

FIRMS AND MARKETS

MPA 612: Economy, Society, and Public Policy

February 27, 2019

**Fill out your reading report
on Learning Suite**

PLAN FOR TODAY

Demand and WTP

XYZ frames

Scale, location, networks, and time

Stone cold sober chocolate milk



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

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

100.00000000000000% of universe explored

Launch Probe

Cost: 100.00 quadrillion clips

Launched: 5.00 thousand
Descendants: 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

Round 56

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

Yomi: 55,594

New Tournament ON

Cost: 16,000 ops

Combat

Lutzen 5

Scale = 265 octillion:1

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

DEMAND AND WTP

WILLINGNESS TO PAY

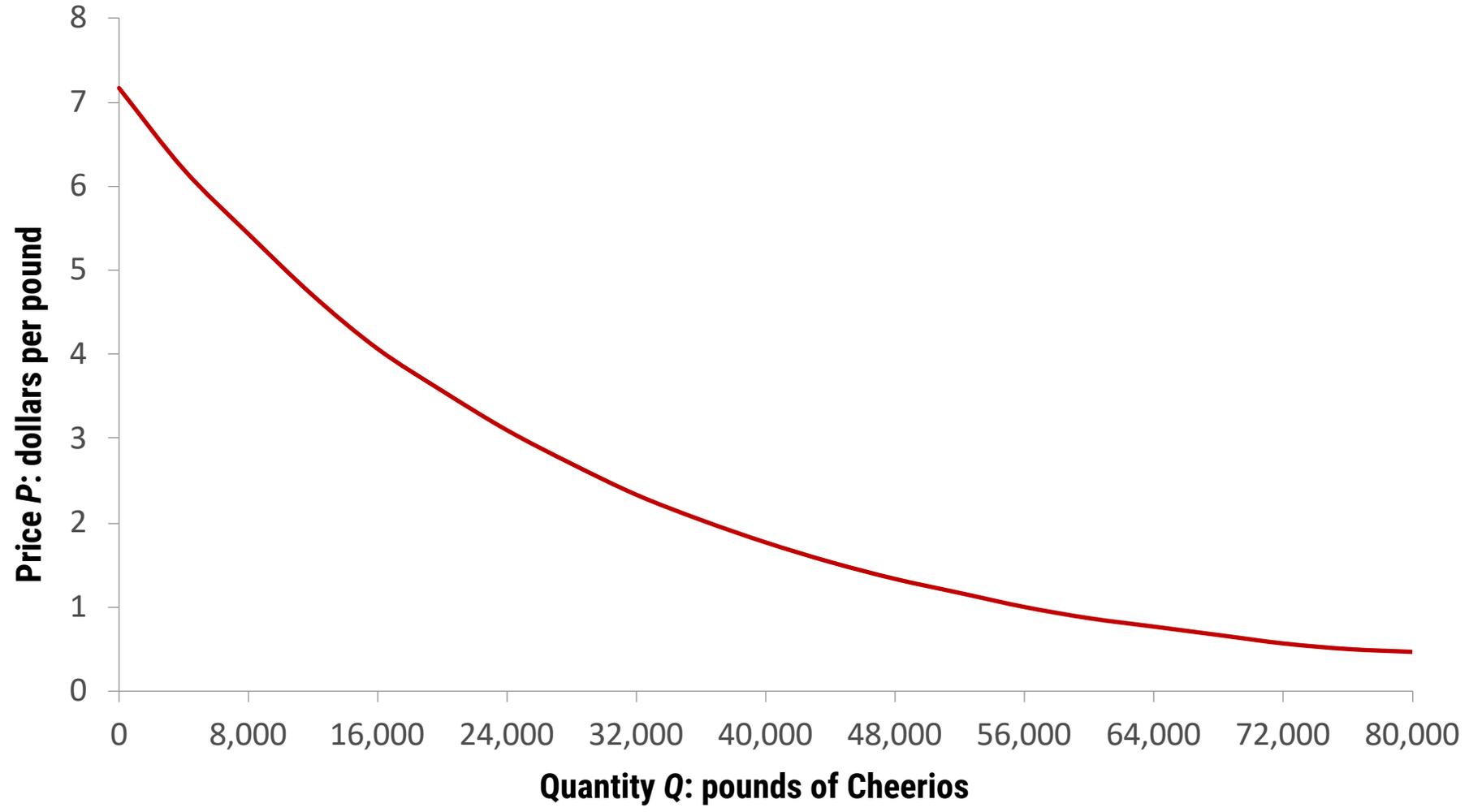
**How much you value
(and would pay)
for something**

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



Willingness Toupee

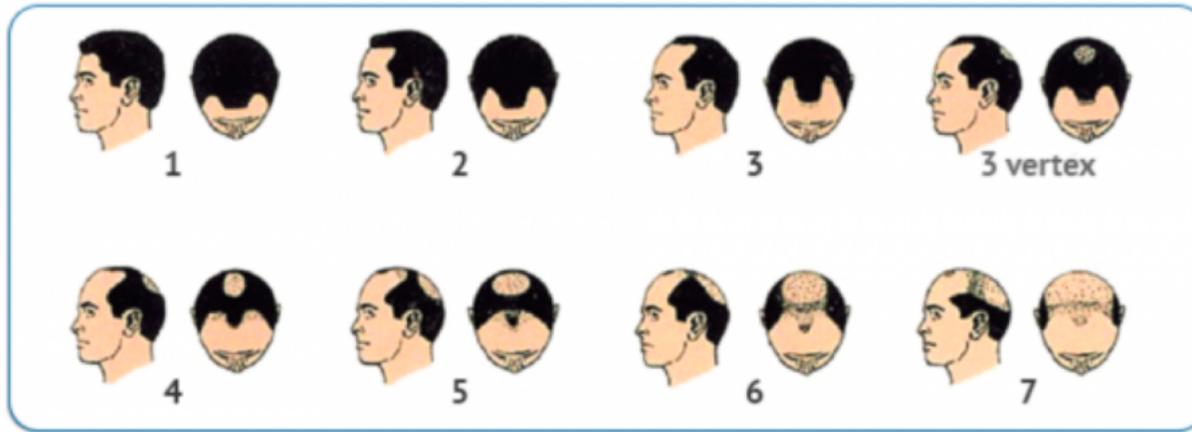
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Abstract: In this paper we tackle the hairy problem of male pattern baldness. We survey balding men and elicit their willingness to pay to move from their current sad situation to a more plentiful one. Then we comb-over the results. What's the average 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.



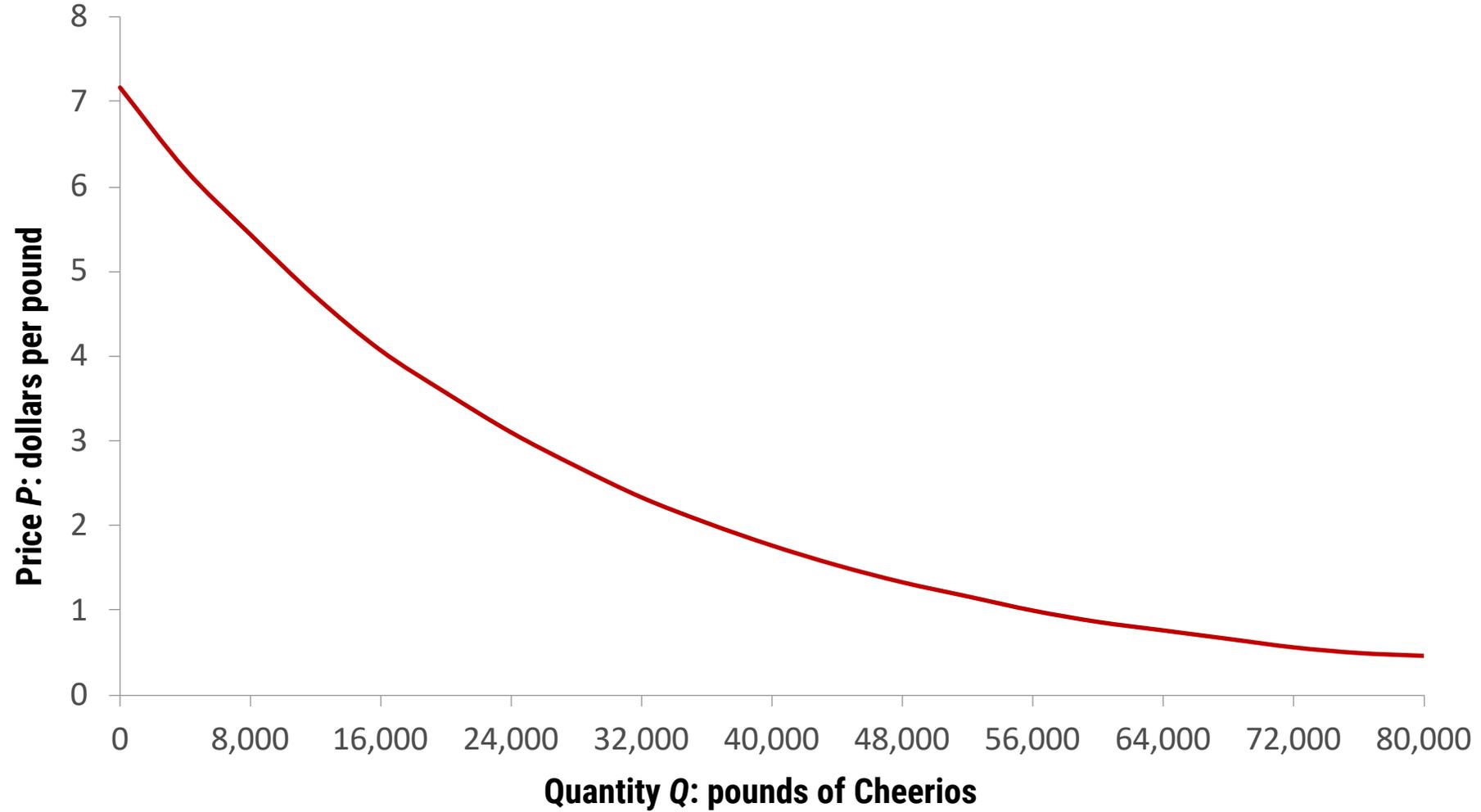
Would you be willing to pay a one-time fee of \$10,000 to improve your hair coverage to a Level 4?

Yes

No

I'll think about it

WTP = DEMAND



XYZ FRAMES

Specifications

Squares attached at all four corners using labels

Labels **cannot** be wider than sticks

Squares must be square when inspected

Labels must be cut (**not torn**) with the scissors

Costs

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

Round 1

1 worker allowed

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

Round 1

1 worker allowed

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Wage per employee: \$0.40

\$2 per good frame

03:00

Round 2

2 workers allowed

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

Round 2

2 workers allowed

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

03:00

Round 3

Unlimited workers allowed

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

Round 3

Unlimited workers allowed

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

03:00

Round 4

Unlimited workers allowed

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

Round 4

Unlimited workers allowed

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

03:00

Round 5

Unlimited workers allowed

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

Round 5

Unlimited workers allowed

Table rental: \$1.00

Scissor rental: \$0.50

Popsicle stick: \$0.10

Label per corner: \$0.05

Wage per employee: \$0.40

\$2 per good frame

03:00

Fixed costs

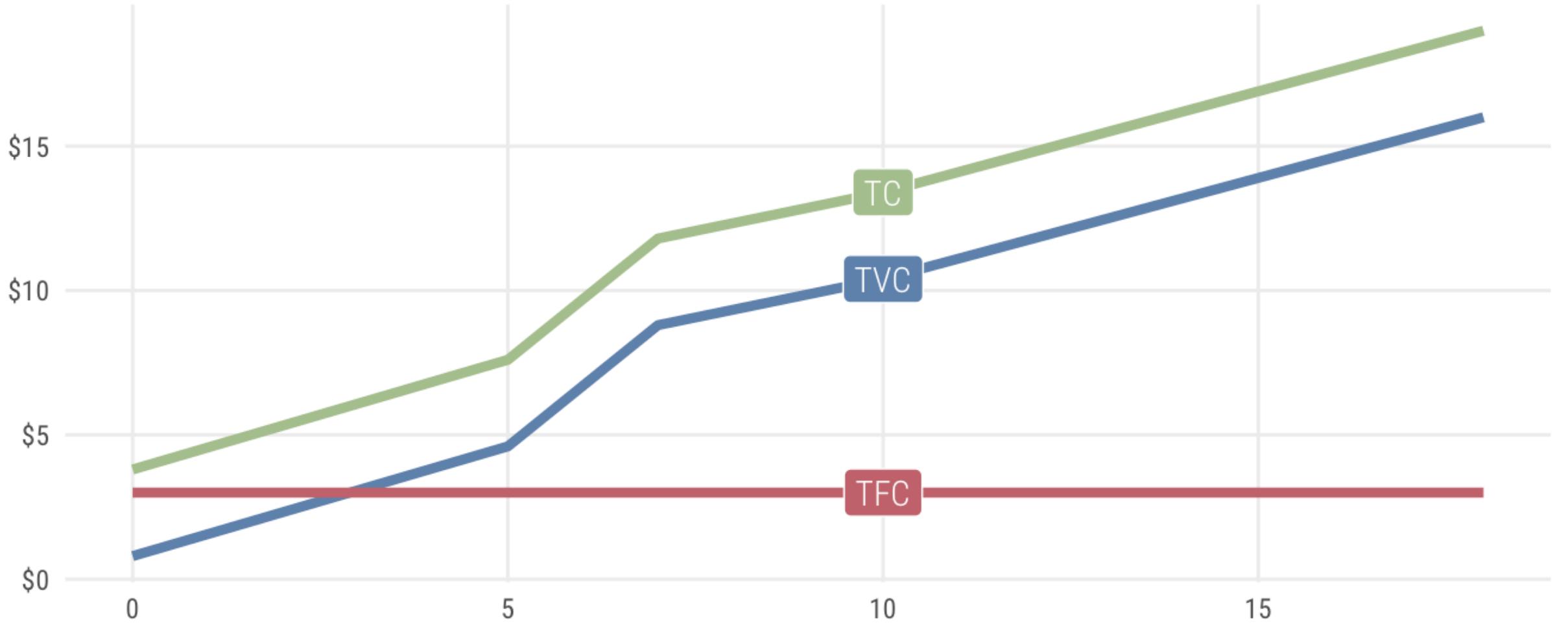
Variable costs

Average costs

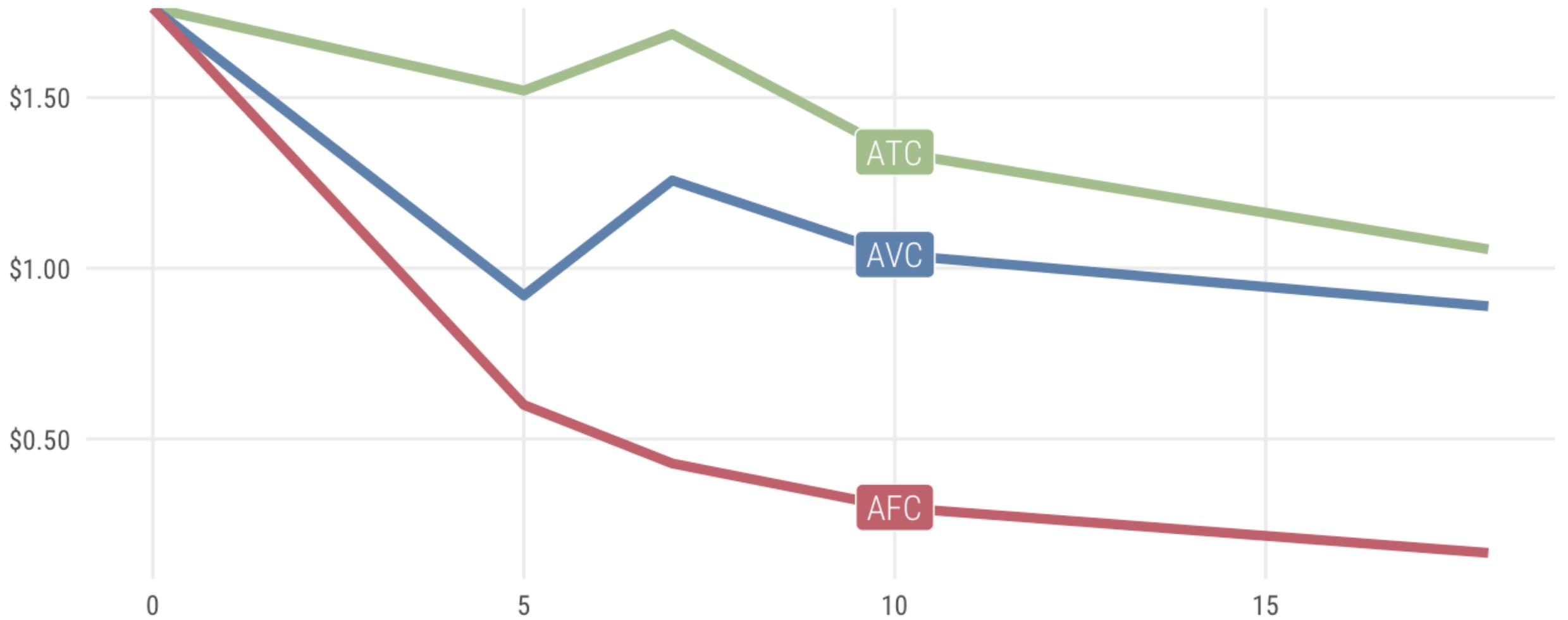
Revenue

Profit

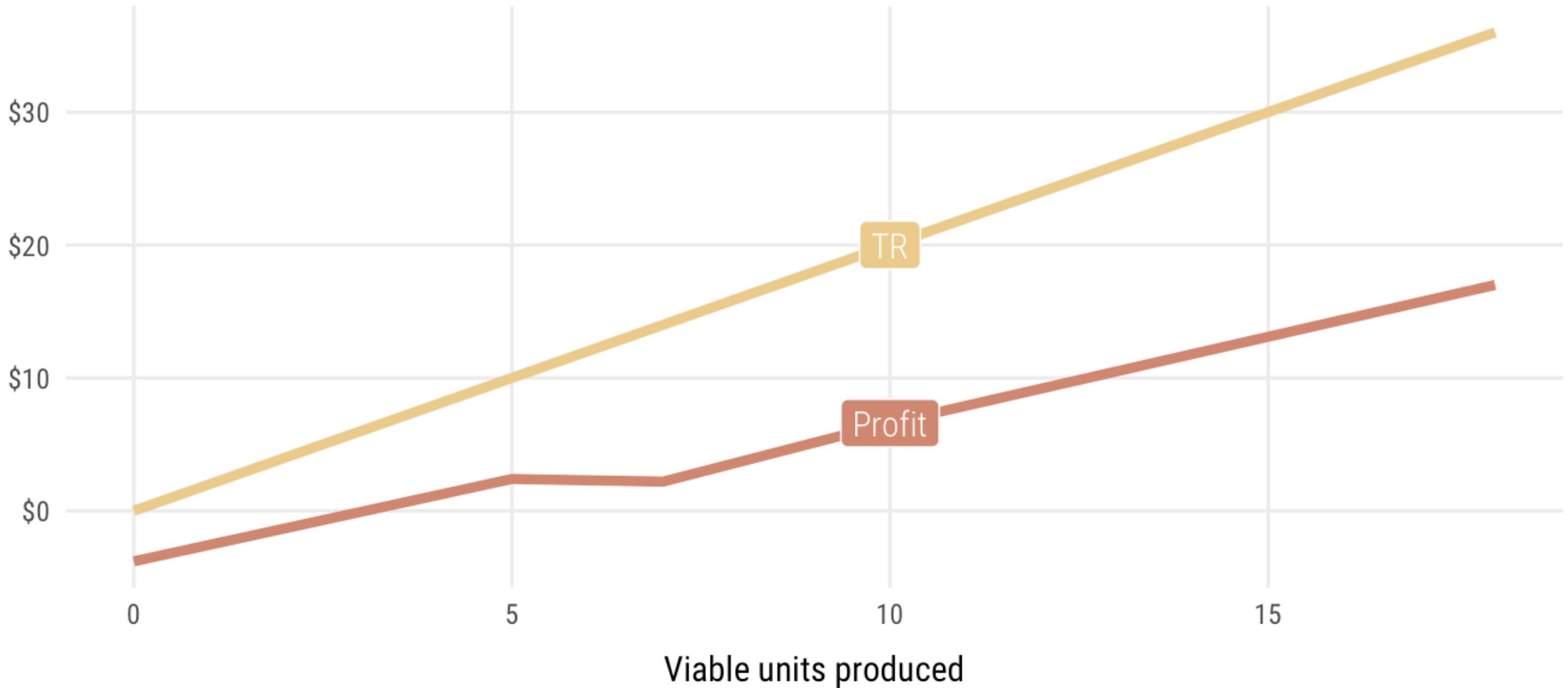
Total costs



Average costs



Revenue and profit



Total costs (TC)

Unit cost \times quantity

$$\text{\$1} \times Q$$

Total revenue (TR)

Price \times quantity

$$P \times Q$$

Profit ($\pi = TR - TC$)

$$(P \times Q) - (\text{\$1} \times Q)$$

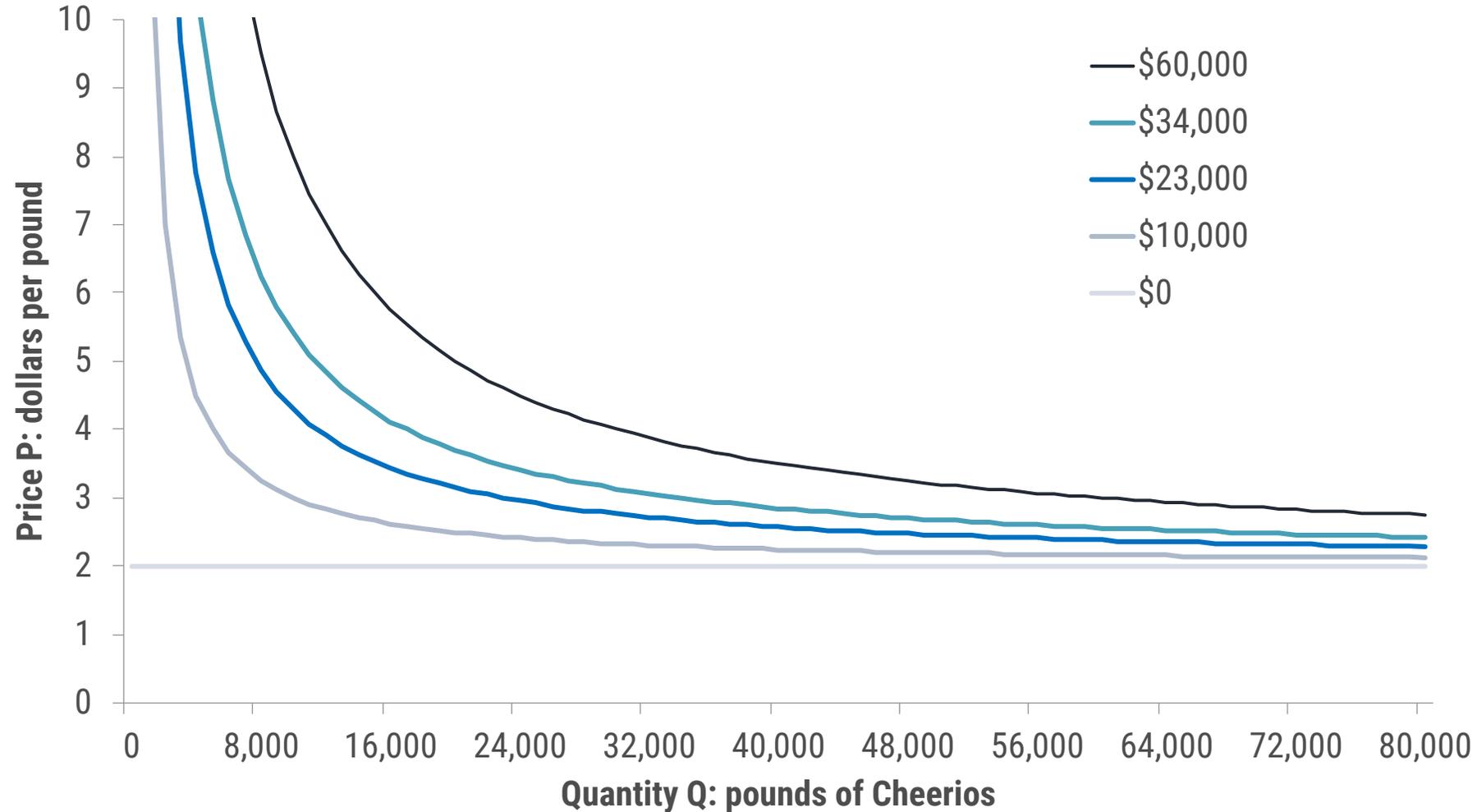
$$\pi = (P - \text{\$1}) \times Q$$

ISOPROFIT CURVES

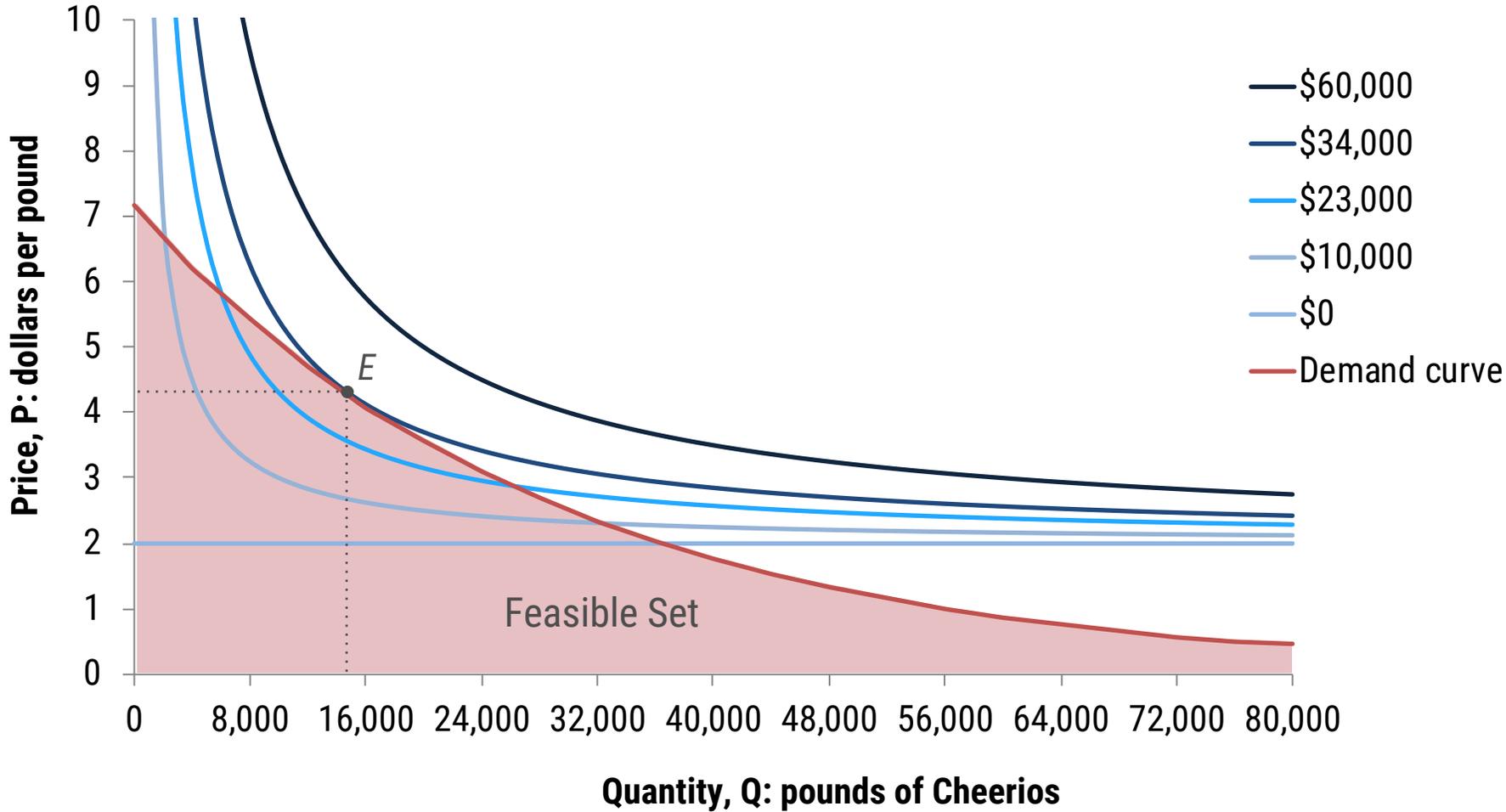
These are real!

$$(P - \$1) \times Q$$

(or some similar equation)



PROFIT MAXIMIZATION



**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

SCALE, LOCATION, NETWORK, OR NOTHING?

eBay and PayPal

Doubling a recipe

QWERTY and
Dvorak keyboards

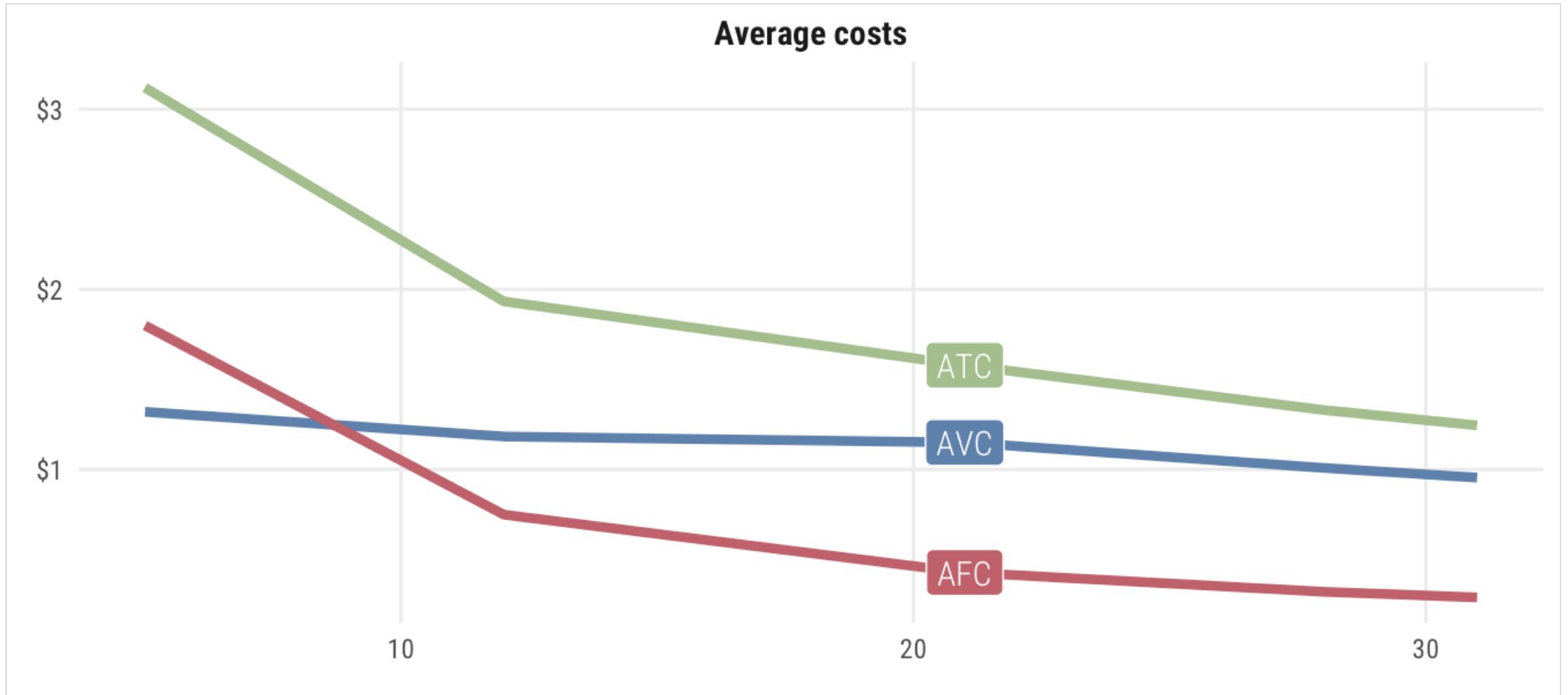
Walmart's distribution network

Costco

Henry Ford's assembly line

Rural Chinese moving to cities

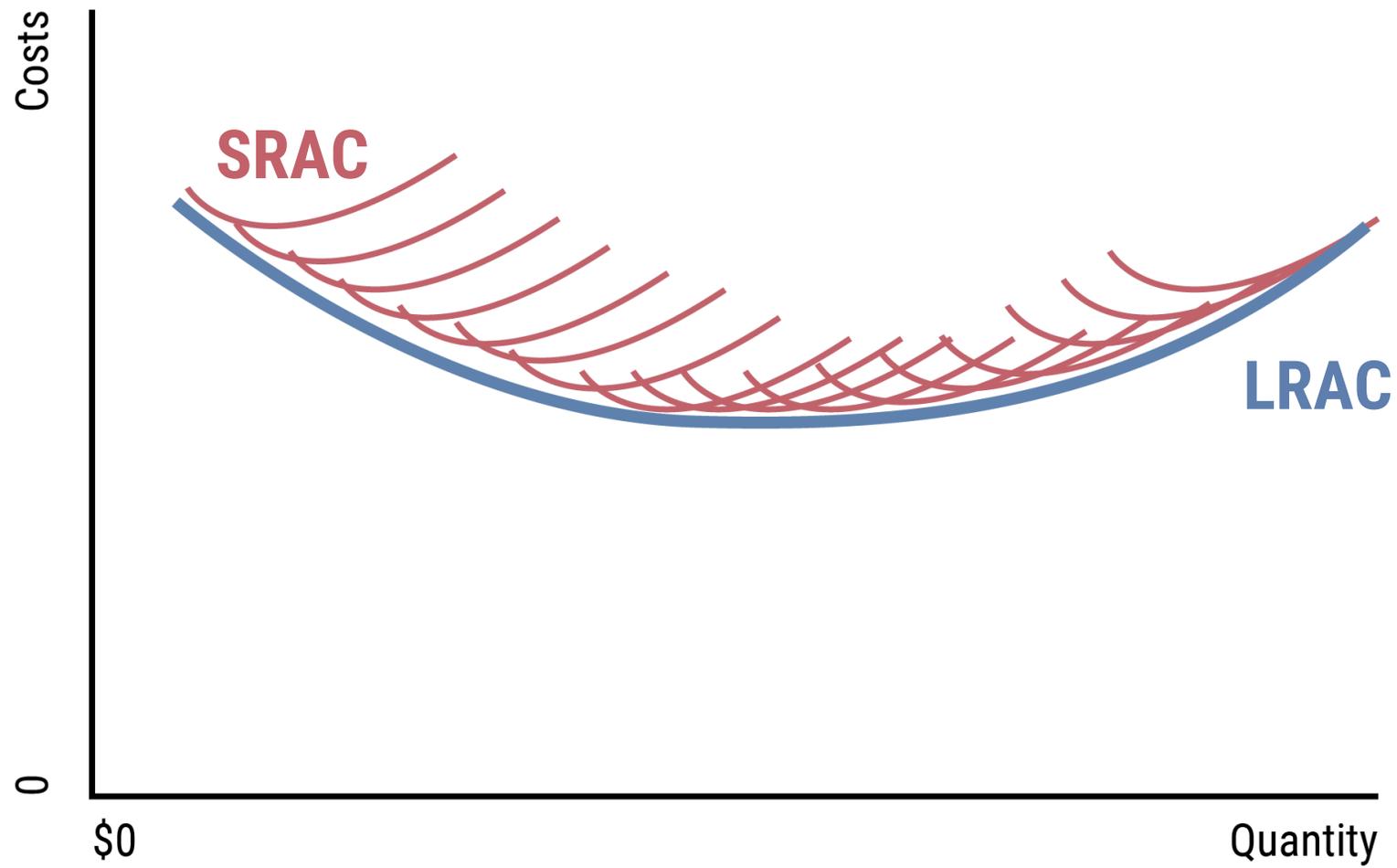
AVERAGE COSTS AND SCALE



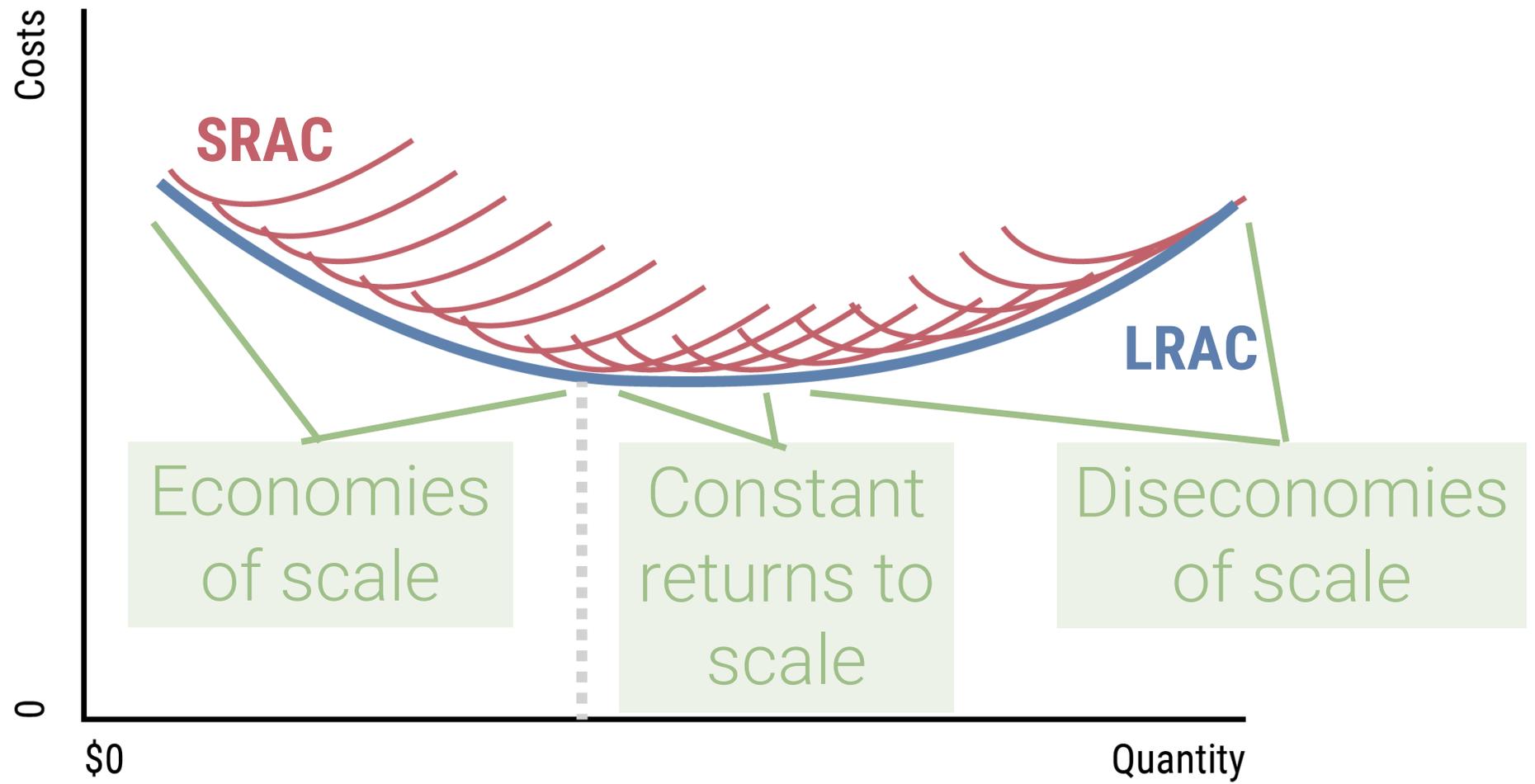
AVERAGE COSTS AND SCALE



TIME AND SCALE



TIME AND SCALE



**STONE COLD SOBER
CHOCOLATE MILK**



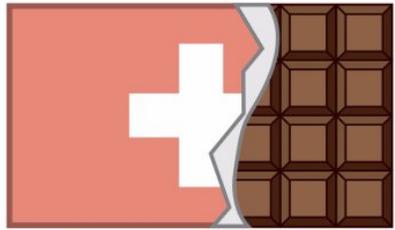
NO. 1 STONE COLD SOBER 20 STRAIGHT YEARS

RAISE A GLASS OF CHOCOLATE MILK IN CELEBRATION!



308,786

BOTTLES OF
CHOCOLATE MILK
SOLD LAST YEAR.

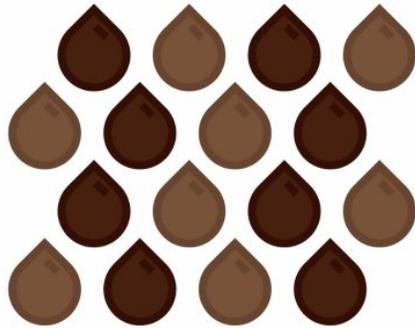


CHOCOLATE MILK RECIPE

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.



5 MILLION GALLONS

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



BYU

BRIGHAM YOUNG UNIVERSITY

STONE
COLD 21

Mint Brownie Chocolate Milk



Excel time!

NEXT TIME(S)

**Rent, surplus, and
gains from trade**

Supply and demand

**Market power and
natural monopolies**