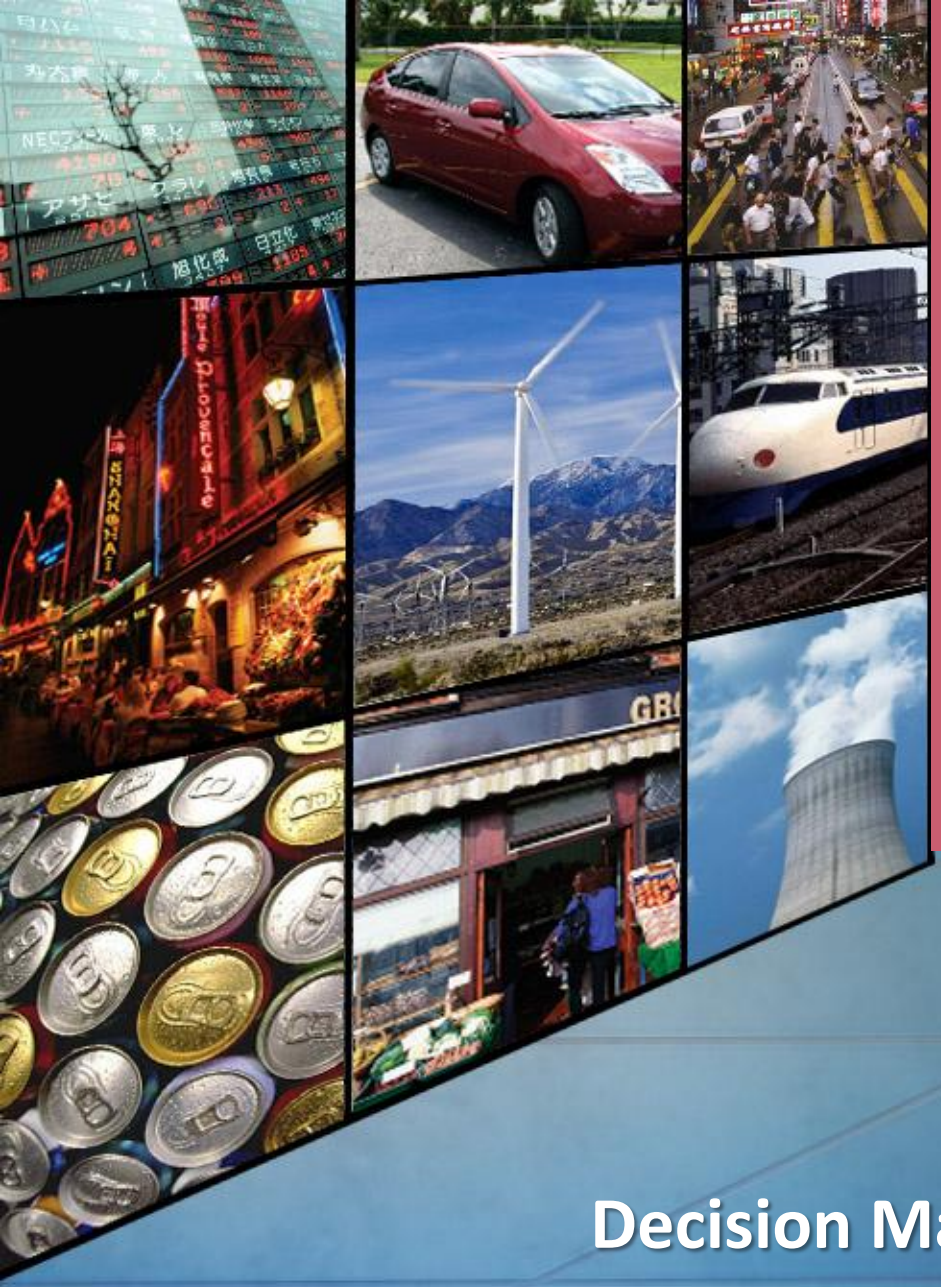


THIRD EDITION

ECONOMICS and MICROECONOMICS

Paul Krugman | Robin Wells

Chapter 9

Decision Making by Individuals and Firms

WHAT YOU WILL LEARN IN THIS CHAPTER

- Why good decision making begins with accurately defining costs and benefits
- The importance of **implicit** as well as **explicit costs** in decision making
- The difference between **accounting profit** and **economic profit**, and why economic profit is the correct basis for decisions
- Why there are three different types of economic decisions: “either-or” decisions, “how much” decisions, and decisions involving **sunk costs**
- The principles of decision making that correspond to each type of economic decision
- Why people sometimes behave irrationally in predictable ways

Opportunity Cost and Decisions

- An **explicit cost** is a cost that involves actually laying out money.

- An **implicit cost** does not require an outlay of money; it is measured by the value, in dollar terms, of the benefits that are forgone.

Opportunity Cost of an Additional Year of School

TABLE 9-1 Opportunity Cost of an Additional Year of School

Explicit cost		Implicit cost	
Tuition	$7,000	Forgone salary	$35,000
Books and supplies	1,000		
Computer	1,500		
Total explicit cost	**9,500**	**Total implicit cost**	**35,000**
Total opportunity cost = Total explicit cost + Total implicit cost = $44,500			

FOR INQUIRING MINDS

Famous College Dropouts

- What do Bill Gates, Tiger Woods, and Madonna have in common? None of them have a college degree.
- Each of them made a rational decision that the implicit cost of getting a degree would have been too high.
  - By their late teens, each had a very promising career that would have to be put on hold to get a college degree.
- It's a simple matter of economics: the opportunity cost of their time at that stage in their lives was just too high to postpone their careers for a college degree.

Accounting Profit Versus Economic Profit

- The **accounting profit** of a business is the business's revenue minus the explicit costs and depreciation.

- The **economic profit** of a business is the business's revenue minus the opportunity cost of its resources. It is often less than the accounting profit.

Its all about the numbers…

'I've done the numbers, and I will marry you.

Capital

- The **capital** of a business is the value of its assets—equipment, buildings, tools, inventory, and financial assets.

- The **implicit cost of capital** is the opportunity cost of the capital used by a business—the income the owner could have realized from that capital if it had been used in its next best alternative way.

"How Much" Versus "Either–Or" Decisions

TABLE 9-3 "How Much" versus "Either–Or" Decisions

"Either–or" decisions	"How much" decisions
Tide or Cheer?	How many days before you do your laundry?
Buy a car or not?	How many miles do you go before an oil change in your car?
An order of nachos or a sandwich?	How many jalapenos on your nachos?
Run your own business or work for someone else?	How many workers should you hire in your company?
Prescribe drug A or drug B for your patients?	How much should a patient take of a drug that generates side effects?
Graduate school or not?	How many hours to study?

ECONOMICS IN ACTION

Farming in the Shadow of Suburbia

- In 1880, more than half of New England's land was farmed; by 2006, the amount was down to 10%.

- The remaining farms of New England are mainly located close to large metropolitan areas.
  - Farmers get high prices for their produce from city dwellers who are willing to pay a premium for locally grown, extremely fresh fruits and vegetables.

ECONOMICS IN ACTION

Farming in the Shadow of Suburbia

- Maintaining the land instead of selling it to property developers constitutes a large implicit cost of capital.

- About two-thirds of New England's farms remaining in business earn very little money but, nevertheless, are maintained out of a personal commitment and satisfaction derived from farm life.

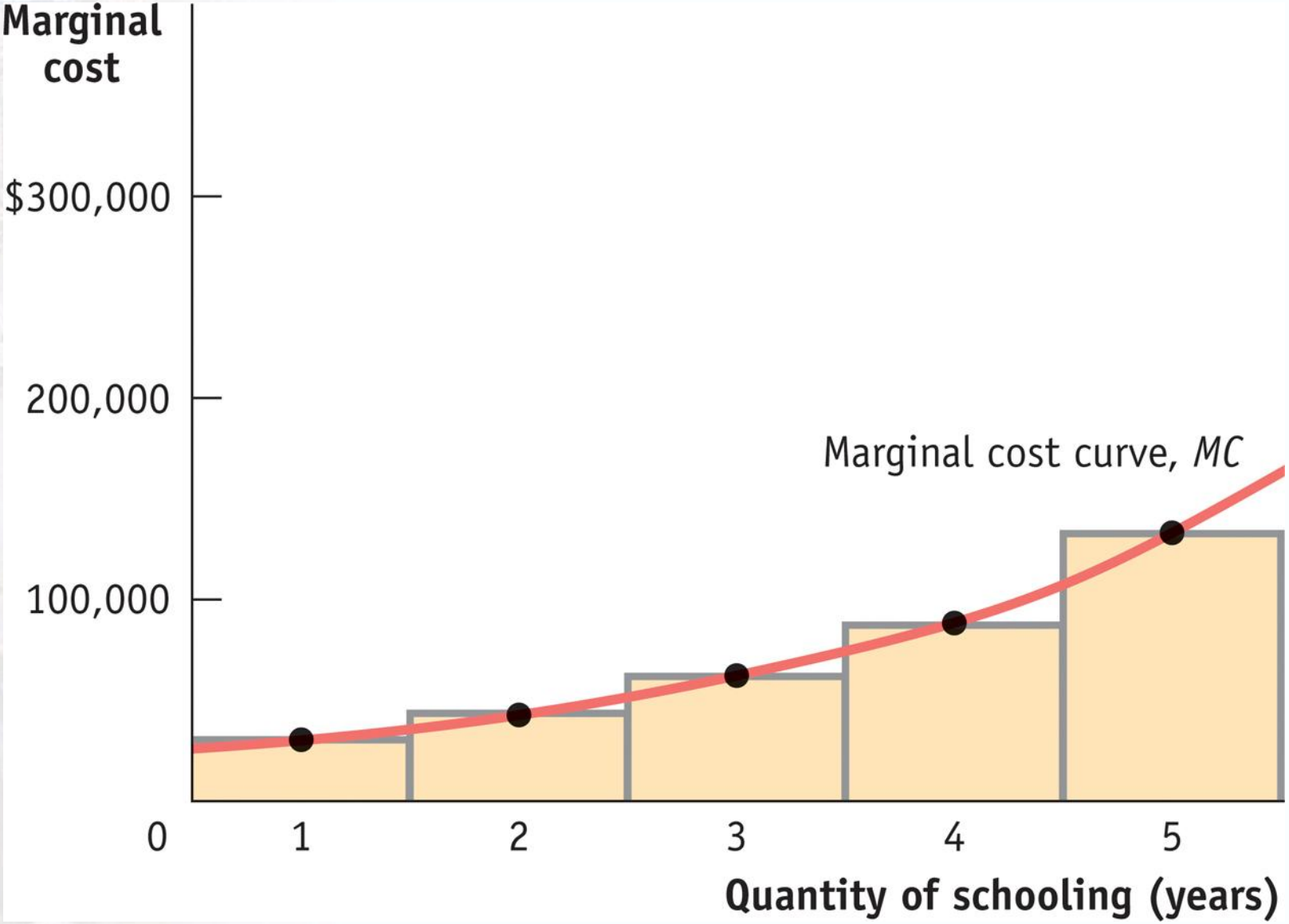
Marginal Cost

The **marginal cost** of producing a good or service is the additional cost incurred by producing one more unit of that good or service.

TABLE 9-4 Alex's Marginal Cost of Additional Years in School

Quantity of schooling (years)	Total cost	Marginal cost
0	$0	
		$30,000
1	30,000	
		40,000
2	70,000	
		60,000
3	130,000	
		90,000
4	220,000	
		130,000
5	350,000	

Increasing Marginal Cost



Marginal Cost

- **Constant marginal cost** occurs when the cost of producing an additional unit is the same as the cost of producing the previous unit.
- **Decreasing marginal cost**: This arises when marginal cost falls as the number of units produced increases.
  - Decreasing marginal cost is often due to *learning effects* in production: in complicated tasks (such as assembling a new model of a car), workers are often slow and mistake-prone in making the earliest units, making for higher marginal cost on those units.
  - But as workers gain experience, assembly time and the rate of mistakes fall, generating lower marginal cost for later units. As a result, overall production has decreasing marginal cost.

Pitfalls

Total cost versus marginal cost

- It can be easy to wrongly conclude that marginal cost and total cost must always move in the same direction.

- What is true is that total cost increases whenever marginal cost is positive, regardless of whether it is increasing or decreasing.

Marginal Benefit

The **marginal benefit** of producing a good or service is the additional benefit earned from producing one more unit of that good or service.

TABLE 9-5 Alex's Marginal Benefit of Additional Years in School

Quantity of schooling (years)	Total benefit	Marginal benefit
0	$0	
		$300,000
1	300,000	
		150,000
2	450,000	
		90,000
3	540,000	
		60,000
4	600,000	
		50,000
5	650,000	

Marginal Cost — Marginal Benefit

- The marginal cost curve shows how the cost of producing one more unit depends on the quantity that has already been produced.

- Production of a good or service has increasing marginal cost when each additional unit costs more to produce than the previous one.

Marginal Cost — Marginal Benefit

- The marginal benefit of a good or service is the additional benefit derived from producing one more unit of that good or service.

- The marginal benefit curve shows how the benefit from producing one more unit depends on the quantity that has already been produced.

Decreasing Marginal Benefit

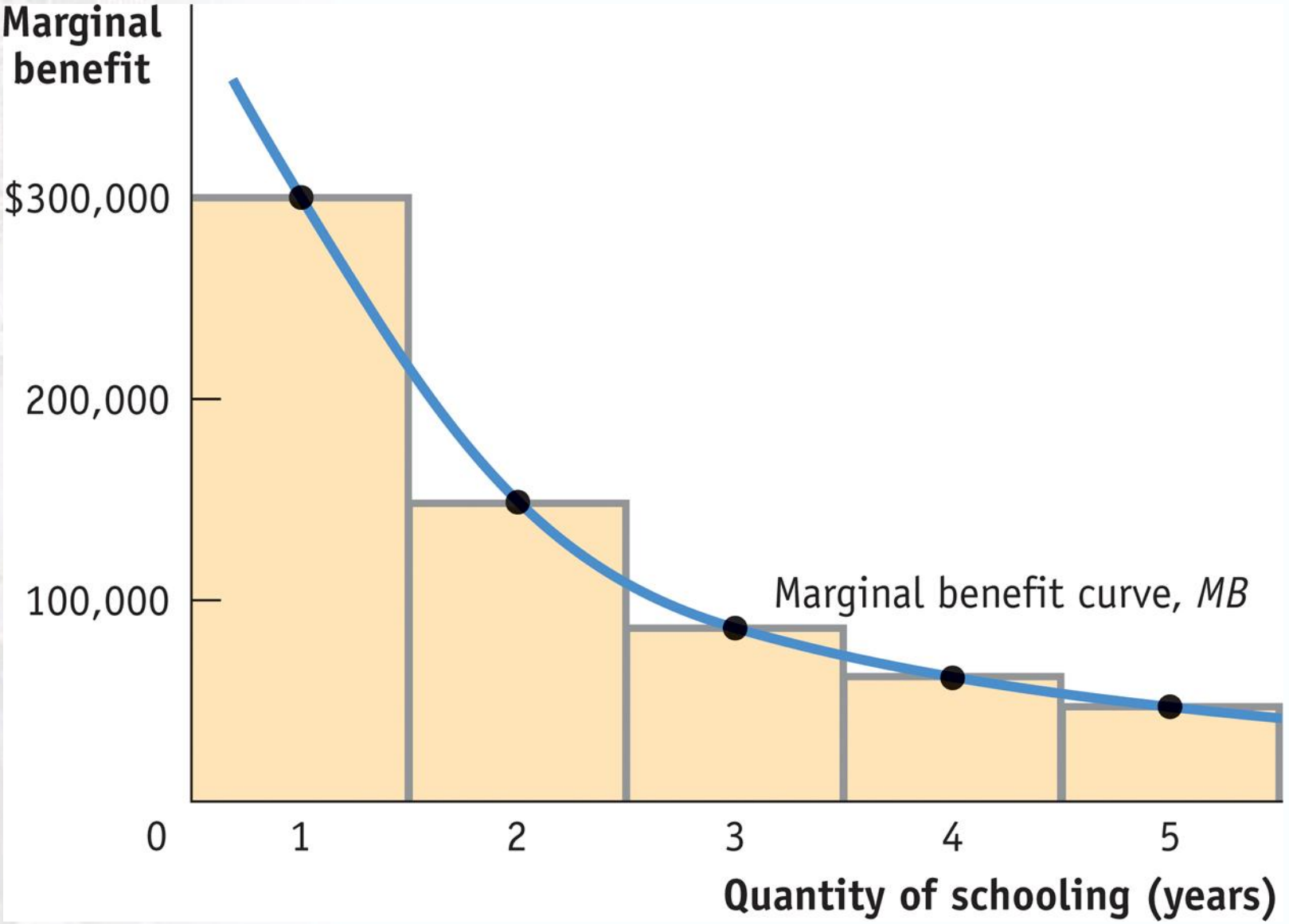
- Each additional lawn mowed produces less benefit than the previous lawn → with decreasing marginal benefit, each additional unit produces less benefit than the unit before.

- There is **decreasing marginal benefit** from an activity when each additional unit of the activity produces less benefit than the previous unit.

Felix's Net Gain from Mowing Lawns

Quantity of lawns mowed	Felix's marginal benefit of lawn mowed	Felix's marginal cost of lawn mowed	Felix's net gain of lawn mowed
0			
	\$35.00	\$10.50	\$24.50
1			
	30.00	11.25	18.75
2			
	26.00	13.25	12.75
3			
	23.00	15.50	7.50
4			
	21.00	18.00	3.00
5			
	19.00	20.75	–1.75
6			
	18.00	23.75	–5.75
7			

Decreasing Marginal Benefit



Marginal Analysis

- The **optimal quantity** is the quantity that generates the maximum possible total net gain.

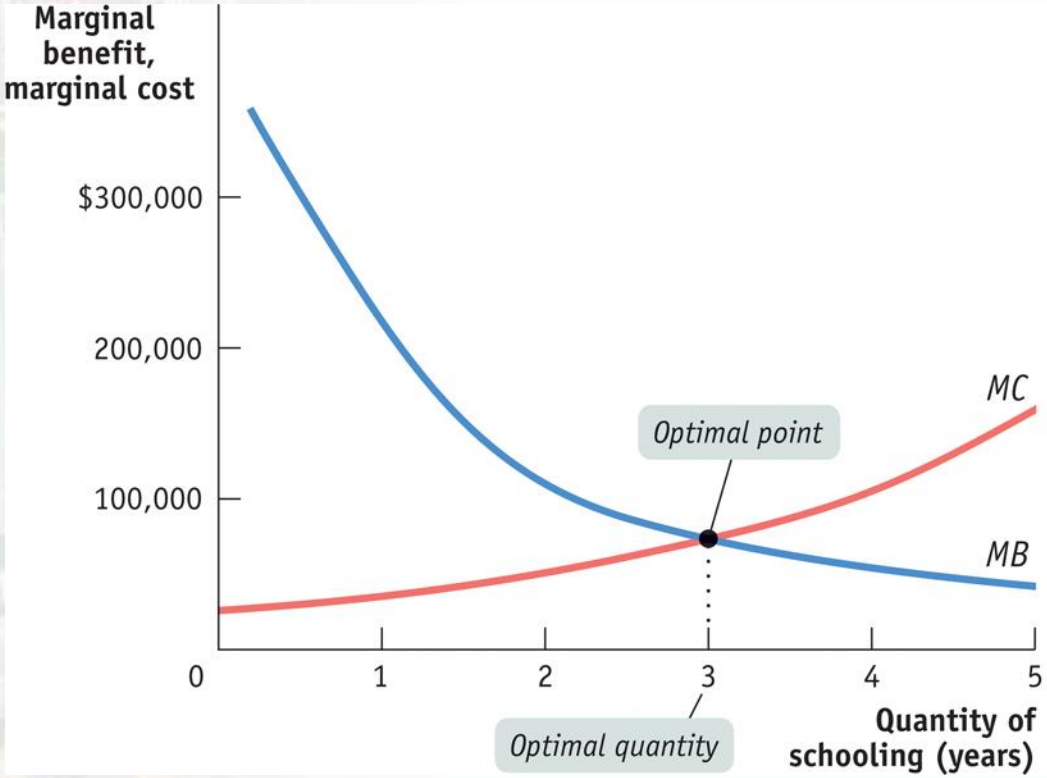
- The **principle of marginal analysis** says that the optimal quantity is the quantity at which marginal benefit is equal to marginal cost.

Alex's Net Profit from Increasing Years of Schooling

TABLE 9-6 Alex's Profit from Additional Years of Schooling

Quantity of schooling (years)	Marginal benefit	Marginal cost	Additional profit
0			
	$300,000	$30,000	$270,000
1			
	150,000	40,000	110,000
2			
	90,000	60,000	30,000
3			
	60,000	90,000	–30,000
4			
	50,000	130,000	–80,000
5			

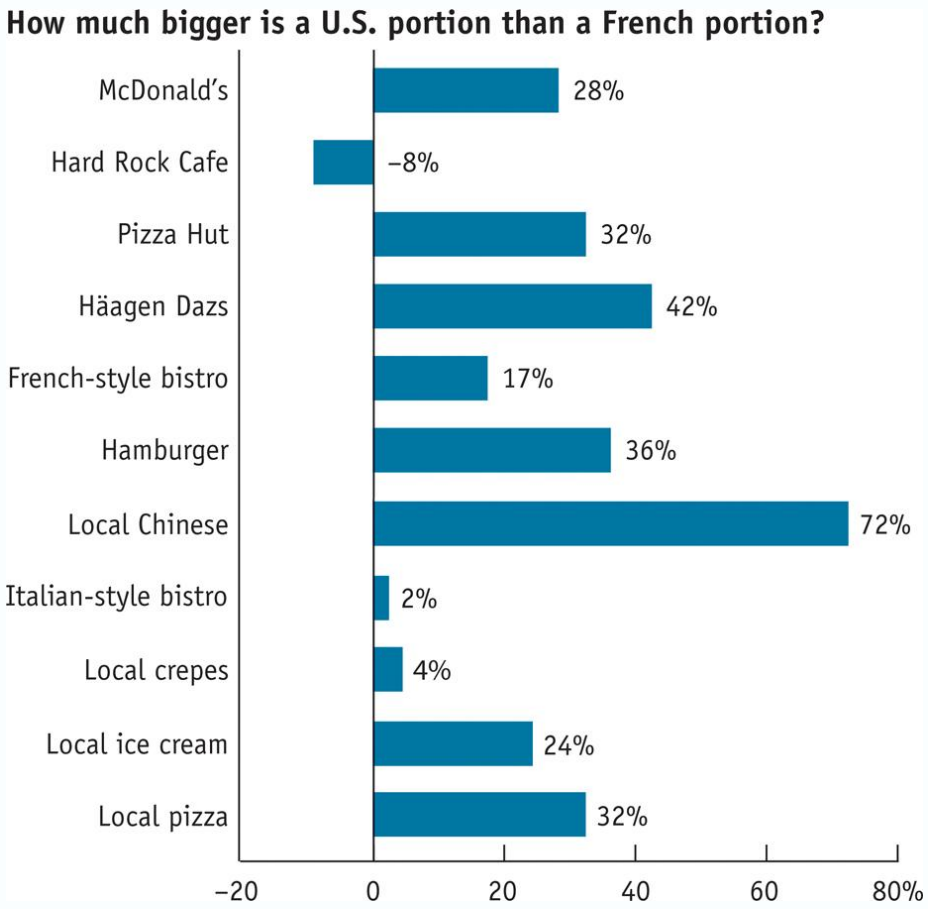
Marginal Analysis and Optimal Quantity



Quantity of schooling (years)	Additional profit	Total profit
0		$0
1	$270,000	270,000
2	110,000	380,000
3	30,000	410,000
4	−30,000	380,000
5	−80,000	300,000

Global Comparison: Portion Sizes

- Health experts call it the “French Paradox.” The French diet is, on average, higher in fat than the American diet. Yet the French themselves are considerably thinner than the Americans.
- What’s the secret? It seems that the French simply eat less, largely because they eat smaller portions.
- Why are American portions so big? Because food is cheaper in the United States.
- At the margin, it makes sense for restaurants to offer big portions, since the additional cost of enlarging a portion is relatively small.



Pitfalls

Muddled at the Margin

- The idea of setting marginal benefit equal to marginal cost sometimes confuses people.
- The point is to maximize the total net gain from an activity. If the marginal benefit from the activity is greater than the marginal cost, doing a bit less will increase the total net gain.
- So only when the marginal benefit and marginal cost are equal is the difference between total benefit and total cost at a maximum.

A Principle with Many Uses

- The profit-maximizing principle of marginal analysis can be applied to just about any “how much” decision.
- It is equally applicable to production decisions, consumption decisions, and policy decisions.
- Furthermore, decisions where the benefits and costs are not expressed in dollars and cents can also be made using marginal analysis (as long as benefits and costs can be measured in some type of common units).

ECONOMICS IN ACTION

The Cost of a Life

- What's the marginal benefit to society of saving a human life? In the real world, resources are scarce, so we must decide how much to spend on saving lives since we cannot spend infinite amounts.

- The U.K. government once estimated that improving rail safety would cost an additional $4.5 million per life saved.
  - But if that amount was worth spending, then the implication was that the British government was spending far too little on traffic safety.

The Cost of a Life

- That's because the estimated marginal cost per life saved through highway improvements was only $1.5 million, making it a much better deal than saving lives through greater rail safety.

Sunk Cost

- A **sunk cost** is a cost that has already been incurred and is nonrecoverable.

- Sunk costs should be ignored in making decisions about future actions.
  - Because they have already been incurred and are nonrecoverable, they have no effect on future costs and benefits.

- "There's no use crying over spilled milk."

ECONOMICS IN ACTION

A Billion Here, a Billion There…

- If there's any industry that exemplifies the principle that sunk costs don’t matter, it has to be the biotech industry.
  - These firms use cutting-edge bioengineering techniques to combat disease.
- It takes about seven to eight years, on average, to develop and bring a new drug to the market.
  - There is also a huge failure rate along the way.

ECONOMICS IN ACTION

A Billion Here, a Billion There…

- Since 1981, Xoma company has never earned a profit on one of its own drugs and has burned through more than $700 million dollars.
- Xoma keeps going because it possesses a very promising technology and because shrewd investors understand the principle of sunk costs.

Behavioral Economics

- Rather than act like "economic computing machines," people often make choices that fall short – sometimes far short – of the greatest possible economic outcome, or payoff.
  - Why people sometimes make less-than-perfect choices is the subject of behavioral economics, a branch of economics that combines economic modeling with insights from human psychology.

- It's well documented that people consistently engage in *irrational* behavior – choosing an option that leaves them worse off than other, available options.
  - Yet, sometimes it's entirely *rational* for people to make a choice that is different from the one that generates the highest possible economic payoff for themselves.

Rational, But Human, Too

- If you are **rational,** you will choose the available option that leads to the outcome you most prefer.
- But is the outcome you most prefer always the same as the one that gives you the greatest possible economic payoff? No.
- It can be entirely rational to choose an option that gives you a lower economic payoff because you care about something other than the size of the economic payoff to yourself.

Rational, But Human, Too

- Reasons why people might prefer a lower economic payoff:
  - **concerns about fairness:** examples: tip giving, gifting
  - **bounded rationality:** making a choice that is close to but not exactly the one that leads to the greatest possible economic payoff because the effort of finding the best payoff is too costly; the “good enough” method of decision-making
  - **risk aversion:** willingness to sacrifice some economic payoff in order to avoid a potential loss.

Irrationality: an Economist's View

- Sometimes, instead of being rational, people are **irrational** – they make choices that leave them worse off than if they had chosen another available option.

- Is there anything systematic that economists and psychologists can say about economically irrational behavior?
  - Yes, because most people are irrational in predictable ways.

- People's irrational behavior stems from six mistakes they typically make when thinking about economic decisions.

Common Mistakes In Decision Making

TABLE 9-7 The Six Common Mistakes in Economic Decision Making

1. Misperceiving opportunity costs
2. Being overconfident
3. Having unrealistic expectations about future behavior
4. Counting dollars unequally
5. Being loss-averse
6. Having a bias toward the status quo

ECONOMICS IN ACTION

The Jingle Mail Blues

- It's called jingle mail – when a homeowner seals the keys to the house in an envelope and sends them to the bank that holds the mortgage loan on the house.
  - He or she is also walking away from the obligation to continue paying the mortgage.

ECONOMICS IN ACTION

The Jingle Mail Blues

- In recent years, an entirely different phenomenon has appeared – what is called a “strategic default” by homeowners.
  - In a strategic default, a homeowner is financially capable of paying the mortgage, but chooses not to.
  - In March 2010, strategic default accounted for 31% of all foreclosures, up from 22% in 2009.
  - And there is little indication that number will change dramatically.

ECONOMICS IN ACTION

The Jingle Mail Blues

- What happened? The Great American Housing Bust happened.

- Prices dropped and many homeowners found their homes “underwater”– they owed more money on their homes than they were worth.

ECONOMICS IN ACTION

The Jingle Mail Blues

- Since it appeared that there would be little chance that the value would move “above water” in the foreseeable future, they realized their losses were sunk costs and simply walked away.

- Perhaps they hadn’t made the best economics decision when they purchased their houses, but leaving them showed impeccable economic logic.

VIDEO

TED TALK: Dan Ariely asks: “Are we in control of our own decisions?”: http://www.ted.com/talks/dan_ariely_asks_are_we_in_control_of_our_own_decisions.html

Summary

SUMMARY

1. All economic decisions involve the allocation of scarce resources. Some decisions are “either–or” decisions, in which the question is whether or not to do something. Other decisions are “how much” decisions, in which the question is how much of a resource to put into a given activity.

Summary

SUMMARY

2. The cost of using a resource for a particular activity is the opportunity cost of that resource.

   Some opportunity costs are **explicit costs**; they involve a direct payment of cash. Other opportunity costs, however, are **implicit costs**; they involve no outlay of money but represent the inflows of cash that are forgone.

   Both explicit and implicit costs should be taken into account in making decisions.

Summary

SUMMARY

Companies use **capital** and their owners' time. So companies should base decisions on **economic profit**, which takes into account implicit costs such as the opportunity cost of the owners' time and the **implicit cost of capital**.

The **accounting profit**, which companies calculate for the purposes of taxes and public reporting, is often considerably larger than the economic profit because it includes only explicit costs and depreciation, not implicit costs.

Summary

SUMMARY

3. According to the principle of either-or decision-making, when faced with an either-or choice between two projects, one should choose the project with the positive economic profit.

Summary

SUMMARY

4. A “how much” decision is made using marginal analysis, which involves comparing the benefit to the cost of doing an additional unit of an activity.

   The **marginal cost** of producing a good or service is the additional cost incurred by producing one more unit of that good or service.

   The **marginal benefit** of producing a good or service is the additional benefit earned by producing one more unit.

   The **marginal cost curve** is the graphical illustration of marginal cost, and the **marginal benefit curve** is the graphical illustration of marginal benefit.

Summary

SUMMARY

5. In the case of **constant marginal cost**, each additional unit costs the same amount to produce as the unit before; this is represented by a horizontal marginal cost curve.

   However, marginal cost and marginal benefit typically depend on how much of the activity has already been done.

   With **increasing marginal cost**, each unit costs more to produce than the unit before, represented by an upward-sloping marginal cost curve.

   In the case of **decreasing marginal benefit**, each additional unit produces a smaller benefit than the unit before, represented by a downward-sloping marginal benefit curve.

Summary

SUMMARY

6. The **optimal quantity** is the quantity that generates the maximum possible total net gain.

   According to the **principle of marginal analysis**, the optimal quantity is the quantity at which marginal benefit is greater than or equal to marginal cost. It is the quantity at which the marginal cost curve and the marginal benefit curve intersect.

Summary

SUMMARY

7. A cost that has already been incurred and that is nonrecoverable is a **sunk cost**. Sunk costs should be ignored in decisions about future actions.

8. With **rational behavior,** individuals will choose the available option that leads to the outcome they prefer the most.

   Bounded rationality occurs because the effort needed to find the greatest economic payoff is costly.

   Risk aversion causes individuals to sacrifice some economic payoff in order to avoid a potential loss.

Summary

SUMMARY

9. **Irrational behavior** occurs because of misperceptions of opportunity costs, unrealistic expectations about the future, and overconfidence.

   Mental accounting, where some dollars are perceived to be more valuable than other dollars, can also cause irrational behavior.

   Loss aversion and **status quo bias** can also lead to choices that leave people worse off than they would otherwise be if they chose another available option.

KEY TERMS

KEY TERM

- Explicit cost
- Implicit cost
- Accounting profit
- Economic profit
- Capital
- Implicit cost of capital
- Marginal cost
- Increasing marginal cost
- Marginal cost curve
- Constant marginal cost
- Marginal benefit
- Decreasing marginal benefit
- Marginal benefit curve
- Optimal quantity
- Principle of marginal analysis
- Sunk cost
- Interest rate
- Rational
- Bounded rationality
- Risk aversion
- Irrational
- Mental accounting
- Status quo bias