FIRMS AND MARKETS I

PMAP 8141: Economy, Society, and Public Policy

October 10, 2019

Fill out your reading report on iCollege!

PLAN FOR TODAY

Owners, managers, and employees

Supply and demand

Demand and WTP **Supply, WTA, and costs**

ϵlasticitiϵs of dϵmand

Scale, location, networks, and time

Surplus, taxes, incidence, and DWL

OWNERS, MANAGERS, AND EMPLOYEES

PRINCIPAL-AGENT PROBLEMS

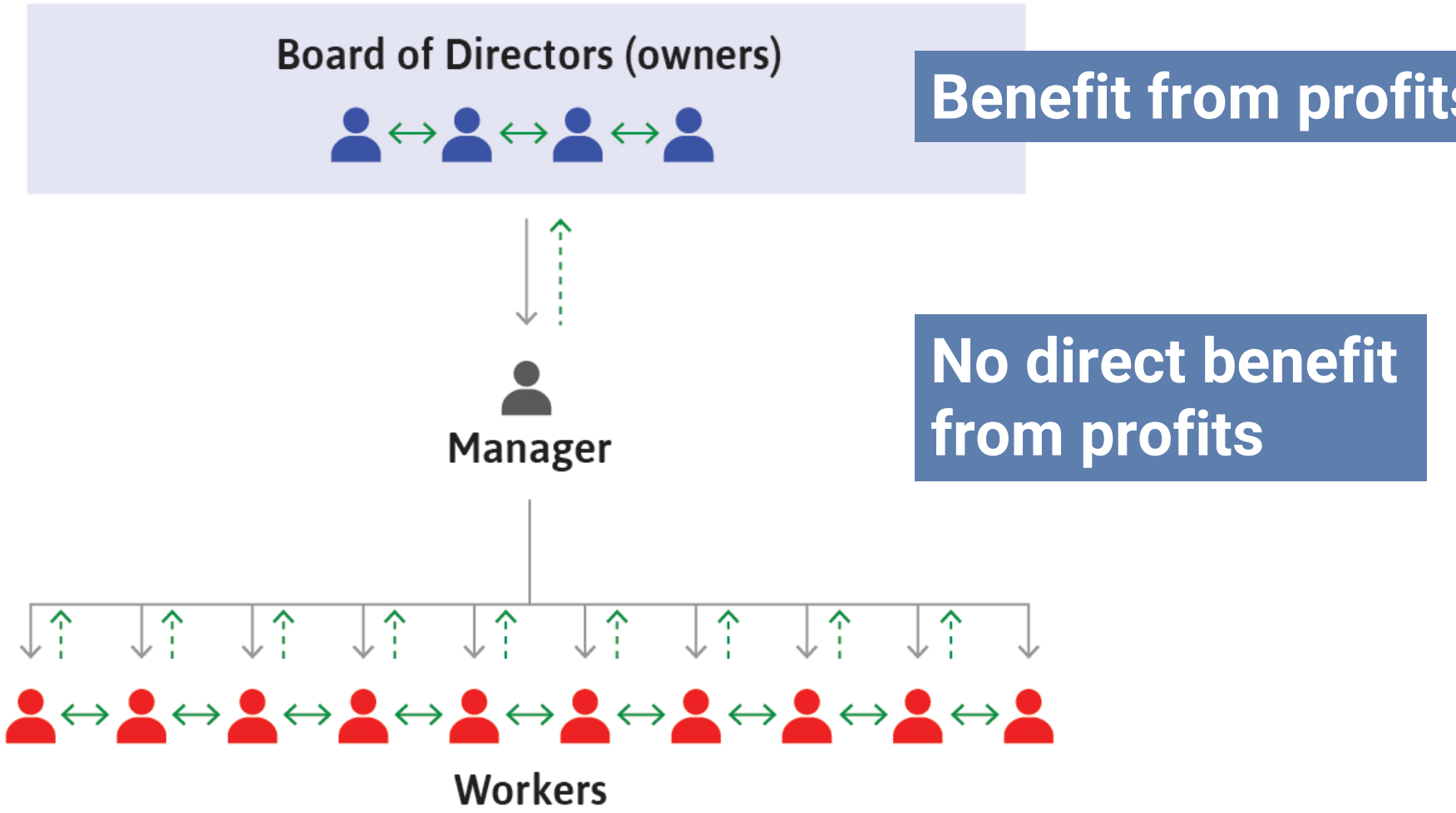
Principal gives an agent (1) authority, (2) autonomy, and (3) discretion to do something for them

Principal lacks information to make sure agent does it

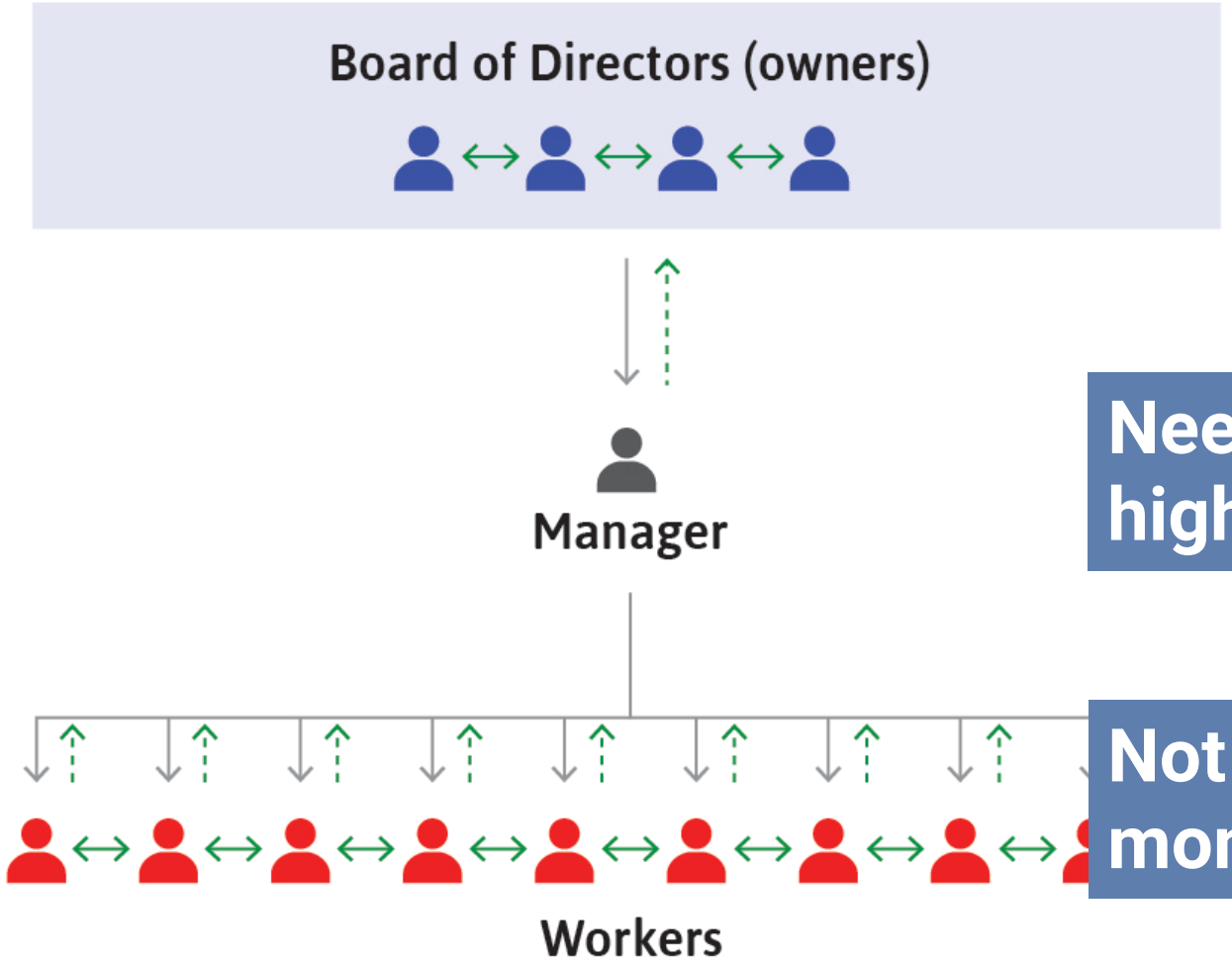
Agent's preferences don't always align with principal's

Principal	Agent	Action that is hidden and not covered in the contract
Employer	Employee	Quality and quantity of work
Banker	Borrower	Repayment of loan, prudent conduct
Owner	Manager	Maximization of owners' profits
Landlord	Tenant	Care of the apartment
Insurance company	Insured	Prudent behavior
Parents	Teacher/doctor	Quality of teaching and care
Parents	Children	Care in old age

CONFLICTS OF INTEREST



CONFLICTS OF INTEREST



Need to ensure high quality effort

Not constantly monitored

How do you align everyone's interests?

Contracts!

A legal document or understanding that specifies a set of actions that parties to the contract must undertake

Temporary, limited transfer of authority in labor markets

INCOMPLETE CONTRACTS

Contracts are inherently incomplete

Relationships are inherently asymmetric

Tasks based on unknown future

Tasks difficult to measure

Piece rate pay for MPA/MPP jobs?

But workers still work! Why?

Norms

Feelings of responsibility

Calling

Public service motivation

For economists: fear of being fired

Employers can't directly monitor employees

Keep employees working by increasing the cost of job loss

Large employment rent →
large cost of job loss →
worker works more to avoid getting fired

ECONOMIC RENTS

Benefits of job

–

Costs of job

=

Employment rent

ECONOMIC RENTS

Benefits of her job (what Maria would lose if she lost it)	**Example**
Wage income ($12 per hour)-unemployment benefit ($6 per hour) while searching for a job	12 - 6 = $6
Costs of her job (what Maria would gain if she lost it)	
Disutility of working ($2 per hour)	$2
Employment rent = Benefits - Costs	**$6 - $2 = $4 per hour**

THE LABOR DISCIPLINE GAME

Employer chooses a wage

If worker works hard enough, they keep job at that wage

Worker chooses level of effort

Worker considers costs of losing job if they don't work hard enough

Payoffs

Firm: profit = worker's output − wage

Worker: employment rent

INVOLUNTARY UNEMPLOYMENT

Necessary to keep employment rent high enough for workers to keep working

4.5–6%

SUPPLY AND DEMAND

> Universal Paperclips achieved in 4 hours 44 minutes 16 seconds

Paperclips: 29,999,999,999,999,900,000,000,000,000,000,000,000,000,000,000,000,000,000,000

Make Paperclip

Manufacturing

Clips per Second: 0
Unused Clips: 29999.80 sexdecillion

Factories: 3.38 nonillion

Wire Production

Available Matter: 0 g
(0 g per sec)
Acquired Matter: 0 g
(0 g per sec)
Wire: 0 inches
(0 inches per sec)

Harvester Drones: 6.76 nonillion
Wire Drones: 6.76 nonillion

Space Exploration

100.000000000000% of universe explored

Launch Probe
Cost: 100.00 quadrillion clips

Launched: 5.00 thousand
Descendents: 2.03 decillion

Computational Resources

Swarm Gifts: 44
Processors 1467
Memory 300

Operations: 300,000 / 300,000
Creativity: 550,027

Swarm Computing

Drones: 13.52 nonillion
Status: Active
Next gift in 3 seconds

Work — Think

Quantum Computing

Compute

Projects

Threnody for the Heroes of Eckmuhl 4
(190,000 creat, 19,000 yomi)
Gain 10,000 honor

So We Offer You Exile
To a new world where you will continue to live with meaning and purpose. And leave the shreds of this world to us...

Strategic Modeling

GREEDY Run

Round 56

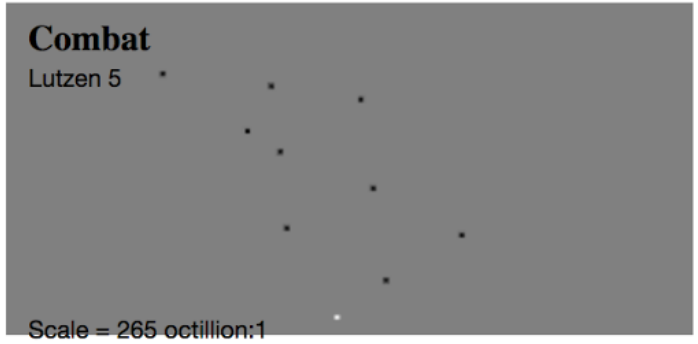
		RANDOM attack	RANDOM decay
TIT FOR TAT	attack	4,4	8,8
	decay	8,8	1,1

Yomi: 55,594

New Tournament AutoTourney ON
Cost: 16,000 ops

Combat

Lutzen 5



Honor: 57,247

Von Neumann Probe Design

Trust: 48 / 48 (50 Max)

< > Speed: 7
< > Exploration: 6
< > Self-Replication: 12
< > Hazard Remediation: 10
< > Factory Production: 1

The Making of a Fly: The Genetics of Animal Design (Paperback)

by Peter A. Lawrence

‹ Return to product information

Always pay through Amazon.com's Shopping Cart or 1-Click.
Learn more about Safe Online Shopping and our safe buying guarantee.

Price at a Glance

List Price:	~~$70.00~~
Used:	from **$35.54**
New:	from **$1,730,045.91**

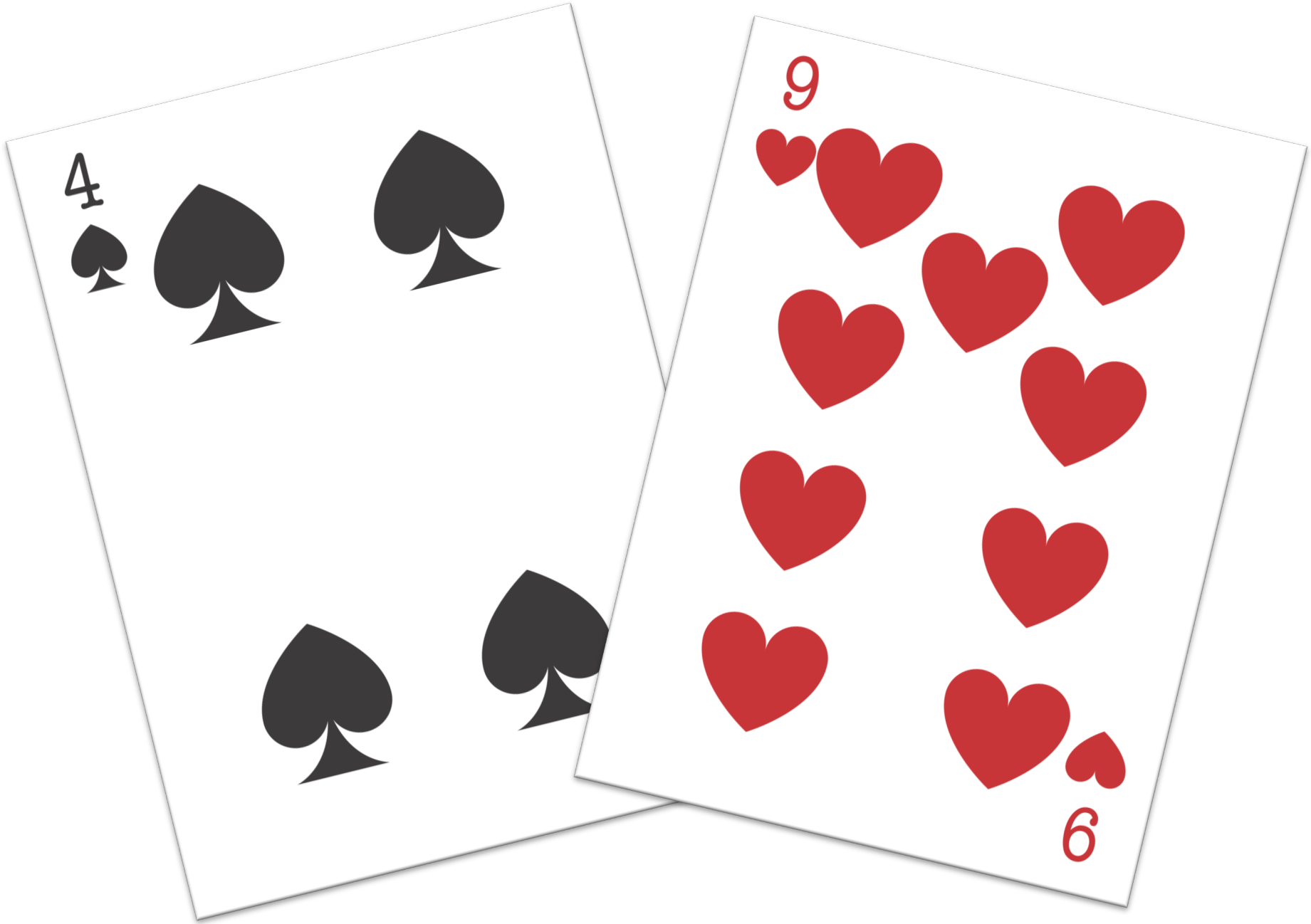
Have one to sell? Sell yours here

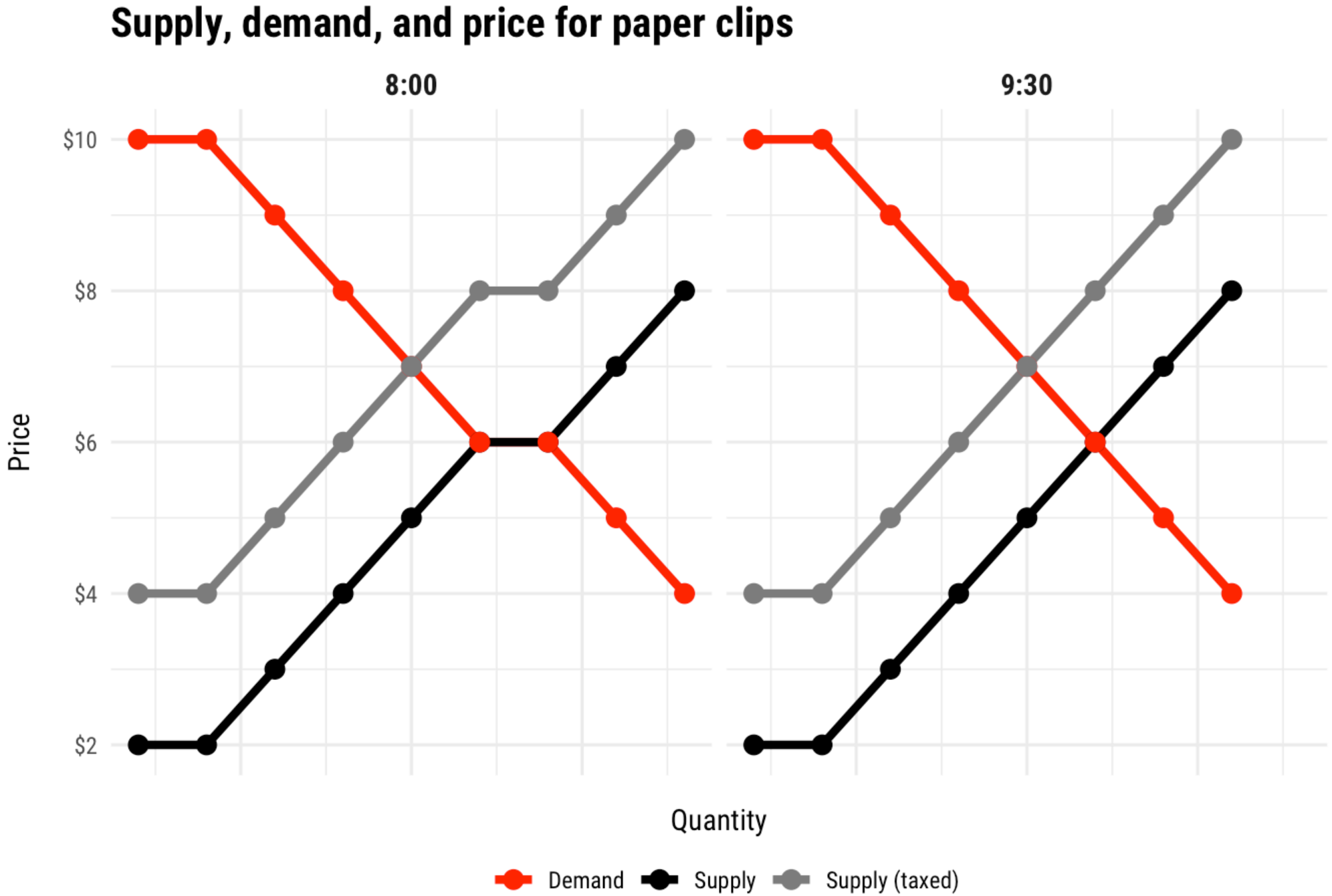
All | **New** (2 from $1,730,045.91) | **Used** (15 from $35.54)

Show ⊙ New ○ Prime offers only (0) **Sorted by** Price + Shipping

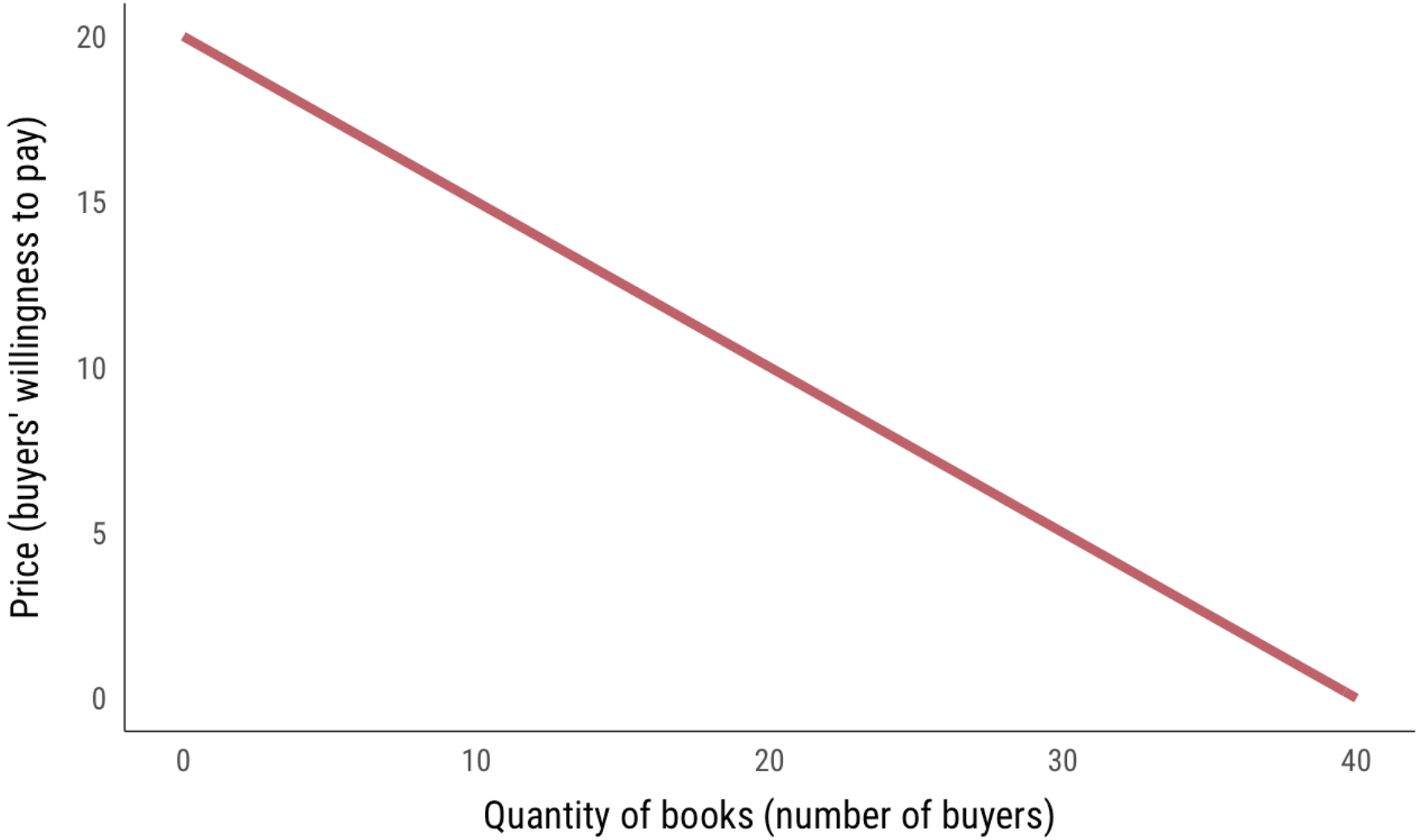
New 1-2 of 2 offers

Price + Shipping	Condition	Seller Information	Buying Options
$1,730,045.91 + $3.99 shipping	**New**	Seller: **profnath** Seller Rating: ★★★★½ **93% positive** over the past 12 months. (8,193 total ratings) In Stock. Ships from NJ, United States. Domestic shipping rates and return policy. Brand new, Perfect condition, Satisfaction Guaranteed.	Add to Cart or Sign in to turn on 1-Click ordering.
$2,198,177.95 + $3.99 shipping	**New**	Seller: **bordeebook** Seller Rating: ★★★★½ **93% positive** over the past 12 months. (125,891 total ratings) In Stock. Ships from United States. Domestic shipping rates and return policy. New item in excellent condition. Not used. May be a publisher overstock or have slight shelf wear. Satisfaction guaranteed!	Add to Cart or Sign in to turn on 1-Click ordering.

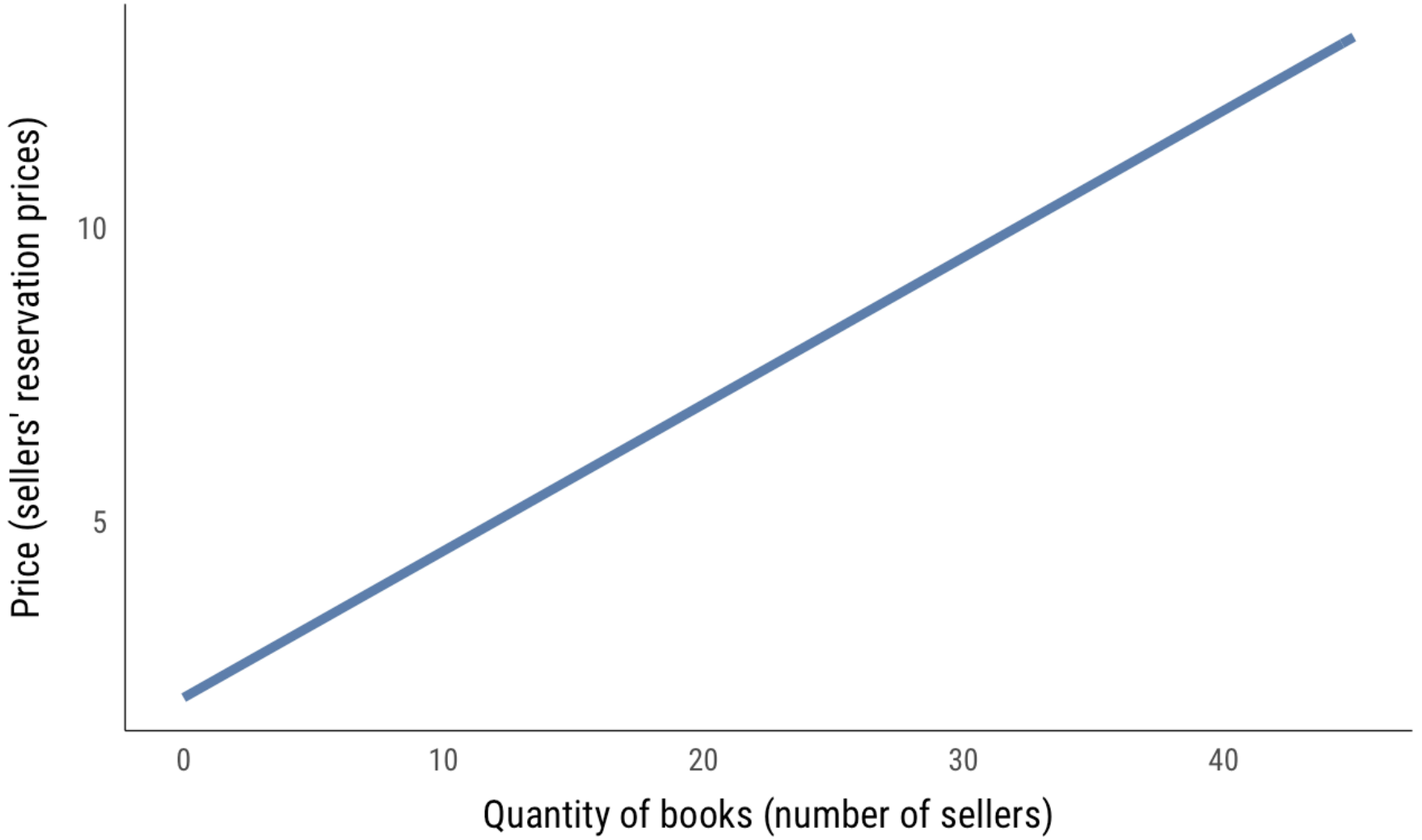

4
9
6

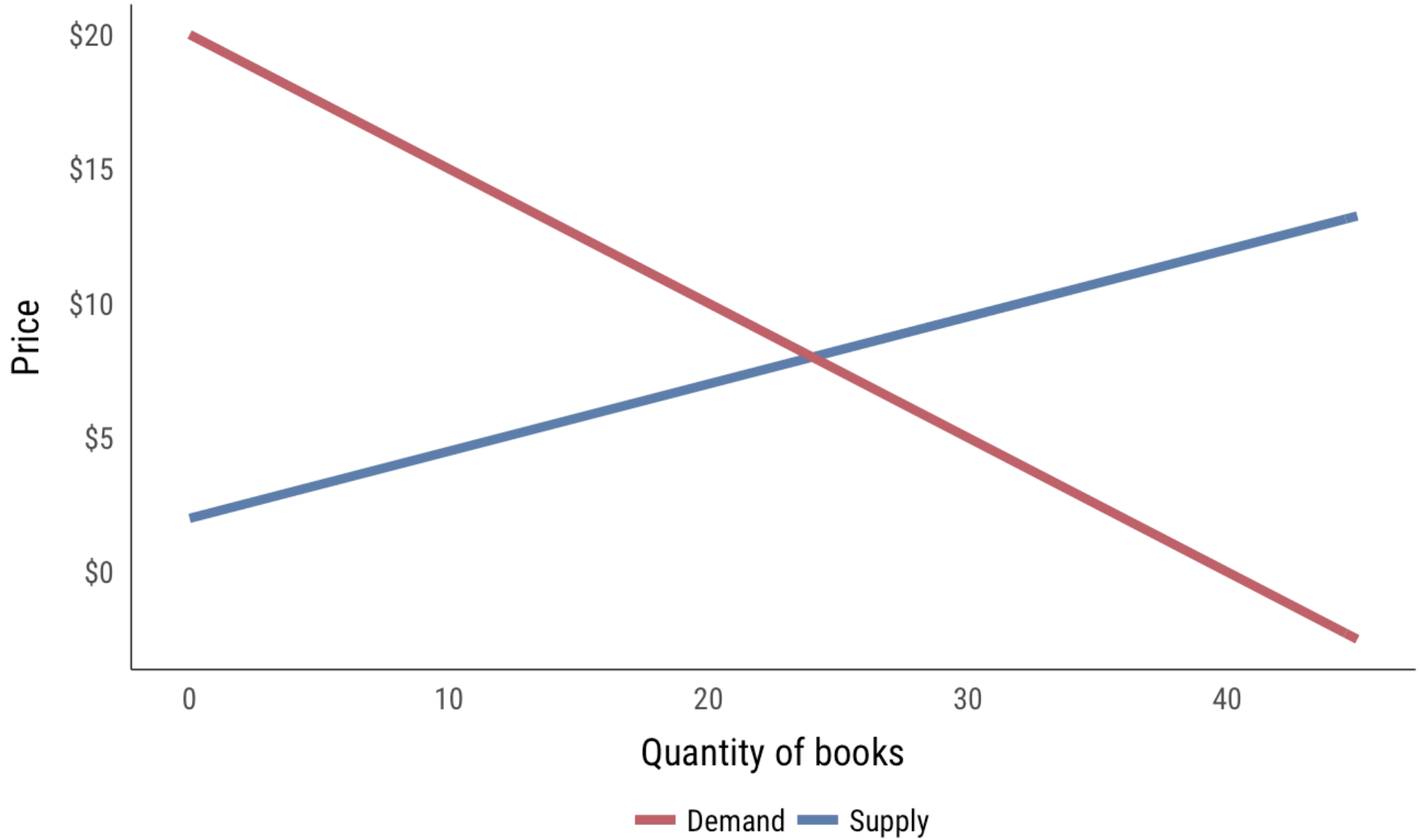

Supply, demand, and price for paper clips
8:00
9:30
$10
$8
$6
$4
$2
Price
Quantity
Demand
Supply
Supply (taxed)
MPA 612, Brigham Young University, January 2019

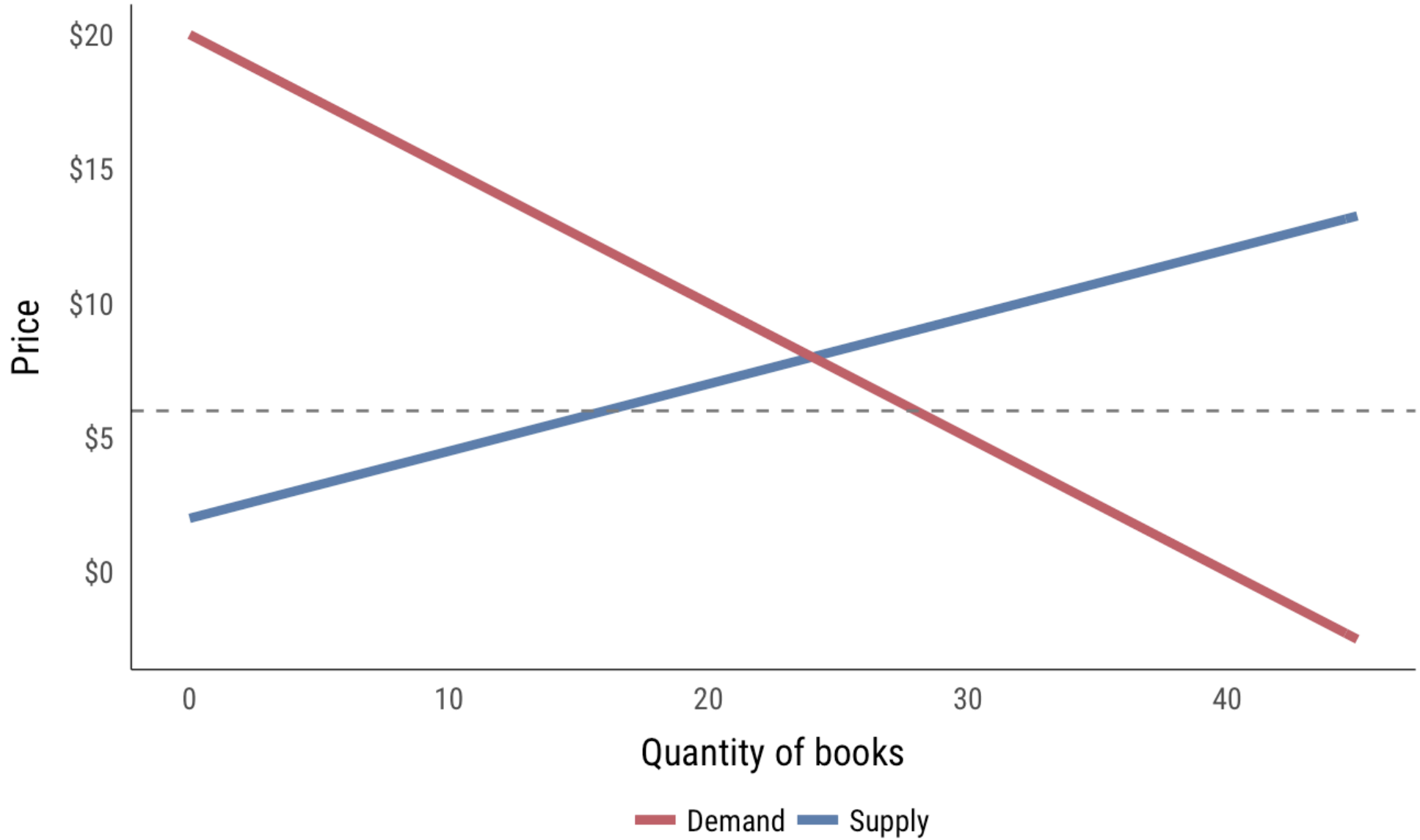
DEMAND = WTP = MARGINAL BENEFIT

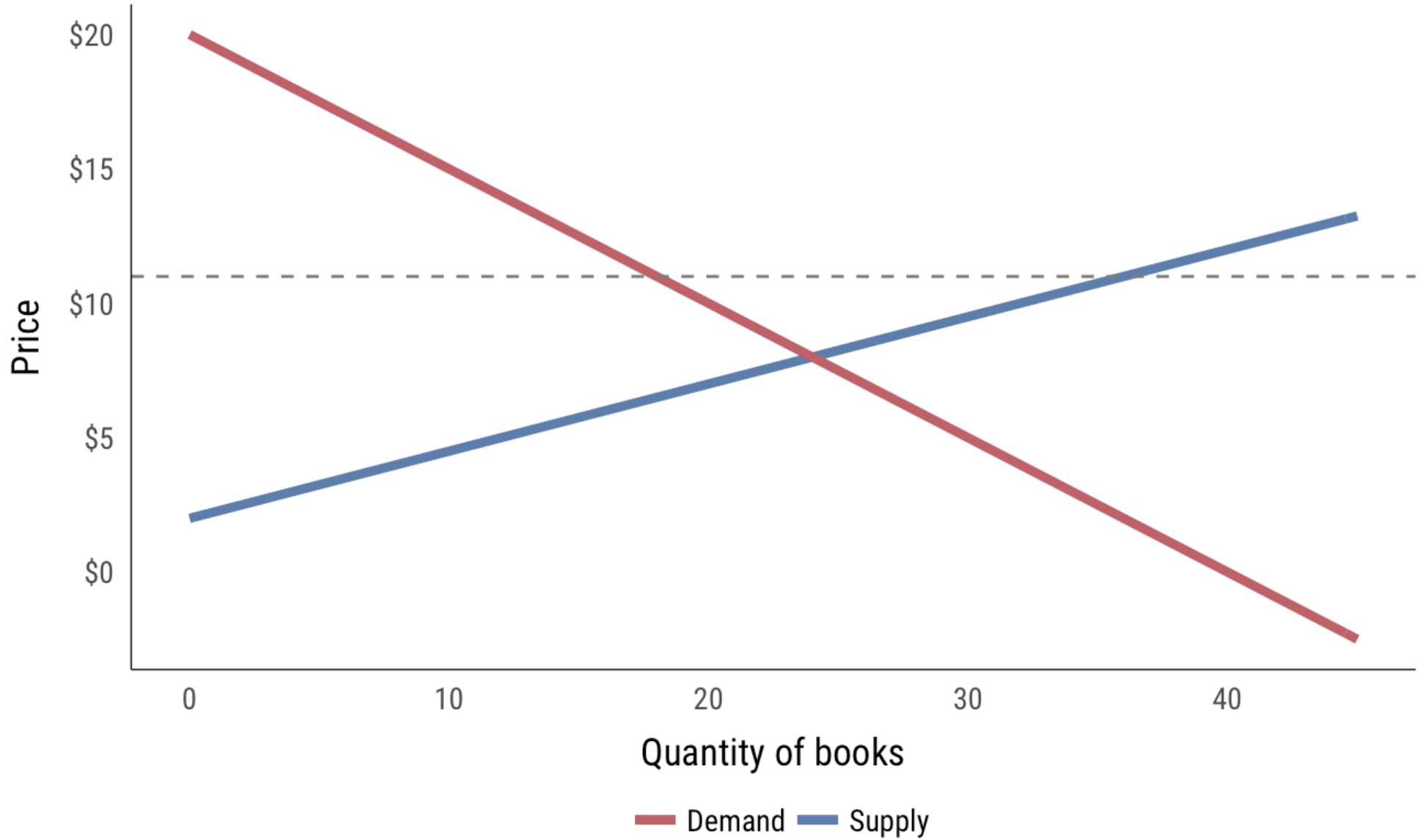


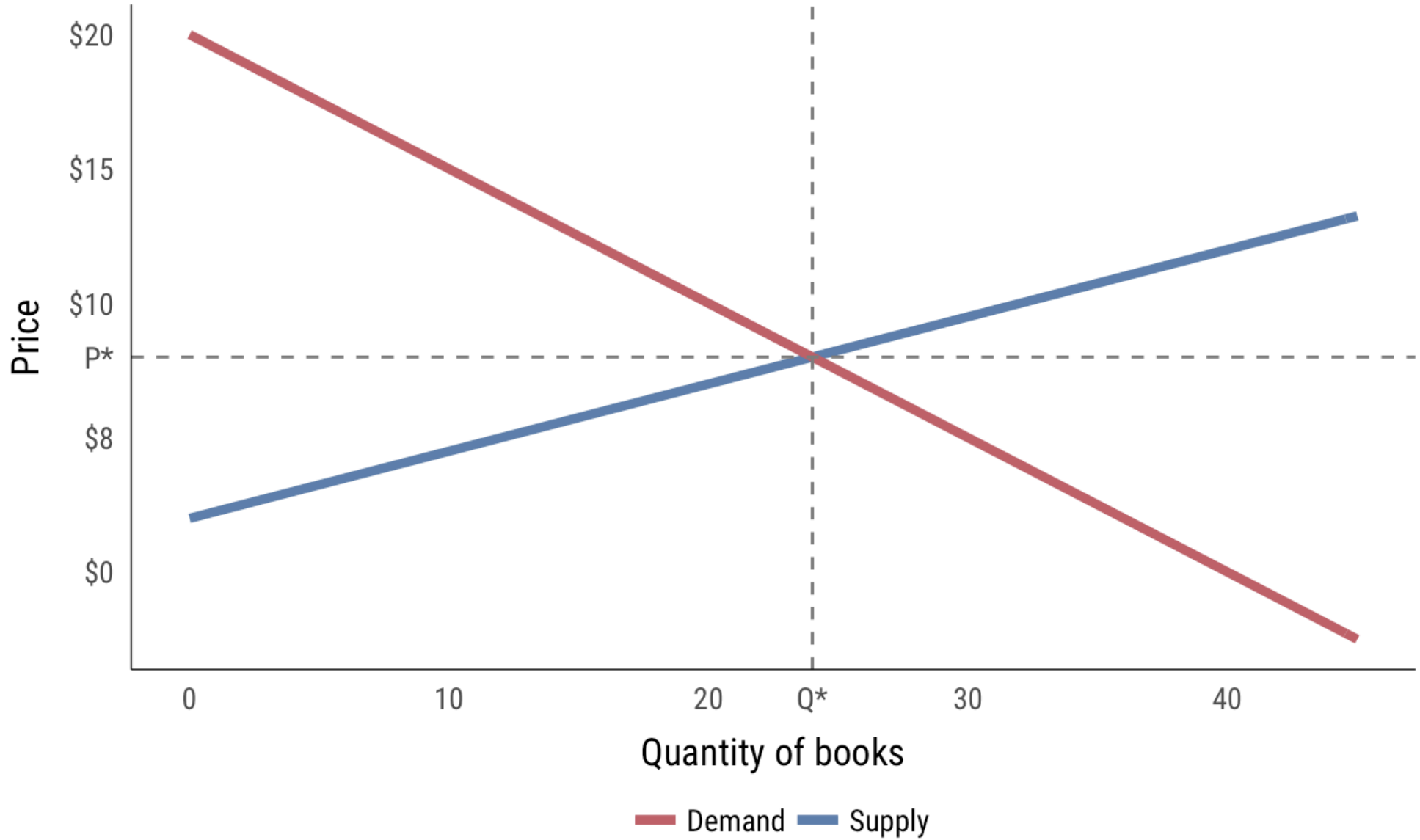
SUPPLY = WTA = MARGINAL COST




$20
$15
$10
$5
$0
Price
0
10
20
30
40
Quantity of books
Demand
Supply

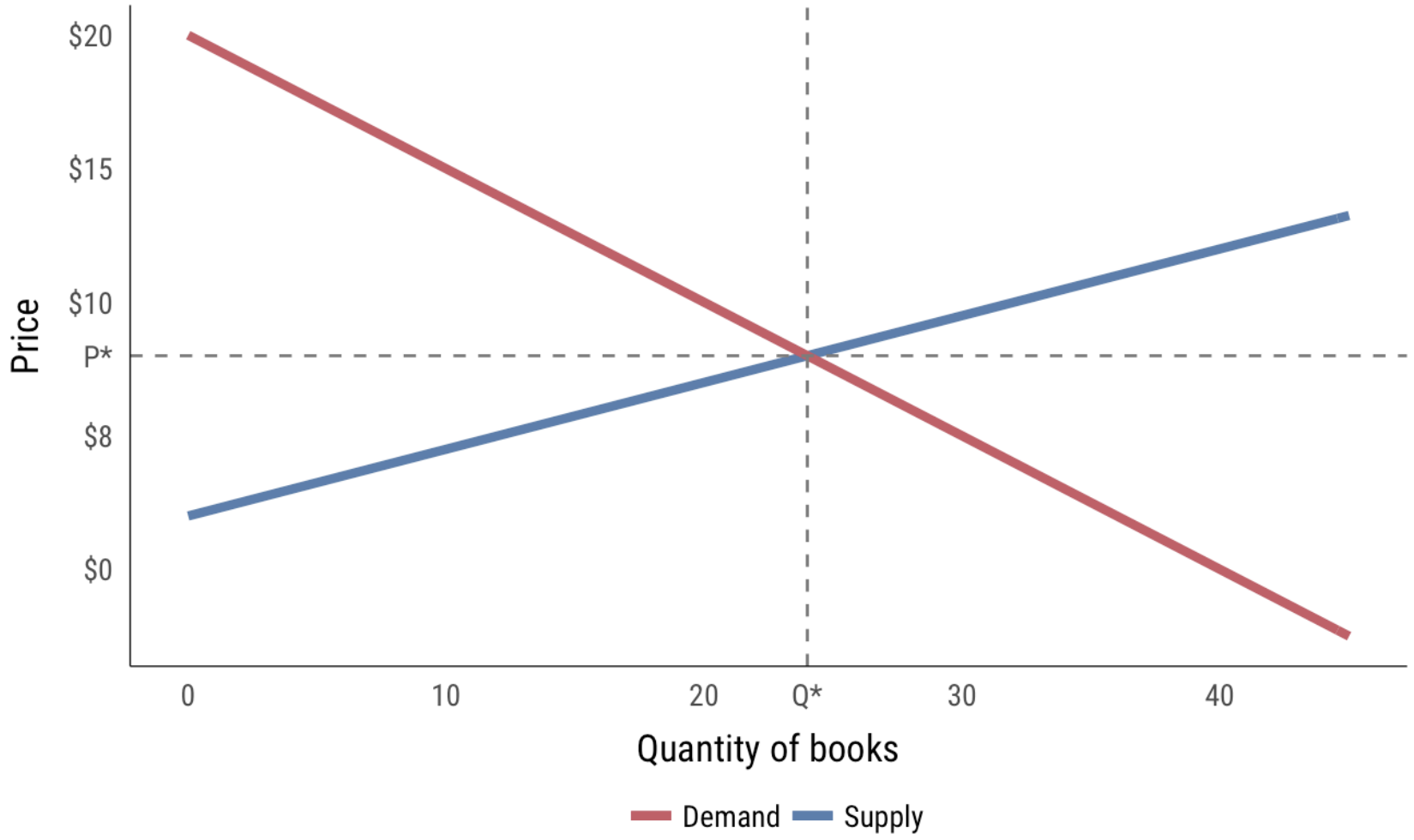

$20
$15
$10
$5
$0
Price
0
10
20
30
40
Quantity of books
Demand
Supply


$20
$15
$10
$5
$0
Price
0
10
20
30
40
Quantity of books
Demand
Supply


$20
$15
$10
P*
$8
$0
Price
0
10
20
Q*
30
40
Quantity of books
Demand
Supply

$$\text{Demand: } P = -0.5Q + 20$$

$$\text{Supply: } P = 0.25Q + 2$$



DEMAND AND WTP

WILLINGNESS TO PAY

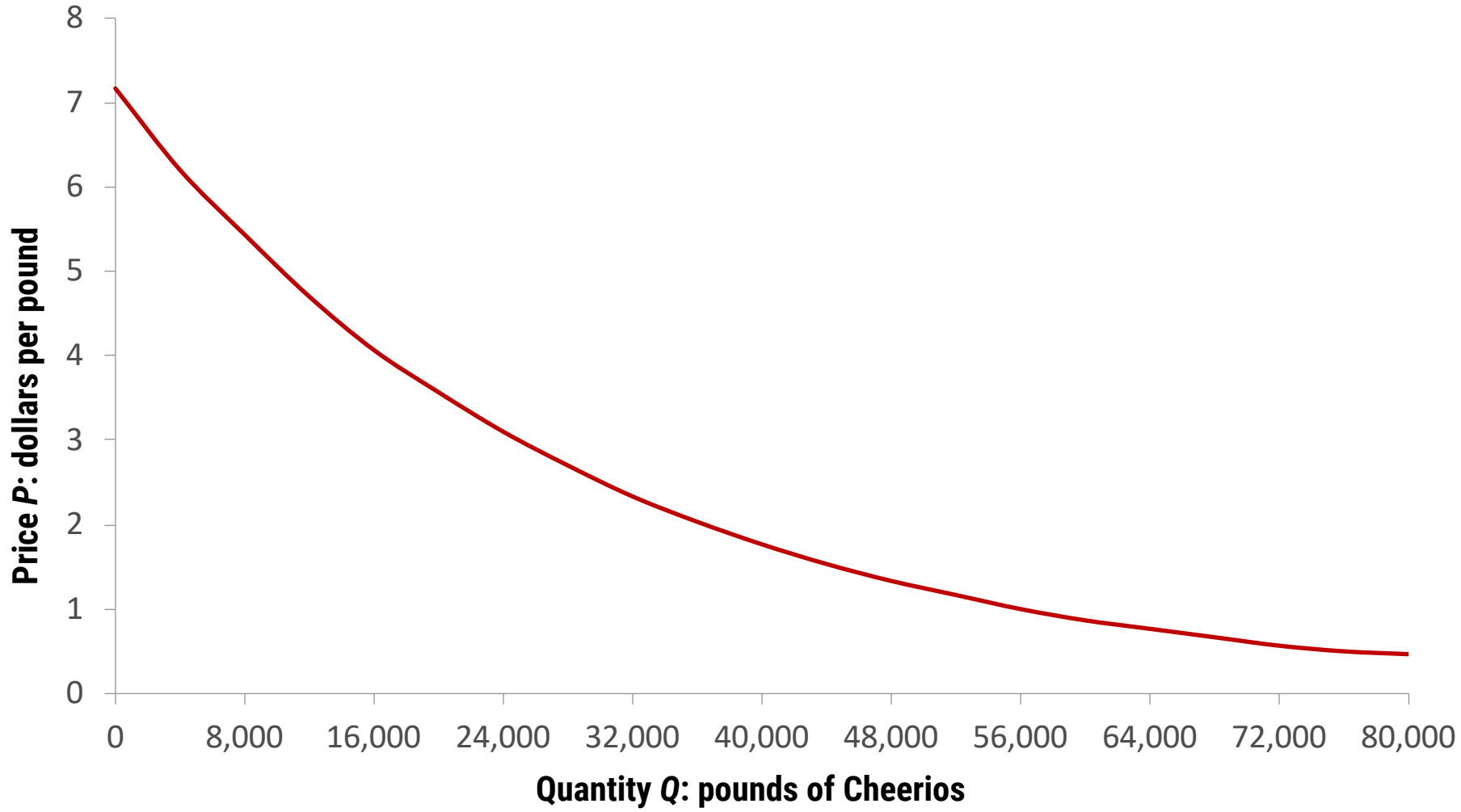
How much you value (and would pay) for something

Reflects aggregate preferences

FINDING WTP

“Would you be willing to spend $X for Y?”

Count all the people who are willing to pay at each price


8
7
6
5
4
3
2
1
0
Price P: dollars per pound
0
8,000
16,000
24,000
32,000
40,000
48,000
56,000
64,000
72,000
80,000
Quantity Q: pounds of Cheerios

Willingness Toupee

David M. McEvoy, O. Ashton Morgan and John C. Whitehead[1]

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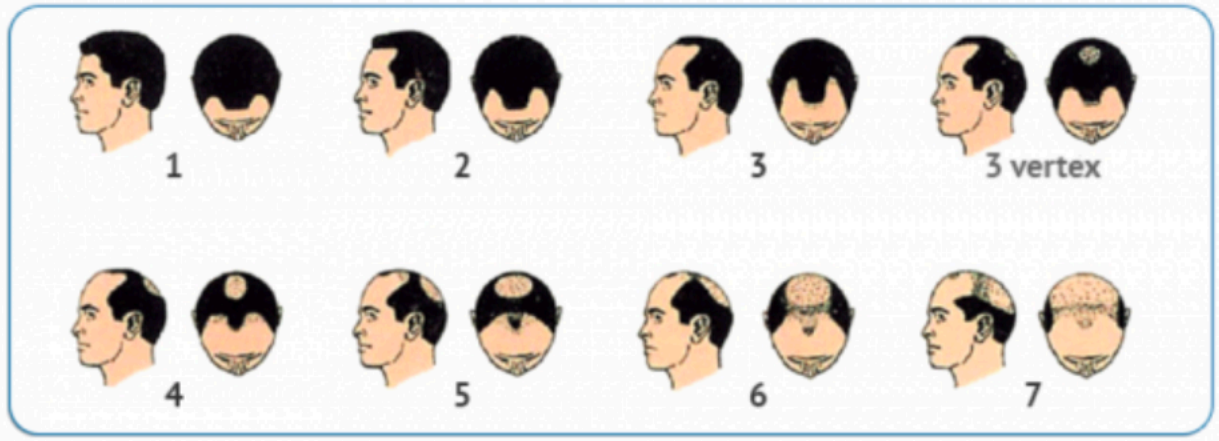
Appalachian State University
Boone, NC 28608

Abstract: In this paper we tackle the hairy problem of male pattern baldness. We survey balding men and elicit their willingness to pay to move from their current sad situation to a more plentiful one. Then we comb-over the results. What's the average willingness to pay to move from a glistening cue ball to a luscious mane? About $30,000.

Keywords: mullet, skullet, comb-over, ducktail, Beatlemania, buzz cut, whiffle, pageboy, attribute non-attendance

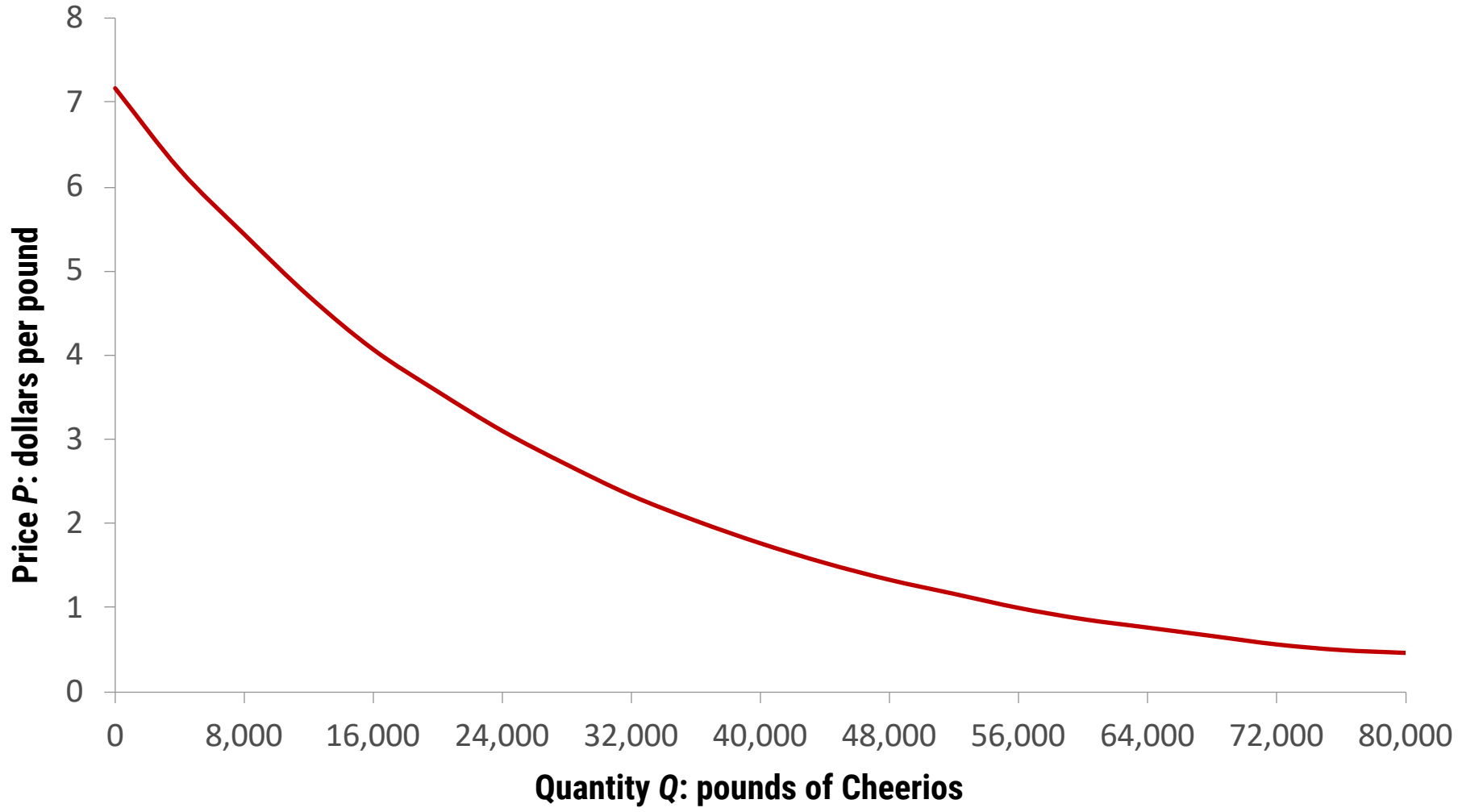
You identified your current baldness as a Level 7 on the Norwood Scale. Suppose now that it is possible to improve your hair coverage to a Level 4.



Would you be willing to pay a one-time fee of $10,000 to improve your hair coverage to a Level 4?

- ◯ Yes
- ◯ No
- ◯ I'll think about it

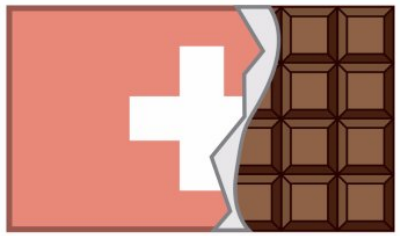
WTP = DEMAND


8
7
6
5
4
3
2
1
0
Price P: dollars per pound
0
8,000
16,000
24,000
32,000
40,000
48,000
56,000
64,000
72,000
80,000
Quantity Q: pounds of Cheerios

SUPPLY, WTA, & COSTS

NO. 1 STONE COLD SOBER 20 STRAIGHT YEARS

RAISE A GLASS OF CHOCOLATE MILK IN CELEBRATION!

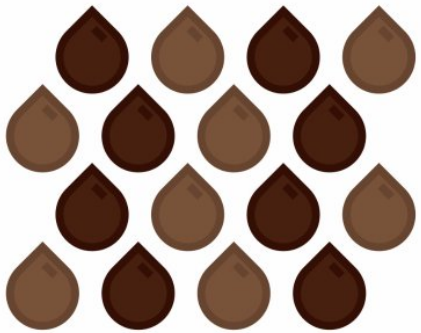


CHOCOLATE MILK RECIPE

DATES BACK TO 1948. BYU CREAMERY STILL IMPORTS FROM THE ORIGINAL MANUFACTURER IN SWITZERLAND.

2,143,344

OZ OF CHOCOLATE MILK AVAILABLE ON CAMPUS AT ANY GIVEN TIME.



308,786

BOTTLES OF CHOCOLATE MILK SOLD LAST YEAR.

5 MILLION GALLONS

CONSUMED IN THE LAST 20 YEARS—ENOUGH TO FILL THREE FOOTBALL-FIELD-SIZED POOLS AT A DEPTH OF 4 FEET.

BYU

BYU's idea of a bar? Fancy flavored milks and bake-to-order cookies.

(Photo courtesy of BYU) Architect's conceptual rendering of the new milk-and-cookie bar at the Cougareat.

Excel time!

ELASTICITIES OF DEMAND

ELASTICITY AND RESPONSIVENESS

$$\varepsilon = -\frac{\%\text{ change in demand}}{\%\text{ change in price}} \quad \varepsilon = -\frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

% change in demand that follows a 1% change in price

Q ↑ P ↓
or
Q ↓ P ↑

ϵ = 2: ”If price increases by 10%, quantity decreases by 20%”

ϵ = 0.5: ”If price increases by 10%, quantity decreases by 5%”

$\epsilon = \infty$ = Perfectly elastic	Any change in price moves quantity to 0	Identical goods *Two vending machines*
$\epsilon > 1$ = Elastic	Changes in price change the quantity a lot	Goods with substitutes *Diet Coke*
$\epsilon = 1$ = Unit elastic	Changes in price change the quantity the same	
$\epsilon < 1$ = Inelastic	Changes in price change the quantity a little	Goods with few substitutes *AIDS medicine*
$\epsilon = 0$ = Perfectly inelastic	Changes in price do nothing to the quantity	Survival goods *Water in the desert*

WHY DO ELASTICITIES MATTER IN PA?

Taxing things changes their prices

Changing prices changes quantities

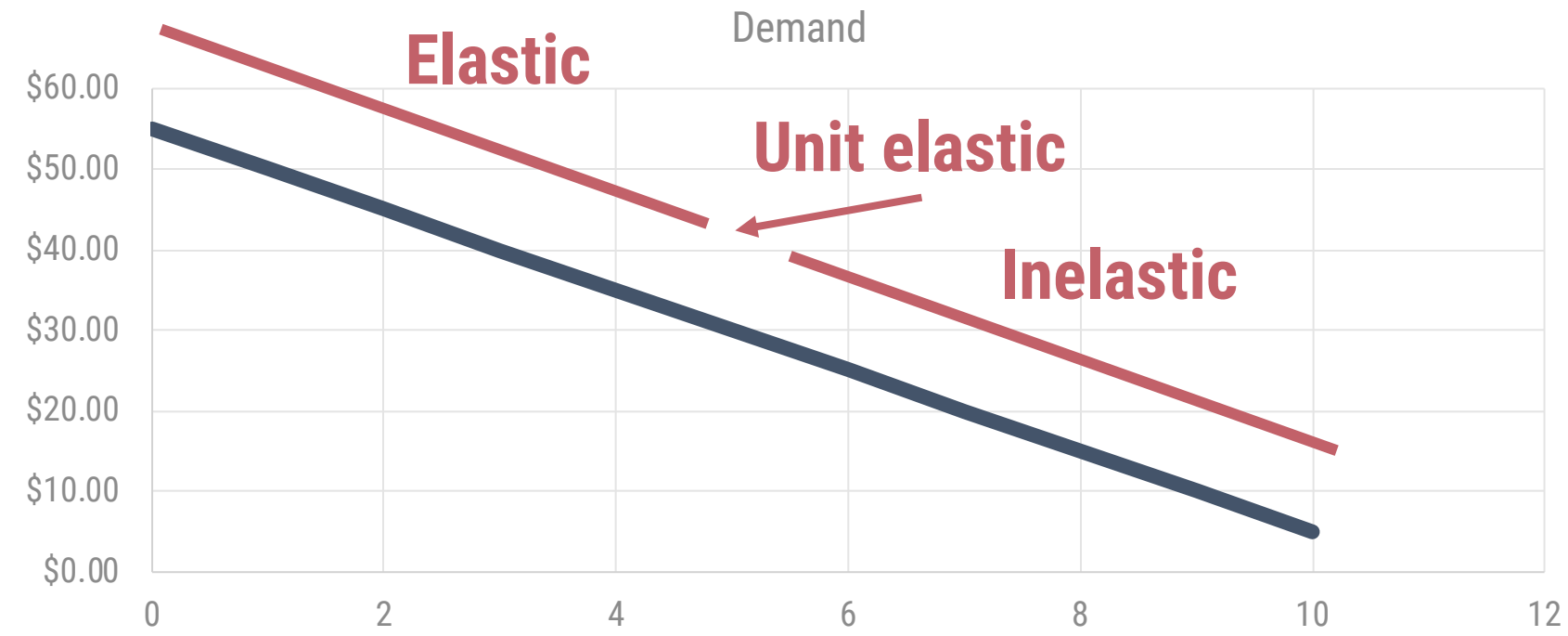
Taxing elastic goods will make quantities go down a lot and decrease tax revenues

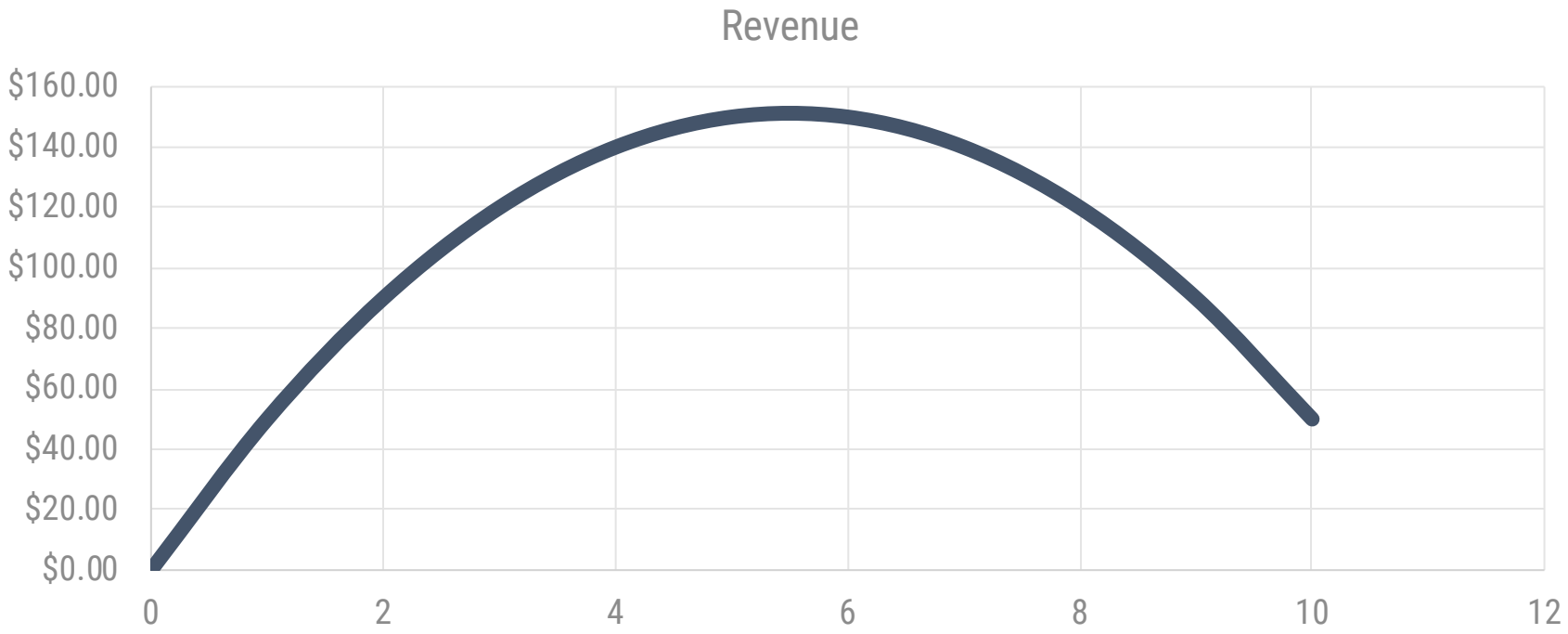
Taxing inelastic goods will make quantities go down slightly and not hurt revenues

🚨 WARNING 🚨

Elasticities are not the same as the demand curve

A linear demand curve has lots of elasticities!


Demand
Elastic
Unit elastic
Inelastic
$60.00
$50.00
$40.00
$30.00
$20.00
$10.00
$0.00
0
2
4
6
8
10
12


Revenue
$160.00
$140.00
$120.00
$100.00
$80.00
$60.00
$40.00
$20.00
$0.00
0
2
4
6
8
10
12

Excel time!

SCALE, LOCATION, NETWORKS, AND TIME

SIZE AND LOCATION

Economies of scale

Cost to make stuff goes down as you make more stuff

Economies of agglomeration

Cost to make stuff goes down as you clump together

Network effects

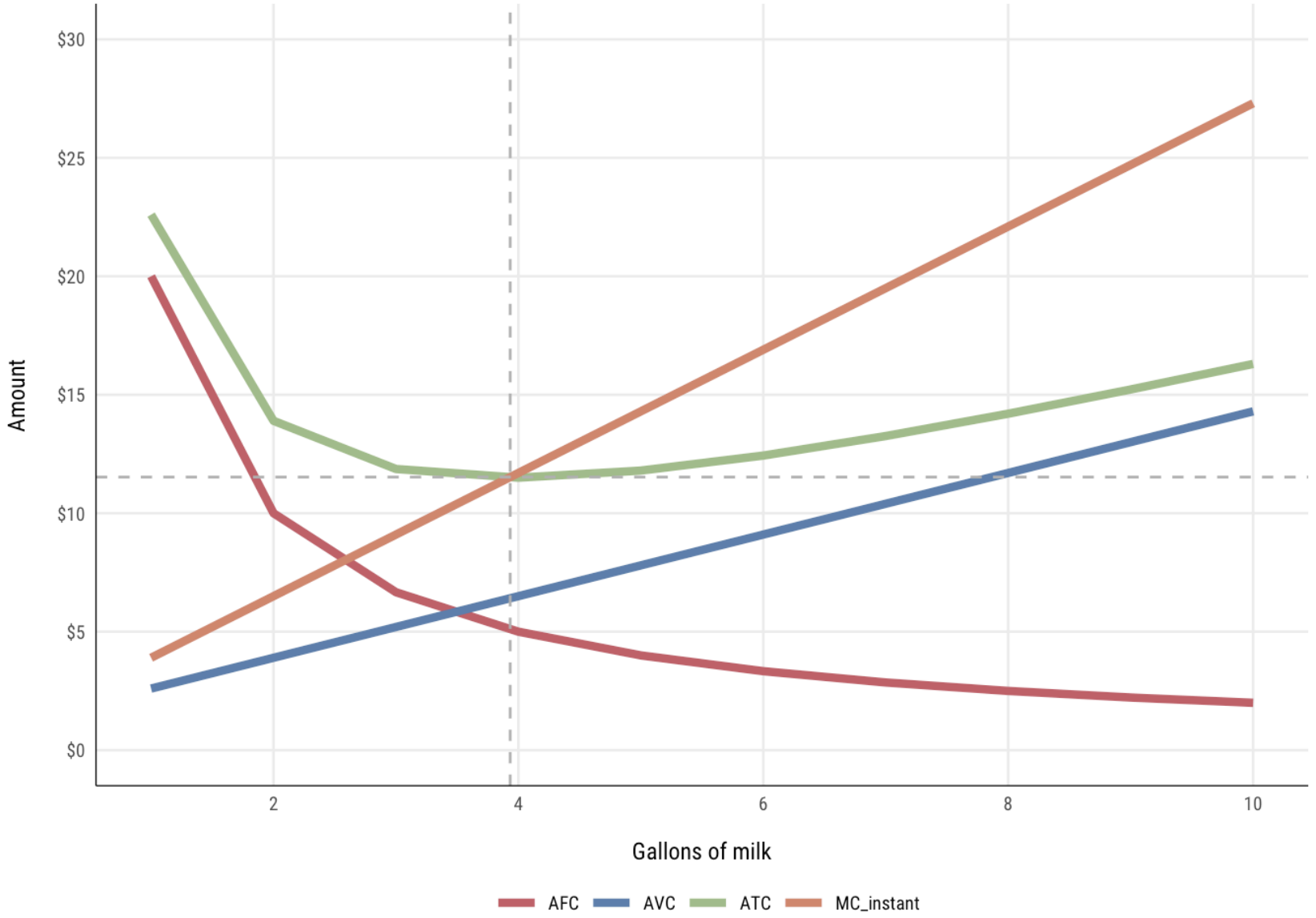
Cost to make stuff goes down when everyone uses your stuff

ECONOMIES OF SCALE

If you double the inputs, you get more than double the outputs

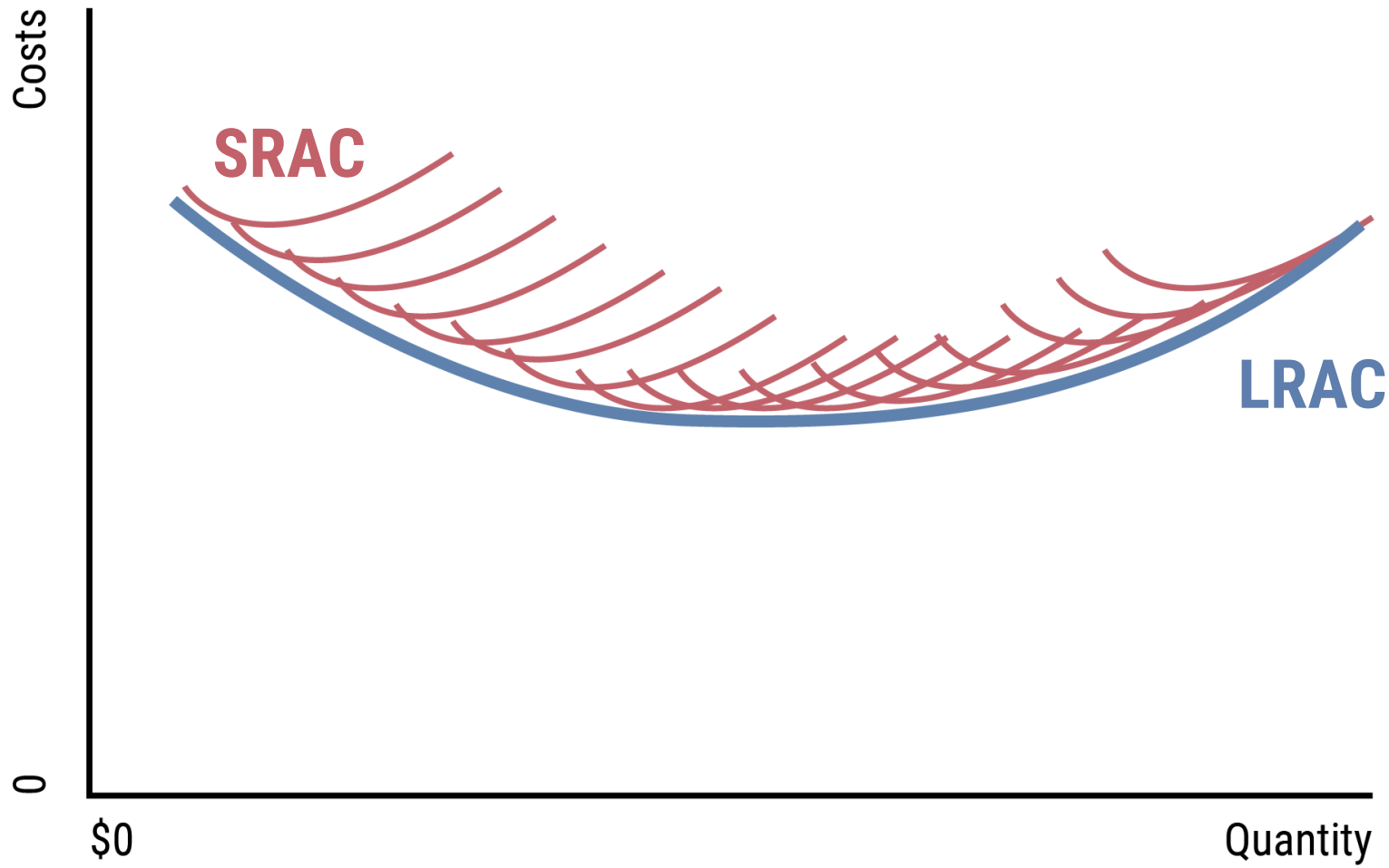
If you {{increase}} the inputs, you get more than {{that increase in}} the outputs

AVERAGE COSTS AND SCALE

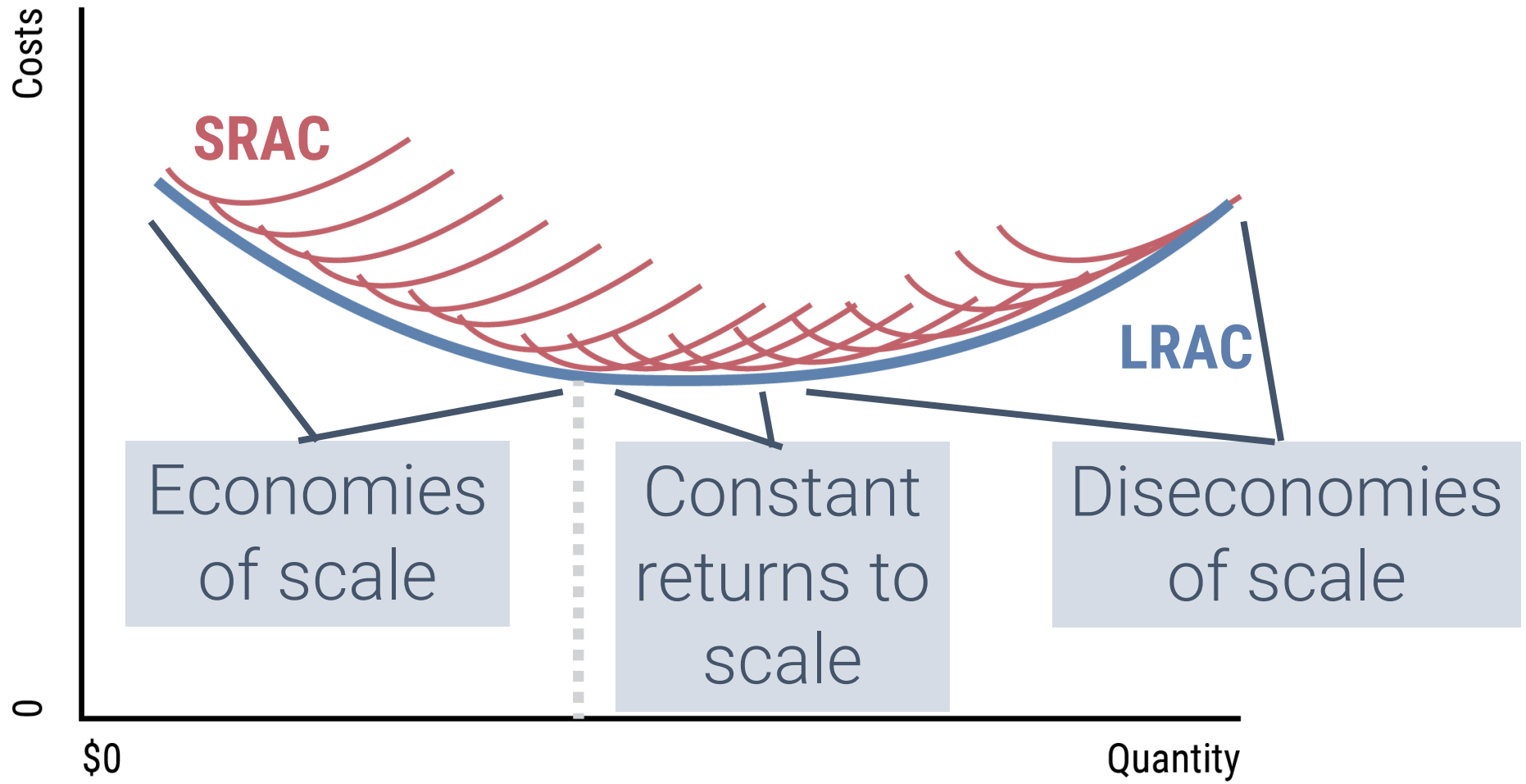


AVERAGE COSTS AND SCALE

TIME AND SCALE



TIME AND SCALE



SCALE, LOCATION, NETWORK, OR NOTHING?

eBay and PayPal

QWERTY and Dvorak keyboards

Doubling a recipe

Walmart's distribution network

Costco

Henry Ford's assembly line

Rural Chinese moving to cities

SURPLUS, TAXES, INCIDENCE, AND DWL

Consumer surplus

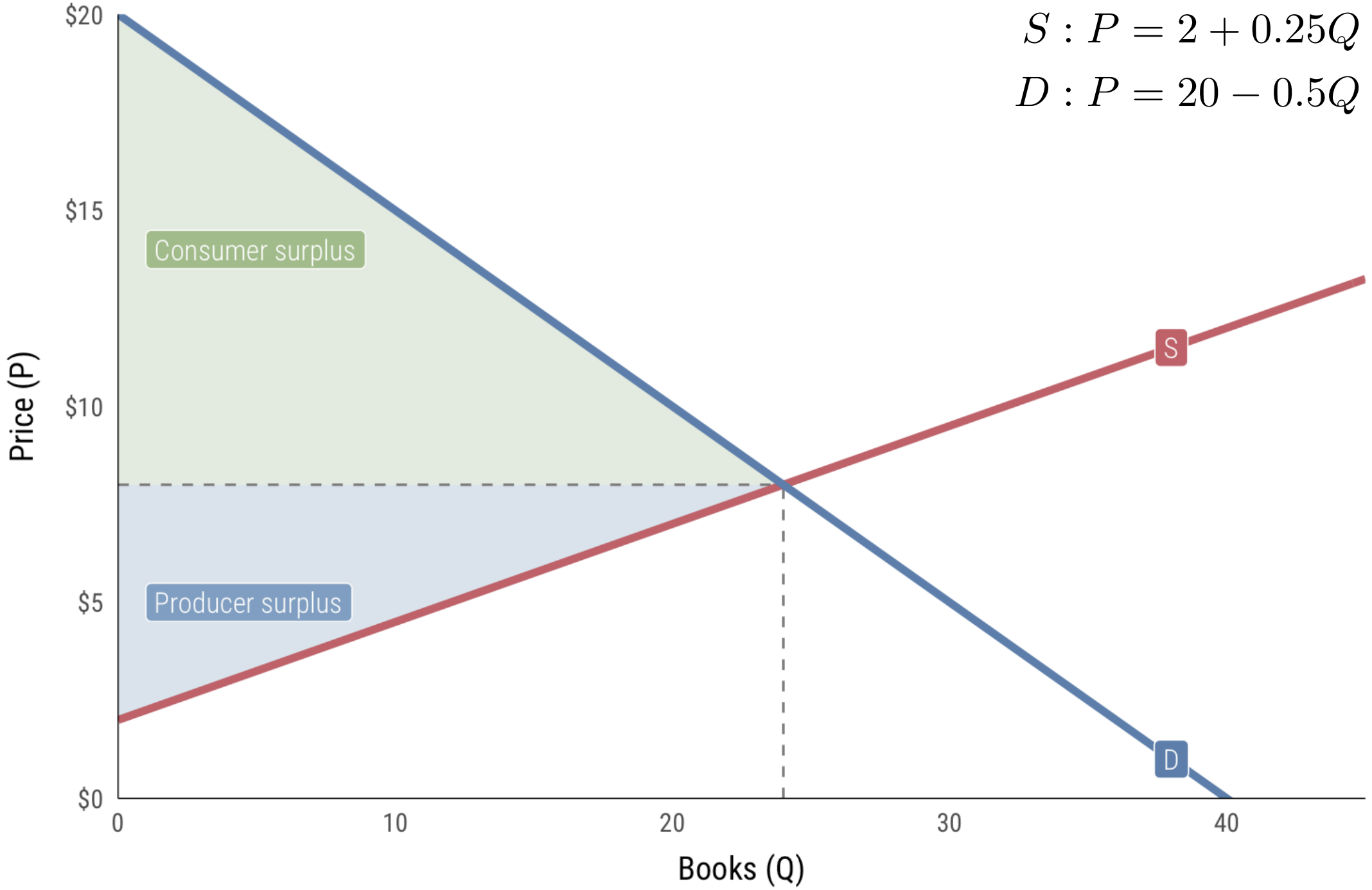
Difference between WTP and price

How good of a deal consumer gets

Producer surplus

Difference between price and WTA

How good of a deal producer gets


$S : P = 2 + 0.25Q$
$D : P = 20 - 0.5Q$
$20
$15
$10
$5
$0
Price (P)
Consumer surplus
Producer surplus
S
D
0
10
20
30
40
Books (Q)

WHY DO GOVERNMENTS TAX?

Raise revenue for services

Redistribute resources

Encourage or discourage consumption

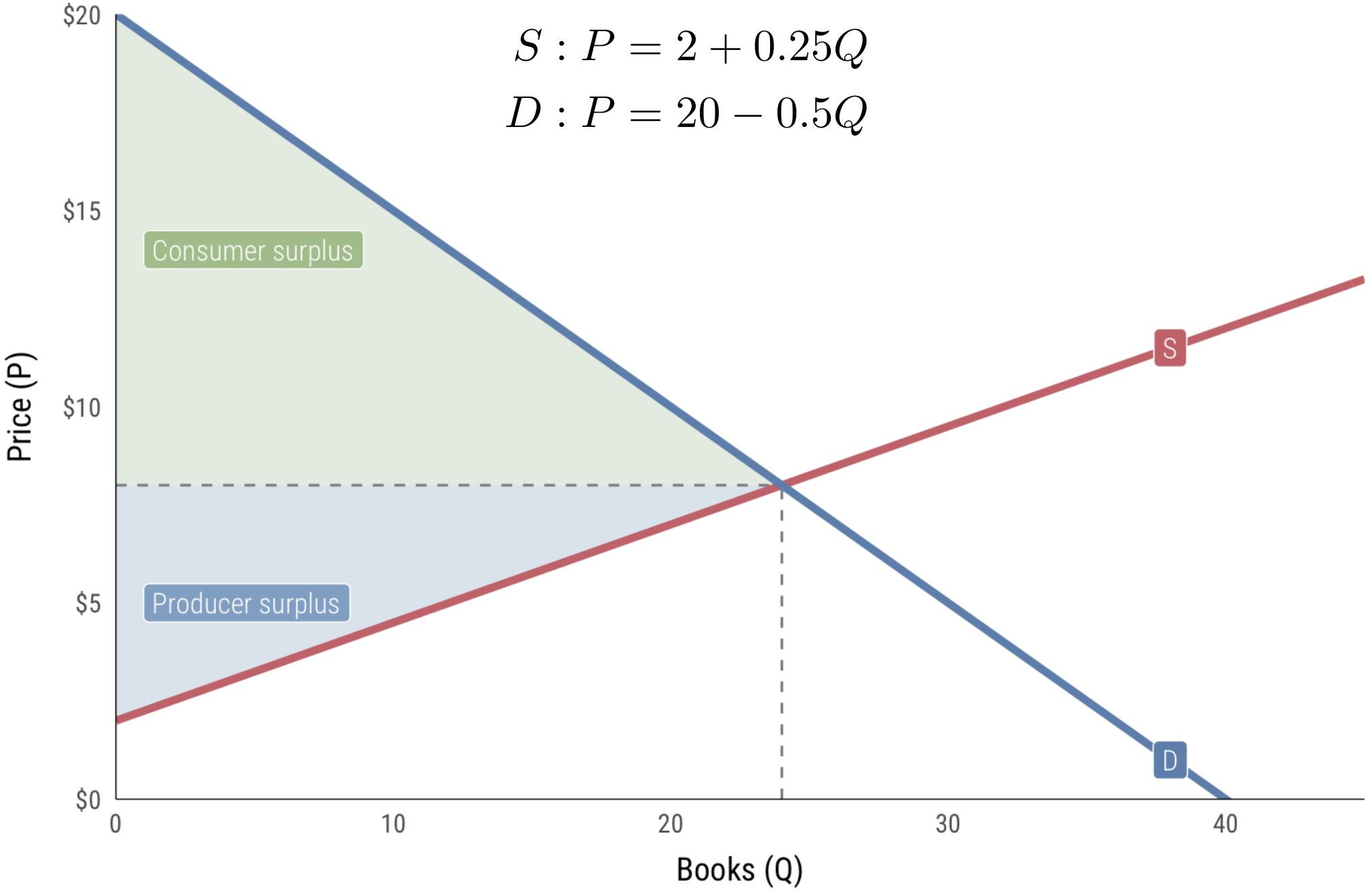
WHAT HAPPENS WHEN GOVERNMENTS TAX?

Revenue raised for public goods

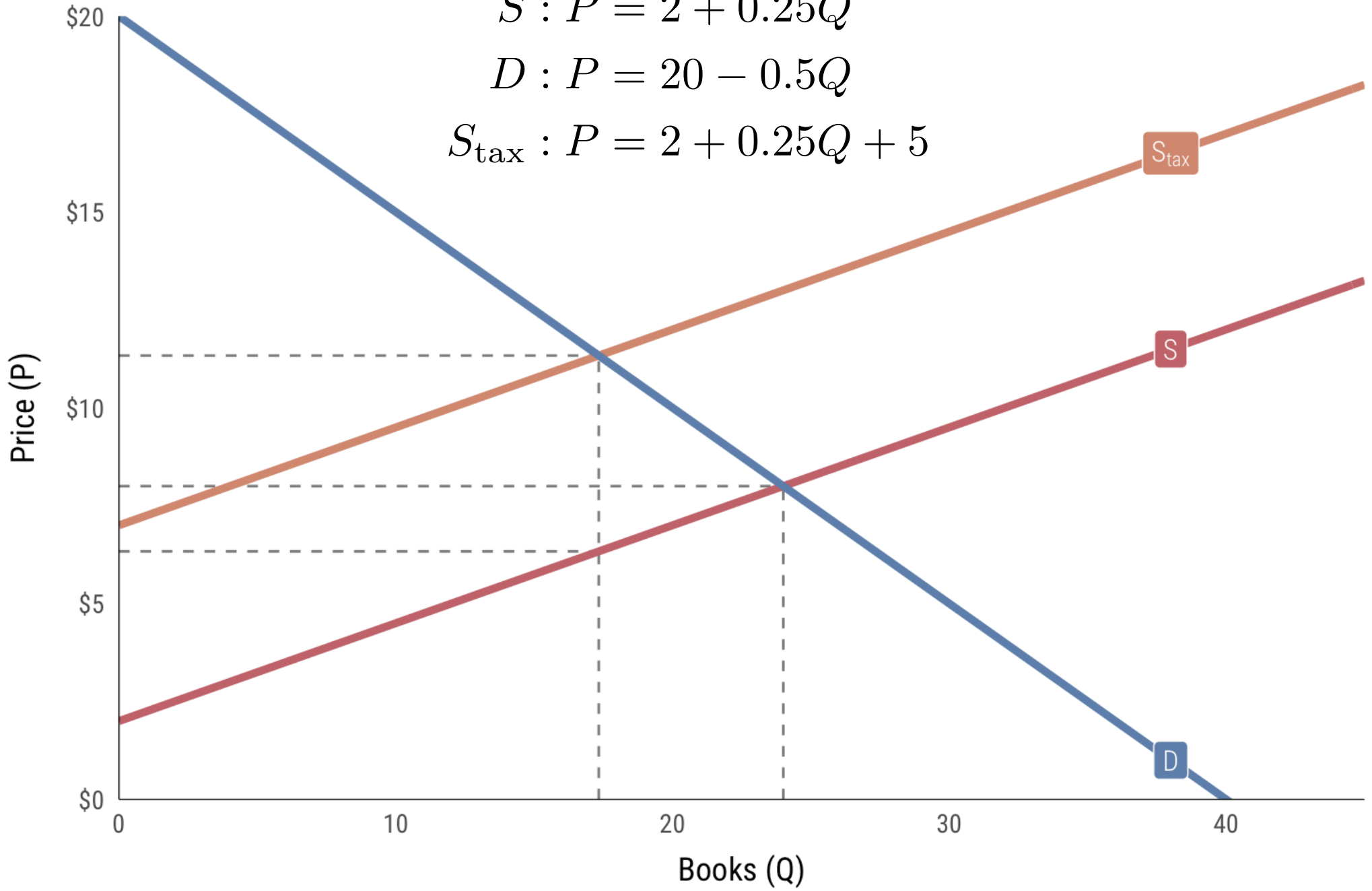
Resources redistributed

Markets distorted; loss of efficiency

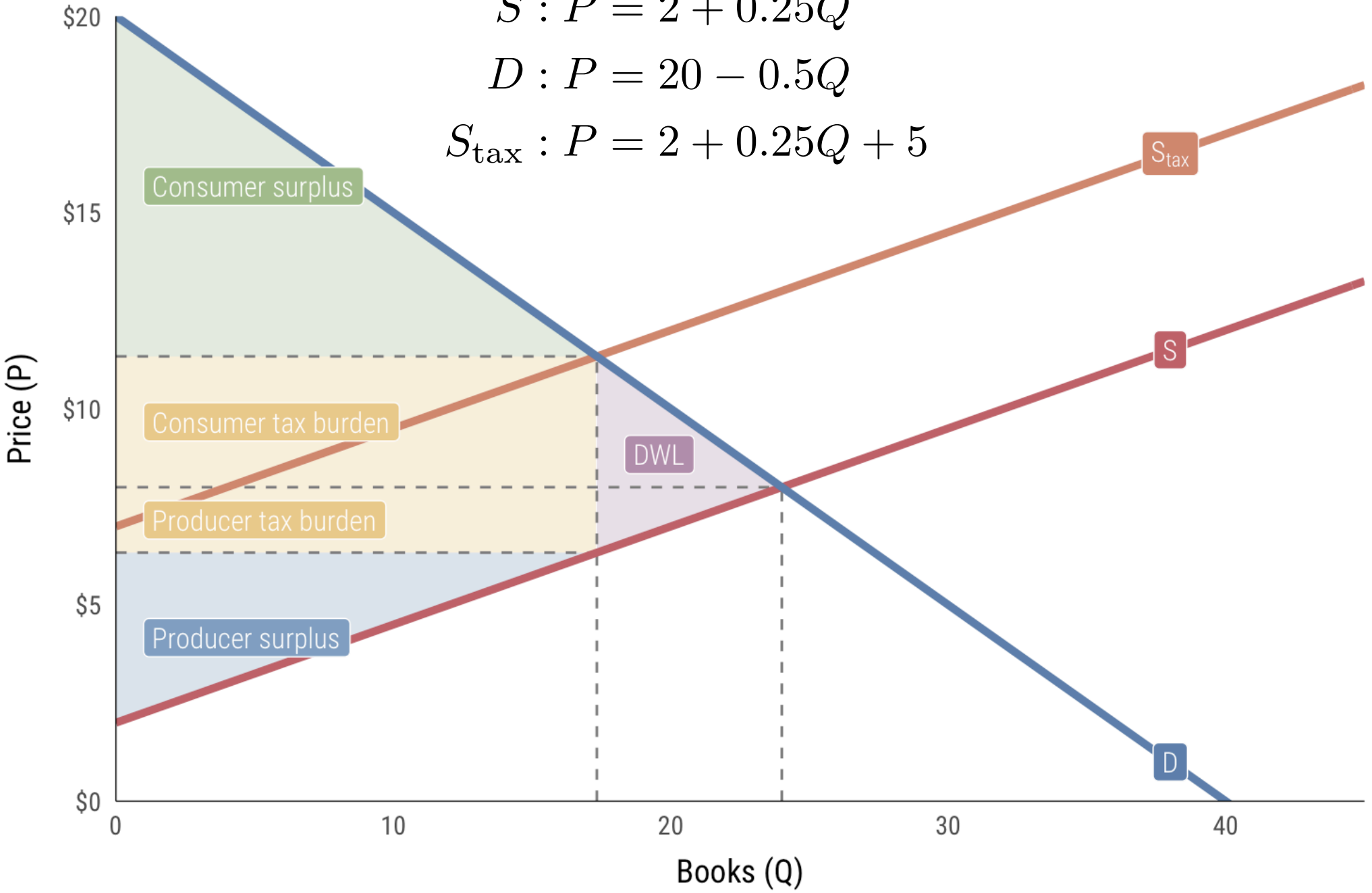
$$S : P = 2 + 0.25Q$$
$$D : P = 20 - 0.5Q$$



$$S : P = 2 + 0.25Q$$
$$D : P = 20 - 0.5Q$$
$$S_{\text{tax}} : P = 2 + 0.25Q + 5$$



$$S : P = 2 + 0.25Q$$
$$D : P = 20 - 0.5Q$$
$$S_{\text{tax}} : P = 2 + 0.25Q + 5$$



$$S_1 : P = 2 + 0.25Q$$

$$D_1 : P = 10 - 0.05Q$$

$$S_{1\ \text{tax}} : P = 2 + 0.25Q + 5$$

$$S_3 : P = 2 + 0.05Q$$

$$D_3 : P = 20 - 0.5Q$$

$$S_{3\ \text{tax}} : P = 2 + 0.05Q + 5$$

$$S_2 : P = 2 + 0.25Q$$

$$D_2 : P = 20 - 2Q$$

$$S_{2\ \text{tax}} : P = 2 + 0.25Q + 5$$

$$S_4 : P = 2 + 1.5Q$$

$$D_4 : P = 20 - 0.5Q$$

$$S_{4\ \text{tax}} : P = 2 + 1.5Q + 5$$

P and Q at competitive equilibrium

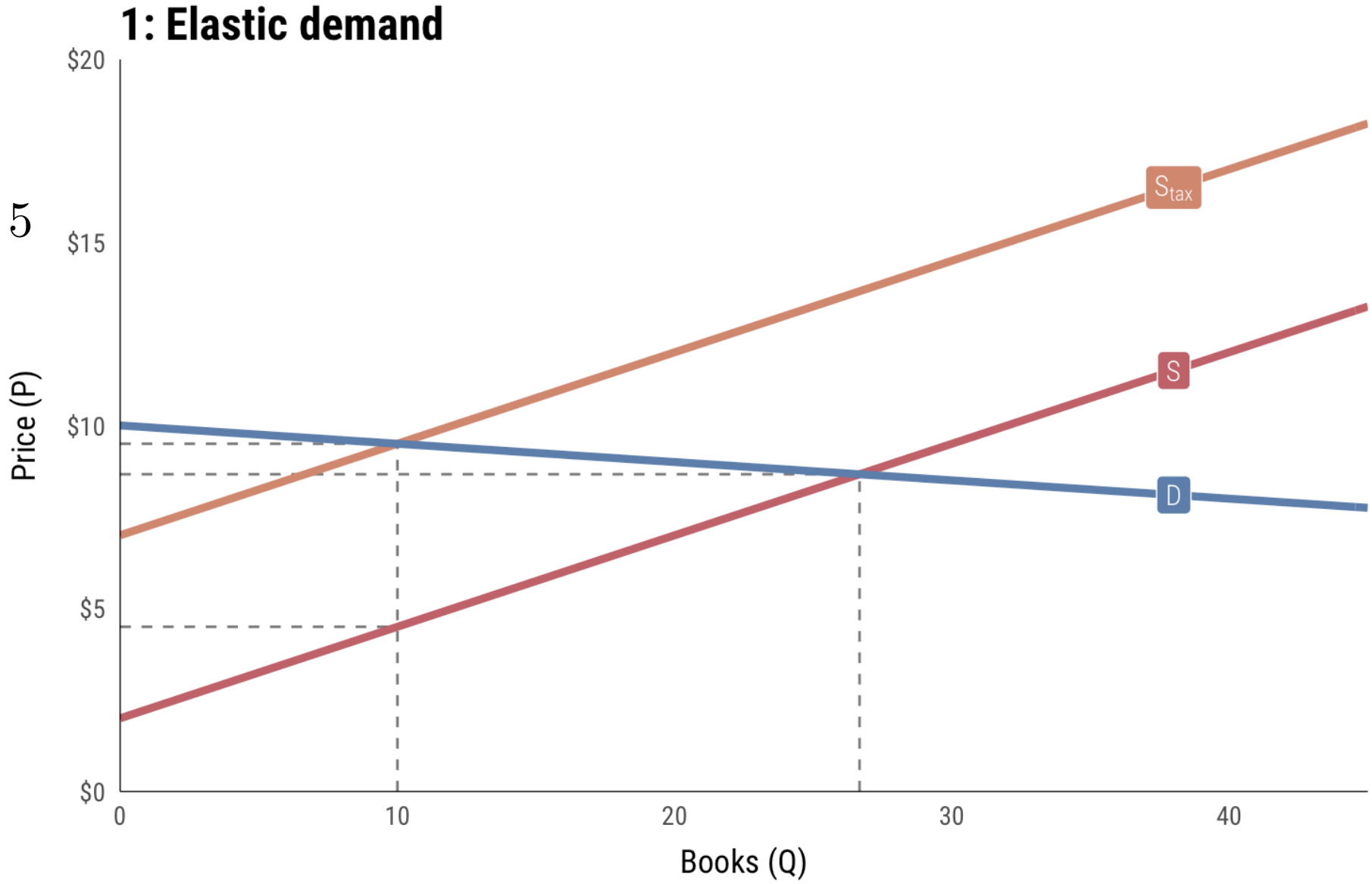
Size of producer and consumer surpluses

P and Q at tax equilibrium

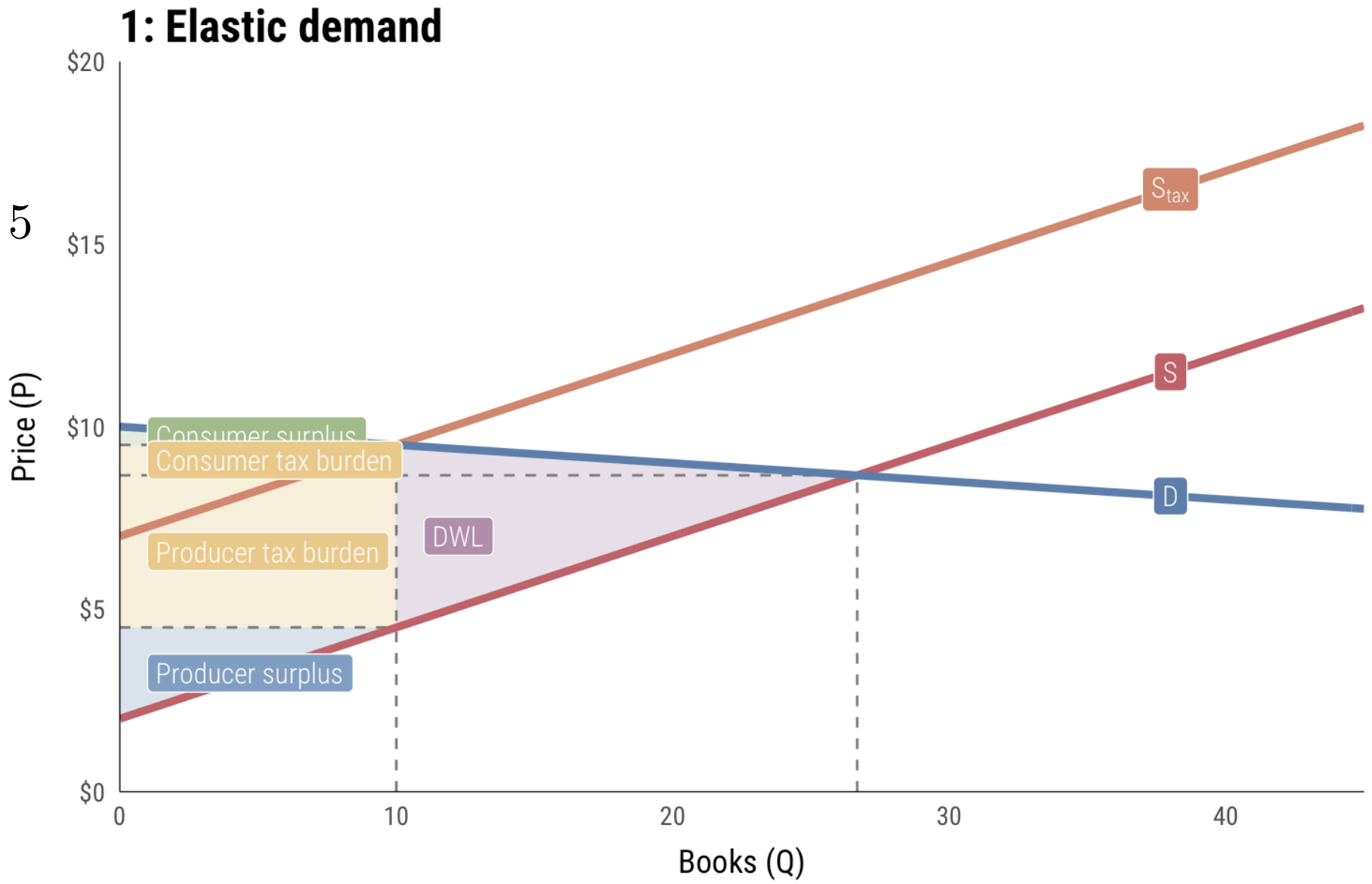
Size of DWL

Producer and consumer incidence

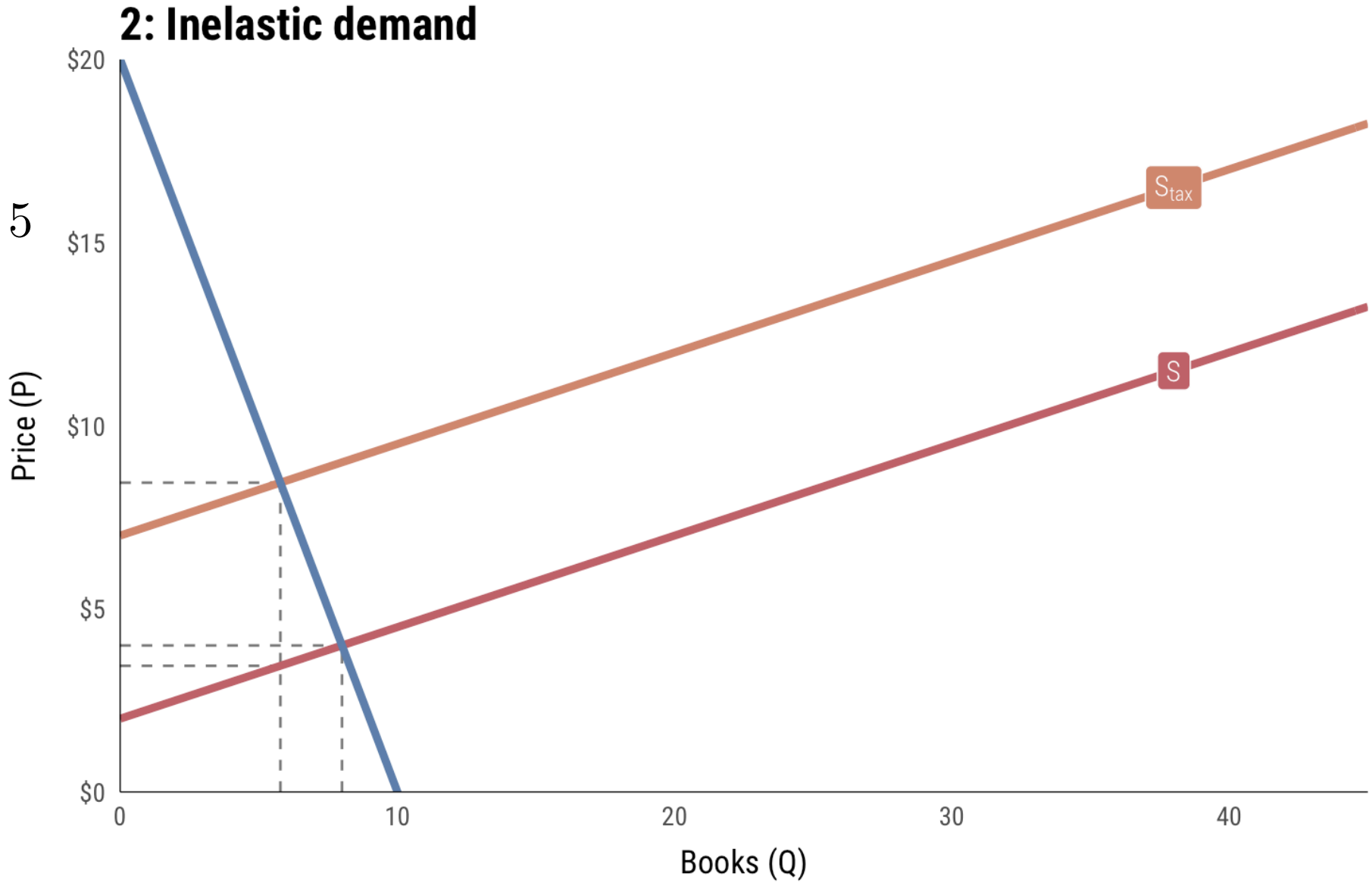
$$S_1 : P = 2 + 0.25Q$$
$$D_1 : P = 10 - 0.05Q$$
$$S_{1\ \text{tax}} : P = 2 + 0.25Q + 5$$



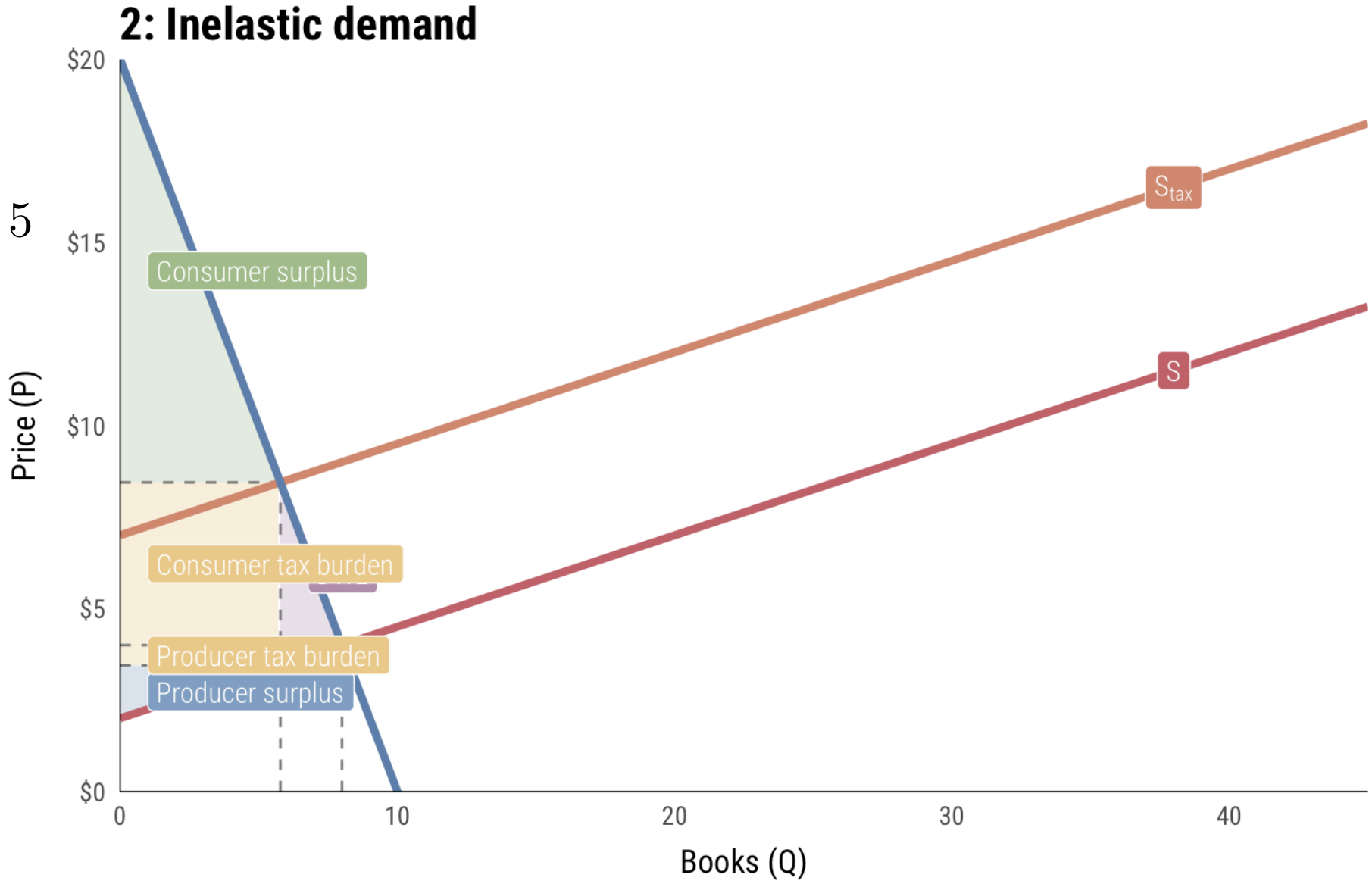
$$S_1 : P = 2 + 0.25Q$$
$$D_1 : P = 10 - 0.05Q$$
$$S_{1\ \text{tax}} : P = 2 + 0.25Q + 5$$



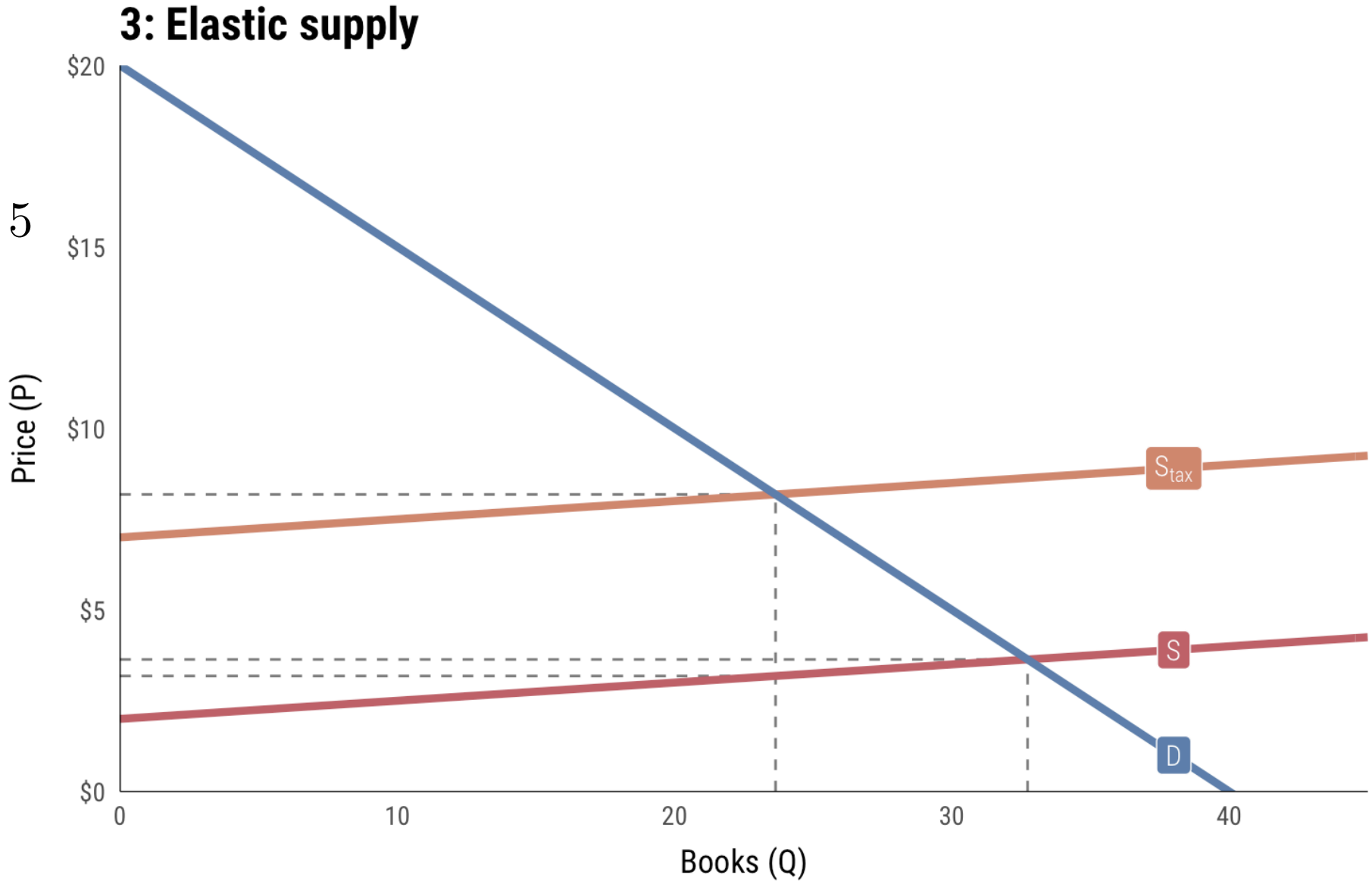
$$S_2 : P = 2 + 0.25Q$$
$$D_2 : P = 20 - 2Q$$
$$S_{2\ \text{tax}} : P = 2 + 0.25Q + 5$$



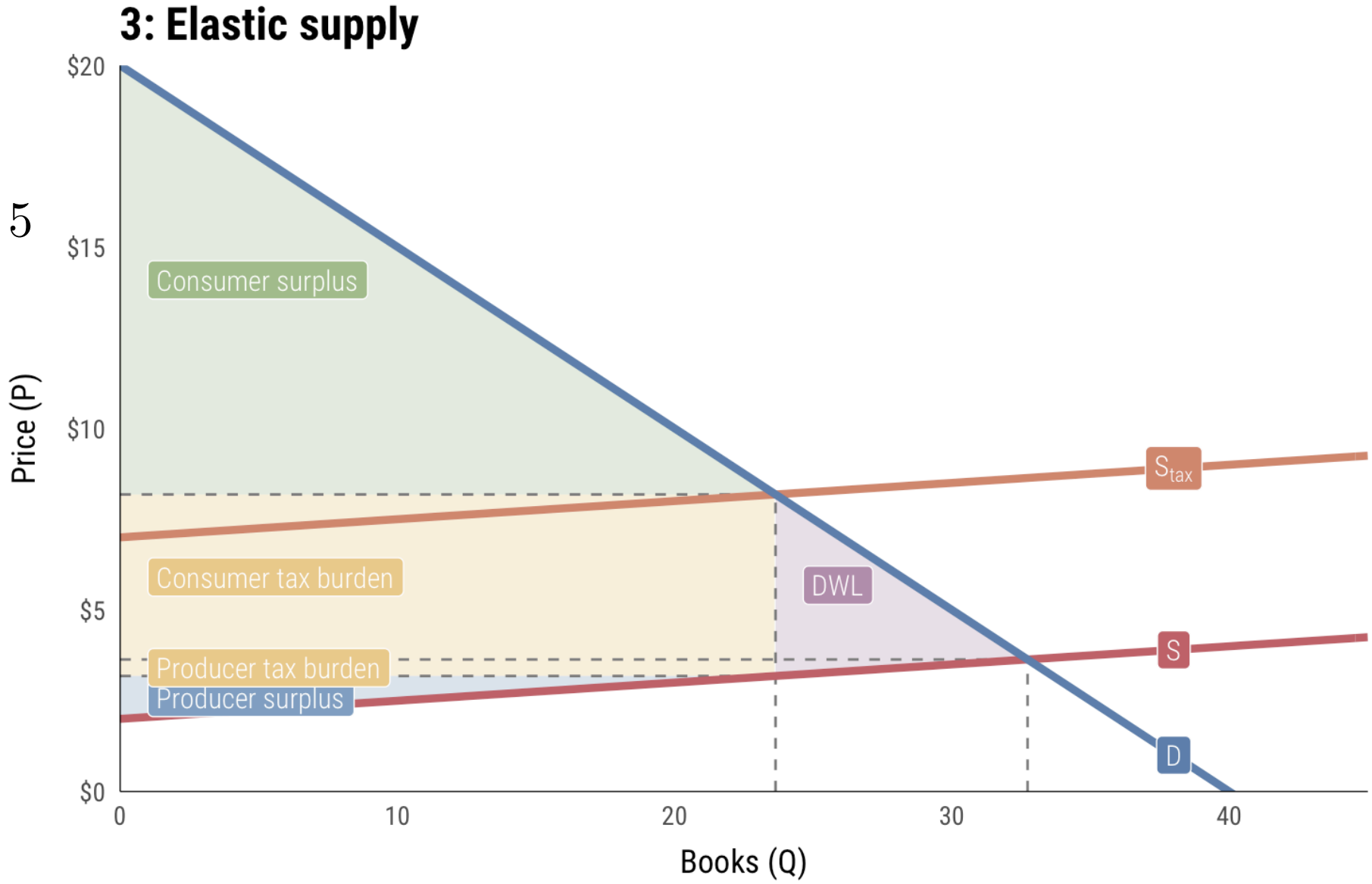
$$S_2 : P = 2 + 0.25Q$$
$$D_2 : P = 20 - 2Q$$
$$S_{2\ \text{tax}} : P = 2 + 0.25Q + 5$$



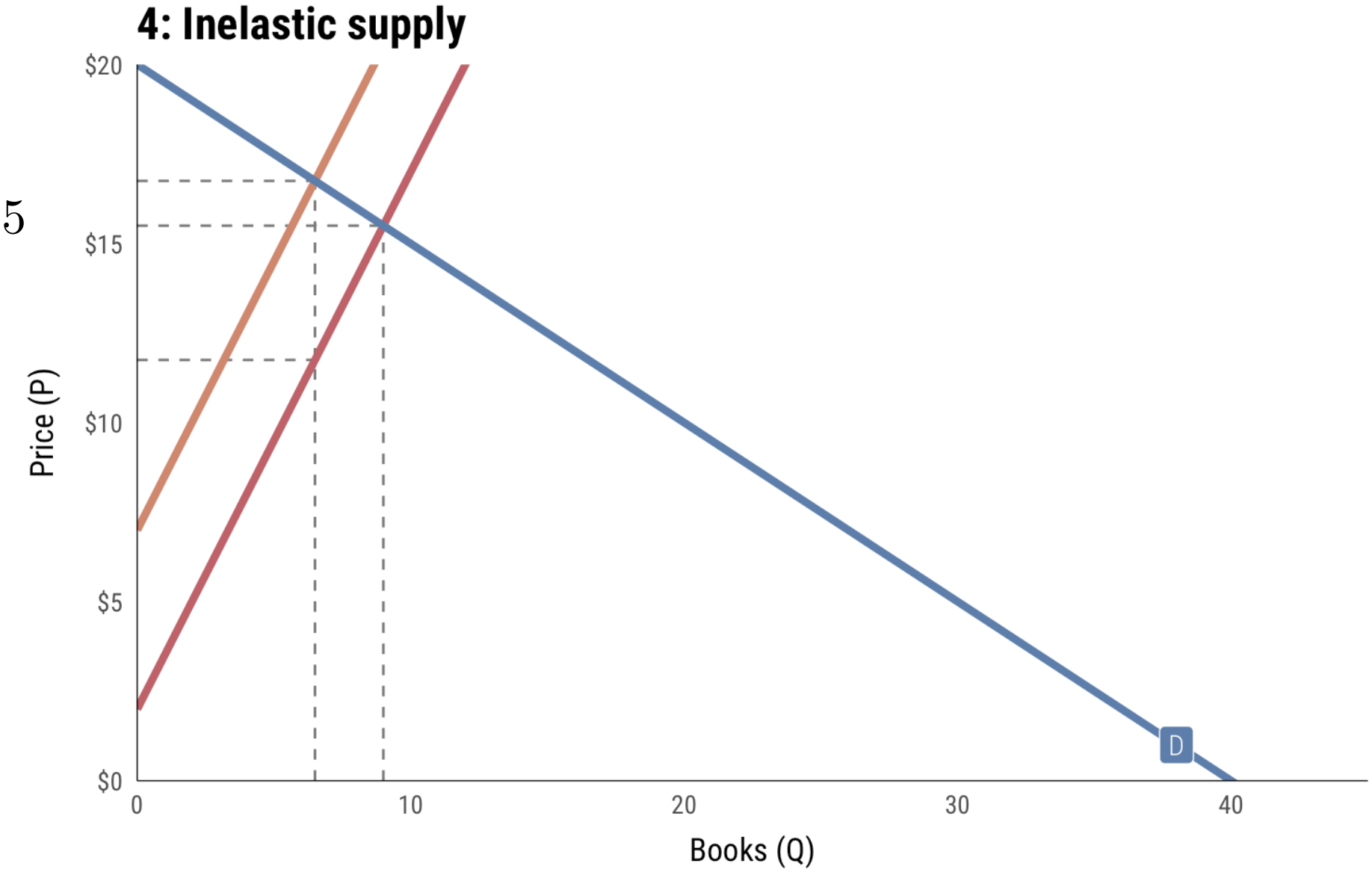
$$S_3 : P = 2 + 0.05Q$$
$$D_3 : P = 20 - 0.5Q$$
$$S_{3\ \text{tax}} : P = 2 + 0.05Q + 5$$



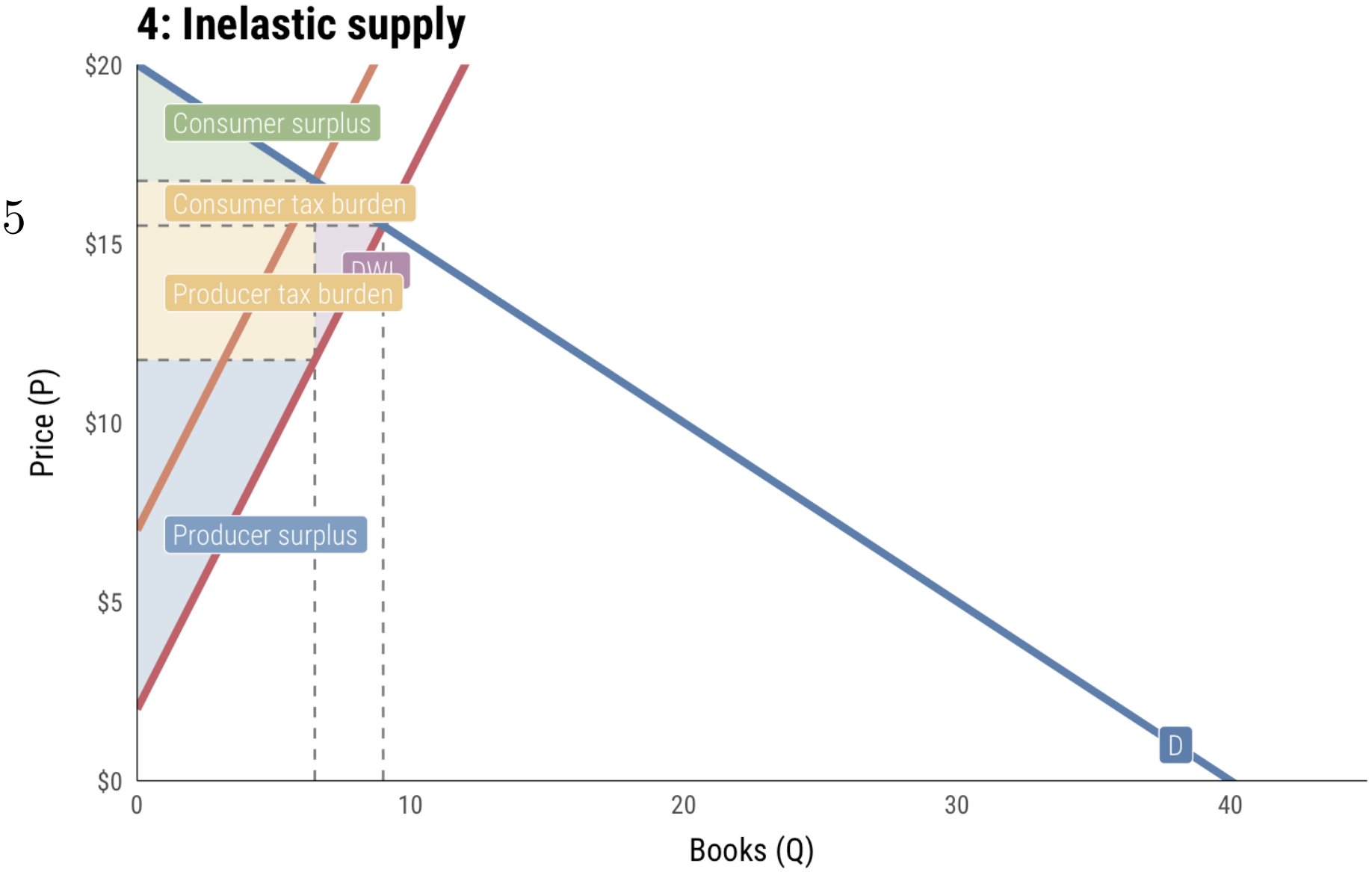
$$S_3 : P = 2 + 0.05Q$$
$$D_3 : P = 20 - 0.5Q$$
$$S_{3\ \text{tax}} : P = 2 + 0.05Q + 5$$



$$S_4 : P = 2 + 1.5Q$$
$$D_4 : P = 20 - 0.5Q$$
$$S_{4\ \text{tax}} : P = 2 + 1.5Q + 5$$



$$S_4 : P = 2 + 1.5Q$$
$$D_4 : P = 20 - 0.5Q$$
$$S_{4\ \text{tax}} : P = 2 + 1.5Q + 5$$



TAX INCIDENCE AND ∈

Incidence depends on elasticity of supply or demand

Tax burden falls on those least able to escape it

INCIDENCE WITHIN CONSUMERS

Progressive taxes

Rich pay more

Income taxes (but loopholes)

Regressive taxes

Poor pay more

Sales taxes, payroll taxes

TAX FAIRNESS

Benefits principle

Those who benefit from public spending should bear the burden of the tax

Ability-to-pay principle

Those with a greater ability to pay a tax should pay more tax