

# Chapter 9: Making Decisions

So far we have learned that people take advantage of opportunities to make themselves better off.

- How do people decide what will make them better off?



## 1. Opportunity Costs and Decisions

**Opportunity Costs** = The real cost of something is what you give up to get it.

Opportunity costs consist of:

(i) **Explicit Costs** = costs that require payment

E.g. tuition, wages, rent



(ii) **Implicit Costs** = costs that are values foregone but with no actual payment.

E.g. Income given up when you take time off from work

E.g. Time away from family when you go to university

**Businesses also have to consider explicit and implicit costs when they calculate their *profit*.**

**Profits that only consider the explicit costs are called the *accounting profits* =**

$$\text{revenues} - \text{explicit costs} - \text{depreciation}$$



**Profits that also include the implicit costs are called *economic profits* = revenues - explicit costs - depreciation - implicit costs.**

**Example:**

**Jack takes \$300,000 of his savings out of the bank to buy a pizza restaurant.**

**In his first year:**

**Revenues = \$200,000**

**Explicit Costs (wages and materials) = \$150,000**

**Depreciation of equipment = \$5,000**

**Lost interest (his money would otherwise stay in the bank and earn 2% interest) = \$6,000**

**Lost income (he otherwise would be working as a mechanic) = \$50,000**

**Accounting Profit = \$45,000**

**Economic Profit = -\$110,000**



**\*\*Note that the \$300,000 is considered an *investment* not a cost.\*\***

**\*Jack's business is not profitable in *economic analysis* since he would be better off working as a mechanic.**

**Income as a mechanic = \$50,000 + \$6,000 = \$56,000**

## **Exercise 1: Calculate the accounting and economic profit**

Sue decides to quit her job as an ambulance driver, where she had earned \$48,000 per year. She also decides to sell a property she owns in northern British Columbia. She was earning \$15,000 per year renting the property. She sells the property for \$180,000. Assume the value of the property is constant over time. Sue uses the \$180,000 of that money to buy equipment to start her own publishing business. In the first year her publishing business has the following values:

**Revenue = \$190,000**

**Wages = \$40,000**

**Utilities = \$3000**

**Rent for office = \$12,000**

**Depreciation of equipment = 15%**

**What is Sue's accounting profit?**

$$19000 - 40000 - 3000 - 12000 - 15\% \cdot 18000$$

**Answer = 10800**

**What is Sue's economic profit?**

$$10800 - 48000 - 15000$$

**Answer = 45000**

## 2. Marginal Analysis

**Marginal decisions** are “how much” decisions rather than “either-or” decisions.

E.g. “Should I eat one more doughnut?”  
Or “Do I need another pair of shoes?”  
Or “Should I take an extra shift at work?”



Deciding on *one more or not* when a person is either buying or producing a good involves comparing the additional cost to the additional benefit.

**Additional cost of one more unit** = marginal cost =  $\frac{\Delta TC}{\Delta Q}$

**Additional benefit of one more unit** = marginal benefit =  $\frac{\Delta TB}{\Delta Q}$

For consumers the MB from one more unit is the  
*extra satisfaction they get*

For consumers the MC of one more unit is the  
*price they have to pay*

For producers the MB from one more unit is the  
*price they get paid*

For producers the MC of one more unit is the  
*extra cost of inputs to produce that unit.*

Market agents do one more unit of an activity as long as  $MB \geq MC$

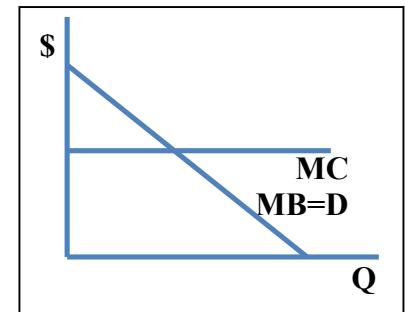
### Example:

Emma is shopping for socks and the price is \$3 per pair.

The MC of each additional pair = \$3 = price per unit  
and the MB = the additional satisfaction from each pair.

For a consumer if the price is constant  
the MC is constant, but the MB will

decreases as  $Q$  increases.



The MB can be measured as the

Maximum marginal willingness to pay  $\rightarrow$   
willingness to pay for one more unit.



Quantity of Socks	Price or MC	MWTP
1	3	6
2	3	5
3	3	4
4	3	3
5	3	2

How many pairs of socks should Emma buy? 4

The optimal quantity of any activity,  $Q^*$ , is where  $MB = MC$

At  $Q^*$  Emma's consumer surplus or net gains are maximized  
 $CS = 3 + 2 + 1 + 0 = 6$

## Example: Studying for an exam

*In a given day, productivity will decrease as a student becomes tired.*

**MC per chapter = time**

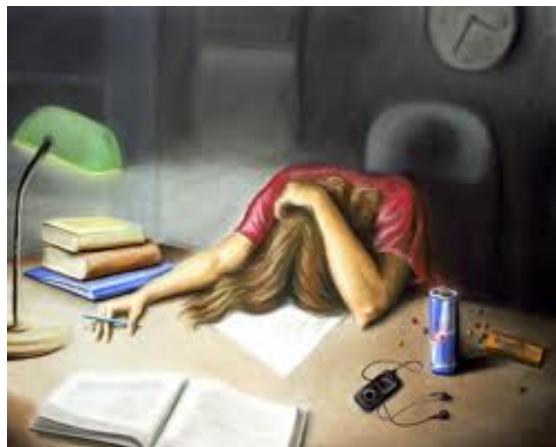
**MB per chapter = potential increase in mark.**

Quantity of Chapters	TC (hours)	MC (hours)
0	0	
1	1	1
2	2.25	1.25
3	3.75	1.5
4	5.5	1.75
5	7.5	2

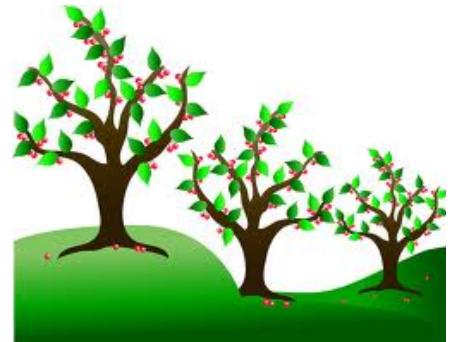
**The marginal cost per chapter will increase because the student becomes slower**

**The marginal benefit will decrease if the student remembers less and less with each chapter.**

**A student will continue to study on a given day as long as they feel the  $MB \geq MC$**



**Example: A Cherry Orchard**  
**For a producer the marginal benefit of selling one more unit is the price paid.**



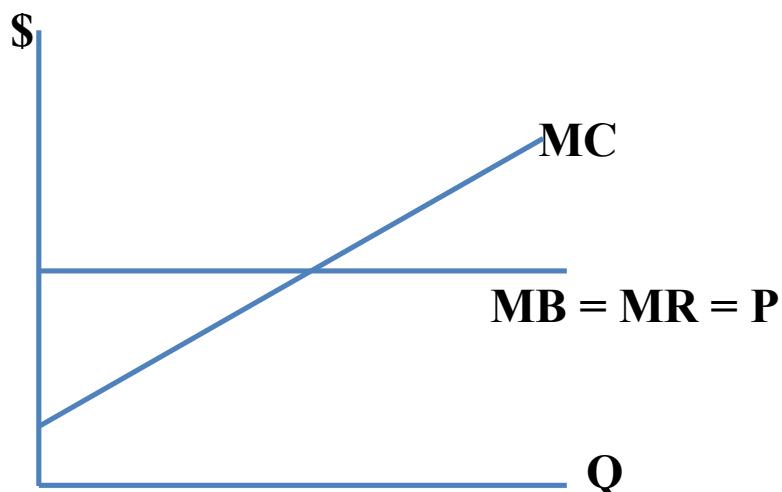
$$MB = \text{marginal revenue} = P$$

$$MR = \frac{\Delta TR}{\Delta Q}$$

**The marginal cost is the cost of the additional resources used to produce one more unit of the good.**

**For a producer, the marginal revenue will be constant as long as the price does not change, but marginal costs will generally increase**

**Why?** A farmer will use the most fertile land first. To increase production the farmer must then use additional land, which is not as fertile.



**A farmer will continue to increase production as long as  $P \geq MC$  or  $MR \geq MC$**

Quantity of Cherries (kg)	Total Revenue	Marginal Revenue (price/kg)	Total Cost	MC per kg	Total Net Gain =TR-TC	Marginal Net Gain =MR-MC
0	0		0		0	
1	4	4	1	1	3	3
2	8	4	3	2	5	2
3	12	4	6	3	6	1
4	16	4	10	4	6	0
5	20	4	15	5	5	-1

**How many kg of cherries should the farmer produce?**

4kg

**At what quantity are profits, or total net gains, maximized?**

4kg

**The optimal quantity,  $Q^*$ , is where**

$$MR = MC \quad \text{or} \quad MB = MC \quad \text{or} \quad P = MC$$

$$MB = MR = P = MC = 4$$

## Exercise 2: Do the following calculations

Emily wants to buy some oranges and her demand is given by  $MB = 15 - 0.5Q$ .

a. What would Emily be willing to pay for the 20<sup>th</sup> orange?

Emily's marginal willingness to pay is her *demand price*.

$$P^d = MWTP = MB = 15 - 0.5(20) = 5$$

b. If oranges cost \$1 each how many oranges would Emily buy?

$Q^*$  is where  $MC = MB$ , and

$$MC = 1 = 15 - 0.5Q$$

$$Q = \frac{14}{0.5} = 28$$

Sam's Sandwich Truck has costs given by  $MC = 1 + 0.2Q$ .

a. What would it cost Sam to produce a 30<sup>th</sup> sandwich?

Sam's marginal cost is his *supply price*.

$$P^s = MC = 1 + 0.2(30) = 7$$

b. How many sandwiches should Sam sell if he can charge \$4 per sandwich?

$Q^*$  is where  $MC = MR = P$ .

$$MR = 4 = 1 + 0.2Q$$

$$Q = 15$$

### Exercise 3: Kerry's Cherry Pies

The table below shows revenue and cost information for Kerry's Cherry Pies. Fill in the columns.

Quantity of Cherry Pies	Total Revenue	Marginal Revenue	Total Cost	Marginal Cost	Total Net Gain	Marginal Net Gain
0	0		0		0	
1	6	6	3	3	3	3
2	12	6	6.5	3.5	5.5	2.5
3	18	6	10.5	4	7.5	2
4	24	6	15	4.5	9	1.5
5	30	6	20	5	10	1
6	36	6	25.5	5.5	10.5	0.5
7	42	6	31.5	6	10.5	0
8	48	6	38	6.5	10	-0.5
9	54	6	45	7	9	-1
10	60	6	52.5	7.5	7.5	-1.5

At what quantity does Kerry's MR = MC?

$$Q = 7$$

At what quantity is Kerry's profit maximized?

$$Q = 7$$

How many pies should Kerry produce?

$$Q = 7$$

At the optimal quantity what is Kerry's marginal net gain?

$$\text{Marginal net gain} = 0$$

### 3. Sunk Costs

**Sunk costs** = costs that cannot be recovered or changed

**Examples:** rent, haircuts, car repairs, time already spent doing an activity, investment losses, lottery tickets, accidents.



Since sunk costs cannot be changed they should be excluded from current decisions → accept the loss and move on.

**Example:** You bought a \$100 textbook in plastic wrap for a course that looked interesting, but after going to the first class you decided to drop it. You had unfortunately already removed the plastic wrap. Your friend offers to pay you \$70 for it → should you sell it?

The original \$100 you paid for the game is a sunk cost.

If you have no use for the book you should sell it even though you will incur a loss of \$30.

## Example 2: Repairing an old car



An old Honda civic Car valued at \$1000 stops running.

If it is fixed it can be sold for \$1000, or if not it can be sold for \$100 for parts.

The 1st repair will cost \$600.

If it is repaired and sold the net benefit is 400

rational to repair since  $\$400 > \$200$

The car does not sell yet and after a few months the car stops running again. The 2nd repair will cost \$550. If it is repaired and sold the net benefit is 450

It is rational to continue to do repairs as long as for each repair  $(\$1000 - \text{cost}) > \$100$ , and as long as the owner is confident that further repairs are unlikely.

It was rational to keep repairing the car even though total costs of  $\$1150 > \$1000$ . loss = 150

If the car had been sold for parts without the second repair then the loss =  $100 - 600 = -500$

The *sunk cost dilemma* occurs when

people who have already incurred sunk costs must decide whether to give up or continue.

## **Exercise 4: Sunk Costs**

You have bought a \$10 nonrefundable ticket for a lacrosse game. You know that going to the lacrosse game will give you a benefit equal to \$20. After you have bought the ticket, you hear that there will be a football game at the same time. Tickets to the football game cost \$20, and you know that going to the football game will give you a benefit equal to \$35. You tell your friends the following: "If I had known about the football game before buying the ticket to the lacrosse game, I would have gone to the football game instead. But now that I already have the ticket to the lacrosse game, it's better for me to just go to the lacrosse game." Are you making the correct decision? Justify your answer by calculating the marginal benefits and marginal costs of your decision.

Yes, it is the right decision.

Go to the L game:  $MB - MC = 20 - 10 = 10$

Go to the F game:  $MB - MC = 35 - 20 = 15$

Total net benefit L:  $20 - 10 = 10$

Total net benefit F:  $35 - 20 = 15$

# Behaviour Economics: Are we really rational?

Behaving *rationally* means doing something if  $B > C$   
and not doing something if  $B < C$

**BUT** the benefits and costs of any situation are not just monetary, so we often do things even when  $B < C$   
**Three common reasons** why people might prefer a worse economic payoff:

## 1. Concerns about morals, ethics, fairness, etiquette:

people care about how their behavior makes them feel.

E.g. Tips to service staff:

tipping is a social norm →

etiquette benefit > monetary cost



E.g. Gift Giving:

Gifts are often not what the recipient really wants, but giving gifts is proper etiquette so the etiquette benefit > monetary cost.

E.g. Littering: it would save us time and effort but would make most of us feel guilty so the benefit < guilt cost.



## E.g. Sharing a cookie with a friend:

Benefit to friendship > lost satisfaction.



## 2. Bounded rationality: We are *not* computers!

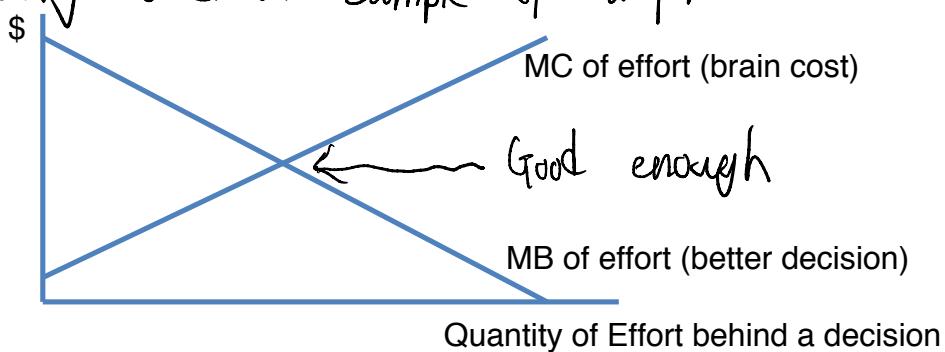
For many reasons we miscalculate costs and benefits,

The effort of thinking, calculating, and researching adds to the cost of an action.

So it is cheaper to make a “good enough” choice than an absolutely best choice.



**The "Good Enough" Method:** consumers approximate a choice using a small sample of information



The optimal amount of effort depends on the action → e.g. a new car versus a new toothbrush

### Other examples of bounded rationality:

- Pricing: we perceive the difference between \$4.99 and \$5 as greater than it actually is because our brains put more weight on the first number.
- Seeing the answer key before doing practice questions makes you believe the question is easier than it actually is.
- Plate size affects how much food we eat.
- Prejudices based on a person's appearance

3. **Risk aversion:** The willingness to sacrifice some economic payoff in order to avoid potential loss.

We hate risk!

→ so we buy insurance  
and extended warranties



$$\text{Expected cost} = (\text{Probability})(\text{Value})$$

Cost of insurance > expected cost of risk  
**BUT**

Cost of insurance < expected cost of risk + cost of worrying about the risk

### Are we Sometimes Irrational?

**Irrational behaviour** is when a decision maker chooses an option that makes them worse off, not better.  
We believe we are making ourselves better off, but in reality we are not.

### The 6 mistakes of economic decision making:

1. **Misperceptions of Opportunity Cost:** The exclusion of non-monetary costs and the inclusion of Example 1: "It's cheaper to grow your own vegetables." sunk costs

Cost of  
gardening  
materials and  
your time

>  
Cost of buying  
vegetables  
from the store

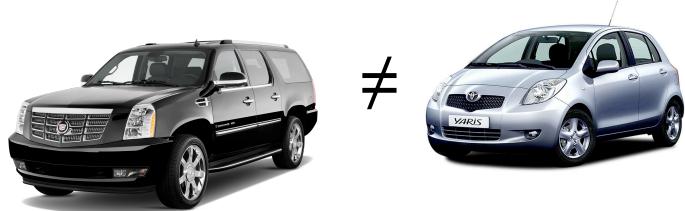


**Example 2:** Meg just bought a brand new Ford SUV for towing her canoe on summer weekends, but high weekly gas bills makes her wish she had a small compact Yaris.

→ “But I already paid for it”

Money that she has already spent on the SUV is a **sunk cost**.

What if she rents an SUV when she goes camping?



Future cost of keeping the SUV >

Future cost of selling the SUV and buying a Yaris

2. **Overconfidence:** We believe that we are better drivers, better parents, better students, better decision makers, healthier eaters, etc than we actually are.



E.g. Predicting the stock market  
→ evidence shows speculative investing lead to lower returns

We remember our wins more than our failures!

E.g. People who think they can do two things WELL at the same time (text and drive, pay attention to the teacher and play phone games)

believed benefit ≠ actual benefit.

believed costs ≠ actual cost.

### **3. Unrealistic expectations about future behaviour:**

We're overoptimistic about our future behavior.

**Examples:**

- Tomorrow I will study
- Tomorrow I will go on a diet
- Tomorrow I will save money



**Solutions: Commit today to an action tomorrow**

- study schedule
- mandatory study groups
- prepackaged diet plans
- Automatic payroll deductions

Commitments make it easier for us to follow through with actions because there is a higher cost of taking no action.

### **4. Spending dollars unequally: Using *mental accounting* when making spending choices**

**Mental accounting:** Mentally assigning dollars to different accounts and different accounts have different values.

**Examples:**

- Spending on a credit card: **Means less since you don't see the money disappearing from your wallet**



- Spending an inheritance: **Free money has less value than money you worked for**

- Spending during a big sale

**Feels like saving money instead of spending money**



**\*\*All money has the SAME value\*\***

## 5. Loss Aversion: Oversensitivity to loss

People are reluctant to accept a loss and move on.

Examples:

- Stock brokers → unwilling to sell losing stock



- My old car → emotional attachment

People avoid paying the emotional cost of accepting a loss.

- Failing relationships

Loss aversion leads people in a *sunk cost dilemma* to not give up:

Unable to accept that sunk costs are unrecoverable

## 6. Status Quo Bias: The tendency to avoid making decisions all together and instead keep things unchanged or do

Examples: what everyone else is doing.

- Donating organs: in countries where you opt out (check "no") instead of opt in (check "yes") there is more organ donation



- Taking forever to change a phone plan, home internet plan, credit card, ...

- Eating the same thing everyday
- Doing something just because others are doing it

Benefit of doing  
something different

Perceived transition  
cost.