

# FIRMS AND MARKETS

MPA 612: Economy, Society, and Public Policy

February 27, 2019

*Fill out your reading report  
on Learning Suite*

# PLAN FOR TODAY

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**Demand and WTP**

**XYZ frames**

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**Scale, location, networks, and time**

**Stone cold sober chocolate milk**





## Manufacturing

Factories: 3.38 nonillion

## Wire Production

Harvester Drones: 6.76 nonillion  
Wire Drones: 6.76 nonillion

## Space Exploration

Cost: 100.00 quadrillion clips

Launched: 5.00 thousand  
Descendents: 2.03 decillion

## Computational Resources

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

 Run

RANDOM

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

Yomi: 55,594

AutoTourney 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

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

Reflects aggregate preferences

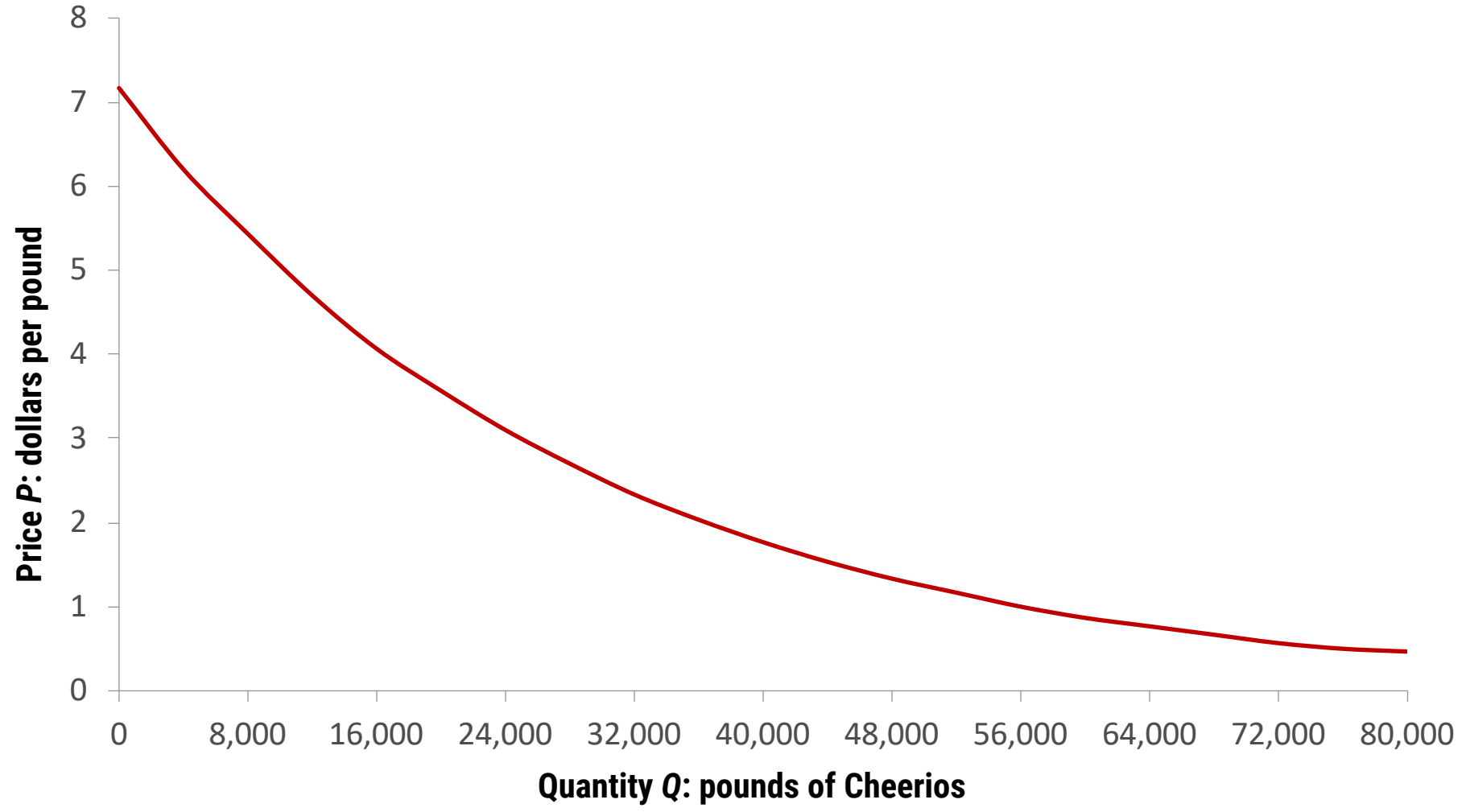
# FINDING WTP

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

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





# Willingness Toupee

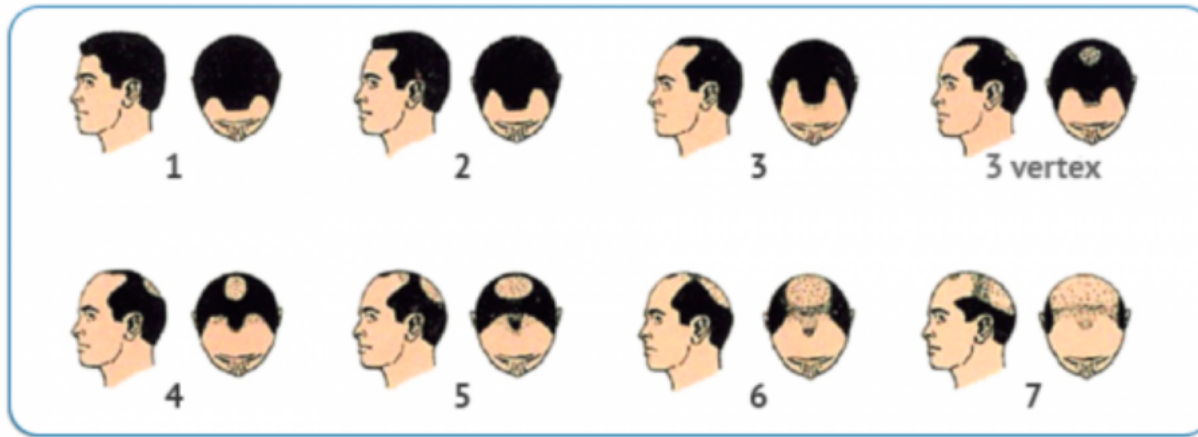
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**Abstract:** In this paper we tackle the hairy problem of male pattern baldness. We survey balding men and elicit their willingness to pay to move from their current sad situation to a more plentiful one. Then we comb-over the results. What's the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

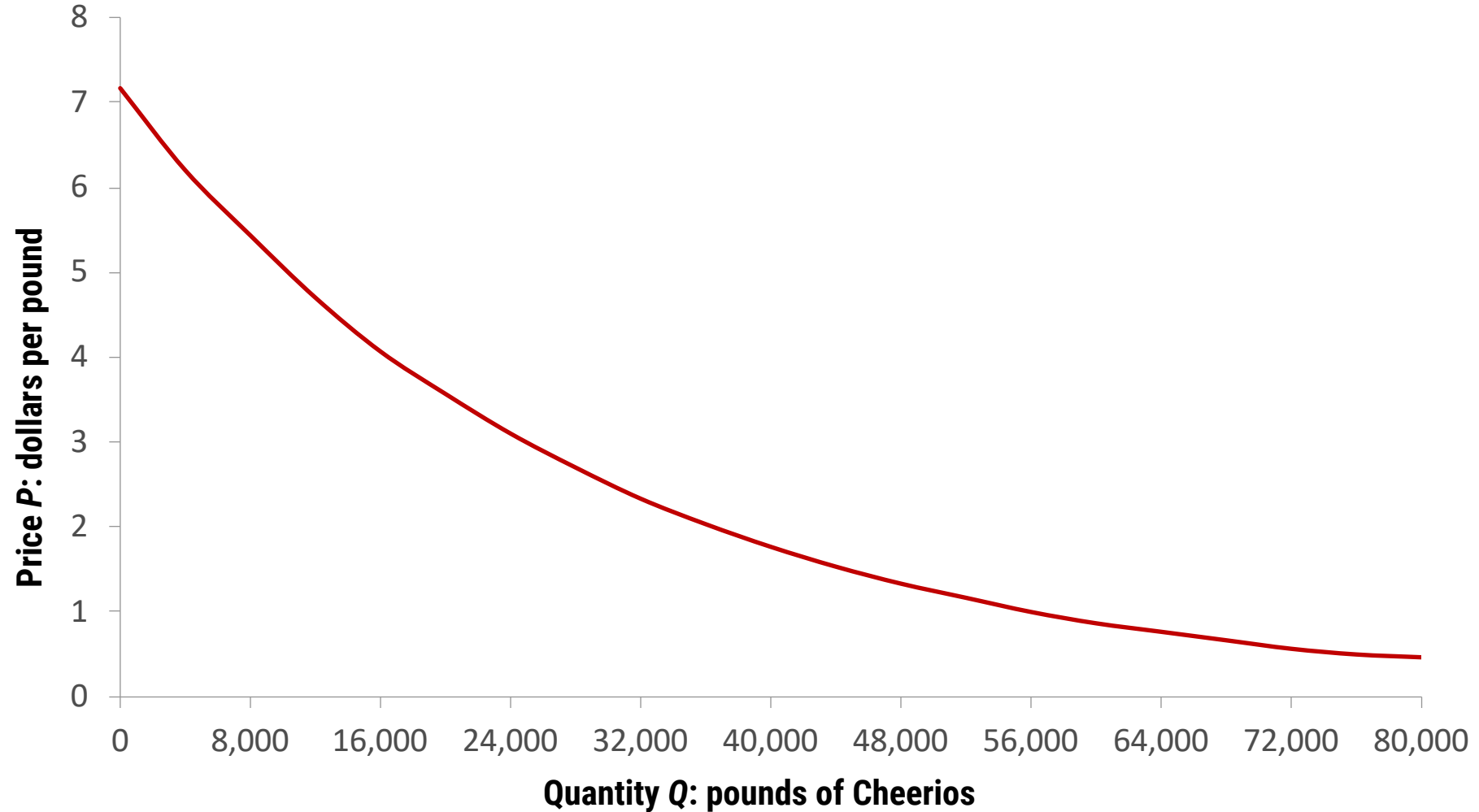
☐ No

☐ I'll think about it



# WTP = DEMAND

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# 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**

Table rental: \$1.00

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Label per corner: \$0.05

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**\$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**

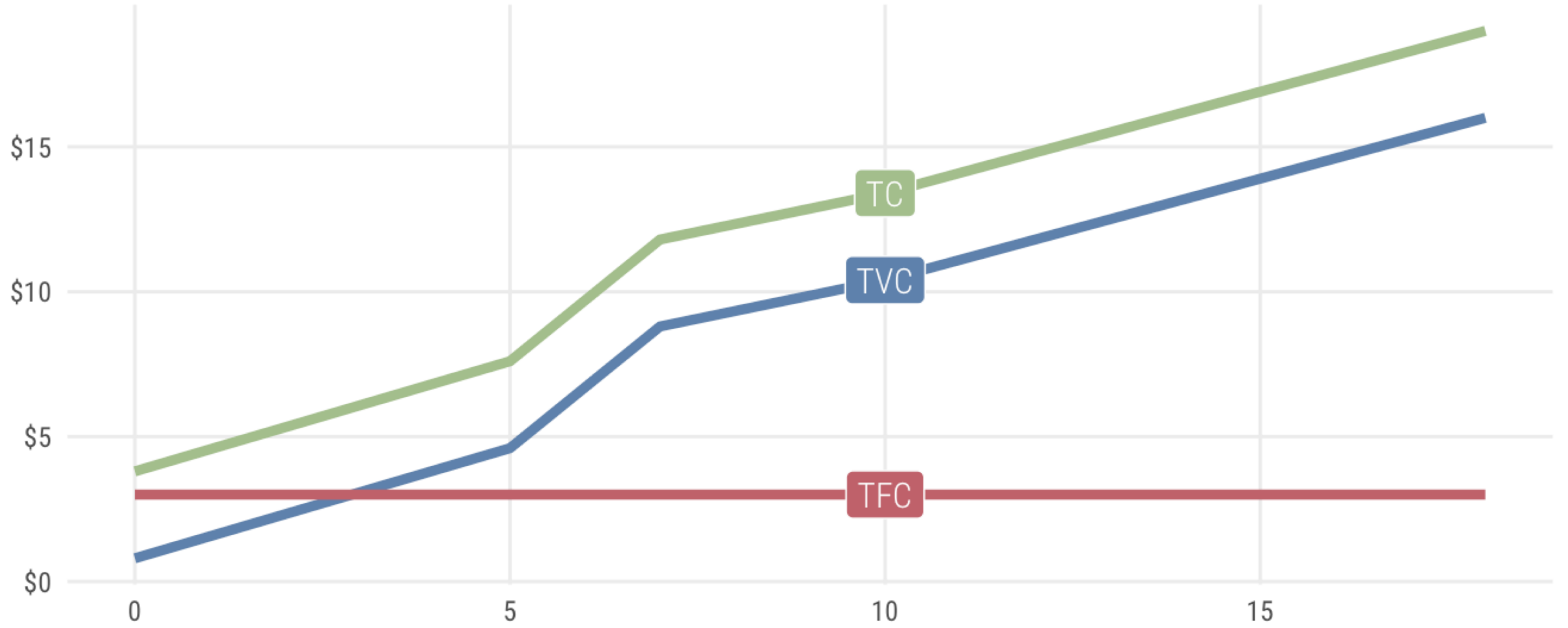
**Variable costs**

**Average costs**

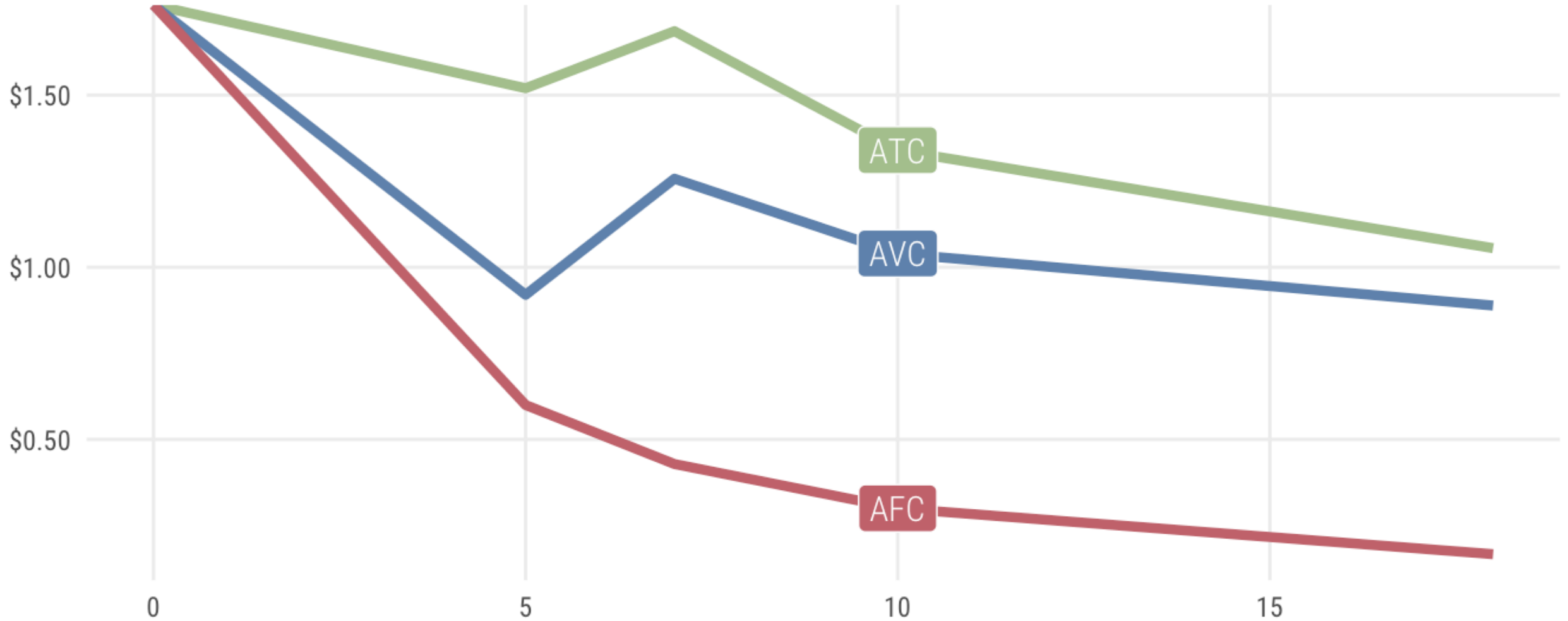
**Revenue**

**Profit**

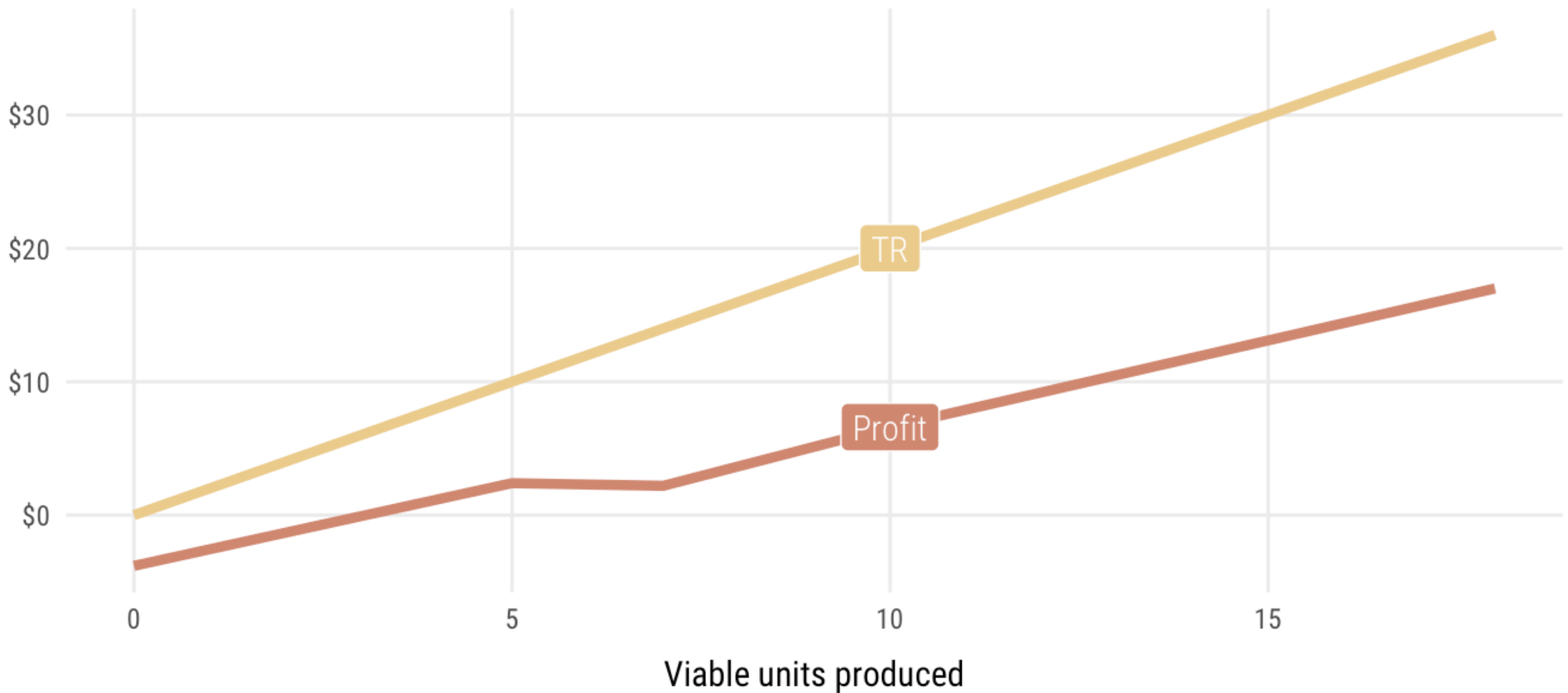
## Total costs



## 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 ( $\pi = TR - TC$ )**

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

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

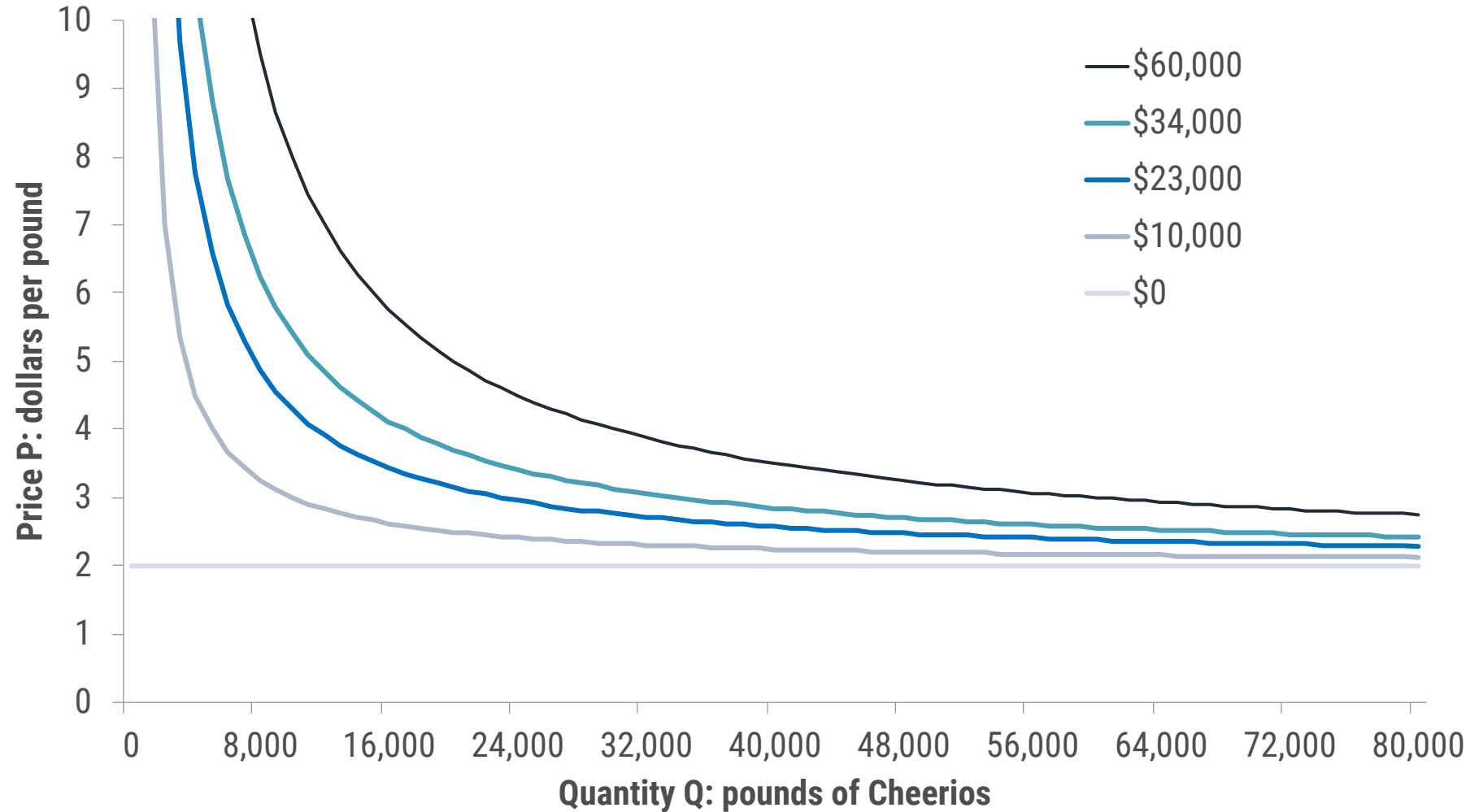
# ISOPROFIT CURVES

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These are real!

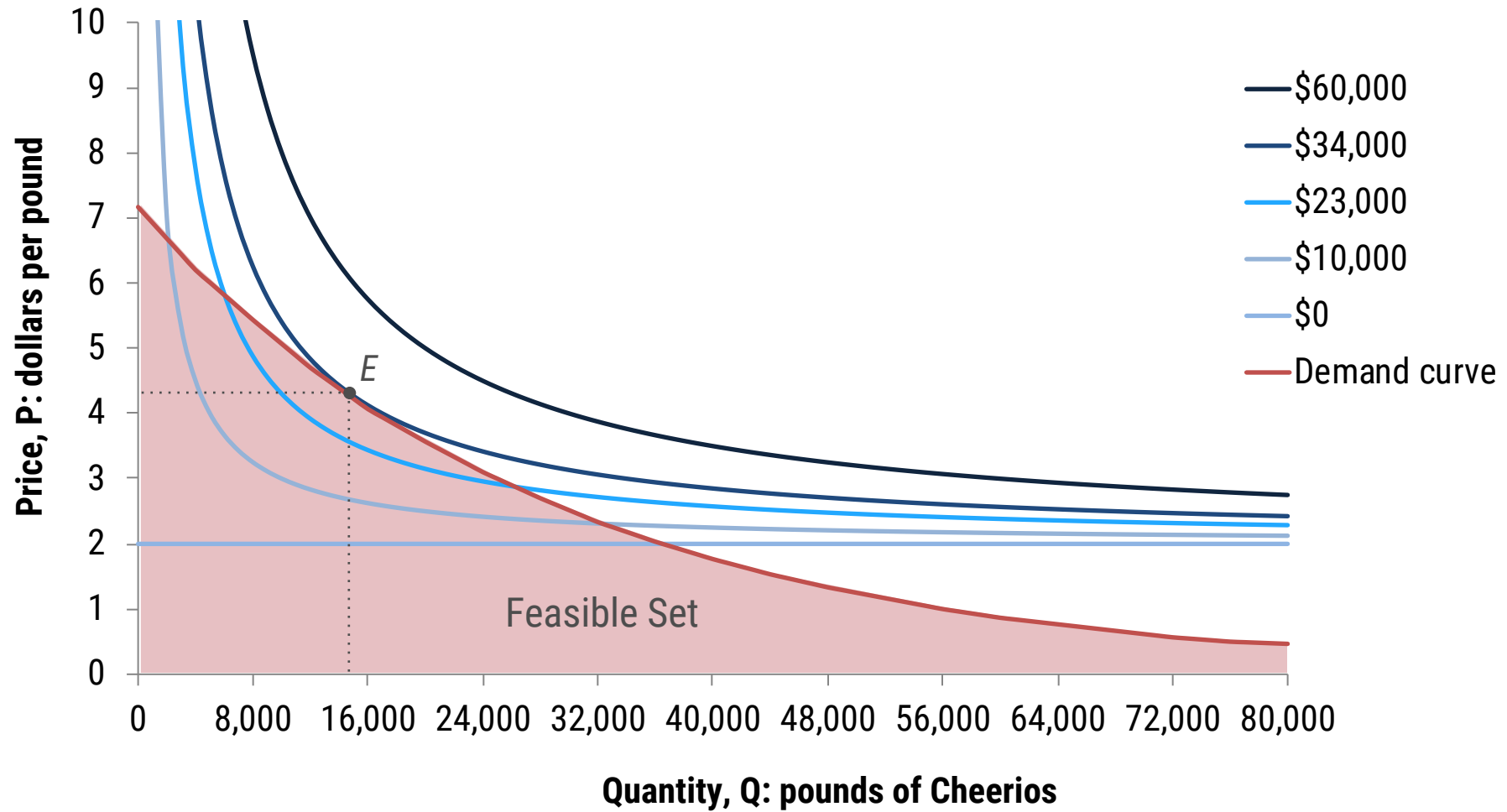
$$(P - \$1) \times Q$$

(or some similar equation)



# PROFIT MAXIMIZATION

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# SCALE, LOCATION, NETWORKS, AND TIME

# SIZE AND LOCATION

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## **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

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**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

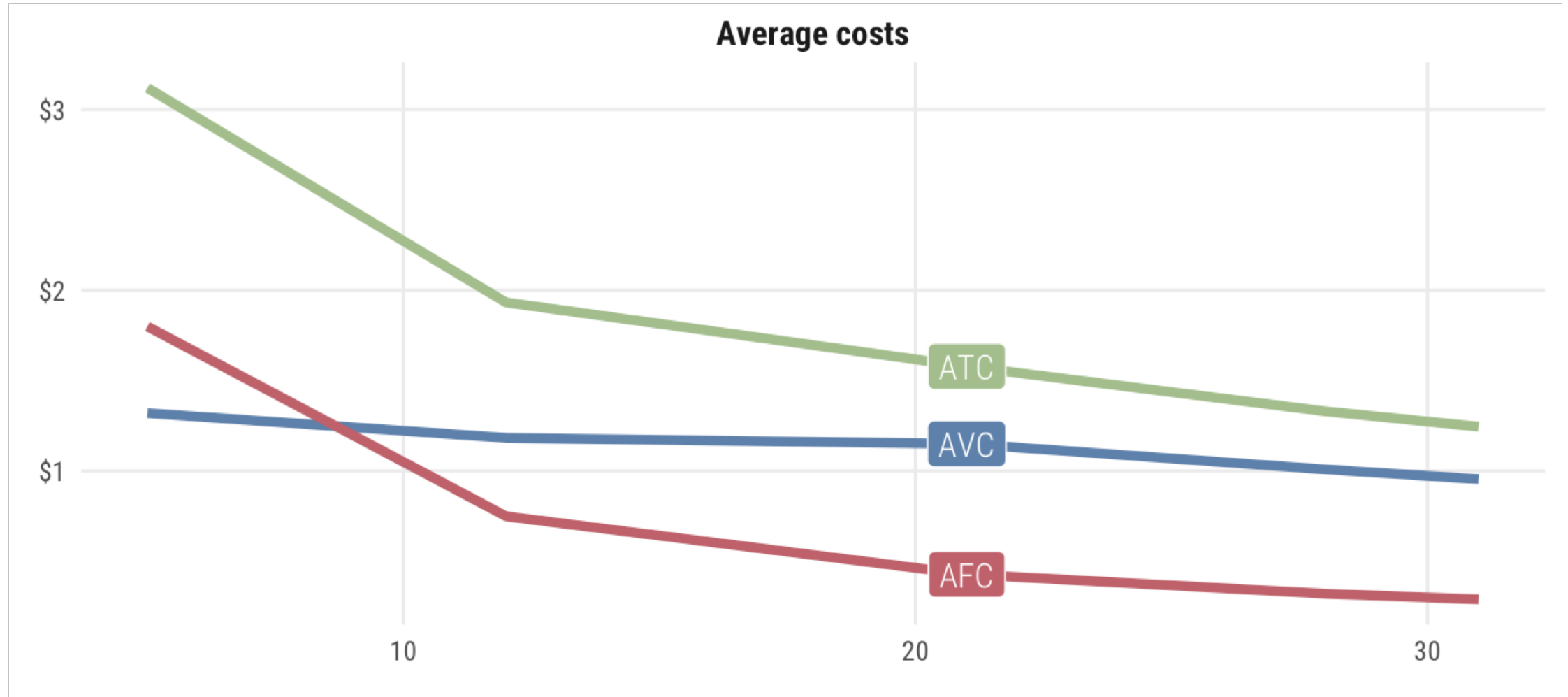
Costco

Henry Ford's assembly line

Rural Chinese moving to cities

# AVERAGE COSTS AND SCALE

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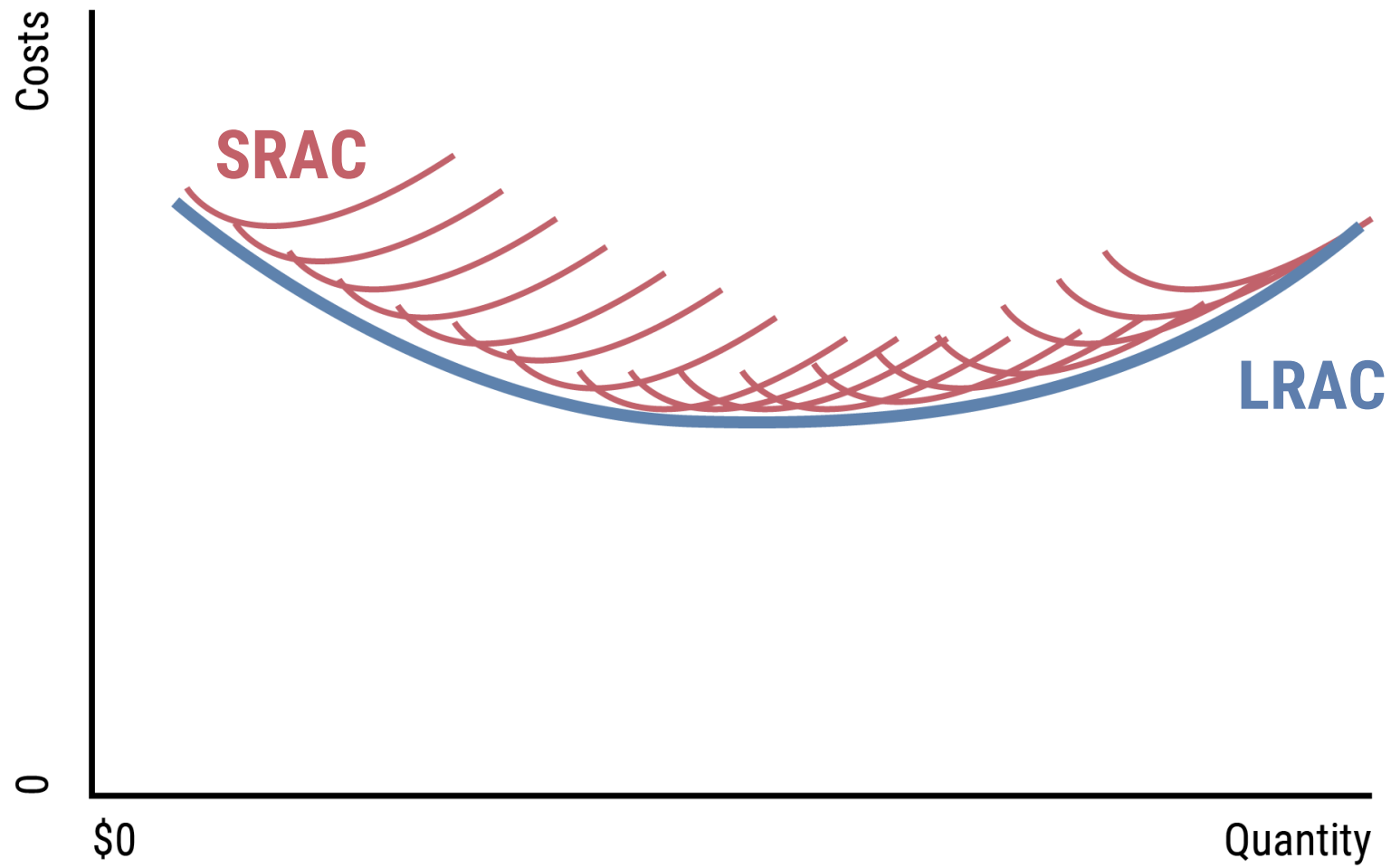
# AVERAGE COSTS AND SCALE

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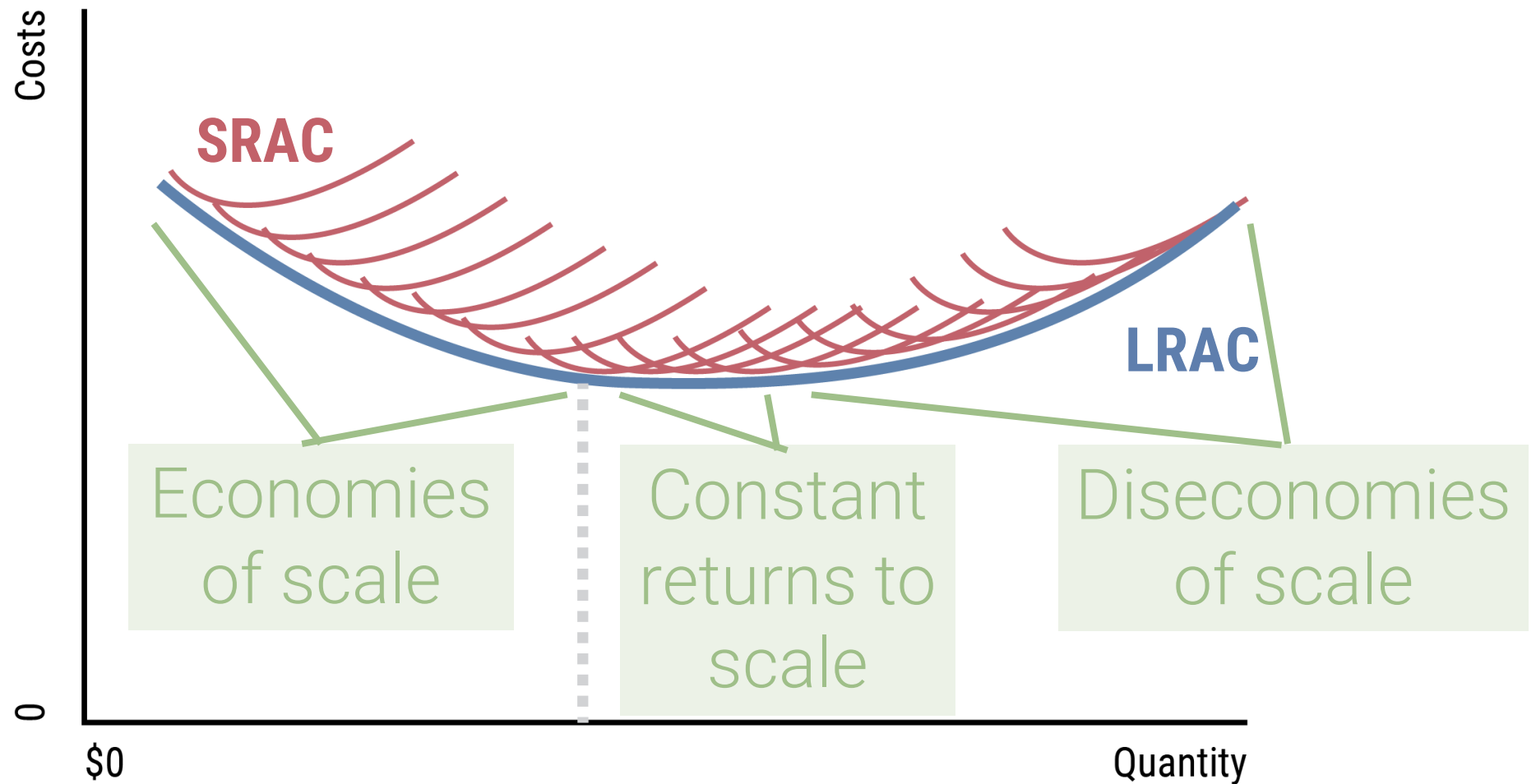
# TIME AND SCALE

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# TIME AND SCALE

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STONE COLD SOBER  
CHOCOLATE MILK



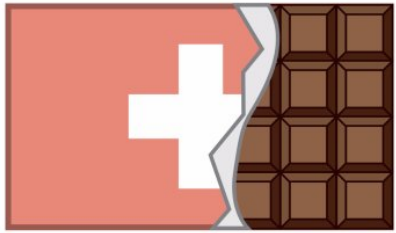
# NO. 1 STONE COLD SOBER 20 STRAIGHT YEARS

RAISE A GLASS OF CHOCOLATE MILK IN CELEBRATION!



## 308,786

BOTTLES OF  
CHOCOLATE MILK  
SOLD LAST YEAR.

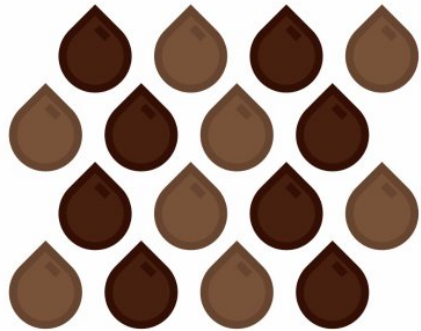


## CHOCOLATE MILK RECIPE

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

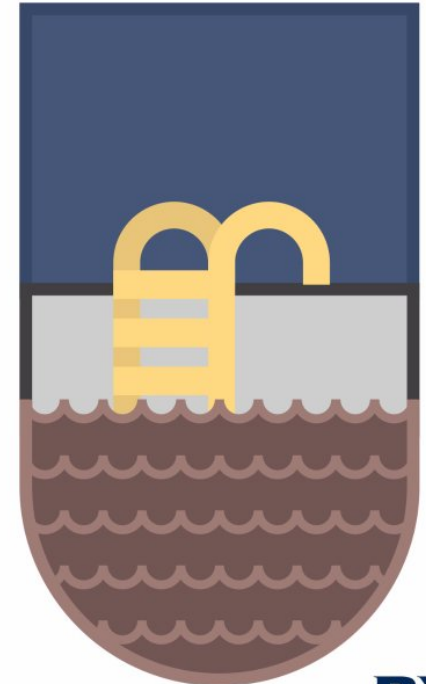
## 2,143,344

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**