Chapter 2

Introduction to Choice in a World of Scarcity

You will learn quickly when you examine the relationship between economics and scarcity that choices involve tradeoffs. Every choice has a cost. In 1968, the Rolling Stones recorded "You Can't Always Get What You Want." Economists chuckled, because they had been singing a similar tune for decades. English economist Lionel Robbins (1898–1984), in his Essay on the Nature and Significance of Economic Science in 1932, described not always getting what you want in this way:

> The time at our disposal is limited. There are only twenty-four hours in the day. We have to choose between the different uses to which they may be put. ... Everywhere we turn, if we choose one thing, we must relinquish others which, in different circumstances, we would wish not to have relinquished. Scarcity of means to satisfy given ends is an almost ubiquitous condition of human nature.

Because people live in a world of scarcity, they cannot have all the time, money, possessions, and experiences they wish. Neither can society.

This chapter will continue our discussion of scarcity and the economic way of thinking by first introducing three critical concepts: opportunity cost, marginal decision making, and diminishing returns. Later, it will consider whether the economic way of thinking accurately describes either how we make choices and how we should make them.

2.1 How Individuals Make Choices Based on Their Budget Constraint

Consider the typical consumer's budget problem. Consumers have a limited amount of income to spend on the things they need and want. Suppose Alphonso has $10 in spending money each week that he can allocate between bus tickets for getting to work and the burgers that he eats for lunch. Burgers cost $2 each, and bus tickets are 50 cents each.

The Alphonso's Consumption Choice Opportunity budget constraint represents a combination of burgers and bus tickets whose total cost adds up to Alphonso's budget of $10. The relative price of burgers and bus tickets determines the slope of the budget constraint. All along the budget set, giving up one burger means gaining four bus tickets. If Alphonso spends all his money on burgers, he can afford five per week. ($10 per week/$2 per burger = 5 burgers per week.) However, if he does this, he will not be able to afford any bus tickets. Alternatively, if Alphonso spends all his money on bus tickets, he can afford 20 per week. ($10 per week/$0.50 per bus ticket = 20 bus tickets per week.) Then, however, he will not be able to afford any burgers. There are a variety of combinations of burgers and bus tickets Alphonso can afford, given the price of the two goods and his budget amount. If Alphonso is like most people, he will choose some combination that includes both bus tickets and burgers. That is, he will choose some combination on the budget constraint.

The Concept of Opportunity Cost

Economists use the term opportunity cost to indicate what people must give up to obtain what they desire. The idea behind opportunity cost is that the cost of one item is the lost opportunity to do or consume something else. In short, opportunity cost is the value of the next best alternative. For Alphonso, the opportunity cost of a burger is the four bus tickets he would have to give up. He would decide whether or not to choose the burger depending on whether the value of the burger exceeds the value of the forgone alternative—in this case, bus tickets. Since people must choose, they inevitably face tradeoffs in which they have to give up things they desire to obtain other things they desire more.

A fundamental principle of economics is that every choice has an opportunity cost. If you sleep through your economics class, the opportunity cost is the learning you miss from not attending class. If you spend your income on video games, you cannot spend it on movies. If you choose to marry one person, you give up the opportunity to marry anyone else. In short, opportunity cost is all around us and part of human existence.

Identifying Opportunity Cost

In many cases, it is reasonable to refer to the opportunity cost as the price. If your cousin buys a new bicycle for $300, then $300 measures the amount of "other consumption" that he has forsaken. For practical purposes, there may be no special need to identify the specific alternative product or products that he could have bought with that $300, but sometimes the price as measured in dollars may not accurately capture the true opportunity cost. This problem can loom especially large when costs of time are involved.

For example, consider a boss who decides that all employees will attend a two-day retreat to "build team spirit." The out-of-pocket monetary cost of the event may involve hiring an outside consulting firm to run the retreat, as well as room and board for all participants. However, an opportunity cost exists as well: during the two days of the retreat, none of the employees are doing any other work.

Attending college is another case where the opportunity cost exceeds the monetary cost. The out-of-pocket costs of attending college include tuition, books, room and board, and other expenses. However, in addition, during the hours that you are attending class and studying, it is impossible to work at a paying job. Thus, college imposes both an out-of-pocket cost and an opportunity cost of lost earnings.

In some cases, realizing the opportunity cost can alter behavior. Imagine, for example, that you spend $8 on lunch every day at work. You may know perfectly well that bringing a lunch from home would cost only $3 a day, so the opportunity cost of buying lunch at the restaurant is $5 each day (that is, the $8 buying lunch costs minus the $3 your lunch from home would cost). Five dollars each day does not seem to be that much. However, if you project what that adds up to in a year—250 days a year × $5 per day equals $1,250, the cost, perhaps, of a decent vacation. If you describe the opportunity cost as "a nice vacation" instead of "$5 a day, " you might make different choices.

Marginal Decision-Making and Diminishing Marginal Utility

The budget constraint framework helps to emphasize that most choices in the real world are not about getting all of one thing or all of another; that is, they are not about choosing either the point at one end of the budget constraint or else the point all the way at the other end. Instead, most choices involve marginal analysis, which means examining the benefits and costs of choosing a little more or a little less of a good. People naturally compare costs and benefits, but often we look at total costs and total benefits, when the optimal choice necessitates comparing how costs and benefits change from one option to another. You might think of marginal analysis as "change analysis." Marginal analysis is used throughout economics.

We now turn to the notion of utility. People desire goods and services for the satisfaction or utility those goods and services provide. Utility, as we will see in the chapter on Consumer Choices, is subjective but that does not make it less real. Economists typically assume that the more of some good one consumes (for example, slices of pizza), the more utility one obtains. At the same time, the utility a person receives from consuming the first unit of a good is typically more than the utility received from consuming the fifth or the tenth unit of that same good. When Alphonso chooses between burgers and bus tickets, for example, the first few bus rides that he chooses might provide him with a great deal of utility—perhaps they help him get to a job interview or a doctor's appointment. However, later bus rides might provide much less utility—they may only serve to kill time on a rainy day. Similarly, the first burger that Alphonso chooses to buy may be on a day when he missed breakfast and is ravenously hungry. However, if Alphonso has multiple burgers every day, the last few burgers may taste pretty boring. The general pattern that consumption of the first few units of any good tends to bring a higher level of utility to a person than consumption of later units is a common pattern. Economists refer to this pattern as the law of diminishing marginal utility, which means that as a person receives more of a good, the additional (or marginal) utility from each additional unit of the good declines. In other words, the first slice of pizza brings more satisfaction than the sixth.

The law of diminishing marginal utility explains why people and societies rarely make all-or-nothing choices. You would not say, "My favorite food is ice cream, so I will eat nothing but ice cream from now on." Instead, even if you get a very high level of utility from your favorite food, if you ate it exclusively, the additional or marginal utility from those last few servings would not be very high. Similarly, most workers do not say: "I enjoy leisure, so I'll never work." Instead, workers recognize that even though some leisure is very nice, a combination of all leisure and no income is not so attractive. The budget constraint framework suggests that when people make choices in a world of scarcity, they will use marginal analysis and think about whether they would prefer a little more or a little less. A rational consumer would only purchase additional units of some product as long as the marginal utility exceeds the opportunity cost. Suppose Alphonso moves down his budget constraint from Point A to Point B to Point C and further. As he consumes more bus tickets, the marginal utility of bus tickets will diminish, while the opportunity cost, that is, the marginal utility of foregone burgers, will increase. Eventually, the opportunity cost will exceed the marginal utility of an additional bus ticket. If Alphonso is rational, he won't purchase more bus tickets once the marginal utility just equals the opportunity cost. While we can't (yet) say exactly how many bus tickets Alphonso will buy, that number is unlikely to be the most he can afford, 20.

Sunk Costs

In the budget constraint framework, all decisions involve what will happen next: that is, what quantities of goods will you consume, how many hours will you work, or how much will you save. These decisions do not look back to past choices. Thus, the budget constraint framework assumes that sunk costs, which are costs that were incurred in the past and cannot be recovered, should not affect the current decision.

Consider the case of Selena, who pays $8 to see a movie, but after watching the film for 30 minutes, she knows that it is truly terrible. Should she stay and watch the rest of the movie because she paid for the ticket, or should she leave? The money she spent is a sunk cost, and unless the theater manager is sympathetic, Selena will not get a refund. However, staying in the movie still means paying an opportunity cost in time. Her choice is whether to spend the next 90 minutes suffering through a cinematic disaster or to do something—anything—else. The lesson of sunk costs is to forget about the money and time that is irretrievably gone and instead to focus on the marginal costs and benefits of current and future options.

For people and firms alike, dealing with sunk costs can be frustrating. It often means admitting an earlier error in judgment. Many firms, for example, find it hard to give up on a new product that is doing poorly because they spent so much money in creating and launching the product. However, the lesson of sunk costs is to ignore them and make decisions based on what will happen in the future.

From a Model with Two Goods to One of Many Goods

The budget constraint diagram containing just two goods, like most models used in this book, is not realistic. After all, in a modern economy people choose from thousands of goods. However, thinking about a model with many goods is a straightforward extension of what we discussed here. Instead of drawing just one budget constraint, showing the tradeoff between two goods, you can draw multiple budget constraints, showing the possible tradeoffs between many different pairs of goods. In more advanced classes in economics, you would use mathematical equations that include many possible goods and services that can be purchased, together with their quantities and prices, and show how the total spending on all goods and services is limited to the overall budget available. The graph with two goods that we presented here clearly illustrates that every choice has an opportunity cost, which is the point that does carry over to the real world.

2.2 The Production Possibilities Frontier and Social Choices

Just as individuals cannot have everything they want and must instead make choices, society as a whole cannot have everything it might want, either. This section of the chapter will explain the constraints society faces, using a model called the production possibilities frontier (PPF). There are more similarities than differences between individual choice and social choice. As you read this section, focus on the similarities.

Because society has limited resources (e.g., labor, land, capital, raw materials) at any point in time, there is a limit to the quantities of goods and services it can produce. Suppose a society desires two products, healthcare and education. The production possibilities frontier in Figure 2.3 illustrates this situation.

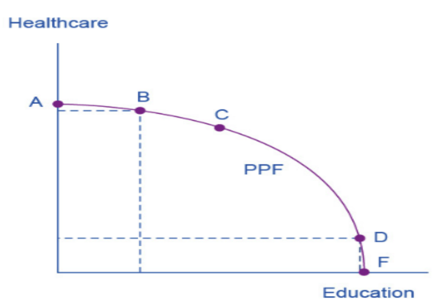

FIGURE 2.3
A Healthcare vs. Education Production Possibilities Frontier This production possibilities frontier shows a tradeoff between devoting social resources to healthcare and devoting them to education. At A all resources go to healthcare and at B, most go to healthcare. At D most resources go to education, and at F, all go to education.

Figure 2.3 shows healthcare on the vertical axis and education on the horizontal axis. If the society were to allocate all of its resources to healthcare, it could produce at point A. However, it would not have any resources to produce education. If it were to allocate all of its resources to education, it could produce at point F. Alternatively, the society could choose to produce any combination of healthcare and education on the production possibilities frontier. In effect, the production possibilities frontier plays the same role for society as the budget constraint plays for Alphonso. Society can choose any combination of the two goods on or inside the PPF. However, it does not have enough resources to produce outside the PPF.

Most importantly, the production possibilities frontier clearly shows the tradeoff between healthcare and education. Suppose society has chosen to operate at point B, and it is considering producing more education. Because the PPF is downward sloping from left to right, the only way society can obtain more education is by giving up some healthcare. That is the tradeoff society faces. Suppose it considers moving from point B to point C. What would the opportunity cost be for the additional education? The opportunity cost would be the healthcare society has to forgo. Just as with Alphonso's budget constraint, the slope of the production possibilities frontier shows the opportunity cost.

Productive Efficiency and Allocative Efficiency

The study of economics does not presume to tell a society what choice it should make along its production possibilities frontier. In a market-oriented economy with a democratic government, the choice will involve a mixture of decisions by individuals, firms, and government. However, economics can point out that some choices are unambiguously better than others. This observation is based on the concept of efficiency. In everyday usage, efficiency refers to lack of waste. An inefficient machine operates at high cost, while an efficient machine operates at lower cost, because it is not wasting energy or materials. An inefficient organization operates with long delays and high costs, while an efficient organization meets schedules, is focused, and performs within budget. The production possibilities frontier can illustrate two kinds of efficiency: productive efficiency and allocative efficiency.

Productive efficiency means that, given the available inputs and technology, it is impossible to produce more of one good without decreasing the quantity that is produced of another good. As a firm moves from any one of these choices to any other, either healthcare increases and education decreases or vice versa. However, any choice inside the production possibilities frontier is productively inefficient and wasteful because it is possible to produce more of one good, the other good, or some combination of both goods.

Allocative efficiency means that the particular combination of goods and services on the production possibility curve that a society produces represents the combination that society most desires. How to determine what a society desires can be a controversial question, and is usually a discussion in political science, sociology, and philosophy classes as well as in economics. At its most basic, allocative efficiency means producers supply the quantity of each product that consumers demand. Only one of the productively efficient choices will be the allocatively efficient choice for society as a whole.

Why Society Must Choose

In Welcome to Economics! we learned that every society faces the problem of scarcity, where limited resources conflict with unlimited needs and wants. The production possibilities curve illustrates the choices involved in this dilemma.

Every economy faces two situations in which it may be able to expand consumption of all goods. In the first case, a society may discover that it has been using its resources inefficiently, in which case by improving efficiency and producing on the production possibilities frontier, it can have more of all goods (or at least more of some and less of none). In the second case, as resources grow over a period of years (e.g., more labor and more capital), the economy grows. As it does, the production possibilities frontier for a society will tend to shift outward and society will be able to afford more of all goods. In addition, over time, improvements in technology can increase the level of production with given resources, and hence push out the PPF.

However, improvements in productive efficiency take time to discover and implement, and economic growth happens only gradually. Thus, a society must choose between tradeoffs in the present. For government, this process often involves trying to identify where additional spending could do the most good and where reductions in spending would do the least harm. At the individual and firm level, the market economy coordinates a process in which firms seek to produce goods and services in the quantity, quality, and price that people want. However, for both the government and the market economy in the short term, increases in production of one good typically mean offsetting decreases somewhere else in the economy.

The PPF and Comparative Advantage

While every society must choose how much of each good or service it should produce, it does not need to produce every single good it consumes. Often how much of a good a country decides to produce depends on how expensive it is to produce it versus buying it from a different country. As we saw earlier, the curvature of a country's PPF gives us information about the tradeoff between devoting resources to producing one good versus another. In particular, its slope gives the opportunity cost of producing one more unit of the good in the x-axis in terms of the other good (in the y-axis). Countries tend to have different opportunity costs of producing a specific good, either because of different climates, geography, technology, or skills.

Suppose two countries, the US and Brazil, need to decide how much they will produce of two crops: sugar cane and wheat. Due to its climatic conditions, Brazil can produce quite a bit of sugar cane per acre but not much wheat. Conversely, the U.S. can produce large amounts of wheat per acre, but not much sugar cane. Clearly, Brazil has a lower opportunity cost of producing sugar cane (in terms of wheat) than the U.S. The reverse is also true: the U.S. has a lower opportunity cost of producing wheat than Brazil.

When a country can produce a good at a lower opportunity cost than another country, we say that this country has a comparative advantage in that good. Comparative advantage is not the same as absolute advantage, which is when a country can produce more of a good. In our example, Brazil has an absolute advantage in sugar cane and the U.S. has an absolute advantage in wheat. One can easily see this with a simple observation of the extreme production points in the PPFs of the two countries. If Brazil devoted all of its resources to producing wheat, it would be producing at point A. If however it had devoted all of its resources to producing sugar cane instead, it would be producing a much larger amount than the U.S., at point B.

The slope of the PPF gives the opportunity cost of producing an additional unit of wheat. While the slope is not constant throughout the PPFs, it is quite apparent that the PPF in Brazil is much steeper than in the U.S., and therefore the opportunity cost of wheat is generally higher in Brazil. In the chapter on International Trade you will learn that countries' differences in comparative advantage determine which goods they will choose to produce and trade. When countries engage in trade, they specialize in the production of the goods in which they have comparative advantage, and trade part of that production for goods in which they do not have comparative advantage. With trade, manufacturers produce goods where the opportunity cost is lowest, so total production increases, benefiting both trading parties.

2.3 Confronting Objections to the Economic Approach

It is one thing to understand the economic approach to decision-making and another thing to feel comfortable applying it. The sources of discomfort typically fall into two categories: that people do not act in the way that fits the economic way of thinking, and that even if people did act that way, they should try not to. Let's consider these arguments in turn.

First Objection: People, Firms, and Society Do Not Act Like This

The economic approach to decision-making seems to require more information than most individuals possess and more careful decision-making than most individuals actually display. After all, do you or any of your friends draw a budget constraint and mutter to yourself about maximizing utility before you head to the shopping mall? Do members of the U.S. Congress contemplates production possibilities frontiers before they vote on the annual budget? The messy ways in which people and societies operate somehow doesn't look much like neat budget constraints or smoothly curving production possibilities frontiers.

However, the economics approach can be a useful way to analyze and understand the tradeoffs of economic decisions. To appreciate this point, imagine for a moment that you are playing basketball, dribbling to the right, and throwing a bounce-pass to the left to a teammate who is running toward the basket. A physicist or engineer could work out the correct speed and trajectory for the pass, given the different movements involved and the weight and bounciness of the ball. However, when you are playing basketball, you do not perform any of these calculations. You just pass the ball, and if you are a good player, you will do so with high accuracy.

Someone might argue: "The scientist's formula of the bounce-pass requires a far greater knowledge of physics and far more specific information about speeds of movement and weights than the basketball player actually has, so it must be an unrealistic description of how basketball passes actually occur." This reaction would be wrongheaded. The fact that a good player can throw the ball accurately because of practice and skill, without making a physics calculation, does not mean that the physics calculation is wrong.

Similarly, from an economic point of view, someone who shops for groceries every week has a great deal of practice with how to purchase the combination of goods that will provide that person with utility, even if the shopper does not phrase decisions in terms of a budget constraint. Government institutions may work imperfectly and slowly, but in general, a democratic form of government feels pressure from voters and social institutions to make the choices that are most widely preferred by people in that society. Thus, when thinking about the economic actions of groups of people, firms, and society, it is reasonable, as a first approximation, to analyze them with the tools of economic analysis. For more on this, read about behavioral economics in the chapter on Consumer Choices.

Second Objection: People, Firms, and Society Should Not Act This Way

The economics approach portrays people as self-interested. For some critics of this approach, even if self-interest is an accurate description of how people behave, these behaviors are not moral. Instead, the critics argue that people should be taught to care more deeply about others. Economists offer several answers to these concerns.

First, economics is not a form of moral instruction. Rather, it seeks to describe economic behavior as it actually exists. Philosophers draw a distinction between positive statements, which describe the world as it is, and normative statements, which describe how the world should be. Positive statements are factual. They may be true or false, but we can test them, at least in principle. Normative statements are subjective questions of opinion. We cannot test them since we cannot prove opinions to be true or false. They just are opinions based on one's values. For example, an economist could analyze a proposed subway system in a certain city. If the expected benefits exceed the costs, he concludes that the project is worthy—an example of positive analysis. Another economist argues for extended unemployment compensation during the COVID-19 pandemic because a rich country like the United States should take care of its less fortunate citizens—an example of normative analysis.

Even if the line between positive and normative statements is not always crystal clear, economic analysis does try to remain rooted in the study of the actual people who inhabit the actual economy. Fortunately however, the assumption that individuals are purely self-interested is a simplification about human nature. In fact, we need to look no further than to Adam Smith, the very father of modern economics to find evidence of this. The opening sentence of his book, The Theor y of Moral Sentiments, puts it very clearly: "How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it." Clearly, individuals are both self-interested and altruistic.

Second, we can label self-interested behavior and profit-seeking with other names, such as personal choice and freedom. The ability to make personal choices about buying, working, and saving is an important personal freedom. Some people may choose high-pressure, high-paying jobs so that they can earn and spend considerable amounts of money on themselves. Others may allocate large portions of their earnings to charity or spend it on their friends and family. Others may devote themselves to a career that can require much time, energy, and expertise but does not offer high financial rewards, like being an elementary school teacher or a social worker. Still others may choose a job that does consume much of their time or provide a high level of income, but still leaves time for family, friends, and contemplation. Some people may prefer to work for a large company; others might want to start their own business. People's freedom to make their own economic choices has a moral value worth respecting.

Third, self-interested behavior can lead to positive social results. For example, when people work hard to make a living, they create economic output. Consumers who are looking for the best deals will encourage businesses to offer goods and services that meet their needs. Adam Smith, writing in The Wealth of Nations, named this property the invisible hand. In describing how consumers and producers interact in a market economy, Smith wrote:

> Every individual…generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain. And he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention…By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it.

The metaphor of the invisible hand suggests the remarkable possibility that broader social good can emerge from selfish individual actions.

Fourth, even people who focus on their own self-interest in the economic part of their life often set aside their own narrow self-interest in other parts of life. For example, you might focus on your own self-interest when asking your employer for a raise or negotiating to buy a car. Then you might turn around and focus on other people when you volunteer to read stories at the local library, help a friend move to a new apartment, or donate money to a charity. Self-interest is a reasonable starting point for analyzing many economic decisions, without needing to imply that people never do anything that is not in their own immediate self-interest.