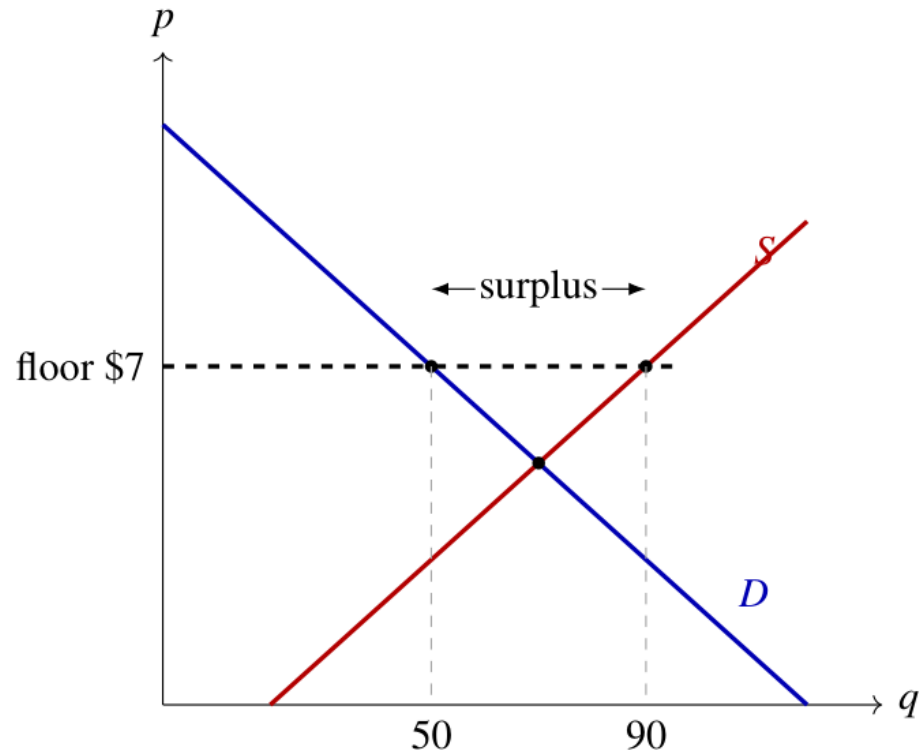
A legal minimum price. It binds only when set above the equilibrium price.

■ At a \$7 floor on coffee

Sellers offer 90 million pounds but buyers want only 50 million: a surplus of 40 million pounds, the mirror image of the ceiling.

4.3 PRICE FLOORS

The floor, drawn



- The floor sits above the \$5 equilibrium, so it binds.
- Quantity supplied (90) exceeds quantity demanded (50): a surplus of 40 million.
- The mirror image of Figure 4.1.

Figure 4.2 A binding price floor above the equilibrium price creates a persistent surplus.

4.3 PRICE FLOORS

The two most important floors



Agricultural supports

Guaranteed crop prices produced exactly the surplus the model predicts, the European Community's 1980s “butter mountains” and “wine lakes,” which governments had to buy and store.



The minimum wage

A floor in the market for low-wage labor. If set above the market-clearing wage, the model predicts a surplus of labor, that is, unemployment.

Whether that prediction holds in practice is one of the most studied questions in economics, see Section 4.7.

4.3.1 THE MINIMUM WAGE AS A PRICE FLOOR

A market for low-wage labor

Wage	Workers demanded	Workers supplied	Pressure
\$6	60,000	40,000	shortage of labor
\$8	50,000	50,000	EQUILIBRIUM
\$10	40,000	60,000	surplus of 20,000 (unemployment)
\$12	30,000	70,000	surplus of 40,000

Table 4.1 A minimum wage above the equilibrium wage creates a surplus of labor.

4.3.1 THE MINIMUM WAGE AS A PRICE FLOOR

A \$10 floor binds above the \$8 equilibrium

THE PREDICTION

At \$10, firms want only 40,000 workers but 60,000 wish to work, a surplus of 20,000. The floor helps the workers who keep their jobs (they earn more) but harms those who cannot find one.

■ Caution 1: how far above?

The effect depends on how far the floor is above equilibrium and on the elasticity of labor demand. A floor only slightly above, or inelastic demand, produces little unemployment.

■ Caution 2: monopsony

A single dominant employer can hold wages below the competitive level (Chapter 11). Then a minimum wage can raise both wages and employment.

4.3.1 THE MINIMUM WAGE AS A PRICE FLOOR

Self-check: does the policy bind?

SELF-CHECK

The competitive price of a good is \$5. State whether each policy binds and what it does: (a) a price ceiling of \$3; (b) a price floor of \$4.

(a) A \$3 ceiling lies below \$5, so it **BINDS** and creates a shortage. (b) A \$4 floor also lies below \$5, so it does **NOT** bind, the price stays at \$5 and nothing changes.

4.4

Taxes and Tax Incidence

- The tax as a wedge
- Who really bears the burden
- Deadweight loss
- Elasticity and the split

4.4 TAXES AND TAX INCIDENCE

A tax drives a wedge between two prices

■ The wedge

A \$2 tax on each pound of coffee makes the price buyers pay and the price sellers keep differ by exactly the tax. We find the quantity at which the buyer's price exceeds the seller's price by exactly \$2.

THE NEW OUTCOME

Working through the coffee schedules, a \$2 tax moves the market to 60 million pounds: buyers pay \$6, sellers keep \$4, a difference of exactly \$2.

4.4 TAXES AND TAX INCIDENCE

The tax, with and without

	No tax	With \$2 tax
Price buyers pay	\$5	\$6
Price sellers keep	\$5	\$4
Quantity traded	70	60

Table 4.2 A \$2 tax raises the buyer's price by \$1 and lowers the seller's by \$1.

READ IT

The split is even here because supply and demand are equally responsive. Buyers and sellers each absorb \$1 of the \$2 tax.

Two lessons about who pays

■ 1. Legal vs. economic burden

It does not matter whether the law collects the tax from buyers or sellers: either way buyers pay \$6, sellers keep \$4, government collects \$2. Who hands over the check is a legal detail; who bears the burden, the tax incidence, is an economic outcome the market decides.

■ 2. Elasticity decides the burden

The burden falls more heavily on whichever side is less elastic. Equal responsiveness splits the tax evenly; inelastic cigarette demand makes smokers bear most of a tobacco tax.

4.4 TAXES AND TAX INCIDENCE

The wedge and the deadweight loss

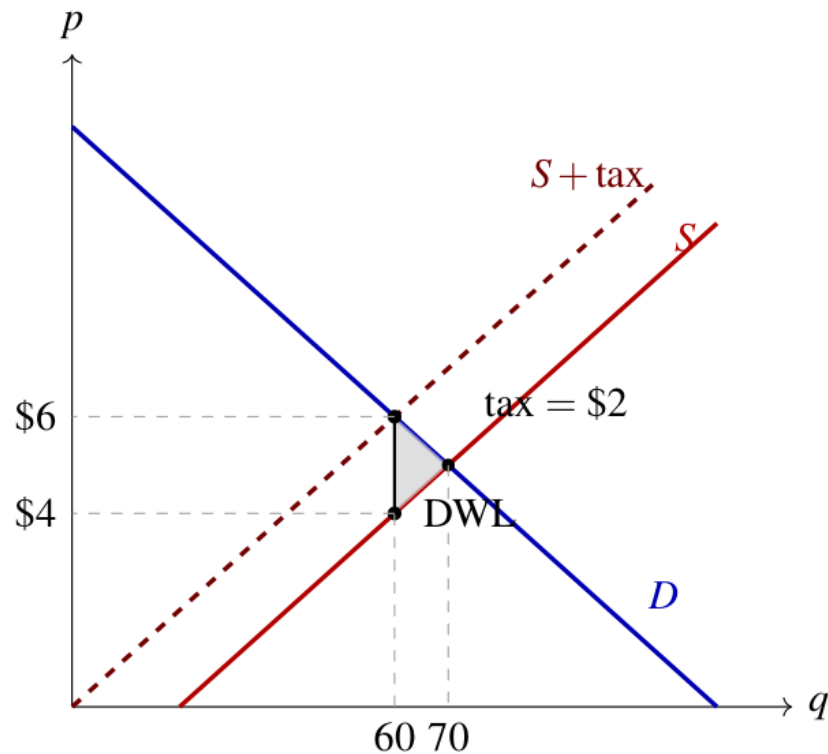


Figure 4.3 A \$2 tax wedges the buyer's price (\$6) and seller's price (\$4) apart, cutting quantity and creating deadweight loss.

■ Deadweight loss

Quantity falls from 70 to 60: the tax blocks 10 million pounds of trades that buyers valued above what sellers would accept, about \$10 million of lost, mutually beneficial trades.

This is why taxes have a cost beyond the revenue they raise.

The less elastic side bears more

THE RULE

The side of the market that is less elastic, less able to walk away, bears the larger share of the tax.

Inelastic demand → buyers pay

Smokers' demand is highly inelastic, so a tax barely cuts their purchases. Sellers pass almost the whole tax through; consumers bear most of it.

Elastic demand → sellers pay

A good with many substitutes, made by producers who cannot switch products, taxes mainly the sellers, who absorb it to keep buyers from fleeing.

The lesson reaches beyond taxes

THE GENERAL PRINCIPLE

Whenever a cost is imposed on a market, a tax, a fee, a tariff, a regulation, the party that bears it is determined not by who legally pays, but by who is less able to change their behavior in response.

Explore it online: slide the tax up and down and watch the wedge widen, quantity fall, and the deadweight-loss triangle grow.

4.5

Subsidies

- A subsidy is a negative tax
- Lower buyer price, higher seller price
- More quantity traded
- A worked subsidy

4.5 SUBSIDIES

A subsidy is a negative tax

■ Subsidy

The government pays sellers (or buyers) for each unit traded, the mirror image of a tax. It lowers the price buyers pay, raises the price sellers receive, and increases the quantity traded beyond the free-market level.

- Governments subsidize goods they want more of, solar panels, electric cars, childhood vaccines, university education.
- Like a tax, a subsidy has a cost: the government must fund it.
- It encourages trades worth less to buyers than they cost to produce, a deadweight loss from over-production.

4.5.1 A WORKED SUBSIDY

A \$2 subsidy on coffee

THE SETUP

Sellers receive the price buyers pay PLUS \$2, so they supply more at any buyer price. The market moves to 80 million pounds: buyers pay \$4, sellers receive \$6, a difference of exactly the \$2 subsidy.

	No subsidy	With \$2 subsidy
Price buyers pay	\$5	\$4
Price sellers receive	\$5	\$6
Quantity traded	70	80

Table 4.3 A \$2 subsidy lowers the buyer's price by \$1 and raises the seller's by \$1.

4.5.1 A WORKED SUBSIDY

The exact mirror of a tax, but not free



The mirror

Where the tax raised the buyer's price and lowered the seller's, the subsidy does the reverse; where the tax shrank quantity $70 \rightarrow 60$, the subsidy expands it $70 \rightarrow 80$.



The bill

The government pays \$2 on each of 80 million pounds, \$160 million, raised through taxes elsewhere.

THE COST

Pushing output beyond the efficient level creates a deadweight loss of its own, now from over-production. How the \$2 is split between buyers and sellers again depends on the relative elasticities of supply and demand.

4.6

Case Study: Does Rent Control Help Tenants?

A price ceiling on housing, and a natural experiment in San Francisco.

4.6 CASE STUDY

A natural experiment in San Francisco

THE STUDY

Diamond, McQuade & Qian (2019) studied a 1994 ballot measure that suddenly extended rent control to a set of older, smaller buildings while leaving similar buildings uncovered, then compared the two groups for over two decades.

- For tenants who stayed put, rent control worked as intended: it held rents down and reduced the chance of displacement, large benefits to those specific renters.
- But landlords responded exactly as the supply-and-demand model predicts.

4.6 CASE STUDY

It helps sitting tenants, and worsens the shortage

-15%

rental housing supply (landlords converted, redeveloped, or sold)

↑ rents

on the city's uncontrolled apartments

THE VERDICT

By shrinking the rental stock, the policy pushed up rents on uncontrolled apartments, so renters as a whole, especially future and newly arriving ones, faced higher rents. Rent control transferred wealth to sitting tenants while making the broader shortage worse.

4.6 CASE STUDY

The same pattern elsewhere



Stockholm

Controlled rents come with waiting lists years long.



Berlin, 2020

The rent freeze was struck down by the courts after rental listings fell sharply.

THE BOTTOM LINE

The policy helps the tenants it covers and harms those it does not.

4.7

Empirical Evidence: The Minimum Wage and Jobs

The test of which case, competitive or monopsony, the real world resembles.

A landmark natural experiment

THE STUDY

Card & Krueger (1994): in April 1992 New Jersey raised its minimum wage from \$4.25 to \$5.05, while neighboring Pennsylvania left its unchanged. Surveying 410 fast-food restaurants on both sides of the border, before and after.

THE FINDING

Employment in New Jersey did not fall relative to Pennsylvania, if anything, it rose slightly. The simplest model's prediction did not appear.

4.7 EMPIRICAL EVIDENCE

A generation of research

Study	Setting	Key finding
Card & Krueger (1994)	NJ vs. PA, 410 fast-food restaurants, 1992	Employment did not fall; if anything rose slightly
Cengiz, Dube, Lindner & Zipperer (2019)	138 U.S. state increases, 1979–2016	Low-wage jobs essentially unchanged; earnings rose
Large-increase studies	Very large minimum-wage hikes	Some employment losses appear

Studies of the minimum wage and employment.

4.7 EMPIRICAL EVIDENCE

Theory gives the prediction; measurement tests it

- The evidence does not say minimum wages never cost jobs, the effect depends on how high the floor is relative to local wages.
- But for the moderate increases studied, the large job losses the simplest model predicts have generally not appeared.

THE TAKEAWAY

A recurring lesson of the book: a model gives a clear prediction, and careful measurement tells us when that prediction holds and when reality is more complicated.

Key takeaways

1

Price ceilings

A binding ceiling (below equilibrium) creates a persistent shortage; price can no longer ration the good.

2

Price floors

A binding floor (above equilibrium) creates a surplus, for the minimum wage, that surplus is unemployment.

3

Tax incidence

It does not matter who legally pays; the burden falls on whichever side is less elastic.

4

Deadweight loss

Taxes block mutually beneficial trades; subsidies cause them in excess. Both have a cost beyond the budget.

5

Subsidies

A negative tax: lower buyer price, higher seller price, more quantity, but a bill and over-production.

6

Evidence

Rent control helps sitting tenants but shrinks supply; moderate minimum-wage hikes show little job loss.