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PRINCIPAL 01.

Decisions in life are rarely black and white but usually involve shades of gray. When it's time for dinner, the decision you face is not between fasting or eating like a pig, but whether to take that extra spoonful of mashed potatoes. When exams roll around, your decision is not between blowing them off or studying 24 hours a day, but whether to spend an extra hour reviewing your notes instead of watching TV. Economists use the term marginal changes to describe small incremental adjustments to an existing plan of action. Keep in mind that "margin" means "edge," so marginal changes are adjustments around the edges of what you are doing. In many situations, people make the best decisions by thinking at the margin. Suppose, for instance, that you asked a friend for advice about how many years to stay in school. If he were to compare for you the lifestyle of a person with a Ph.D. to that of a grade school dropout, you might complain that this comparison is not helpful for your decision. You have some education already and most likely are deciding whether to spend an extra year or two in school. To make this decision, you need to know the additional benefits that an extra year in school would offer (higher wages throughout life and the sheer joy of learning) and the additional costs that you would incur (tuition and the forgone wages while you're in school). By comparing these marginal benefits and marginal costs, you can evaluate whether the extra year is worthwhile. As another example, consider an airline deciding how much to charge passengers who fly standby. Suppose that flying a 200-seat plane across the country costs the airline $100,000. In this case, the average cost of each seat which is One might be tempted to conclude that the airline should never sell a ticket for less than $500. In fact, however, the airline can raise its profits by thinking at the margin. Imagine that a plane is about to take off with ten empty seats, and a standby passenger is waiting at the gate willing to pay $300 for a seat. Should the airline sell it to him? Of course it should. If the plane has empty seats, the cost of adding one more passenger is minuscule. Although the average cost of flying a passenger is $500, the marginal cost is merely the cost of the bag of peanuts and can of soda that the extra passenger will consume. As long as the standby passenger pays more than the marginal cost, selling him a ticket is profitable. As these examples show, individuals and firms can make better decisions by thinking at the margin. Arational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost.

PRINCIPAL 02.

Because people make decisions by comparing costs and benefits, their behavior may change when the costs or benefits change. That is, people respond to incentives. When the price of an apple rises, for instance, people decide to eat more pears and fewer apples, because the cost of buying an apple is higher. At the same time, apple orchards decide to hire more workers and harvest more apples, because the benefit of selling an apple is also higher. As we will see, the effect of price on the behavior of buyers and sellers in a market—in this case, the market for apples—is crucial for understanding how the economy works. Public policymakers should never forget about incentives, for many policies change the costs or benefits that people face and, therefore, alter behavior. Atex on gasoline, for instance, encourages people to drive smaller, more fuel-efficient cars. It also encourages people to take public transportation rather than drive and to live closer to where they work. If the tax were large enough, people would start driving electric cars. When policymakers fail to consider how their policies affect incentives, they can end up with results that they did not intend. For example, consider public policy regarding auto safety. Today all cars have seat belts, but that was not true 40 years ago. In the late 1960s, Ralph Nader's book Unsafe at Any Speed generated much public concern over auto safety. Congress responded with laws requiring car companies to make various safety features, including seat belts, standard equipment on all new cars. How does a seat belt law affect auto safety? The direct effect is obvious. With seat belts in all cars, more people wear seat belts, and the probability of surviving a major auto accident rises. In this sense, seat belts save lives. But that's not the end of the story. To fully understand the effects of this law, we must recognize that people change their behavior in response to the incentives they face. The relevant behavior here is the speed and care with which drivers operate their cars. Driving slowly and carefully is costly because it uses the driver's time and energy. When deciding how safely to drive, rational people compare the marginal benefit from safer driving to the marginal cost. They drive more slowly and carefully when the benefit of increased safety is high. This explains why people drive more slowly and carefully when roads are icy than when roads are clear. Now consider how a seat belt law alters the cost–benefit calculation of a rational driver. Seat belts make accidents less costly for a driver because they reduce the probability of injury or death. Thus, a seat belt law reduces the benefits to slow and careful driving

PRINCIPAL 03.

The collapse of communism in the Soviet Union and Eastern Europe may be the most important change in the world during the past half century. Communist countries worked on the premise that central planners in the government were in the best position to guide economic activity. These planners decided what goods and services were produced, how much was produced, and who produced and consumed these goods and services. The theory behind central planning was that only the government could organize economic activity in a way that promoted economic well-being for the country as a whole. Today, most countries that once had centrally planned economies have abandoned this system and are trying to develop market economies. In a market economy, the decisions of a central planner are replaced by the decisions of millions of firms and households. Firms decide whom to hire and what to make. Households decide which firms to work for and what to buy with their incomes. These firms and households interact in the marketplace, where prices and self-interest guide their decisions. At first glance, the success of market economies is puzzling. After all, in a market economy, no one is looking out for the economic well-being of society as a whole. Free markets contain many buyers and sellers of numerous goods and services, and all of them are interested primarily in their own well-being. Yet, despite decentralized decision making and self-interested decision makers, market economies have proven remarkably successful in organizing economic activity in a way that promotes overall economic well-being. In his 1776 book An Inquiry into the Nature and Causes of the Wealth of Nations, economist Adam Smith made the most famous observation in all of economics: Households and firms interacting in markets act as if they are guided by an "invisible hand" that leads them to desirable market outcomes. One of our goals in

PRINCIPAL 04.

The first lesson about making decisions is summarized in the adage: “There is no such thing as a free lunch.” To get one thing that we like, we usually have to give up another thing that we like. Making decisions requires trading off one goal against another. Consider a student who must decide how to allocate her most valuable resource—her time. She can spend all of her time studying economics; she can spend all of her time studying psychology; or she can divide her time between the two fields. For every hour she studies one subject, she gives up an hour she could have used studying the other. And for every hour she spends studying, she gives up an hour that she could have spent napping, bike riding, watching TV, or working at her part-time job for some extra spending money.

When people are grouped into societies, they face different kinds of tradeoffs. The classic tradeoff is between “guns and butter.” The more we spend on national defense to protect our shores from foreign aggressors (guns), the less we can spend on consumer goods to raise our standard of living at home (butter). Also important in modern society is the tradeoff between a clean environment and a high level of income. Laws that require firms to reduce pollution raise the cost of producing goods and services. Because of the higher costs, these firms end up earning smaller profits, paying lower wages, charging higher prices, or some combination of these three. Thus, while pollution regulations give us the benefit of a cleaner environment and the improved health that comes with it, they have the cost of reducing the incomes of the firms’ owners, workers, and customers. Another tradeoff society faces is between efficiency and equity. Efficiency means that society is getting the most it can from its scarce resources. Equity means that the benefits of those resources are distributed fairly among society’s members. In other words, efficiency refers to the size of the economic pie, and equity refers to how the pie is divided. Often, when government policies are being designed, these two goals conflict. Consider, for instance, policies aimed at achieving a more equal distribution of economic well-being. Some of these policies, such as the welfare system or unemployment insurance, try to help those members of society who are most in need. Others, such as the individual income tax, ask the financially successful to contribute more than others to support the government. Although these policies have the benefit of achieving greater equity, they have a cost in terms of reduced efficiency. When the government redistributes income from the rich to the poor, it reduces the reward for working hard; as a result, people work less and produce fewer goods and services. In other words, when the government tries to cut the economic pie into more equal slices, the pie gets smaller.

PRINCIPAL 05.

The invisible hand usually leads markets to allocate resources efficiently. Nonetheless, for various reasons, the invisible hand sometimes does not work. Economists use the term market failureto refer to a situation in which the market on its own fails to allocate resources efficiently. One possible cause of market failure is an externality. An externalityis the impact of one person's actions on the well-being of a bystander. The classic example of an external cost is pollution. If a chemical factory does not bear the entire cost of the smoke it emits, it will likely emit too much. Here, the government can raise economic well-being through environmental regulation. The classic example of an external benefit is the creation of knowledge. When a scientist makes an important discovery, he produces a valuable resource that other people can use. In this case, the government can raise economic well-being by subsidizing basic research, as in fact it does. Another possible cause of market failure is market power. Market power refers to the ability of a single person (or small group of people) to unduly influence market prices. For example, suppose that everyone in town needs water but there is only one well. The owner of the well has market power—in this case a monopoly—over the sale of water. The well owner is not subject to the rigorous competition with which the invisible hand normally keeps self-interest in check. You will learn that, in this case, regulating the price that the monopolist charges can potentially enhance economic efficiency. The invisible hand is even less able to ensure that economic prosperity is distributed fairly. Amarket economy rewards people according to their ability to produce things that other people are willing to pay for. The world's best basketball player earns more than the world's best chess player simply because people are willing to pay more to watch basketball than chess. The invisible hand does not ensure that everyone has sufficient food, decent clothing, and adequate health care. Agoal of many public policies, such as the income tax and the welfare system, is to achieve a more equitable distribution of economic well-being. To say that the government can improve on markets outcomes at times does not mean that it always will. Public policy is made not by angels but by a political process that is far from perfect. Sometimes policies are designed simply to reward the politically powerful. Sometimes they are made by well-intentioned leaders who are not fully informed. One goal of the study of economics is to help you judge when a government policy is justifiable to promote efficiency or equity and when it is not.

PRINCIPAL 06.

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PRINCIPAL 07.

The differences in living standards around the world are staggering. In 1997 the average American had an income of about $29,000. In the same year, the average Mexican earned $8,000, and the average Nigerian earned $900. Not surprisingly, this large variation in average income is reflected in various measures of the quality of life. Citizens of high-income countries have more TV sets, more cars, better nutrition, better health care, and longer life expectancy than citizens of low-income countries. Changes in living standards over time are also large. In the United States, incomes have historically grown about 2 percent per year (after adjusting for changes in the cost of living). At this rate, average income doubles every 35 years. Over the past century, average income has risen about eightfold. What explains these large differences in living standards among countries and over time? The answer is surprisingly simple. Almost all variation in living standards is attributable to differences in countries' productivity—that is, the amount of goods and services produced from each hour of a worker's time. In nations where workers can produce a large quantity of goods and services per unit of time, most people enjoy a high standard of living; in nations where workers are less productive, most people must endure a more meager existence. Similarly, the growth rate of a nation's productivity determines the growth rate of its average income. The fundamental relationship between productivity and living standards is simple, but its implications are far-reaching. If productivity is the primary determinant of living standards, other explanations must be of secondary importance. For example, it might be tempting to credit labor unions or minimum-wage laws for the rise in living standards of American workers over the past century. Yet the real hero of American workers is their rising productivity. As another example, some commentators have claimed that increased competition from Japan and other countries explains the slow growth in U.S. incomes over the past 30 years. Yet the real villain is not competition from abroad but flagging productivity growth in the United States. The relationship between productivity and living standards also has profound implications for public policy. When thinking about how any policy will affect living standards, the key question is how it will affect our ability to produce goods and services. To boost living standards, policymakers need to raise productivity by ensuring that workers are well educated, have the tools needed to produce goods and services, and have access to the best available technology.

PRINCIPAL 08.

Although the United States has never experienced inflation even close to that in Germany in the 1920s, inflation has at times been an economic problem. During the 1970s, for instance, the overall level of prices more than doubled, and President Gerald Ford called inflation “public enemy number one.” By contrast, inflation in the 1990s was about 3 percent per year; at this rate it would take more than.

20years for prices to double. Because high inflation imposes various costs on society, keeping inflation at a low level is a goal of economic policymakers around the world. What causes inflation? In almost all cases of large or persistent inflation, the culprit turns out to be the same—growth in the quantity of money. When a government creates large quantities of the nation’s money, the value of the money falls. In Germany in the early 1920s, when prices were on average tripling every month, the quantity of money was also tripling every month. Although less dramatic, the economic history of the United States points to a similar conclusion: The high inflation of the 1970s was associated with rapid growth in the quantity of money, and the low inflation of the 1990s was associated with slow growth in the quantity of money.

Despite the inherent link between microeconomics and macroeconomics, the two fields are distinct. In economics, as in biology, it may seem natural to begin with the smallest unit and build up. Yet doing so is neither necessary nor always the best way to proceed. Evolutionary biology is, in a sense, built upon molecular biology, since species are made up of molecules. Yet molecular biology and evolutionary biology are separate fields, each with its own questions and its own methods. Similarly, because microeconomics and macroeconomics address different questions, they sometimes take quite different approaches and are often taught in separate courses.

PRINCIPAL 09.

This interplay between theory and observation also occurs in the field of economics. An economist might live in a country experiencing rapid increases in prices and be moved by this observation to develop a theory of inflation. The theory might assert that high inflation arises when the government prints too much money. (As you may recall, this was one of the Ten Principles of Economics in Chapter 1.) To test this theory, the economist could collect and analyze data on prices and money from many different countries. If growth in the quantity of money were not at all related to the rate at which prices are rising, the economist would start to doubt the validity of his theory of inflation. If money growth and inflation were strongly correlated in international data, as in fact they are, the economist would become more confident in his theory. Although economists use theory and observation like other scientists, they do face an obstacle that makes their task especially challenging: Experiments are often difficult in economics. Physicists studying gravity can drop many objects in their laboratories to generate data to test their theories. By contrast, economists studying inflation are not allowed to manipulate a nation's monetary policy simply to generate useful data. Economists, like astronomers and evolutionary biologists, usually have to make do with whatever data the world happens to give them. To find a substitute for laboratory experiments, economists pay close attention to the natural experiments offered by history. When a war in the Middle East interrupts the flow of crude oil, for instance, oil prices skyrocket around the world. For consumers of oil and oil products, such an event depresses living standards. For economic policymakers, it poses a difficult choice about how best to respond. But for economic scientists, it provides an opportunity to study the effects of a key natural resource on the world's economies, and this opportunity persists long after the wartime increase in oil prices is over. Throughout this book, therefore, we consider many historical episodes.

PRINCIPAL 10.

One of the Ten Principles of Economics discussed in is that people face tradeoffs. The production possibilities frontier shows one tradeoff that society faces. Once we have reached the efficient points on the frontier, the only way of getting more of one good is to get less of the other. When the economy moves from point A to point C, for instance, society produces more computers but at the expense of producing fewer cars. Another of the Ten Principles of Economics is that the cost of something is what you give up to get it. This is called the opportunity cost. The production possibilities frontier shows the opportunity cost of one good as measured in terms of the other good. When society reallocates some of the factors of production from the car industry to the computer industry, moving the economy from point Ato point C, it gives up 100 cars to get 200 additional computers. In other words, when the economy is at point A, the opportunity cost of 200 computers is 100 cars. Notice that the production possibilities frontier in Figure 2-2 is bowed outward. This means that the opportunity cost of cars in terms of computers depends on how much of each good the economy is producing. When the economy is using most of its resources to make cars, the production possibilities frontier is quite steep. Because even workers and machines best suited to making computers are being used to make cars, the economy gets a substantial increase in the number of computers for each car it gives up. By contrast, when the economy is using most of its resources to make computers, the production possibilities frontier is quite flat. In this case, the resources best suited to making computers are already in the computer industry, and each car the economy gives up yields only a small increase in the number of computers. The production possibilities frontier shows the tradeoff between the production of different goods at a given time, but the tradeoff can change over time. For example, if a technological advance in the computer industry raises the number of computers that a worker can produce per week, the economy can make more computers for any given number of cars. As a result, the production possibilities frontier shifts outward, as in Figure 2-3. Because of this economic growth, society might move production from point A to point E, enjoying more computers and more cars. The production possibilities frontier simplifies a complex economy to highlight and clarify some basic ideas.

THINKING LIKE AN ECONOMICS:

Every subject you study will contain a mixture of knowledge that is deemed important for its own sake, as well as practical applications that may prove useful in your daily life. For example, every student should have a basic understanding of astronomy, since it illustrates the grandeur of the universe; but basic astronomy can also come in handy when guiding a wayward yachtsman who has lost sight of land. For a different example, consider mathematics. The study of advanced calculus is rewarding for its sheer elegance (though some students might consider the reward inadequate for the effort required!). But everyone needs to know basic arithmetic in order to function in society.

The economic perspective is not useful in every situation. On the soccer field or at the prom, the lessons in this book will not prove as relevant. But in your life you will encounter many situations of critical importance when your decisions will need to be informed by sound economics. It is not necessary for everyone to *become* an economist. It is important for everyone to learn how to think like an economist.

Creative and careful thinkers throughout human history have developed various disciplines for studying the world. Each discipline (or subject) offers its own perspective as history unfolds before us. For a complete education, the student must become acquainted with some of the most important findings in each field. Economics has proven itself to be worthy of universal study. A well-rounded young adult will have studied not only algebra, Dante, and photosynthesis, but will also be able to explain why prices rise.

We will see the same pattern holds in the subject of economics. It is, in a word, simply fascinating to learn that there are underlying principles or "laws" that explain the operation of any economy, whether in ancient Rome, the Soviet Union, or a county fair in Boise, Idaho. Yet economics also has much to offer in practical guidance of your daily life. Knowledge of economics, by itself, will not make you rich, but it's a good bet that *ignoring* the lessons of this book will keep you poor.

Warning! When we say economics is a science, we do *not* mean that we conduct experiments to test economic laws, the way a nuclear physicist studies the results of smashing atoms in a particle accelerator. There are important differences between a social science such as economics, versus a *natural* science such as physics. We will explain this in more detail in Lesson 2, but for now we simply want to caution you that basic economic principles can be discovered through mental reasoning. It wouldn't make sense to go out and "test" the laws of economics, just as it doesn't make sense to use a ruler to go out and "test" the various proofs that you might learn in a geometry class. The upshot of all this is that the lessons in this book will stand the test of time—there is no danger that a new experimental finding will overturn them

tomorrow. In practice, professional economists make all sorts of conjectures, many of which turn out to be wrong. But the core body of economic theory the types of laws and concepts contained in this book is not testable; it's simply a way of viewing the world.

Pushing it to the extreme, economics even has a lot to say about cases where a *single, isolated person* takes actions to improve his or her situation. This is often called "Crusoe economics," after the fictional character Robinson Crusoe who was shipwrecked on an (apparently) deserted island. We will study Crusoe economics in Lesson 4. It will be clear that even an isolated person behaves "economically" because he takes what nature has given him and *exchanges* the status quo for an environment that he hopes will be more pleasant.

The common theme running throughout all of the examples of exchanges is the concept of scarcity**.** Scarcity can be succinctly explained by the observation that there are limited resources and unlimited desires. Even Bill Gates faces **.** he cannot literally do whatever he wants. If he takes his wife out to a fancy restaurant, he has reduced his options (ever so slightly) and has diminished his ability to buy other things in the future. We can describe the situation by saying, "Bill Gates needs to *economize* on his resources, because they are finite.

Economic science, as taught in this book, does *not* tell workers that they should take whatever job pays the most money, nor does it tell business owners that they must consider only financial issues when running their operations. These points will be made clearer during the subsequent lessons themselves, but we must stress up front that there is no "economic man" in the following pages; we are always discussing the principles that explain the choices of real people in the face of scarcity. The principles involve the fact that people *have* desires in the face of limited resources, but the principles are broad enough to cover people with any desires.

Beyond its intrinsic beauty and practical applications to your own life, economics is a crucial topic because we live in a society plagued by an activist government. Unlike other scientific disciplines, the basic truths of economics must be taught to enough people in order to preserve society itself. It really doesn't matter if the man on the street thinks quantum mechanics is a hoax; the physicists can go on with their research without the approval of the average Joe. But if most people believe that minimum wage laws help the poor, or that low interest rates cure a recession, then the trained economists are helpless to avert the damage that these policies will inflict on society.

For this reason, it is the young adult's duty to learn basic economics. The lessons in this book will show you how.