

WORK, WELLBEING, AND SCARCITY II + NUDGES

MPA 612: Economy, Society, and Public Policy

February 11, 2019

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on Learning Suite**

PLAN FOR TODAY

Measuring policy outcomes

Opportunity cost

Preferences and tradeoffs

Heuristics and shortcuts

Nudges

MEASURING POLICY OUTCOMES

Godwin's law

From Wikipedia, the free encyclopedia

Godwin's law (or **Godwin's rule of Hitler analogies**)^{[1][2]} is an [Internet adage](#) asserting that "As an online discussion grows longer, the probability of a comparison involving [Nazis](#) or [Hitler](#) approaches 1";^{[2][3]} that is, if an online discussion (regardless of topic or scope) goes on long enough, sooner or later someone will compare someone or something to Adolf Hitler or his deeds, the point at which effectively the discussion or thread often ends. Promulgated by the American attorney and author [Mike Godwin](#) in 1990,^[2] Godwin's law

GODWIN'S LAW FOR STATISTICS

**Correlation does not
imply causation**

Except when it does

Even if it doesn't,
this phrase is useless
and kills discussion

Not everyone found the news believable. “Facepalm. Correlation doesn’t imply causation,” wrote one unhappy Internet user. “That’s pretty much how I read this too... correlation is NOT causation,” agreed a Huffington Post superuser, seemingly distraught. “I was surprised not to find a discussion of correlation vs. causation,” cried someone at Hacker News. “Correlation does not mean causation,” a reader moaned at Slashdot. “There are so many variables here that it isn’t funny.”



David Robinson

@drob

Following



Correlation implies causation, don't @ me

1:12 PM - 22 Jun 2017 from [Manhattan, NY](#)

4 Retweets 56 Likes



2



4



56



Tweet your reply



David Robinson @drob · 22 Jun 2017



Replying to @drob

"Correlation implies casuation," the dean whispered as he handed me my PhD.

"But then why-"

"Because if they knew, they wouldn't need us."



5



46



169





John B. Holbein @JohnHolbein1 · Apr 7

Causality isn't achieved; it's approached.



3



1



8



[Show this thread](#)



John B. Holbein @JohnHolbein1 · Apr 7

Causality isn't binary; it's a continuum.



1



5



13



[Show this thread](#)

CORRELATION VS. CAUSATION

How do we figure out correlation?

Math and statistics

How do we figure out causation?

Philosophy. No math.

THE CAUSALITY CONTINUUM



COMPARING GROUPS

Before vs. after

Treatment vs. control

On their own, neither is
sufficient for proving causality

TWO WRONGS MAKE A RIGHT

Difference-in-difference (DD)

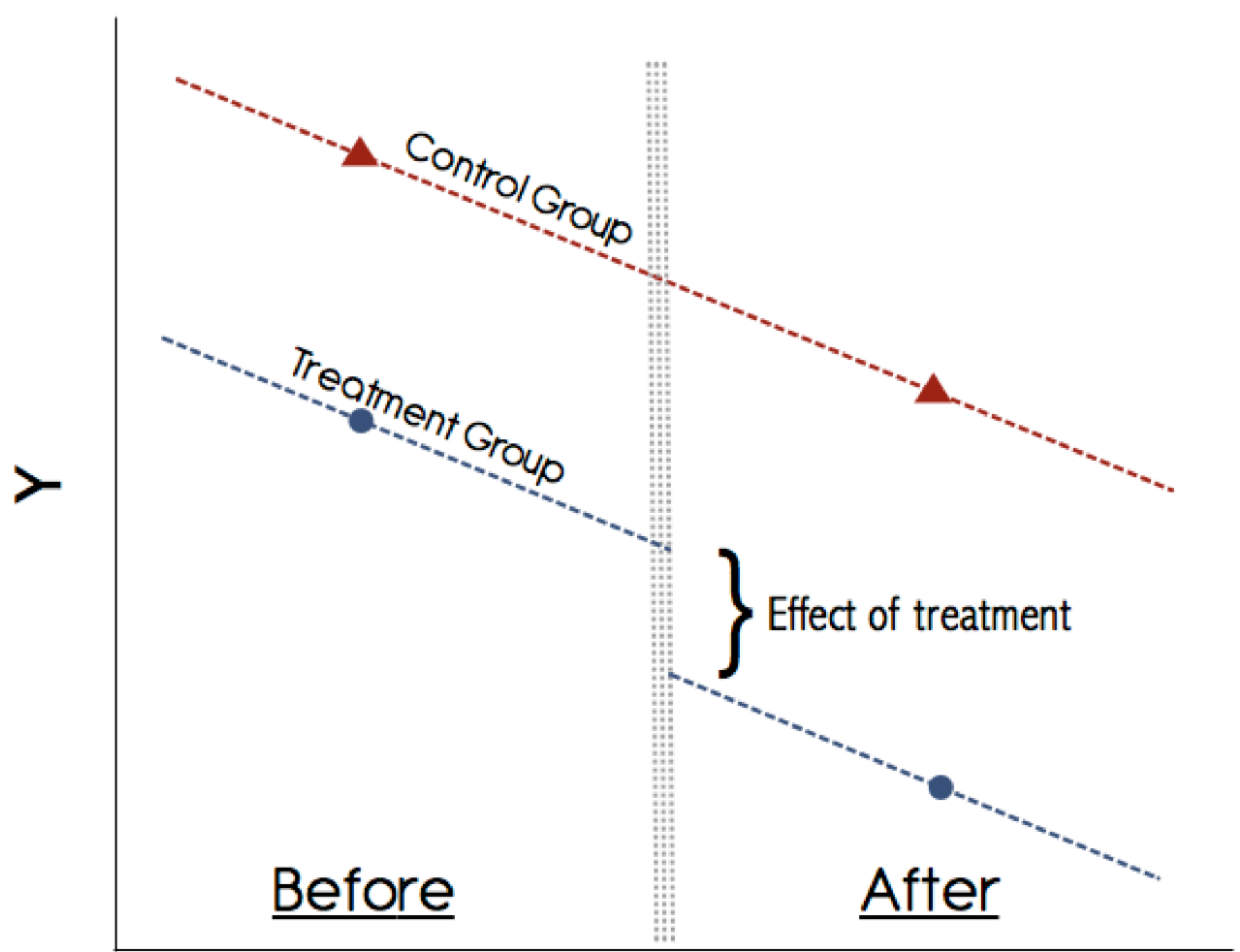
Compare treatment and control groups before and after intervention

$$\begin{aligned} \text{DD} = & (\bar{x}_{\text{treatment, post}} - \bar{x}_{\text{treatment, pre}}) \\ & - (\bar{x}_{\text{control, post}} - \bar{x}_{\text{control, pre}}) \end{aligned}$$

TABLE 5.2.1
Average employment in fast food restaurants before and after the
New Jersey minimum wage increase

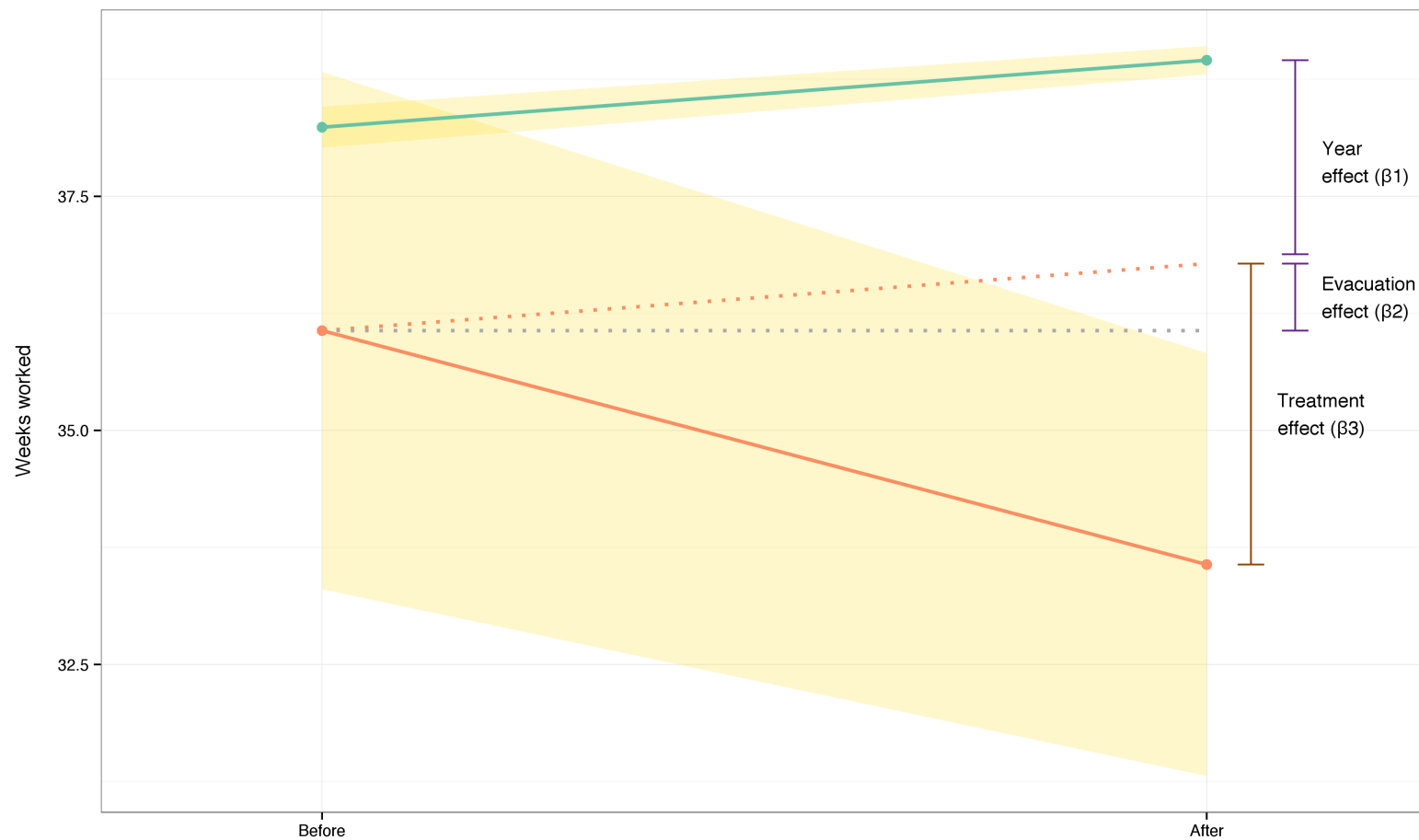
Variable	PA (i)	NJ (ii)	Difference, NJ – PA (iii)
1. FTE employment before, all available observations	23.33 (1.35)	20.44 (.51)	-2.89 (1.44)
2. FTE employment after, all available observations	21.17 (.94)	21.03 (.52)	-.14 (1.07)
3. Change in mean FTE employment	-2.16 (1.25)	.59 (.54)	2.76 (1.36)

Notes: Adapted from Card and Krueger (1994), table 3. The table reports average full-time-equivalent (FTE) employment at restaurants in Pennsylvania and New Jersey before and after a minimum wage increase in New Jersey. The sample consists of all restaurants with data on employment. Employment at six closed restaurants is set to zero. Employment at four temporarily closed restaurants is treated as missing. Standard errors are reported in parentheses.



Number of weeks worked

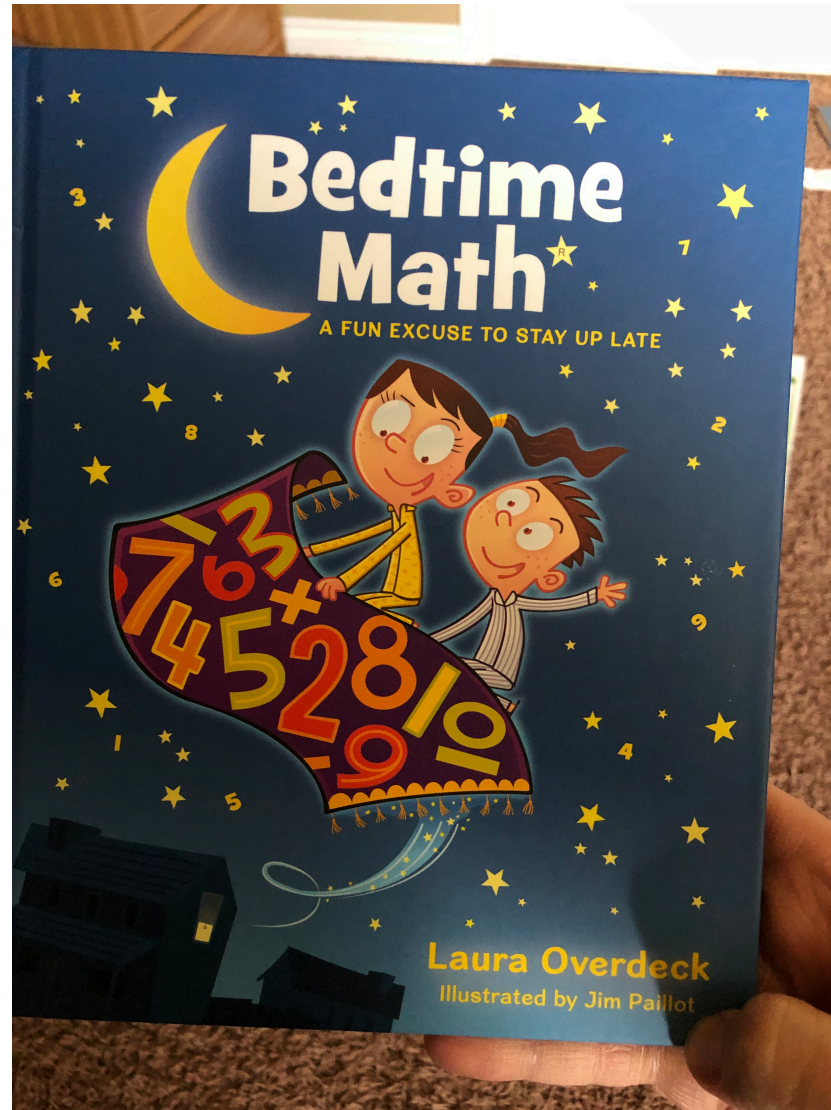
Not evacuated Evacuated



Effect of Katrina on employment

Weeks worked ~
Year +
Evacuated +
Year × Evacuated

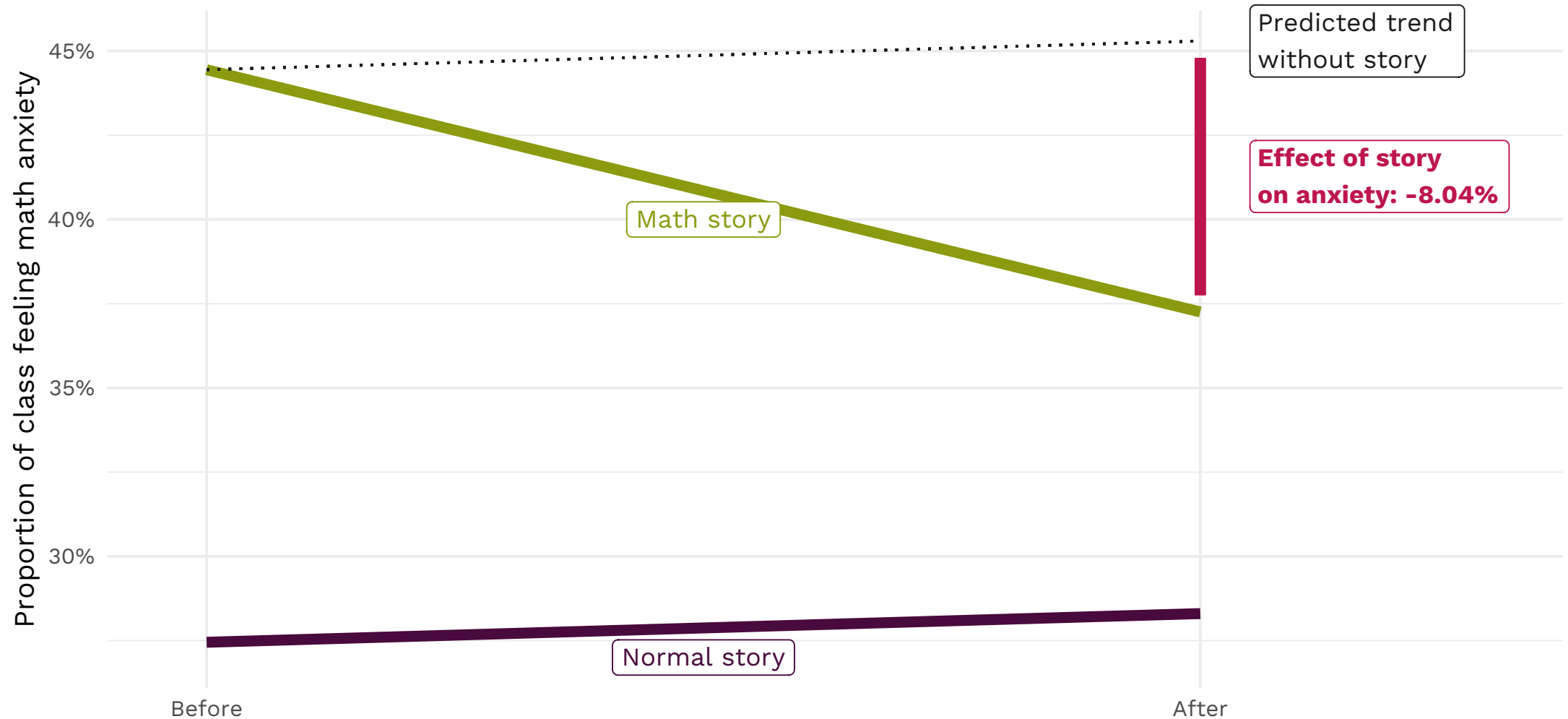
MICROEXPERIMENTS



MICROEXPERIMENTS

Reading a story about math reduces math anxiety

Experiment in four 4th grade classes



OPPORTUNITY COST

WHY ARE YOU GOING HERE?
GAS IS TEN CENTS A GALLON CHEAPER AT
THE STATION FIVE MINUTES THAT WAY.

BECAUSE A PENNY SAVED
IS A PENNY EARNED.

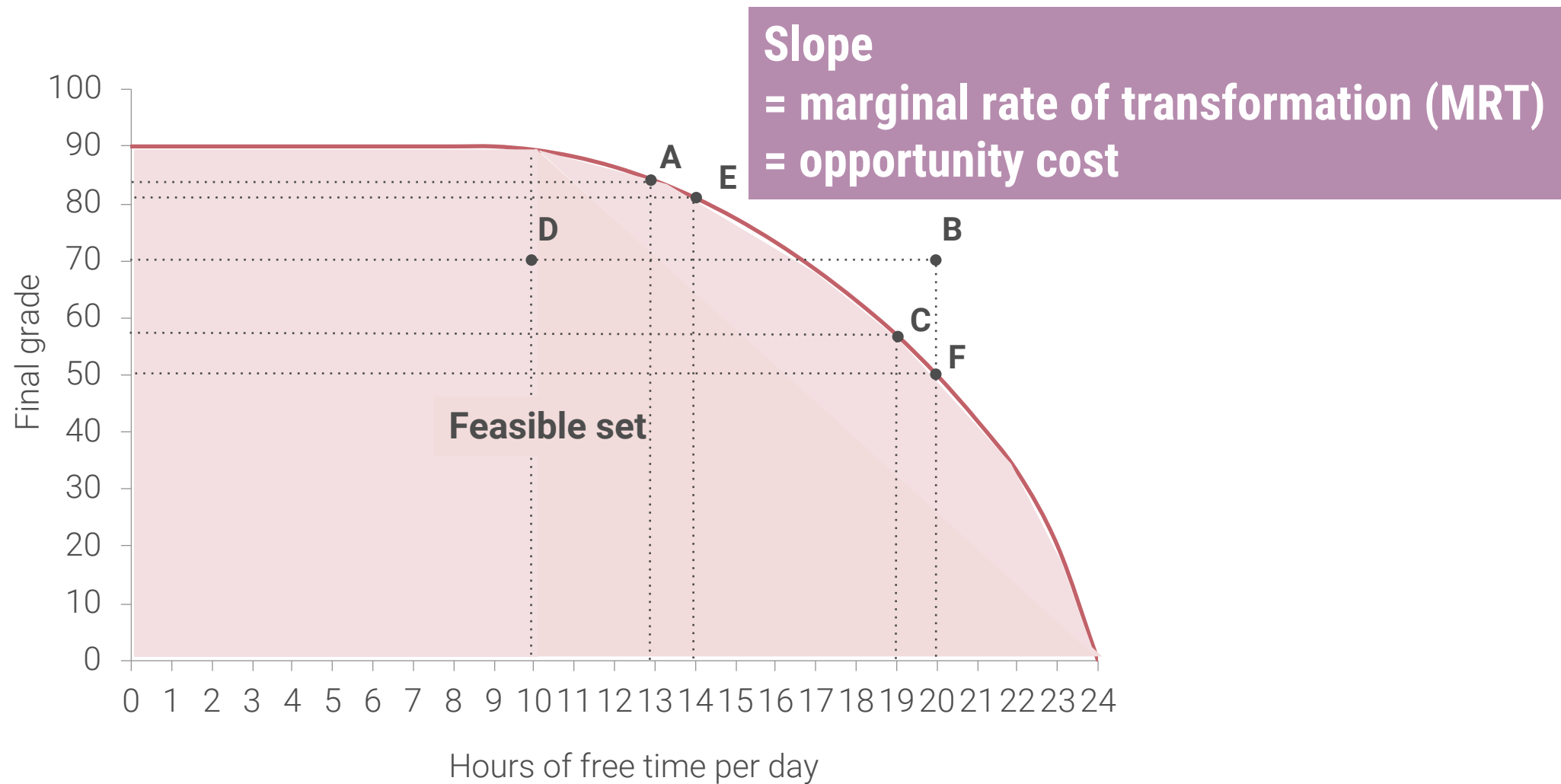


IF YOU SPEND NINE MINUTES OF YOUR
TIME TO SAVE A DOLLAR, YOU'RE WORKING
FOR LESS THAN MINIMUM WAGE.

OPPORTUNITY COST

The value of the thing you can't do because of a decision

The value of the forgone option



	A	E	C	F
Free time	13	14	19	20
Grade	84	81	57	50
Opportunity cost		3		7



OPPORTUNITY COST

Cost for
theater concert

\$25

Value of park
concert *to you*

\$15

Economic
cost of theater

\$40

Value of theater
concert *to you*

\$50

\$35

Your choice

Theater

Park

PREFERENCES & TRADEOFFS

Are We Running Out of Ideas? (Ep. 310)

November 29, 2017 @ 11:00pm

by **Stephen J. Dubner**

Produced by **Greg Rosalsky**



LISTEN NOW:



Stuck in a rut: If new ideas spread so easily, why is productivity growth slowing? (Photo: Wikimedia Commons)

*Our latest Freakonomics Radio episode is called “Are We Running Out of Ideas?” (You can subscribe to the podcast at **Apple Podcasts** or **elsewhere**, get the **RSS feed**, or listen via the media player above.)*

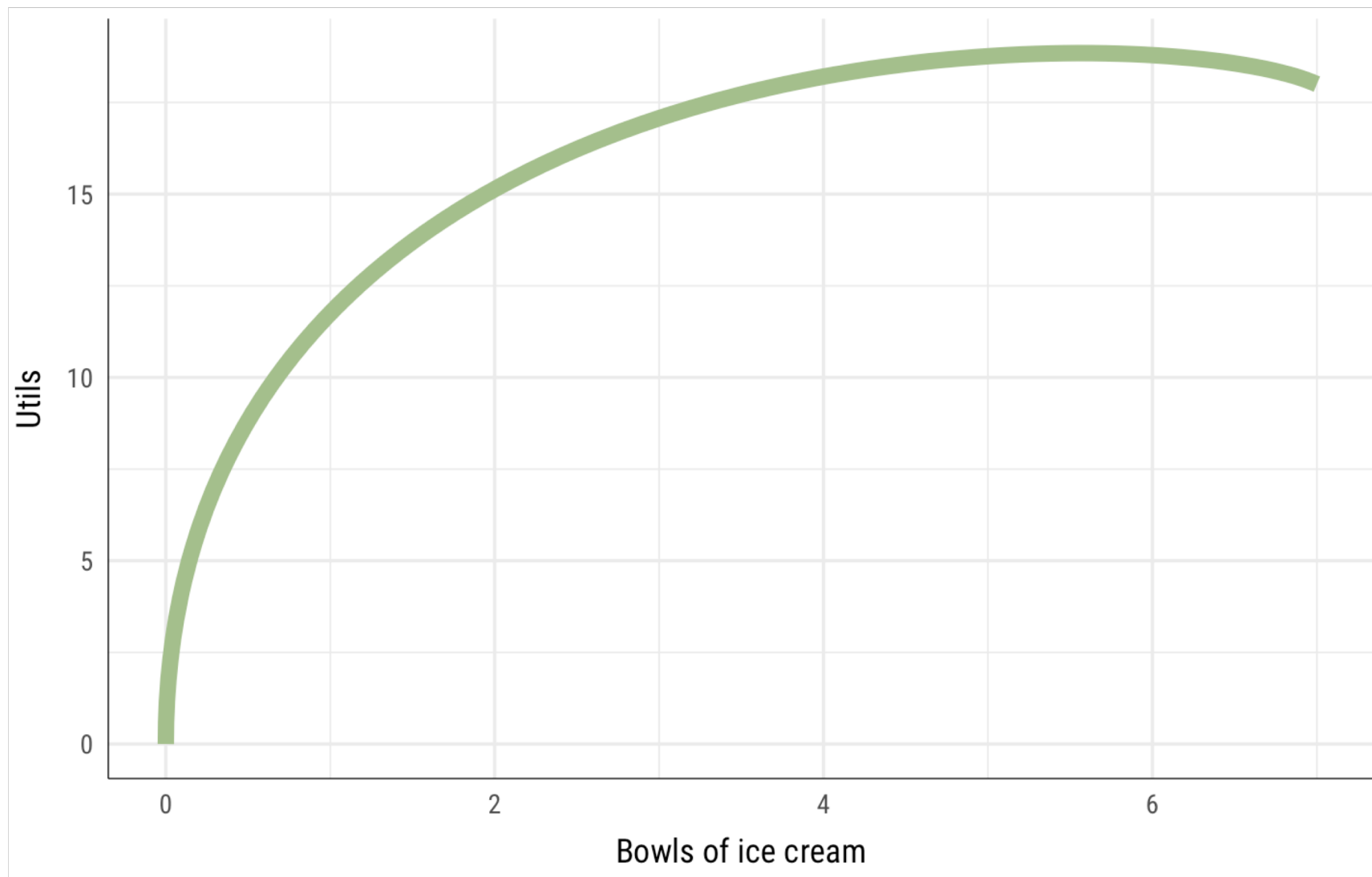
Economists have a hard time explaining why productivity growth has been shrinking. One theory: true innovation has gotten much harder – and much more expensive. So what should we do next?

UTILITY

Happiness points



Diminishing marginal utility



UTILITY BUNDLES

**Theoretical combination of goods
that provide same level of utility**

$$u(x_1, x_2)$$

$$u(x_1, x_2) = x_1 x_2$$

UTILITY BUNDLES

$$u(x_1, x_2) = x_1 x_2$$

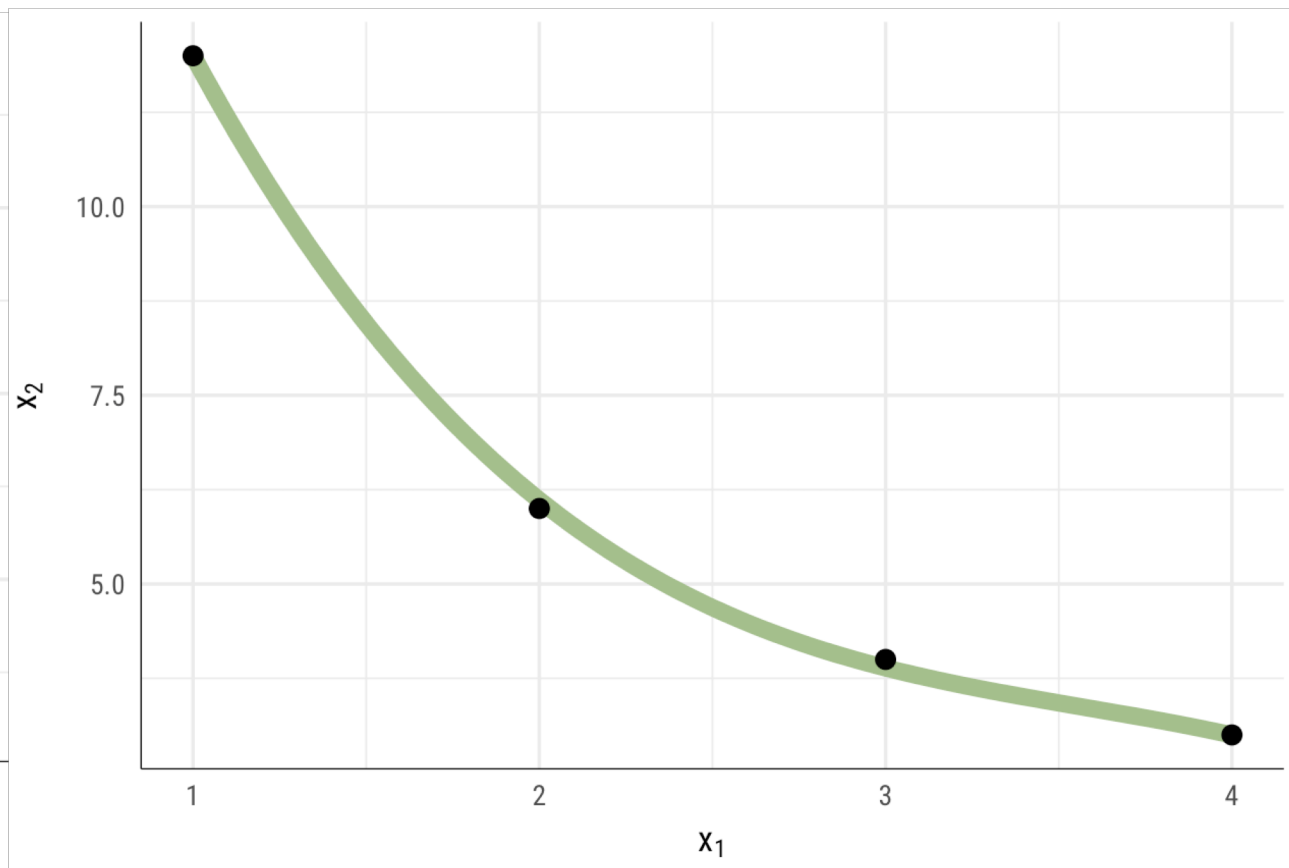
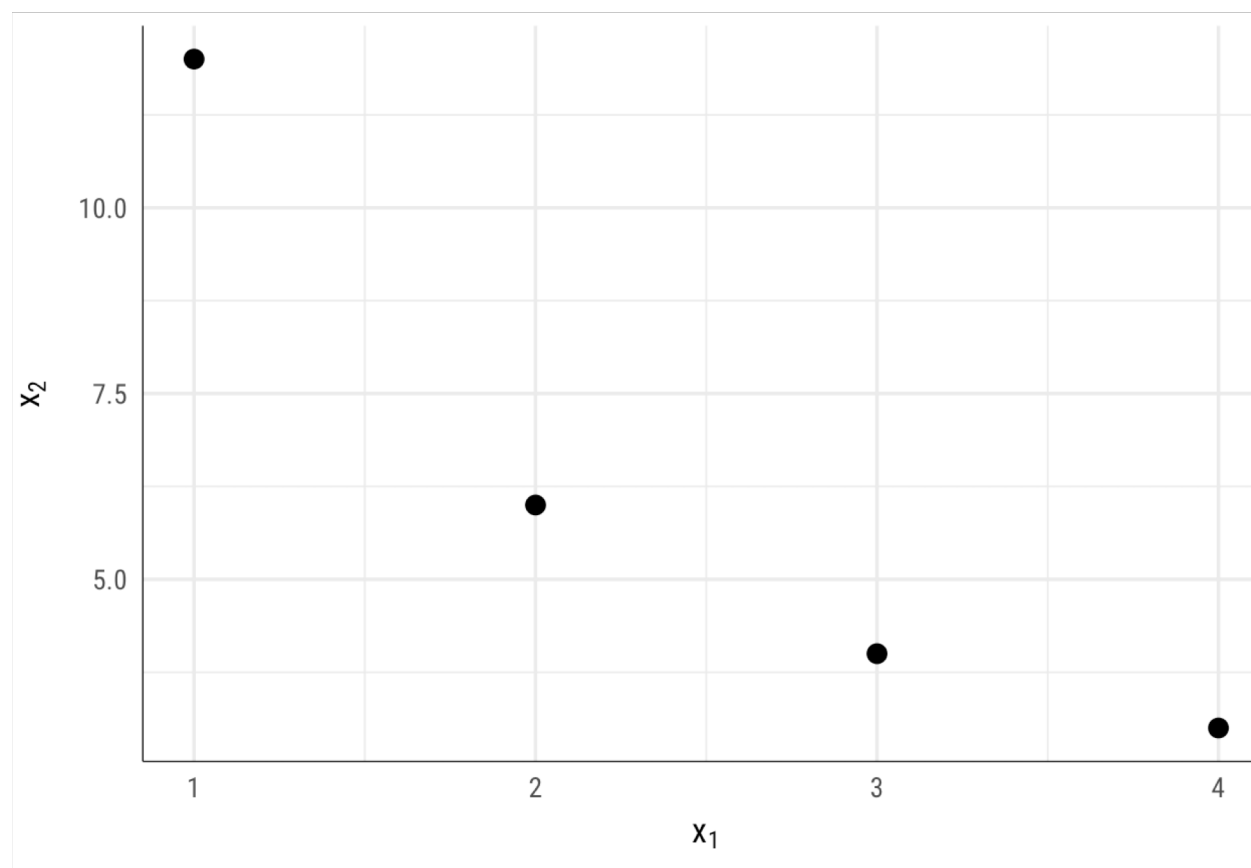
$$u(1, 2) \quad \mathbf{2}$$

$$u(100, 3) \quad \mathbf{300}$$

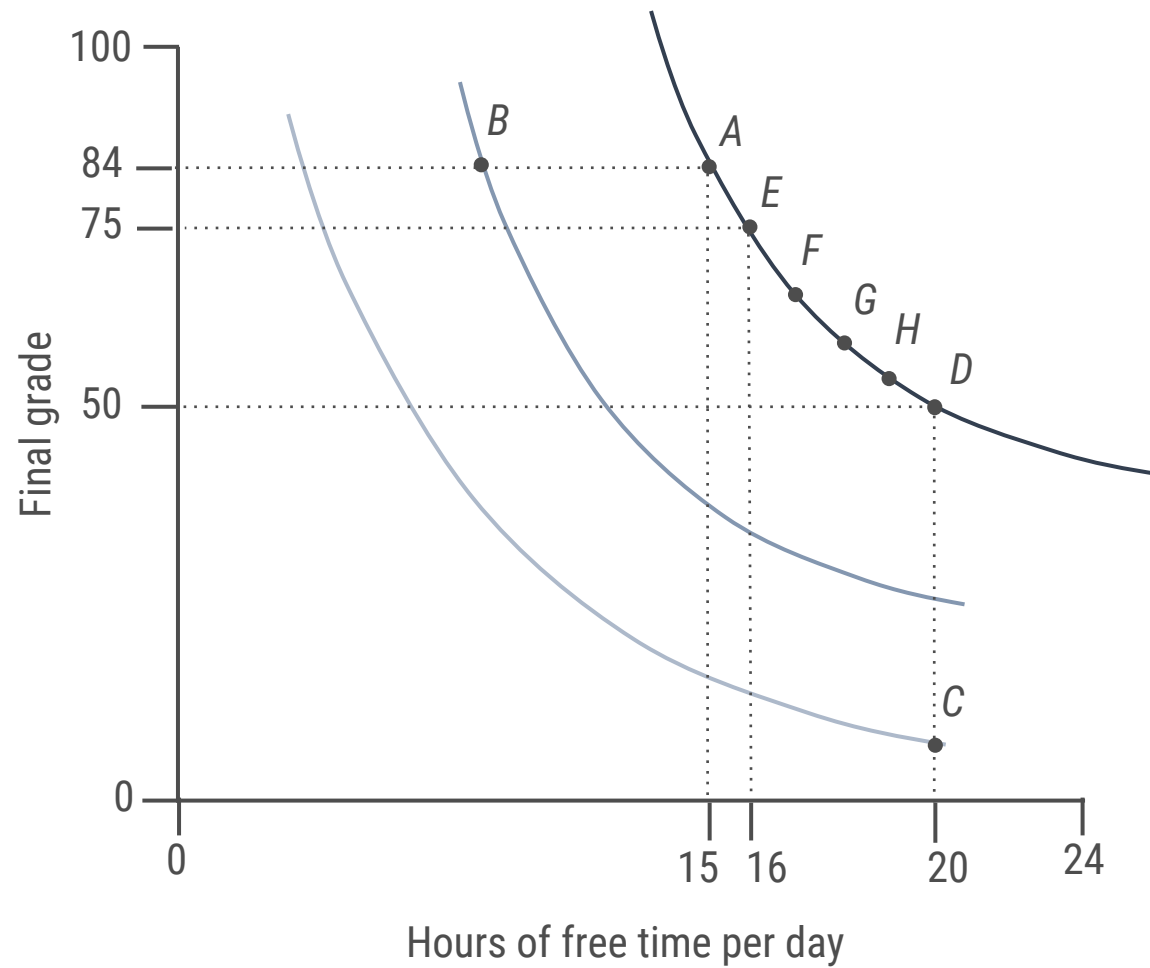
$$u(4, 1) \quad \mathbf{4}$$

What combinations of inputs will produce 12 utils?

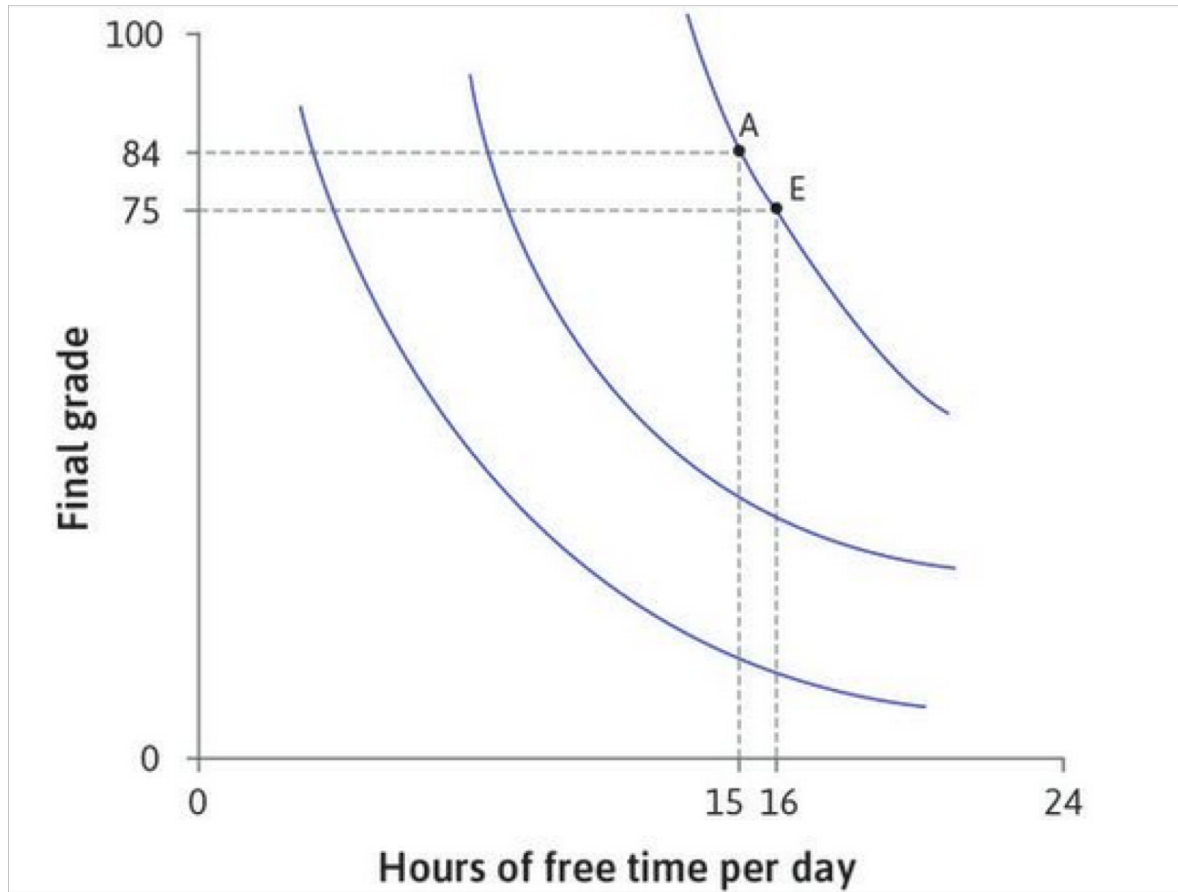
$$u(x_1, x_2) = x_1 x_2$$



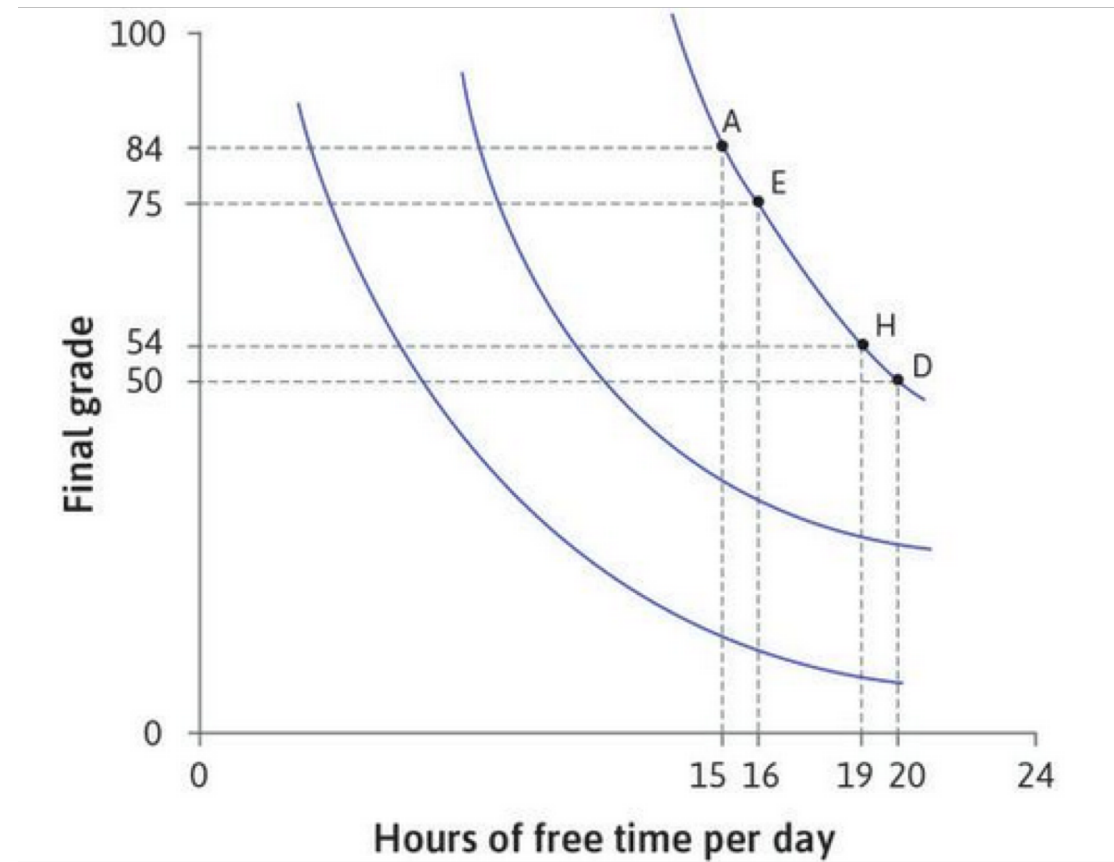
INDIFFERENCE CURVES



**Slope of indifference curve =
marginal rate of substitution (MRS)**



MRS at A = 9



MRS at H = 4

INDIFFERENCE CURVES

$$u = xy$$

$$u = \sqrt{xy}$$

$$u = x^2y^2$$

$$u = x^2y$$

Marginal rate of substitution (MRS)

Theoretical tradeoff between inputs

Slope of indifference curve

$$MRS = \frac{dy}{dx} = \frac{\Delta y}{\Delta x} = \frac{P_x}{P_y} = \frac{MU_x}{MU_y} = \frac{\partial u / \partial x}{\partial u / \partial y}$$

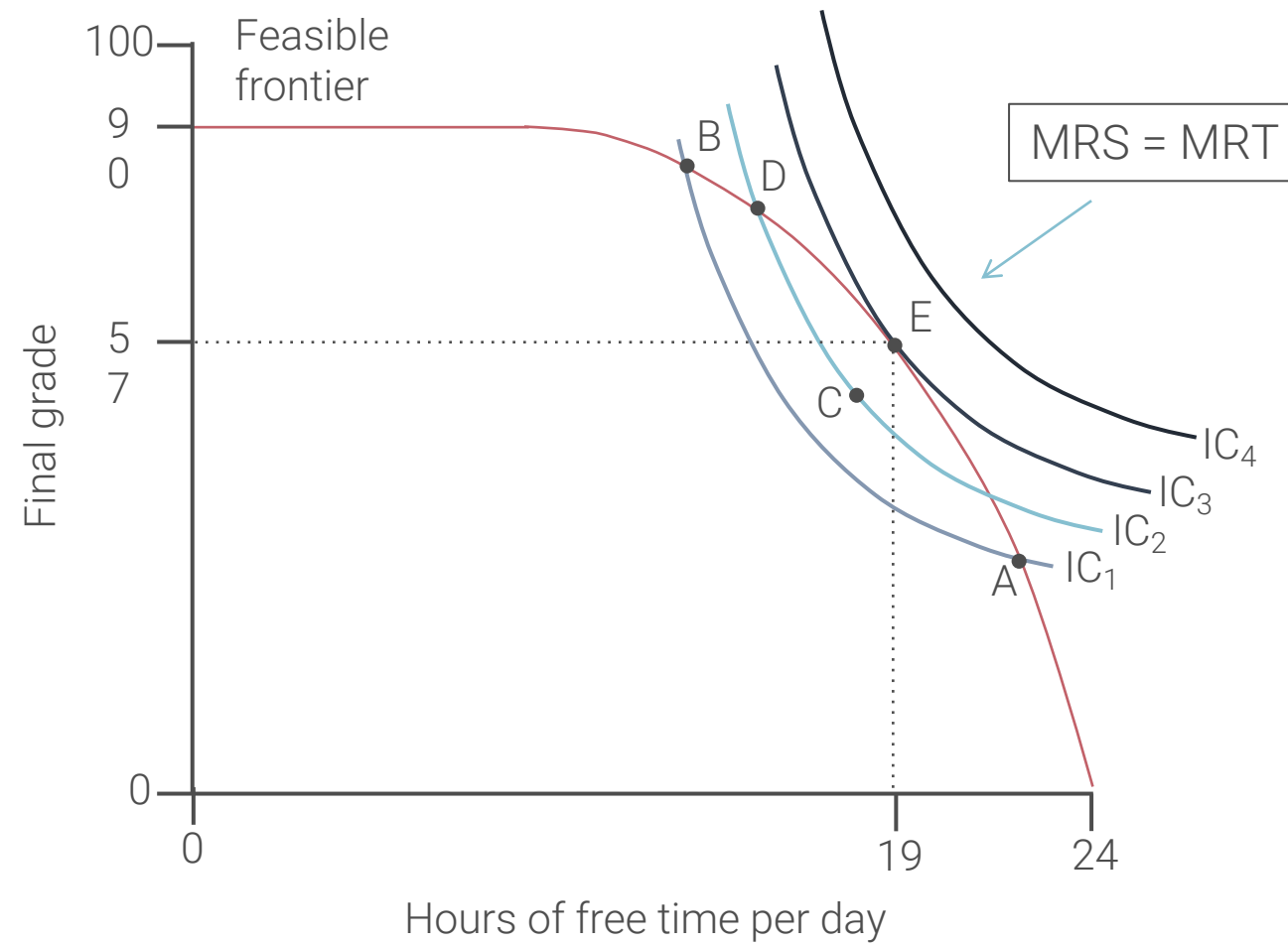
Marginal rate of transformation (MRT)

Actual tradeoff between inputs
constrained by feasible frontier

Slope of feasible frontier

**What's the best number of
workers to use / planes to make?**

**What's the best combination of
hours studied / free time?**





UTILITY MAXIMIZATION

0. Plot indifference curve

1. Figure out feasible set or MRT
(budget line)

2. Use calculus and prices to figure out ideal MRS

$$(\Delta y / \Delta x = \text{price } x / \text{price } y = MU_x / MU_y)$$

3. MRT = MRS and solve for x and y

Waffles (x)

\$1

Calzones (y)

\$2

Utility

$$u = xy$$

Budget

\$20

Normal goods

As income increases, you buy more

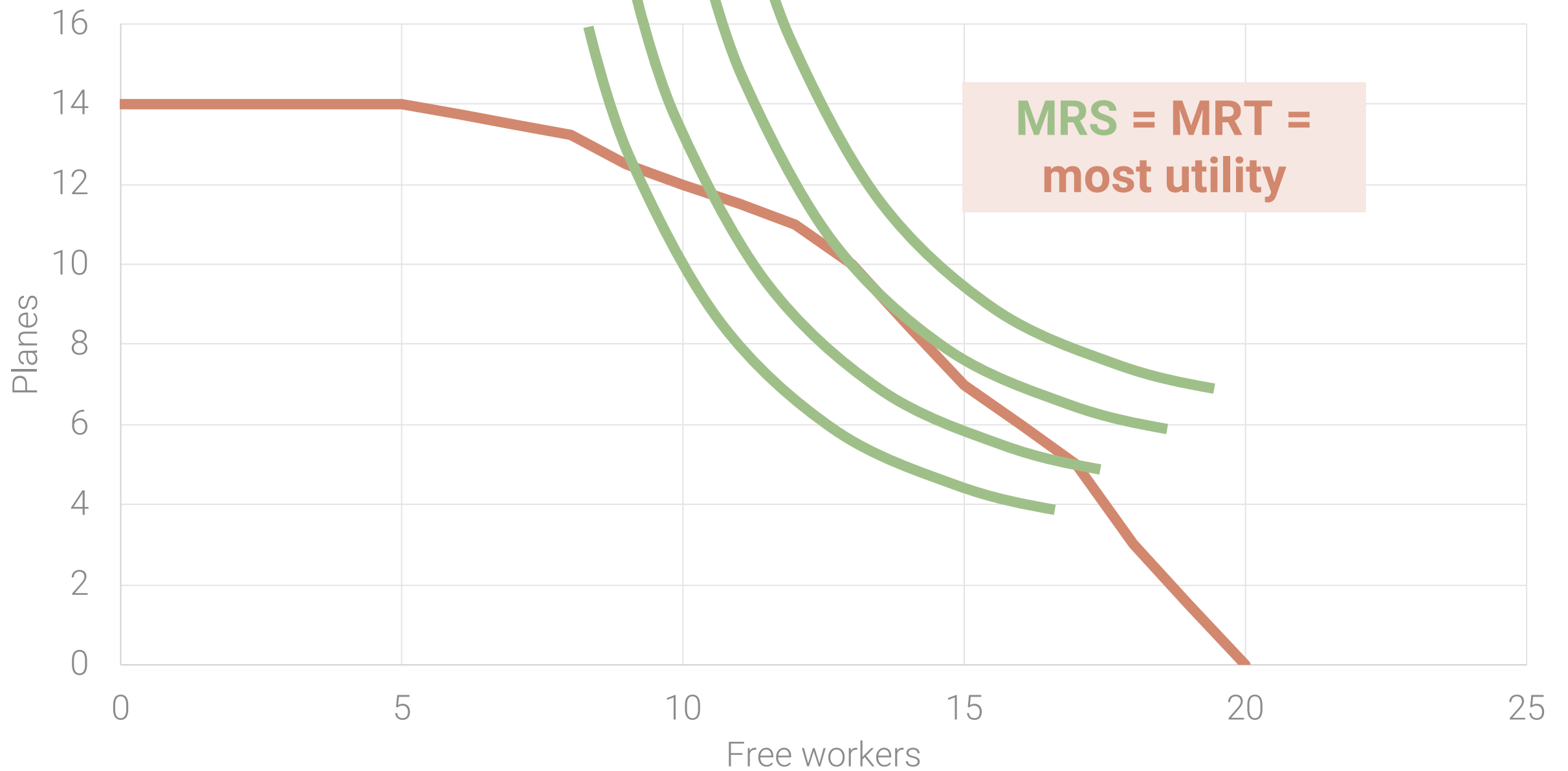
Inferior goods

As income increases, you buy less

Why do we even care about indifference curves?

Indifference curve meeting budget line =
where happiness meets reality

Policies change individual budget lines and move people to different indifference curves

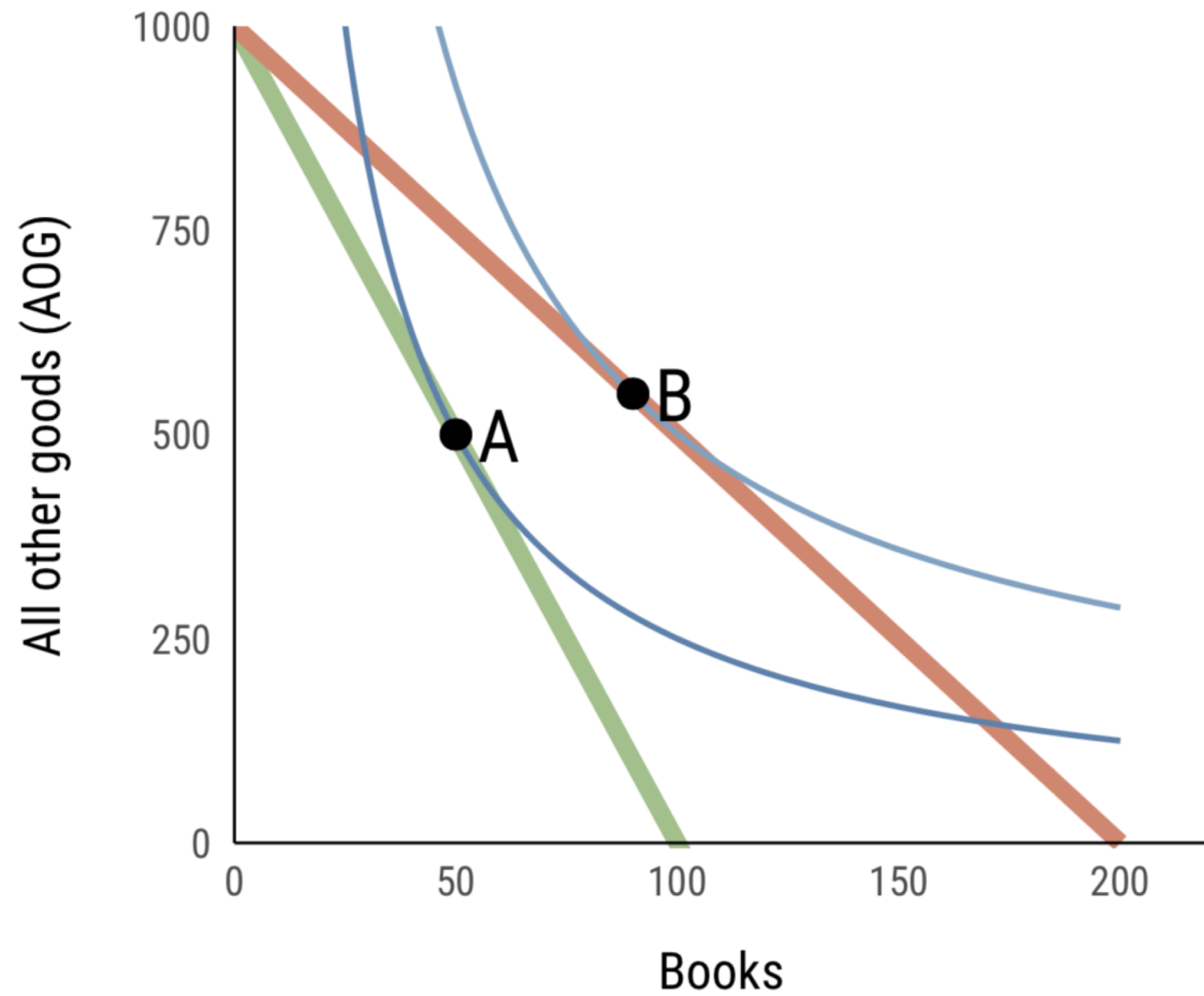


Income effect

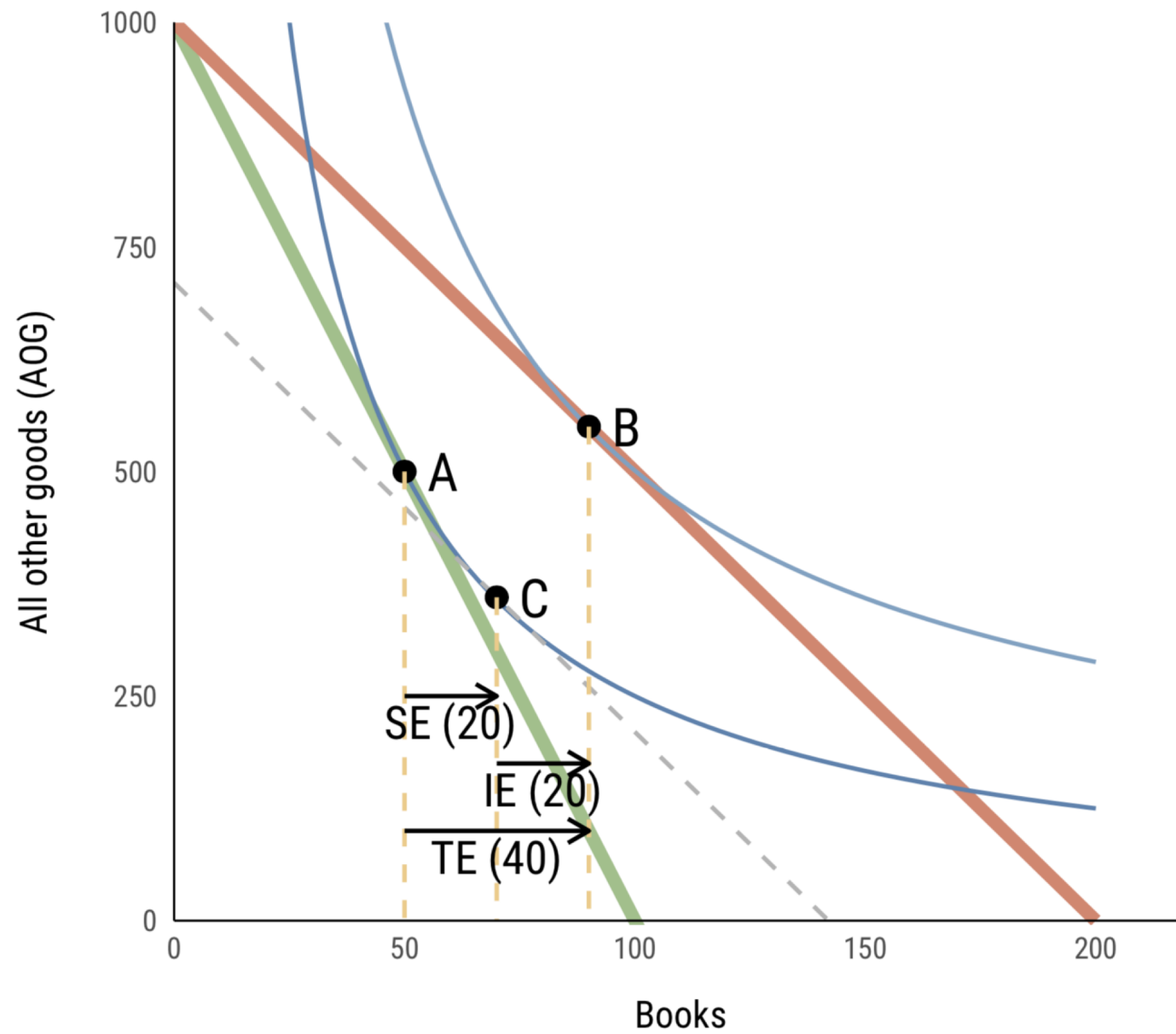
Movement **to** a new indifference curve because of a change in income or feasibility

Substitution effect

Movement **along** the same indifference curve because of a change in the mix of inputs



Original indifference New indifference
Original budget New budget



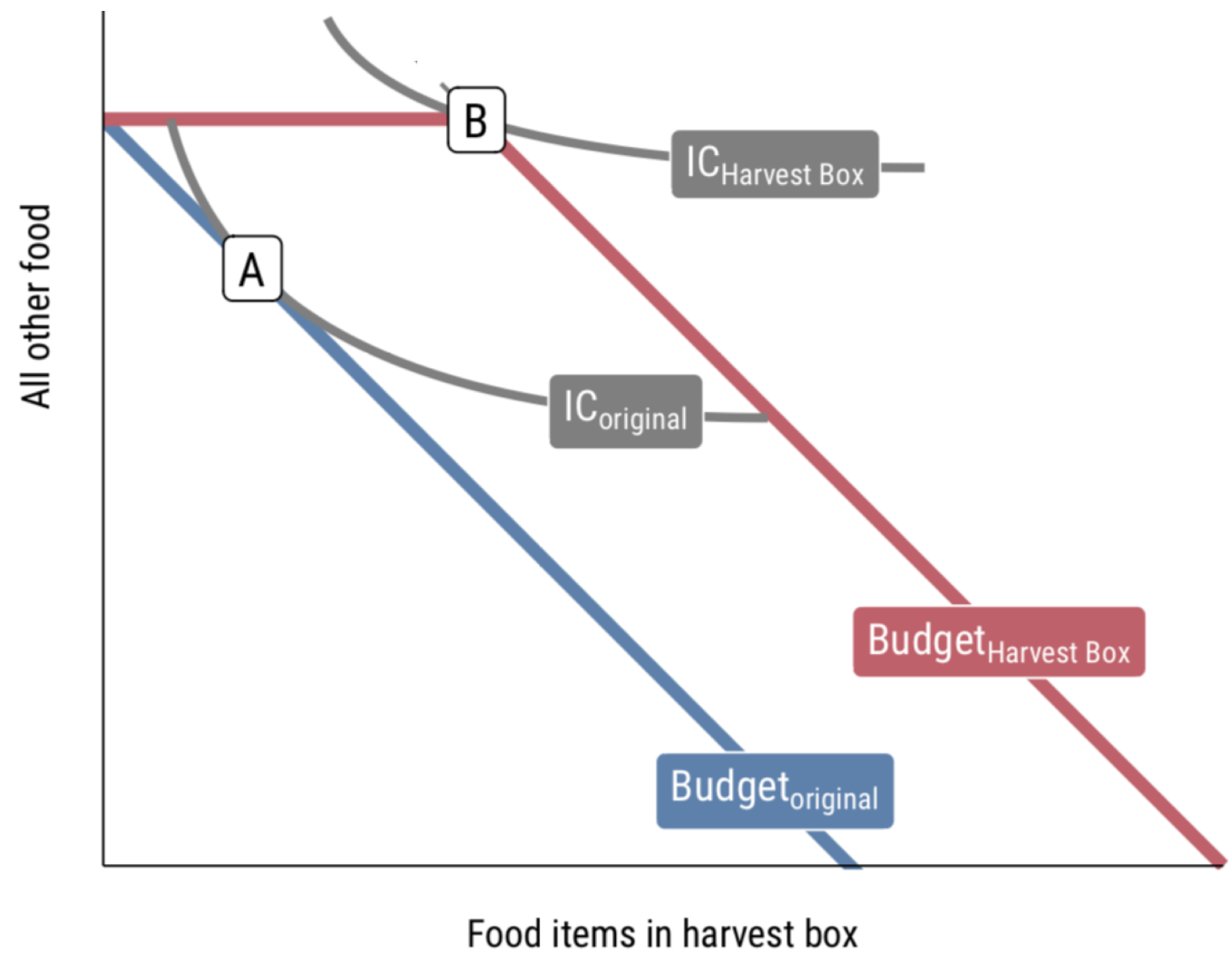
Original indifference New indifference
Original budget New budget

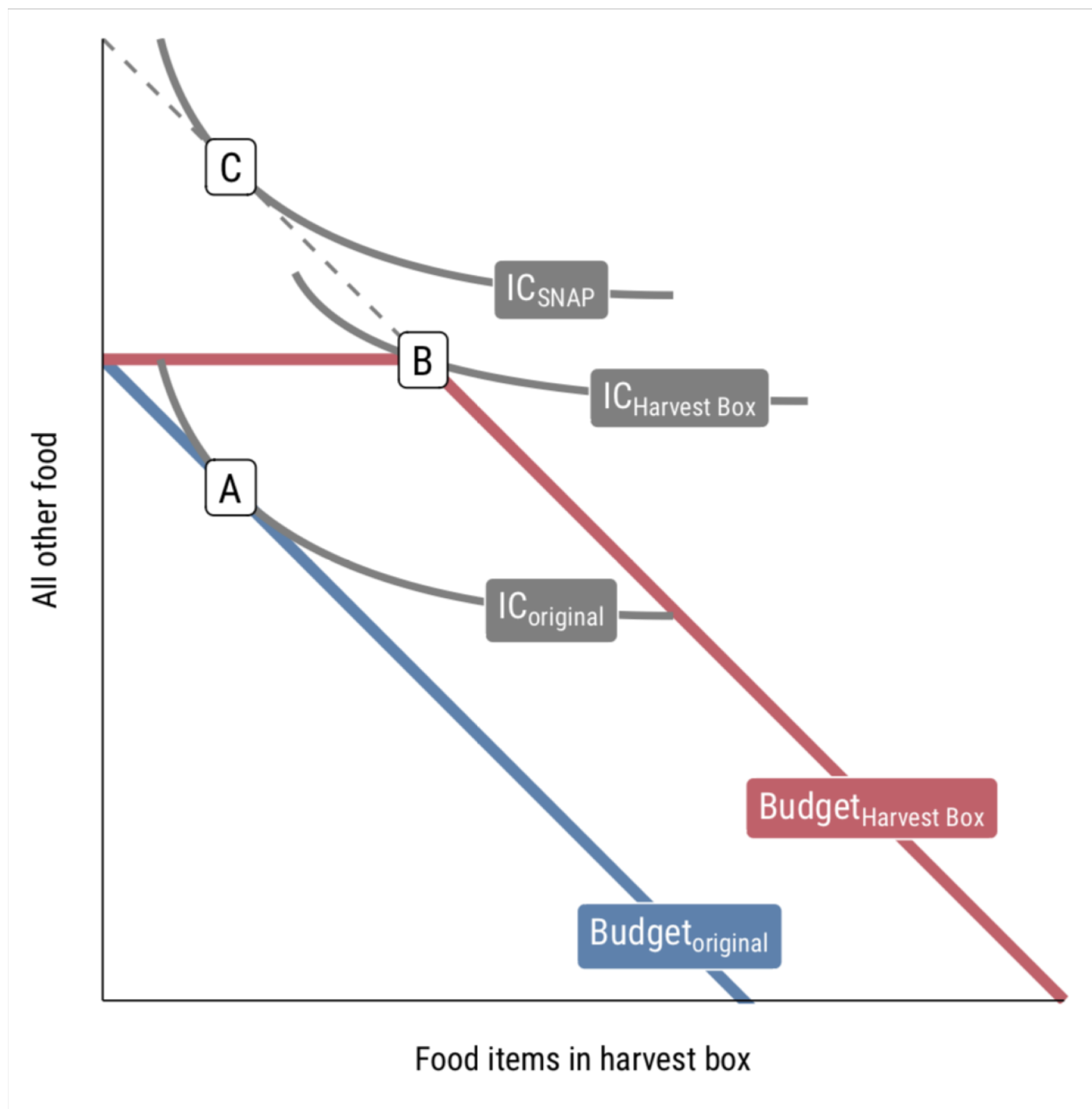
Trump wants to slash food stamps and replace them with a 'Blue Apron-type program'



White House budget director Mick Mulvaney explained on Feb. 12 how the Trump administration hopes to save money on food aid. (The Washington Post)

When announcing the program, Secretary of Agriculture Sonny Perdue stated that “It maintains the same level of food value as SNAP participants currently receive, provides states flexibility in administering the program, and is responsible to the taxpayers.” In response, Kathy Fisher, policy director at Philadelphia’s Coalition Against Hunger stated “We know SNAP works now, when people can choose what they need. How they would distribute foods to people with specialized diets, or [to people in] rural areas ... It’s very expensive and very complicated.”





HEURISTICS AND SHORTCUTS

HUMAN RATIONALITY

**People are rational and
always maximize utility**

**Except when they aren't
and they don't**

BOUNDED RATIONALITY

**We can't process all
information, but we can
(and do!) filter and
privilege information**

COMMON HEURISTICS

Representativeness

Availability

Adjustment and anchoring

Time issues

REPRESENTATIVENESS

We make judgments based on how well information represents the norm

Ignore base rates, think backwards,
start with exceptions and stereotypes

REPRESENTATIVENESS

Insensitivity to prior probability of outcomes

Insensitivity to sample size

Misconceptions of chance

Misconceptions of regression

AVAILABILITY

We make judgments based on how quickly other examples come to mind

AVAILABILITY

**Biases due to the
retrievability of instances**

Biases of imaginability

Illusory correlation

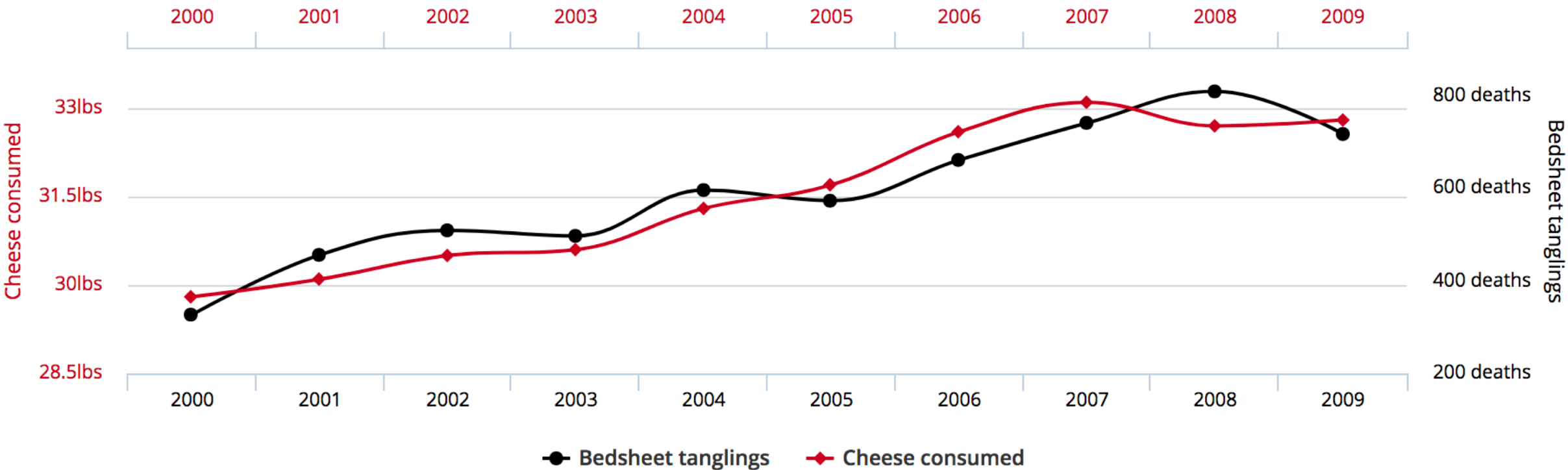


Per capita cheese consumption

correlates with

Number of people who died by becoming tangled in their bedsheets

Correlation: 94.71% (r=0.947091)



tylervigen.com

Data sources: U.S. Department of Agriculture and Centers for Disease Control & Prevention

ADJUSTMENT & ANCHORING

Different starting points yield estimates that are biased toward the initial values

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CHOOSE

Today

\$100

December 25,
2020

Next week

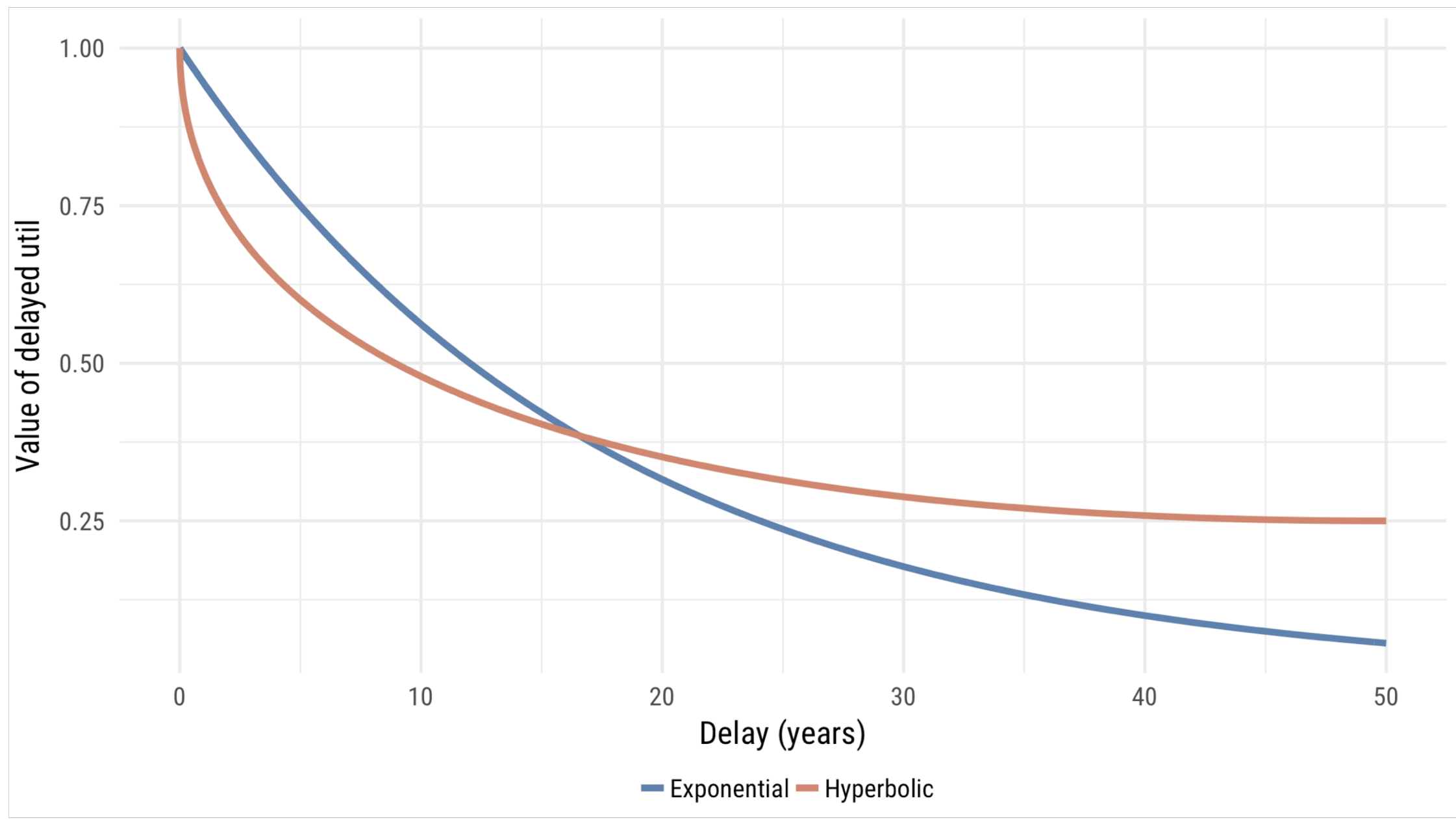
\$110

December 31,
2020

TIME ISSUES

Hyperbolic discounting

We prefer immediate payoffs
more than future payoffs



THE BATTLE WITHIN US

Intrapersonal strategic conflict

Our present selves force their preferences on our future selves

Chips and salsa

Saving for retirement



COMMITMENT DEVICES

Deadlines and coauthors

Exercise pacts

Save More Tomorrow

NUDGES

WHAT IS A NUDGE?

**Adjusting choice architecture
in a way that helps people
make better choices**

Libertarian paternalism

Why nudge?

Why not nudge?

CONDITIONS FOR NUDGING

Disconnect between costs and benefits

Costs now, benefits later

Benefits now, costs later

Choices are complex

Mortgages

Choices are rare

Buying a car

Getting married

Low feedback

High cholesterol diet

Poor knowledge

Health plans

Examples of nudges?