1

The Four Core Principles of Economics

1. A Principled Approach to Economics
2. The Cost-Benefit Principle
3. The Opportunity Cost Principle
4. The Marginal Principle
5. The Interdependence Principle

Chapter 1

Economics as a lens through which to examine and understand **your decisions** and the **decisions of others**

1. **A Principled Approach to Economics**
2. **The Cost-Benefit Principle**
3. **The Opportunity Cost Principle**
4. **The Marginal Principle**
5. **The Interdependence Principle**

What do *you* think economics is about?

Common answers …

- **Money**, stock markets, Business and Government policy analysis

but it goes beyond this—
Economics is a **way of thinking!**

True, it gives insight into why businesses make the choices they make, but also why **you** make the choice you make in your **everyday life**.

Economics is the study of *choices*

- **toolkit** to help you understand your decisions and the decisions of others.

The **four core principles** provide a systematic **framework** for **analyzing** individual decisions.

Let's look at those principles now!

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- Defining and practicing the cost-benefit principle
- Willingness to pay
- Economic surplus
- Understanding and avoiding framing effects

1. **A Principled Approach to Economics**
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3. **The Opportunity Cost Principle**
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Key Definition

Cost-benefit principle: Costs and benefits are the **incentives** that **shape decisions**.

Before you make a decision …

- **Evaluate** the **full set** of costs and benefits associated with that choice
- **Pursue** that choice **only if benefits** are **at least as great** as the **costs**.

Diving into the Definition

Scenario 1: You're hungry and are considering buying a granola bar from a vending machine after class. The granola bar costs $2.

Do you decide to buy the granola bar?

Dilemma: **How do you compare** the benefit with the costs?

Solution: **Convert** costs and benefits **into dollars** by evaluating your **willingness to pay**

Key Definition

Willingness to pay: In order to **convert nonfinancial** costs or benefits into their **monetary equivalent**, ask yourself: "What is the **most I am willing to pay** to get this benefit (or avoid that cost)?"

Helpful Hint

Do not confuse "**want** to pay" with "**willing** to pay" when doing this conversion.

Scenario 1 Continued

The **benefit** of the granola bar **depends** on how delicious it is to **you**.

Let's say you are **willing to pay up to $3** for the granola bar.

- Costs: $2
- Benefits: $3
- Decision: buy the granola bar

Take-Away: using the **cost-benefit principle,** we see the **benefits exceed** the **costs,** which is why you buy the granola bar!

Evaluating the FULL set of costs and benefits

Using **money as the measuring stick** allows you to take into account the **financial** and **nonfinancial** costs and benefits of a decision.

In cost-benefit analysis, **money** is the measuring stick, **not the objective.**

- Cost-benefit analysis still **allows for unselfish decisions.**

Scenario 1 (expanded upon):
Suppose **your friend is also hungry** but doesn't have any money with them.

- Do you buy them a granola bar from the vending machine too?

Cost-benefit analysis:

Your friend's happiness makes you happy and should be counted among the benefits.

If you get a lot a joy from doing nice things for your friends, then cost-benefit analysis tells you to **purchase the granola bar for**

Key Definition

Economic Surplus: The **total benefits minus the total costs** flowing from a decision. It measures **how much** a decision has **improved your well-being.**

Making good decisions is all about maximizing your economic surplus!

- You **generate economic surplus** every time you make a decision in accordance with the **cost-benefit principle.**

Diving into the Definition

Recall the granola bar your bought for yourself in scenario 1:

- you gained something worth **$3** to you (the granola bar) in exchange for something only worth **$2** (your money)

This exchange generated an **extra $1** worth of benefits to you! **This $1 is your economic surplus**.

Transactions can also generate **economic surplus for suppliers**. *Can you describe a scenario in which this happens?*

Framing effects can lead you astray

Helpful Hint: when out shopping, you should be **wary of the clever sales tactics** employed by sellers. Sellers often try to **cloud your cost-benefit analysis** through use of sly product **framing** or description.

Framing effect: when a decision is affected by **how** a choice is **described** or **framed**.

You should **avoid framing effects** altering your own decisions.

Framing Effect Examples:

- When an item's price tag shows both the **original price** and the **sale price.**
- A restaurant has one outrageously priced item on the menu, making everything else on the menu seem **cheap by comparison.**

Your choice should depend on the costs and benefits of that item—not on something **irrelevant**, like how much the item cost in the **past.**

Focus on the costs & benefits, not how they are framed

As CEO, you need to cut costs. Your current plan is to **layoff 6,000 employees.**
You assemble a team to brainstorm **alternative options.**

Monday morning meeting…

Plan A:
Saves 2,000 jobs with 100% certainty

Plan B:
has a 1/3 chance of saving all 6,000 jobs but a 2/3 chance of saving no jobs at all

Between Plan A and Plan B, which plan would you vote for?

Focus on the costs & benefits, not how they are framed

As CEO, you need to cut costs. Your current plan is to **layoff 6,000 employees**.
You assemble a team to brainstorm **alternative options**.

Tuesday morning meeting…

Plan 1:
Results in the certain loss of 4,000 jobs

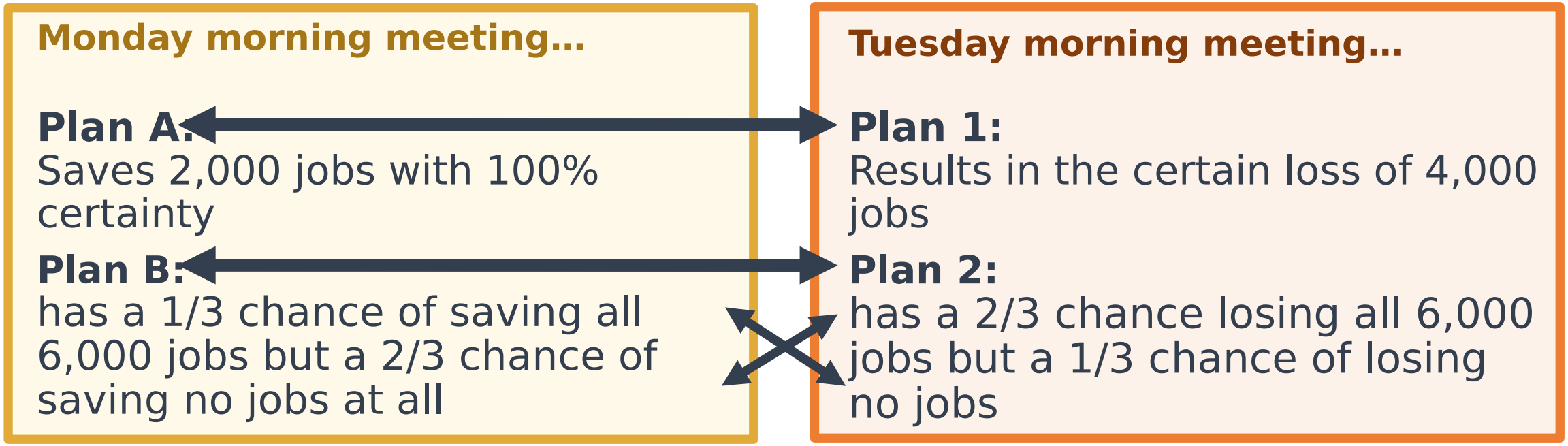
Plan 2:
has a 2/3 chance losing all 6,000 jobs but a 1/3 chance of losing no jobs

Between Plan 1 and Plan 2, which plan would you vote for?

Focus on the costs & benefits, not how they are framed

Framing can make **identical choices seem different**!

The **underlying costs and benefits** of Plan A **are identical** to those of Plan 1, so if you chose Plan A originally, you should choose Plan 1 as well (and likewise for Plan B/Plan 2)



Key take-aways: Cost-benefit principle

Evaluate the full set of benefits and costs for any given choice:

- Pursue the choice if the benefits are **at least a large** as the costs.
- How much am I **willing to pay** to enjoy this benefit (or avoid this cost)?
- 'Full set' ☾ consider both **financial** and **nonfinancial** aspects
- Avoid being led astray by framing effects

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Understanding opportunity cost as the **next best alternative**.

Always consider the opportunity cost rather than just the out-of-pocket financial costs.

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Key Definition

Opportunity cost: The **opportunity cost** of something is the next best alternative you have to give up to get it.

Costs are not always obvious

- you often have to **give up more than just money** to get something.

Focus on the **trade-offs** associated with a particular option. What did you give up to pursue this option?

Diving into the Definition

Scenario 2: You have a **one-hour break** between classes. You have many ways you could spend this time:

- Hang out with friends
- Work on homework
- Take a nap
- Watch something on Netflix

Whatever you choose to do, you are implicitly choosing not to do something else. **That's your opportunity cost!**

Scenario 2 Analysis:

Suppose you rank the options as follows:

1. Work on homework
2. Hang out with friends
3. Watch something on Netflix
4. Take a nap

Given the ranking above, you choose to **work on homework** for the hour in between classes.

What was the **opportunity cost of your choice**?

What did you give up by working on homework in between classes?

- **Answer: hanging out with friends**

HELPFUL HINT: The opportunity cost of working on homework is **not *all* the other options.** Rather, the opportunity cost is your **next best** alternative (hang out with friends).

Ask yourself, "Or what?"

Should I work on homework **OR** hang out with friends?

- Your answer to **"or what"** is the

Scarcity makes trade-offs inescapable

Every choice involves a **trade-off**. Every choice has a cost.

Why? ☾ Because everyone deals with issues of scarcity!

Scarcity: **resources are limited**, therefore any resources you spend pursuing one activity leaves fewer resources to pursue others.

- Limited **money**: what could I spend my money on instead?
- Limited **time**: there are only 24 hours in a day (we all have a time-budget)
- Limited **attention** and **willpower**
- Limited **production resources**: what else could be produced with this machinery and labor?

Calculating Opportunity Cost!

Let's look at the costs of **attending school** versus continuing to **work full time** (the alternative)

Attending School	Working Full Time	Opportunity Cost
Tuition + books cost $60,000	You do not pay tuition + textbook costs	
You quit your job	You earn $70,000 from your job	
Apartment and food cost $24,000	Apartment and food cost $24,000	
10 hours per day studying	10 hours per day working	

What counts as an opportunity cost of school?

Some out-of-pocket costs

The $60,000 tuition is an out-of-pocket financial cost, and *also* an opportunity cost. She wouldn't have had this expense if she continued working full time.

1

Not all out-of-pocket costs

The $24,000 spent on apartment and food is spent either way, and therefore is **not** an opportunity cost of attending school.

2

Non-out-of-pocket financial costs

The $70,000 salary you forgo by **not** working is not something you pay directly but it is money that you give up, and is thus an opportunity cost.

3

Not all time costs (nonfinancial)

You do not count all 10 hours of study time as an opportunity cost since your job requires 10 hours of your time. Thus, relative to your next best alternative, the time spent studying is not an opportunity cost of school.

4

Concept Check: Opportunity Cost

You rank your options for Friday night as follows:

1. Going to watch a movie at the movie theater
2. Attending an economics club event/mixer
3. Studying for your upcoming biology exam

What is the opportunity cost of

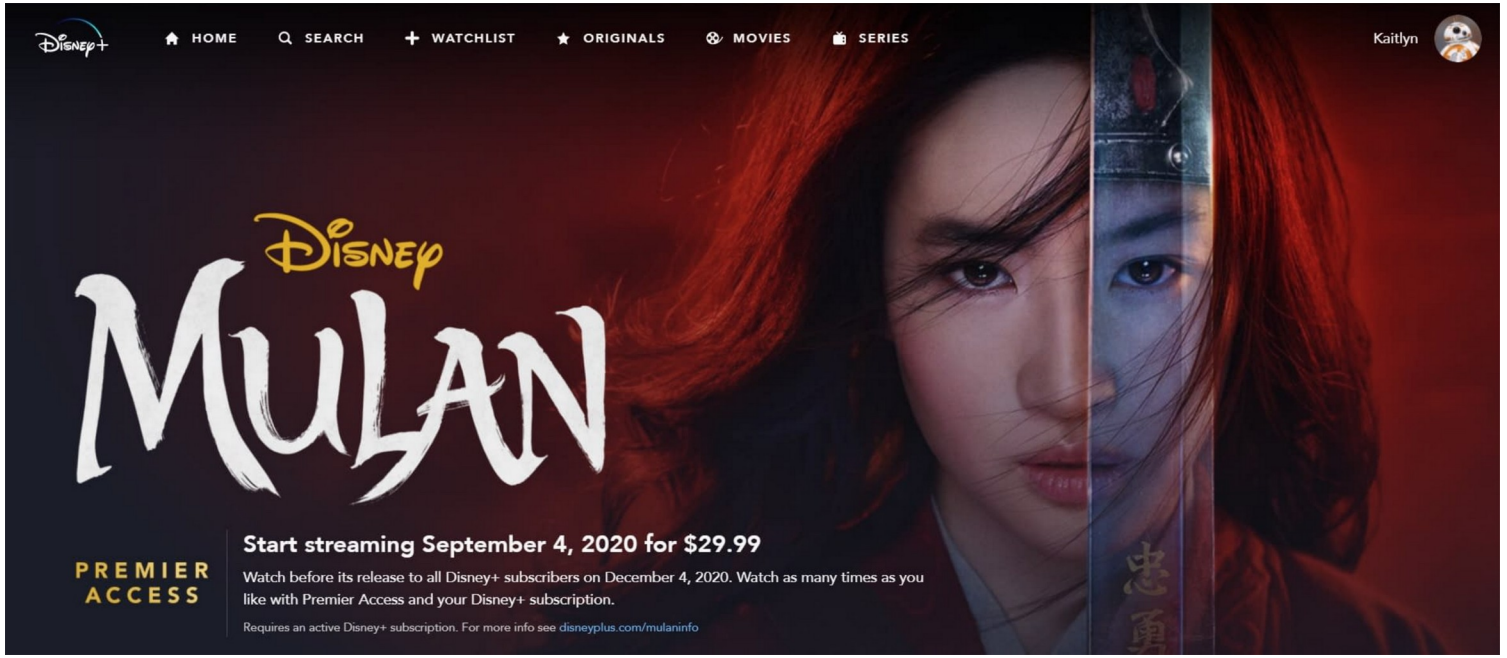
The opportunity cost of seeing the movie is…

a. the economics club event you missed, and the time spent not studying for the exam.

b. the economics club event you missed, and the time spent not studying for the exam, and the money spent on the movie ticket.

c. the time spent not studying for the exam, and the money spent on the movie ticket.

d. the economics club event you



Applying the opportunity cost principle

During the 2008 recession, the movie business boomed. During the pandemic, streaming services enjoyed record profits.

Question: Why do people watch more movies during an economic downturn?

Answer: The **opportunity cost of your time is lower!** You may no longer have a job, or you may no longer have parties or social gatherings to alternatively attend. Thus, you watch more movies instead!

How entrepreneurs think about opportunity cost

The opportunity cost principle allows entrepreneurs to **evaluate whether or not to start a business:**

- Should you start a new business, **or** stay in your existing job?
  - If you quit your current job, you are giving up the paycheck that comes with it. **Forgone wages** are an opportunity cost.

- Should you invest your money in this new business, **or** leave in the bank (or the stock market)?
  - If you take your money out of the bank (or stock market), then you will not be earning interest on that money. This **forgone interest** (or the **forgone investment opportunity**) is an opportunity cost associated with starting your new business.

Key Definition

Sunk cost: a cost that has been incurred and **cannot be reversed.** A sunk cost exists in whatever choice you make, and hence it is **not an opportunity cost.**

- Good decision makers **ignore** sunk costs.

Do not incorporate past, irreversible costs into your current cost-benefit analysis.

Sunk costs are irrelevant to the current decision at hand because these costs are associated with every alternative moving forward.

Sunk Cost Example

Scenario 3: You bought a movie ticket for $12. Within the first 30 minutes you realize the movie is horrible.

Question: Do you continue watching the movie, or leave?

Answer: Most likely, whatever you do upon leaving the movie theater will be a more enjoyable use of your time, so **leave**!

- Do not let the $12 sunk cost guilt you into staying. Whether you stay or leave, the $12 has been spent.

Production Possibilities Frontier

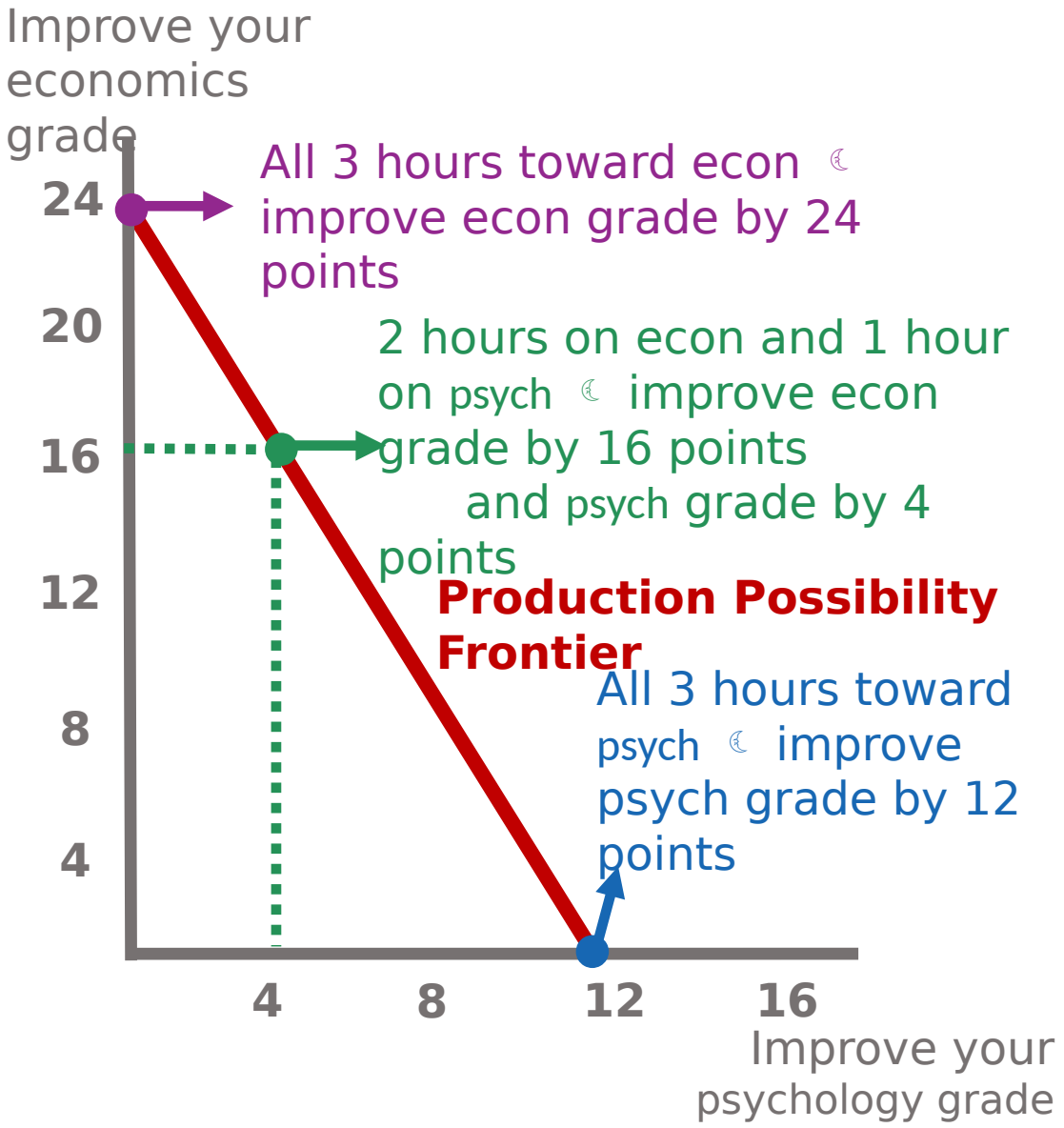
Let's **visualize** opportunity cost!

Production Possibilities Frontier (PPF): shows the different sets of **output that are attainable** with your **scarce resources**.

- The PPF **illustrates the trade-offs** you confront when deciding how to allocate your scarce resources (like your time)

Scenario 4: You have 3 hours per night of study time for economics and/or psychology:

- 1 hour toward econ ☾ 8-point boost in grade
- 1 hour toward psych ☾ 4-point boost in grade



Production Possibilities Frontier

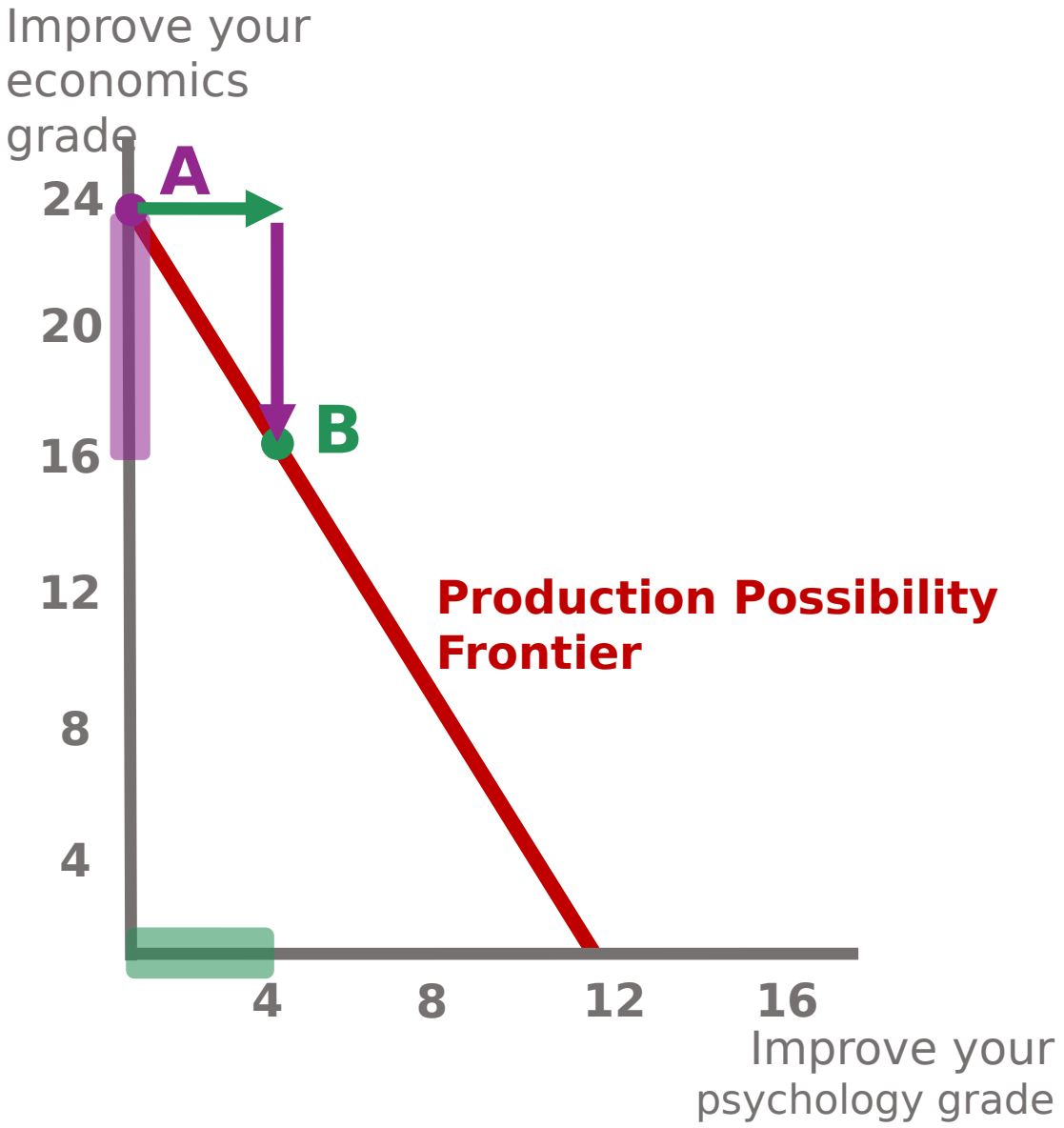
Moving along your PPF reveals your opportunity costs.

Every hour you devote to studying psychology is one less hour you can devote toward economics..

Visualizing the Opportunity Cost:

For example, moving from point **A** to **B** along the PPF you see that to **gain 4 points in psychology**, you had to **sacrifice 8 points in economics**.

- Thus, the **opportunity cost of adding 4 points** to your psychology grade **is earning 8 fewer points** in economics.



Production Possibilities Frontier

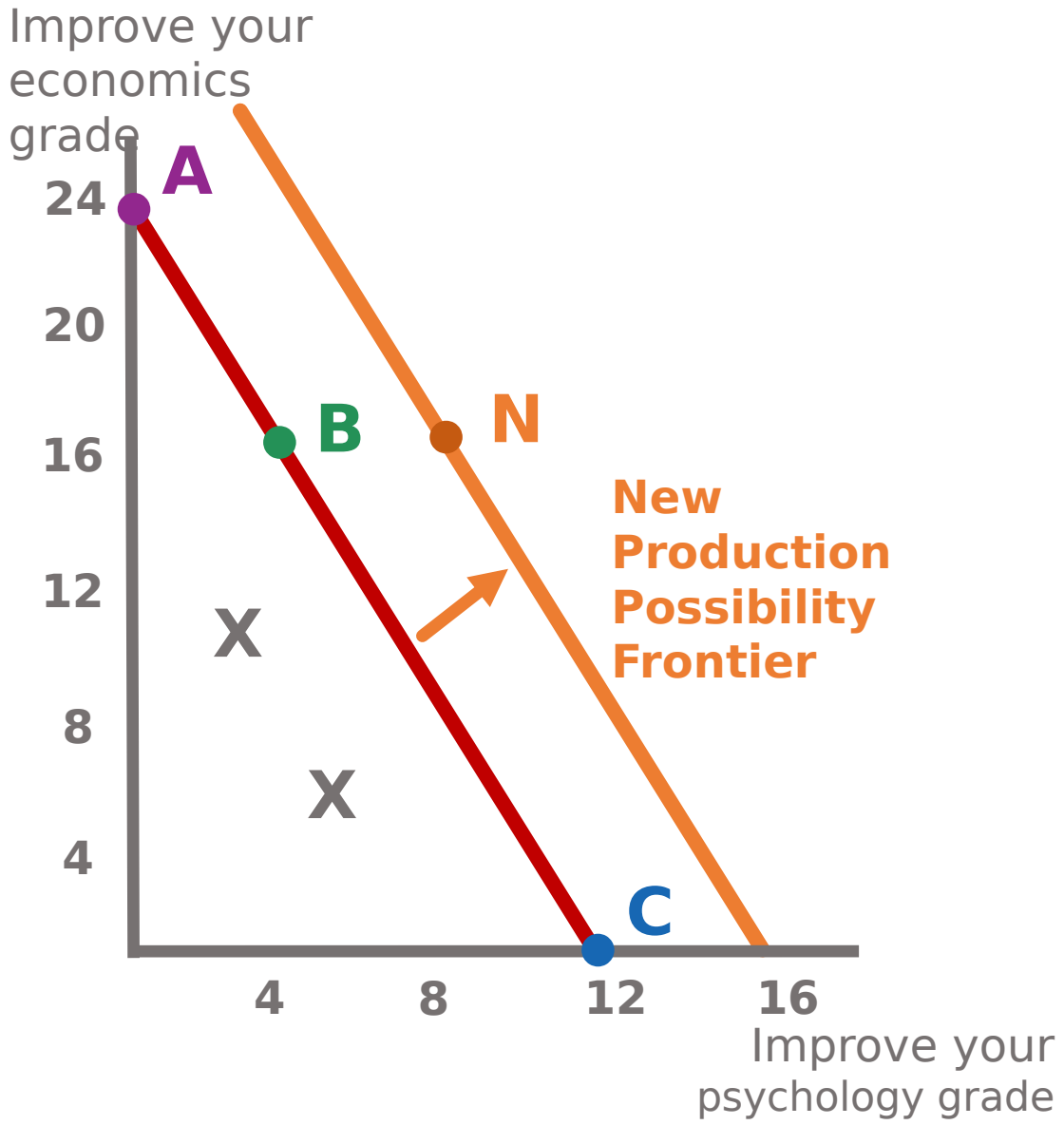
Any allocation of time such that you are **on your PPF** is an **efficient** use of your resources (**A**, **B**, **C**)

- All 3 hours of study time are being used
- No time is being wasted

Any allocation of time such that you are **below your PPF** is an **inefficient** use of your resources

- At points marked with an **X**, time is being wasted (not all 3 hours are being used)

You can only reach a point **above your original PPF** (**N**) if you **increase your productivity** in some way (new study techniques). **Otherwise,** points beyond your PPF would be **unattainable.**



Key take-aways: Opportunity cost

The opportunity cost is the **most valuable alternative** you had to give up to pursue your choice.

- Even if the choice has no direct financial cost, there is always a cost because **every choice has an opportunity cost** associated with it.
- **Scarcity** makes opportunity costs (trade-offs) inescapable.
- Good decision makers **ignore sunk costs.**
- The production possibilities frontier (**PPF**) can be **used to visualize** the opportunity costs we face.

1

Define and **practice** the marginal principle.

Use the marginal principle to break **“how many” decisions** down into a series of smaller, or marginal, decisions.

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Key Definitions

Marginal principle: Decisions about quantities are best made **incrementally**.

You should break "**how many**" questions into a **series of smaller, or marginal, decisions** weighing the marginal benefits and marginal costs.

Marginal Benefit: the **extra benefit** from one extra unit (of goods purchased, hours studied, etc.).

Marginal Cost: the **extra cost** from one extra unit.

Diving into the Definition

Quantity Decisions:
Instead of: "**how many** workers should I hire?"
Simplify to: "Should I hire **one more** worker?"

Apply the cost-benefit principle to this **marginal decision** to answer the question "should I hire one more worker?"

- **What are the extra benefits** of hiring one more worker?—**marginal benefit**
- **What are the extra costs** of hiring one more worker?—**marginal cost**

Hire the additional worker if the **marginal benefit exceeds** the **marginal cost**

Which decisions are marginal decisions?

How many pairs of shoes should I buy?

- Marginal! Should I buy one more pair of shoes?

How many slices of pizza should I eat?

- Marginal! Should I eat one more slice of pizza?

How many classes should I take this semester?

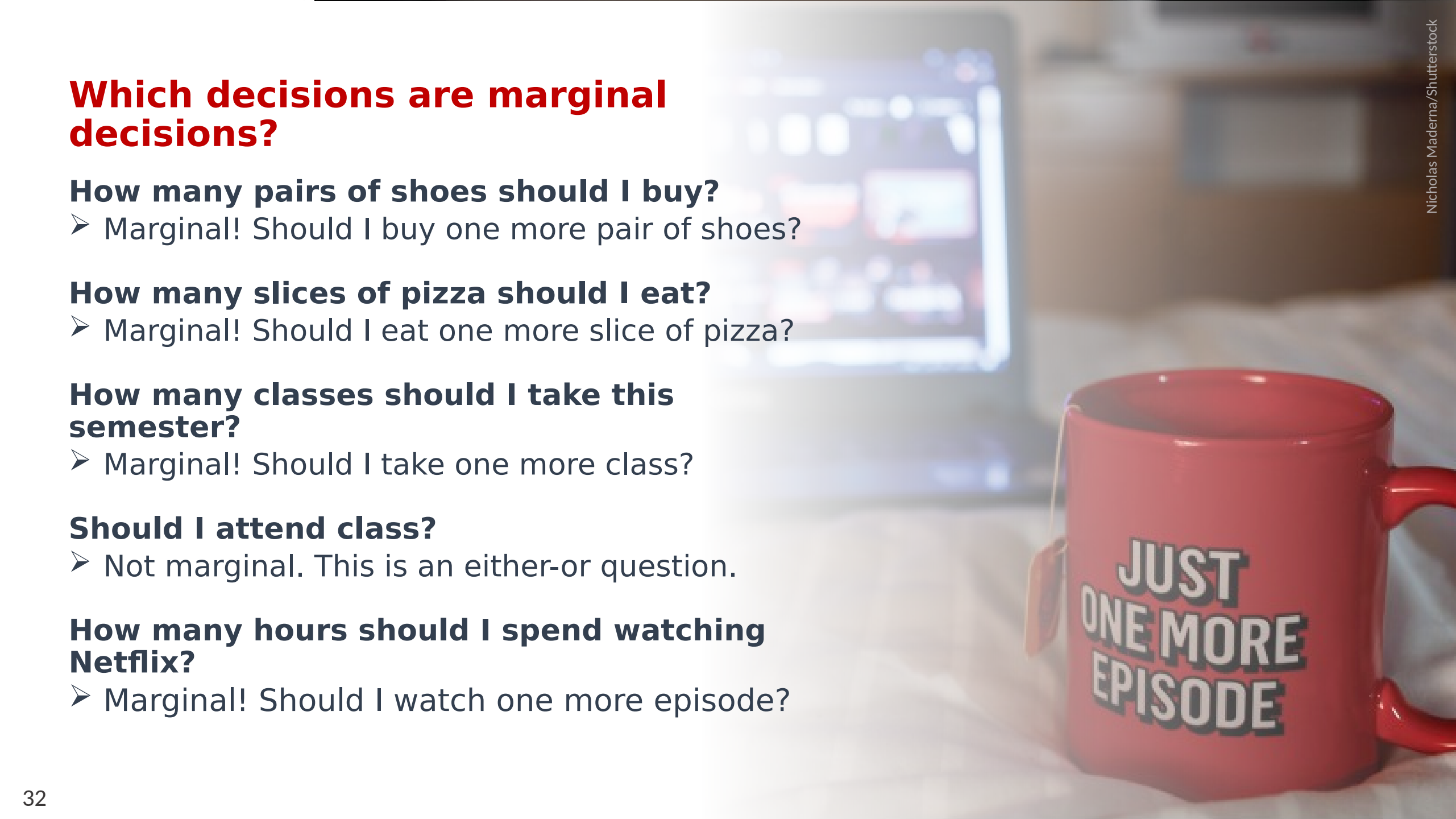
- Marginal! Should I take one more class?

Should I attend class?

- Not marginal. This is an either-or question.

How many hours should I spend watching Netflix?

- Marginal! Should I watch one more episode?



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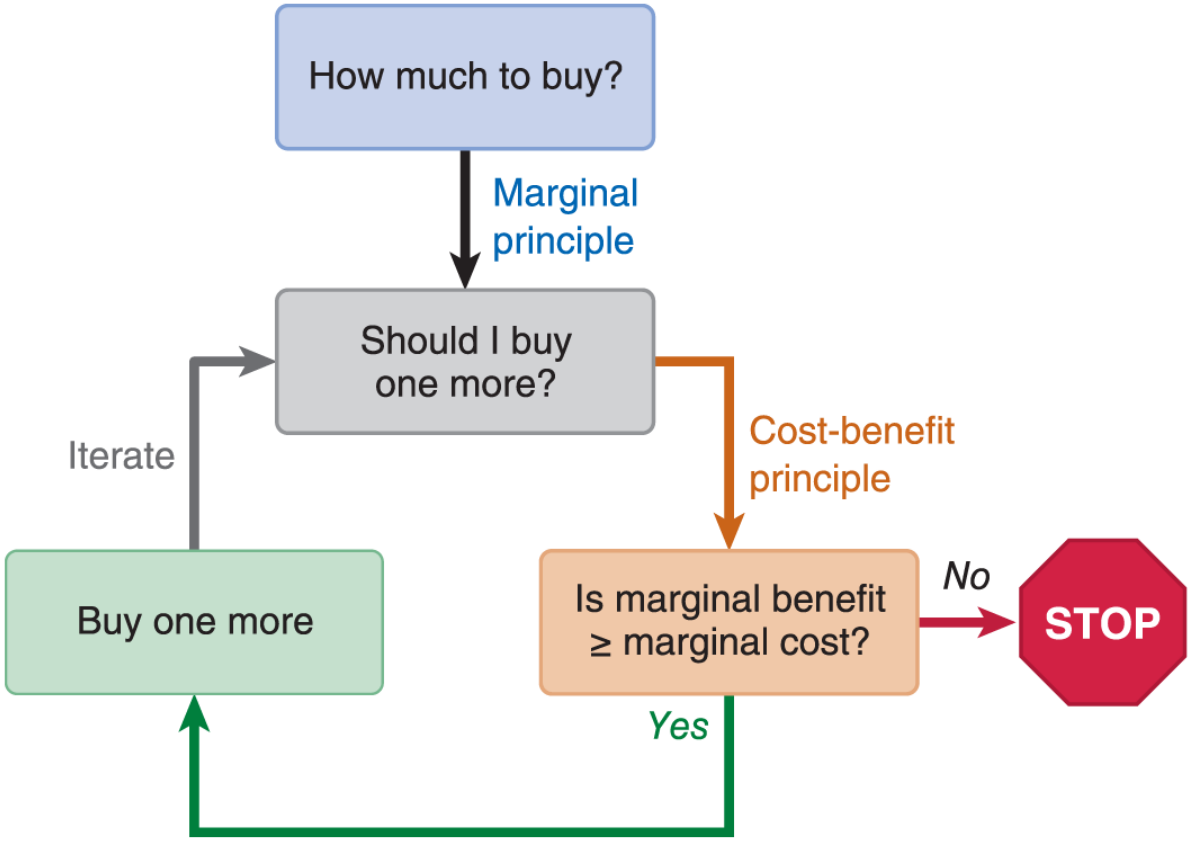
Visualizing the marginal principle

1. **Determine** what **type of choice** you face:
   - If it is a **"how many?"** decision
     - break it down into a series of smaller marginal decisions ("should I buy one more?")
2. **Weigh** the marginal benefits against the marginal costs
   - cost-benefit principle applied to a marginal decision
3. **Apply** the marginal principle **iteratively** until you eventually



The marginal principle and the rational rule

- Whenever the benefits of a choice exceed the cost, it is a good choice (*cost-benefit principle*)
- When you do marginal analysis, you iteratively apply cost-benefit to figure out if "one more unit" is a good choice.

Rational Rule: If something is worth doing, **keep doing it until** your marginal benefits **equal** your marginal costs.

Connecting Concepts:

Every additional unit you acquire using the **marginal principle** will increase your **economic surplus** (recall: economic surplus = benefits – costs)

- **Economic surplus** is **maximized** when the **marginal benefit <u>equals</u>** the **marginal cost**

Using the rational rule to maximize your economic surplus

You decide to open a restaurant. **How many workers** should you hire?

Benefits of an additional worker:

- You can prepare and serve more meals, which brings in additional revenue
- You can sell each meal for $25
  - **Revenue = $25 x meals served**

Costs of an additional worker:

- An additional worker means additional wages must be paid ($300 a week per additional worker)
- Additional meals will require you to purchase additional ingredients ($10 per additional meal)

Other relevant costs: your rent costs **$500** per week, and the opportunity cost of *your* time as the entrepreneur is **$1,000** per week.

Number of Workers	Meals Served	Total Benefits (Revenue = $25 x number of meals	Marginal Benefit (change in total benefit)	Total Costs ($10 per meal + $300 per waiter + $500 rent + $1,000 for your time)	Marginal Cost (Change in total cost)	Profit or Economic Surplus (total benefits less total costs)
2	160	$4,000		$3,700		
3	210	$5,250		$4,500		
4	250	$6,250		$5,200		
5	280	$7,000		$5,800		
6	300	$7,500		$6,300		
7	310	$7,750		$6,700		

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5	280	$7,000	$750	$5,800	$600	
6	300	$7,500	$500	$6,300	$500	
7	310	$7,750	$250	$6,700	$400	

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3	210	$5,250	$1,250	$4,500	$800	$750
4	250	$6,250	$1,000	$5,200	$700	$1,050
5	280	$7,000	$750	$5,800	$600	$1,200
6	300	$7,500	$500	$6,300	$500	$1,200
7	310	$7,750	$250	$6,700	$400	$1,050

Key take-aways: The marginal principle

The marginal principle tells you to break "**how many**" decisions into a **series of smaller, marginal decisions.**

- If the marginal benefit **exceeds** the marginal cost, then buy that additional unit.
- **Continue to buy** additional units as long as the marginal benefit is **at least as large** as the marginal cost (**rational rule**).
- **Stop** when the **marginal benefit equals marginal cost**.
- **Economic surplus is maximized** when marginal benefit **equals** marginal cost.

1

Defining and **understanding** the interdependence principle.

How does **your decision interact** with **everything** and **everyone** else around you?

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Key Definition

Interdependence principle:
Your best choice **depends** on …

1. **your other choices**,
2. the **choices others make**,
3. developments in **other markets**,
4. and **expectations** about the future.

When any of these factors change, **your best choice might change**.

You are not making decisions in isolation.

- You are part of a larger network.

Diving into the Definition

By deciding to take this class..

1. **you can't take other classes** that are offered at the same time.
2. there is now **one less spot available to others.**
3. makes you a **more attractive intern/employee** in the labor market.
4. you fulfill a **prerequisite** needed for enrollment in **future classes.**

1. Dependence among each of your individual choices

Your own choices are all connected because you have **limited resources:**

- Your decision on how much to spend on movies will impact how often you can eat out because you have **limited income.**
- Your decision on how much time to dedicate to studying economics affects the time available for studying psychology because you have **limited time.**
- Because you only have one oven (i.e., you have **limited production capacity**) you may not be able

2. Dependence between economic actors

The choices made by other economic actors (people, businesses, governments, etc.) **shape the choices available to you:**

- If Microsoft hires the most talented software engineers in Seattle, then there will be **fewer talented people available** for other Seattle-based tech companies to hire.
- If **your friends** all have chosen to buy iPhones, you may also want to buy an iPhone to maximize OS compatibility across phones.
- If your classmate gets hired for an internship, then **your chances of getting hired at that same company have decreased.**

3. Dependence between markets

Changes in prices and opportunities in **one market affect** the **choices** you might make **in other markets:**

- Declining interest rates in the **credit market** make it less expensive to get a mortgage, which might lead you buy a home in the **housing market.**

- Your decision to join the **labor market** as a worker depends on the availability of high-quality, low-cost child care options in the **childcare market.**

4. Dependence through time

Is it better to **act today, or tomorrow?**

- Should I buy gas today, or next week? My decision depends on whether I think gas prices will fall or not next week.
- Should I buy a hybrid car now, or wait a few years for the technology to get even better?

Furthermore, **decisions today shape future opportunities** and decisions.

- Should I go to grad school and get my MBA? This decision not only affects your future job opportunities but also your salary.

1

Do benefits exceed costs?

“Or what?”

“One more?”

Everything is connected

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