### AP Macro Economics Summer Assignment

### **Cornwall Central High School**

Instructor, Mr. Cook

Congratulations on accepting the challenge of taking AP Macro Economics in your senior year at CCHS. I'm very pleased and excited to be teaching this important course. We will learn a lot together. I believe this is an important course because there are few decisions that we make that some connection to economics in some capacity, so this class should be personally relevant to you. I also believe that general economic literacy is critical in making us well rounded individuals and informed citizens. This is a class in Macro Economics but it will contain elements of Micro Economics as well. We will also be interweaving coverage of US Government into our class throughout the school year as they pertain to our coverage of Macro concepts.

One of the first things I would like to point out to you is that the College Board website has some very good support materials for our course as well as other AP courses. I strongly encourage you to visit that site and review the materials for our course online and survey the practice questions provided to offer insight into some of our course's content. (<a href="www.collegeboard.com">www.collegeboard.com</a>) This course will be a challenge and it will require a concerted effort on your part, but I hope to make the class both fun and meaningful. You should be ready for a rigorous class that will prepare you to do well on the AP Macro exam in May.

### Summer Assignment Introduction,

My challenge in offering this summer work is to begin the process of getting you to think like an economist. Thinking in economic terms as you view the world you live in and make decisions in everyday life is fun but also empowering. As already mentioned, there really are no choices that don't have economic considerations and or consequences: choosing where you attend college, how should the nation address taxation and the national debt, or should the nation go to war? Economics is all about choices. Economists must observe and collect data in order to formulate policy choices or personal choices when we make economic decisions at any level. Economics has a language of its own and the next segment of this introduction will identify several terms you will need to utilize in your summer work.

Terms to Consider: Goods, Scarcity, Wealth, Opportunity Costs, Efficiency and Inefficiency, Specialization, Comparative Advantage, Positive and Normative Analysis.

Your summer assignment is going to be based on two readings provided:

- 1. "Efficiency, Exchange, and Comparative Advantage" from The Economic way of Thinking.
- 2. "Return of the Luddites: Technophobia and Economic Growth" from <u>The Economics of Macro Issues</u> 3<sup>rd</sup> Ed.

Within these readings you will be introduced to all the terms identified previously, except *positive and normative analysis*, which I will explain below. You should read the articles in the order presented. As you do these readings you should familiarize yourself with the meanings of the terms.

**Positive Analysis:** Analysis of what is or analysis that doesn't impose the value judgments of one individual on the decisions of others.

**Normative Analysis:** Analysis of what ought to be or analysis of economic choices with value judgements.

### The Assignment:

You will write an essay that is typed and double spaced which will be four to five pages in length. Your work should follow all of the established patterns of quality writing for a formal essay. (Proper Intro with a Thesis statement, topic sentences, transitionary sentences, supporting detail from the readings which substantiate your points within each paragraph, and a conclusion).

### What you must do:

- -Your Intro should start with a basic explanation of Comparative Advantage and its association to "Wealth" creation.
- -Next, based off of your first reading, analyze what constitutes "Wealth". The terms Goods, Scarcity, and Opportunity Costs must be considered in the analysis of Wealth
- -Next, you must discuss how "Efficiency and or Inefficiency of production and exchange" and "Specialization" allow or encourage "Comparative Advantage" in creating "Wealth".
- -Lastly, having shown your understanding of these concepts, you must apply the concepts of comparative advantage and wealth creation to the second article <u>Technophobia and Economic Growth</u>. How might "Positive or Normative Analysis" of the points raised in the article aid or hinder the generation of wealth? I would like you to specifically use the source material from the second article in your assessment of positive or normative analysis in relation to technological change in manufacture.

I would like you to conclude your essay with some personal reflection on your part regarding the value of positive and normative analysis. You will find in our course that schools of economic thought have evolved along the lines of positive and normative economic choices which we will be discussing in great detail this year. I eagerly await your responses and look forward to a fantastic year with you. Enjoy your summer and I will see you in the fall. Good Luck! Mr. Cook

The summer assignment is available on the school website if you happen to misplace your readings.

If you have any questions you can contact me by email <a href="mailto:mcook@cornwallschools.com">mcook@cornwallschools.com</a>

### Return of the Luddites: Technophobia and Economic Growth

began the attacks. The objects of their rage were factories in began the attacks. The objects of their rage were factories in L. Nottingham, England, that were using newly installed weaving machines. The Luddites, as they came to be known, feared that the new machines would take away their jobs and leave them unemployed. Passage of the Frame Breaking Act (which specified the death penalty for anyone who destroyed industrial machinery) soon brought a halt to the Luddites' activities. But their spirit is resurgent today in people who see catastrophe in every new technology.

# 激 **翻 】** Technology and Wealth

There is no doubt that technological advances have fueled economic growth and thereby markedly improved the lives and lengthened the life spans of human beings. Whether we look at the whieel, which drastically reduces transportation costs, or vaccines and antibiotics, which save the lives of millions of people every year, technology has raised our wealth. Higher wealth, in turn, enables us to make a broader range of decisions regarding

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outcomes everywhere in our lives, including education, environ not feasible in 1900. And note finally that higher wealth, spurred mental quality, cultural amenities, and charitable activities. spread of technology raised wealth and enabled people to make average life span around the world rose to sixty-seven years from wealth and enabled them to choose more healthful diets and spans; they live longer because the technology has raised their conditions in which they live, and face the prospect of never choose to have improved health for their children or higher enviby technological advances, has enabled us to choose better residents of technologically advanced nations have longer life doing anything about either outcome. It is no accident that the hood diseases, are powerless to improve the environmental who are poor must watch their offspring die of preventable childthe use of a wider range of resources. People who are wealthy can life-preserving and health-enhancing choices that simply were thirty during the twentieth century. This occurred because the higher-quality health care. Likewise, it is no accident that the ronmental quality, or—if they are wealthy enough—both. People

To be sure, not every technological advance has made us unambiguously better off. Nuclear weapons, for example, have threatened human survival since their invention. More recently, improved knowledge of how to refine anthrax spores has been used to kill people and poses the possibility of killing still more. Nevertheless, on balance, the overwhelming impact of technological advance has been to spur economic growth and, in so doing, vastly improve the economic condition of humankind. Despite the huge benefits created by fechnological advance

Despite the huge benefits created by technological advances, many people in addition to Ned Ludd's Army of Redressers have objected to the introduction of new technology. Because these objections are both persistent and loudly voiced, it is important that we examine them carefully to assess their validity.

# 新聞篇 The Fear of Competition

The Luddites' actions were driven by one motive, pure and simple: They were hand weavers who objected to the competition offered by the new mechanized weaving machines of the

would reduce the demand for hand weavers, and so they sought day. They perceived, quite correctly, that the new machines and hot weather in the summer. Moreover, the rapid spread of more than one set of clothes, worn all day, every day-a tically reduced the price of textiles, enabling people to own machines or to find employment in other pursuits. It also drasto prevent this competition. But the new technology did more chemicals, which have further raised our wealth. To be sure, the technology that led to the creation of new industries, such as the textile industry helped spur the development of other "luxury" that reduced deaths from cold weather in the winter than compel many hand weavers to learn how to use the rest of society have been staggeringly greater. hand weavers were worse off, but the gains then and later to the

and margarine became a commercial success long before the uct was enough to overcome dairy industry resistance, however, law yellow margarine, forcing consumers to take home white ists were successful in persuading many state legislatures to out because the new stuff was made to look like butter. Dairy lobby purveyors of animal-fat-based butterl) and a fraud as well ple, when vegetable-oil-based margarine was invented around numerous other objections to technological advances. For examhealth *benefits* of vegetable oil over animal fat became apparent. their own kitchens. The substantially lower price of the new prodmargarine from the store and mix it with yellow food coloring in that the new product was a threat to human health (this from the the middle of the twentieth century, the dairy industry claimed In more recent times, the fear of competition has spurred

wage clerical workers rather than by expensive members of times as fast as the Linotype and could be operated by lower these electronic typesetters, called the Photon, was four machines, which required skilled workers to set metal type of electronic typesetting offered competition for Linotype month strike against all New York City newspapers in petitive threat posed by the Photon led the ITU to call a four the International Typographical Union (ITU). The combefore newspapers and books could be printed. The first of 1962–1963. The strike ended the life of the New York Mirror, Somewhat later in the twentieth century, the development

> ment no doubt objected to by Photon operators. obsolete by yet another technological advance, the relatively few decades, of course, the Photons themselves were made and other materials, thereby raising society's wealth. Within a drastically reduced the costs of printing newspapers, books, use the Photon—in return for guaranteeing all existing ITU but the remaining newspapers won from the union the right to typesetters lifetime employment contracts. The new machines low-cost but high-powered personal computer—a develop

### 題 The Fear of Adverse Effects

genetically modified food. adverse effects on human, animal, or plant life. This, for example, is the source of current objections to irradiated food and to cific new technology on the grounds that it has or might have It has become commonplace in recent years to object to spe

millions of other human beings. climates, and an unequivocal threat to the lives of hundreds of of malaria, the deaths of millions of those living in iropical countries have banned DDT. The result has been a resurgence bles, thereby increasing the consumption of these important DDT even significantly out the costs of raising fruits and vegetanations around the world, saving the lives of millions of people. enormously successful in wiping out malaria in underdeveloped accidental or suicidal ingestion." Moreover, the use of DDT was only confirmed cases of injury have been the result of massive cancer-fighting foodstuffs. Despite the evidence, however, most humans, the World Health Organization has found that "the thus should be banned. Despite the claims of dangers to claimed, for example, that DDT caused cancer in humans and other pesticides, which developed during the 1960s. It was This type of objection stems largely from scares over DDT and

government agencies (rather than farmers) were responsible for animal life resulted from excessive applications of DDT, that instructive, though, that recent research reveals that this harm to numerous animal species, including the bald eagle. It is perhaps criminate use of DDT threatened the health and existence of On the other side of the coin, there is evidence that indis-

almost all such applications, and that if the government agencies had followed the manufacturers' instructions, it is likely that no animal species would ever have been threatened.

## ■ III I The Fear of Wealth

Strange as it may seem, the third objection to technological advances is that they stimulate economic growth and make us richer! There are two complaints here. First, there is the argument that economic growth promotes population growth, which will eventually overwhelm our supposedly fixed resource base and thereby lead to widespread starvation and misery. Second, there is the claim that economic growth inevitably leads to environmental degradation, which in turn threatens the existence not just of humans but of all species. Whatever the plausibility of these arguments to some people, the evidence clearly refutes these notions.

Technological advances that raise our wealth do tend to promote population growth. After all, it takes resources to live. But the positive effect of wealth on population is much less than you might think because as people get richer, they tend to have fewer children per family. Instead of pouring resources into a larger number of children, they put those resources into a higher-quality experience for the fewer children that they do rear—for example, by spending more funds on education. More important, a crucial way that technological advances raise our wealth is by enabling us to extract resources more effectively and to use those resources more efficiently. Just consider some seemingly mundane examples:

- Steam injection wells permit more complete extraction of petroleum.
- Improved machinery and designs have cut the weight of aluminum beverage cans by 40 percent.
- Advances in chemistry have created stronger, lighter plastice and longer-lasting paints and finishes.

As the result of these and thousands of other inventions, the world's reserves of oil, natural gas, aluminum, zinc, and many

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other commodities have *risen* over time, despite our continued use of these resources. So to be concerned that growing prosperity will cause population growth that outstrips our resources is to fail to understand the sources of that growing prosperity.

a better environment as incomes rise more. Thus technological advances don't merely bring us lighter beverage cans; they ultimately bring us country, environmental quality begins improving dramatically ple begin insisting that more and more resources be devoted after technological advances begin pushing up incomes, peoconsume more of as they get richer. The result is that soon Indeed, after per capita income reaches about \$6,000 in any to protecting and enhancing environmental amenities. tal quality is a normal good, that is, a good that people want to the effect is soon overwhelmed by another one. Environmen power. Moreover, although early stages of economic development of cleaner processes, such as hybrid cars and solar reasoning would be correct if it did not ignore two crucial ment are often accompanied by environmental degradation per unit of output, and they also make possible the developbut they make it possible to produce goods with fewer inputs facts. Technological advances do help promote production, tion, and that, it seems, must lead to more pollution. This ment? After all, more consumption necessitates more produc-But what impact does higher wealth have on the environ

## 繼**繼 ■** The Bottom Line

The lesson of history—emphatically and unmistakably—is that technological change raises our wealth and improves the lot of humankind. Yes, there is always the possibility that some new technology could cause more harm than good. But what is certain is that systematic attempts to suppress technological change almost always cause more harm than good. It is sensible to consider carefully the potential adverse effects of new technologies and to make sure that all of the costs of those technologies are taken into account. But it is foolhardy—and impoverishing—to let unfounded fears blind us to the benefits of those technologies.

From: The Geometric way of Thisking
Myne, Boethe, and Prychithe

Efficiency, Exchange,
and Comparative

Advantage

Economists generally favor free trade, but trading has long had an unsavory reputation in the Western world. This is probably the result of a deep-seated bias that nothing can really be gained through mere exchange. Agriculture and manufacturing are believed to be genuinely productive: They seem to create something new, something additional. But trade only exchanges one thing for another. It seems to follow that the merchant, who profits from trading, must be imposing some kind of tax on the community. The wages or other profit of the farmer and artisan can be obtained from the alleged real product of their efforts, so that they are perhaps entitled in some sense to their income; they reap what they have sown. But merchants seem to reap without sowing; their activity does not appear to create anything and yet they are rewarded for their efforts. Trading, some have thought, is therefore social waste, the epitome of inefficiency.

Thus, the old hostility toward the merchant in the form of a distrust of the "middleman." People often want to bypass the middleman, who is pictured as a kind of legal bandit on the highways of trade, authorized to exact a percentage from everyone foolish or unlucky enough to come his way. (And in a market system they often are free to avoid the middleman; yet, more often than not, people choose to use the middleman's services.)

However ancient or deep-seated this conviction of the unproductiveness of trade, however, it is completely mistaken. There is no defensible sense of the word *productive* that can be applied to agriculture or manufacturing but not to trading. Exchange is productive! It is productive because it makes available more of what people want.

The exchange of private property rights is fundamental to market processes. This chapter explores why people voluntarily trade goods and services. We shall show that trade increases the wealth of the trading parties, that trade is productive. We shall also introduce you to your first graphs—the production possibilities frontiers. Graphs are useful tools to recognize trade-offs and to clarify the growth in wealth that occurs through specialization and exchange.

### Goods and Bads

The act of cooperative exchange is fundamentally an agreement to swap property rights—ownership—of goods and services. Your purchase of oranges at the local grocery provides you the opportunity to consume the oranges as you now wish and provides the grocer the opportunity to use the cash payment as best he sees fit. What were his (the oranges) are now yours; what were yours (the three dollars) are now the grocer's. In many of our everyday exchanges there is no explicitly written contract. (It is simply understood that you now own the oranges.) In other exchanges, such as the purchase of a car or a home, or the rental of an apartment unit, contracts and agreements will be drafted giving clear account of who owns what and how the property can be used.

Economists are fascinated with the everyday exchange of goods, and, thankfully, we have a very clear meaning of the word good. In the economic way of thinking, something is a good if, in the eyes of the chooser, more of it is preferred to less. It's that simple. We can analyze the concept of a good a little further by distinguishing between a "free good" and a "scarce good." A free good is a good that can be acquired without sacrifice; a scarce good can

only be acquired by sacrificing some other good.

Your voluntary purchase of oranges, for example, suggests that oranges are a good to you, and, moreover, they're a scarce good because you sacrificed something else you value (the three dollars) to gain ownership of the oranges. Your roommate's willingness to stand in line for "free" concert tickets suggests that those tickets are a scarce good for her. She'd prefer to have them, and she sacrifices her time that could have been devoted to some other activity that she values. Think of it this way: A good is scarce if one must incur a sacrifice to obtain it.

Something represents a free good only if it is acquired without any sacrifice whatsoever. Free goods are harder to imagine, but they do exist. It's all a matter of context. Air is a scarce good to a scuba diver, but air is typically a free good to students in the college classroom. Lovely tropical sunshine is a free good to the child born and raised in the Bahamas, but it's a scarce good for the family that travels from Milwaukee to enjoy a few hot days during the winter holidays.

A good is anything whereby more of it is preferred to less.

A scarce good can be obtained only through sacrifice.

If only all goods were free goods! Then none of us would face scarcity, none of us would have to make sacrifices, trade-offs, or choices. We would have everything that we could possibly desire, automatically. Heaven is often depicted that way. The problem is, here on earth, we face scarcity. We can't have everything we desire all at once. We must choose.

And not only that, economic "bads" also exist. If a good is something in which more is preferred to less, then, you've guessed it, a bad is something in which less is preferred to more. Summertime mosquito bites, Los Angeles smog, and the terror of 9/11 are just a few examples of bads. In all of this, don't forget that the notion of an economic good—or bad—is subjective. Consider your authors here. Boettke detests old-time fiddle music. Prychitko loves it. We're not sure if Paul Heyne had any strong opinion of it either way. What's considered a bad to one person might very well be a good to somebody else, and neither a good nor a bad to yet another person.

Efficiency, exchange, and comparative advantage

The economic problem: scarcity.

### The Myth of Material Wealth

If we are going to demonstrate that trade, and therefore market exchanges of scarce goods in general, creates "wealth," it is also best to clarify what we mean by that word, too.

Of what does wealth consist? Merely money? Stocks and bonds, too? What constitutes your own wealth? Many people have drifted into the habit of supposing that an economic system produces "material wealth," things such as Apple iPods, Sun workstations, John Deere tractors, Ford minivans, Martin guitars, Sunbeam toasters, Jim Beam whiskey, Game Boys, and Harry Potter novels. But none of these is wealth unless it is available to someone who values it. Wealth, in the economic way of thinking, is whatever people value.

And value is in the eyes of the chooser A-Rod managed to sign a \$275 million contract with the Yankees. Buddha, we are reminded, wanted nothing—and that's pretty much what he got. Because he had found what he wanted, he had greatly increased his wealth. He had found nirvana. Different people can, and do, have quite different values. Additional water is additional wealth to a farmer who wants to irrigate; it is not wealth to a farmer caught in a Mississippi River flood. Two feet of fresh snow is additional wealth to the owner of a ski resort, but perhaps only a backbreaking burden to the driveway shoveler. An accordion is wealth to a front man in a polka band, but not to the old men in Metallica.

Economic growth consists not in increasing the production of things, but in increasing the production of wealth. Material things can contribute to wealth, obviously, and are in some sense essential to the production of wealth (accordions are made of material things; snow can be made by snowmaking machines). Even such

Wealth is whatever people value.

"nonmaterial" goods as health, love, and peace of mind do, after all, have some material embodiment. But there is no necessary relation between the growth of wealth and an increase in the volume or weight or quantity of material objects. The claim that "wealth = material things" must be rejected at the root. It makes no sense. And it blocks understanding of many aspects of economic life, such as specialization and exchange—the heart of what Adam Smith called the commercial society.

### Trade Creates Wealth

Those suspicious of trade, going at least as far back as Aristotle, tended to believe that voluntary exchange is (or should be) the exchange of equal values. The exact reverse is true: Voluntary exchange is never an exchange of equally valued things. If it were, it would not occur. Traders cooperate with one another to enjoythe opportunity to gain more of what each values. The opportunity for each to gain provides the incentive. In an informed and uncoerced exchange, both parties expect to gain by giving up something of lesser value for something of greater value. If Jack swaps his basketball for Jim's baseball glove, Jack values the glove more than the ball, and Jim values the ball more than the glove. We observe each person freely sacrifice one good he values for some other good he values more. Viewed from either side, the exchange was unequal, for the traders have differing values; otherwise, they wouldn't have rearranged their property rights of the ball and glove ("the glove is now yours"). And that is precisely the source of its productivity. Jack now has greater wealth than he had before, and so does Jim. The exchange was productive because it increased the wealth of both parties.

"Not really," says a contentious voice from the rear of the classroom. "There was no real increase in wealth. Jack and Jim feel better off; it's true; they may be happier and all that. But the exchange didn't really produce anything. There is still just one baseball glove and one basketball, regardless of who the new owner is."

True, nothing physically new has been manufactured by the swap. But what is manufacturing, anyway? Factories, raw material inputs, workers' sweat and toil, and the packaging of final products immediately leap to mind. We tend to picture the technical element of production—looking only "inside the box," as it were. We are inclined to ignore that manufacturers of the baseball glove and the basketball technically try to rearrange those materials into more valuable combinations. That's the economic element—they are trying to add value—that's why they're manufacturing in the first place. All it takes is a little thought outside the box.

The swapping of the ball for the glove didn't produce a new material thing—it didn't require an additional technical feat—but it did produce a rearranged pattern valued more highly by both Jack and Jim, and that's why they traded. It added value, wealth, for Jack and for Jim. Think of exchange as being an alternative way of producing something. Jack used the basketball as an "input" to obtain the "output" of a baseball glove. For Jim the glove was the input and the ball the output.

Each traded a scarce and valuable good for a more valuable good. Each incurred a cost. In fact, any choice or action entails a trade-off, a forsaken opportunity. In the economic way of thinking, the cost of obtaining anything is the value placed on whatever must be sacrificed in order to obtain it. We call that, for emphasis, an opportunity cost. Jack valued the basketball, but he freely sacrificed that for something he valued even more, the glove. Jim valued the glove, but sacrificed that for something he valued more, the ball. Each found that the benefit outweighed the cost. They each enjoyed a net benefit—an increase in their wealth.

Where did the additional wealth come from? If Jack enjoys more wealth after the trade, it might seem that it must have come from Jim. But notice that Jim also enjoys more wealth. It could not have been taken away from Jack. Instead, the voluntary trade was an opportunity that created more wealth for both traders. Each found a way to increase his own wealth by cooperating in an exchange.

The result of the productive process (the exchange) was an output value greater than input value for both parties. Nothing further is required to make an activity productive. The exchange expanded real wealth. It was an efficient way for the two parties to get more of what they wanted.

### Is It Worth It? Efficiency and Values

Economists speak a lot about efficiency. So let's try to answer this question: Which is more efficient, a car that gets 25 miles per gallon or a car that gets 75 miles per gallon? At first blush it seems that higher miles per gallon necessarily means higher efficiency. And, in some technical sense, that's true. A gallon of fuel "input" goes further, provides greater "output," with the more "fuel-efficient" car. And those figures, the "objective data," as it were, are an important piece of information for the prospective car buyer. But the decision maker will surely ask another question: "Is it worth it?" After all, the greater fuel efficiency often comes at a greater cost. When making a decision, an individual tends to weigh all the expected additional benefits against all the expected additional costs.

The additional cost of acquiring the car with the higher miles per gallon is another important piece of information for the chooser. Suppose the auto that gets 75 miles per gallon is priced at \$80,000, while the auto that gets only 25 miles per gallon is priced at \$20,000. Most prospective buyers might feel that the higher mileage is simply not worth the higher price. For them,

Efficiency, exchange, and comparative advantage

Any choice implies a sacrifice, an opportunity cost.

A plan or project is economically efficient if the additional benefits outweigh the additional costs.

Debates about efficiency are debates about values and rights. the additional costs of acquiring such a vehicle outweigh the additional benefits provided by the greater fuel savings. The concept of technical efficiency, which only focuses on the objective data (such as miles per gallon), does not account for the values that the chooser places on the inputs and the outputs. The economist's notion of efficiency—call it economic efficiency, for emphasis—compares, from the chooser's own perspective, the additional benefits against the additional costs. A decision or plan of action is said to be economically efficient if the chooser judges that the expected additional benefits will exceed the expected additional costs.

Simply put, a question that asks "Is it worth it?" is a question about economic efficiency. And each of us might answer that question very differently. One office worker drives a Hummer to work, another takes the bus, and a third rides a bicycle. Each worker compared the additional costs and benefits and selected the form of travel that they thought was best. Each is pursuing an "economically efficient" way to get to work. Their disagreements at the office about the best way to get to work are ultimately

disagreements over values.

That's right. An economist cannot definitively answer questions such as "Which is more efficient, a nursing degree or a philosophy degree? A cell phone or a pay phone? Clear-cutting forests or selective thinning?" In fact, stated this way, these questions are meaningless. It all depends on the situation at hand.

What we value determines what we will consider efficient or inefficient. Disagreements in society about the relative efficiency of particular projects will usually be disagreements about the relative value to be assigned to particular goods—or the relative disvalue of particular nongoods. Knowing this won't settle any controversial issue. But failing even to recognize what we're arguing about surely makes the resolution of controversy more difficult.

The question is not "What is really more efficient?" but rather "Who has the right to make particular decisions?" Crawling out of a sleeping bag to climb a mountain is atrociously inefficient to someone who plans to crawl back into that sleeping bag in the evening and is merely looking for the shortest distance between those two points, as opposed to looking for the greatest challenge. Fans of mountain climbing strenuously disagree, of course. But that creates no social conflict, because we all agree that individuals should have the right to decide for themselves whether it's more valuable to put their bodies on mountain peaks or to keep them in bed during vacations. It is when we do not agree on who has which rights that we get into vehement arguments about whether it is "really" efficient, for example, to clear-cut forests or to strip-mine coal. Or whether extensive use of the single-occupant vehicle is "incredibly inefficient in a world of rapidly depleting natural resources."

When the rules of the game establish clear and secure property rights, they implicitly decide by what process prospective benefits and costs are to be evaluated for decision-making

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purposes. If Mom decides to open her windows and turn up the thermostat on a cold winter day, she is using resources efficiently as long as she has an uncontested right to allocate all the resources she's using. If, on the other hand, she is cooling off someone else's living space, or if someone else is paying her heating bills, her property rights are likely to be challenged. Then the issue becomes not the efficiency of her preferred arrangements but rather her exclusive right to value the inputs and the outputs in what she does.

When property rights are clear, stable, and exchangeable, scarce resources tend to acquire money prices that reflect their relative scarcity. Decision makers then pursue efficiency by using these prices as information, the subject of the next few chapters. To say that free-market prices are "wrong" because they don't reflect the real value of certain costs or benefits amounts to rejecting the entire market process by which those prices were determined. It is a critique not of efficiency, but of the existing system of property rights and of the rules of the game of which they form a part. Some radicals are well aware of this, but most critics are not so sophisticated.

### Recognizing Trade-Offs: Comparing Opportunity Costs of Production

Economists can safely argue that individuals who engage in voluntary exchange do so because *they* think it's worth it. They expect exchange to be an efficient way of enjoying greater wealth. Let's consider this a bit further using the following example.

In a house on Elm Street, Jones makes two kinds of beer, a lager and a stout. (A lager is a rather light beer; a stout is dark and heavy.) Every three months he can make either 10 gallons of quality lager or 5 gallons of quality stout, or any linear combination in between. This is illustrated by Jones's production possibilities frontier in Figure 2–1. The production possibilities frontier (PPF) illustrates the maximum combination of stout and lager that Jones can produce using a given set of resources and talent.

Meanwhile Brown, who lives on Oak Street, also makes lager and stout. Given her skills and resources, every three months she can make either 3 gallons of quality lager or 4 gallons of quality stout, or any linear combination in between. We illustrate Brown's production possibilities frontier in a separate graph in Figure 2–1, given her resources and talent. When all is said and done, Jones's stout tastes just as good as Brown's, and the same for their lagers.

At first glance it appears that Jones is more efficient at brewing both lager and stout. After all, he can make more of either one than Brown. But the ability to make more, in itself, is not a measure

Efficiency, exchange, and comparative advantage

The production possibilities frontier.

More is better, but at what cost?

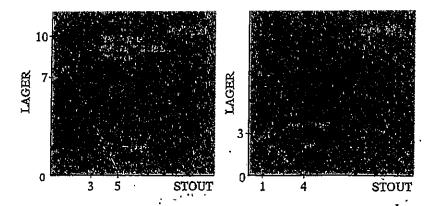


Figure 2-1 Simple production possibilities frontiers

These graphs illustrate the production possibilities frontiers of Jones and Brown. If Jones specializes in producing lager (10 gallons) and Brown specializes in producing stout (4 gallons), and they trade 3 lagers for 3 stouts, each enjoys a combination of lager and stout that lies beyond his or her own frontier.

of efficiency. We must compare what is sacrificed against what is gained, for neither beer is a free good. We must, in other words, look at the opportunity costs of producing lager and stout, and compare those costs between Jones and Brown.

Okay, then, just what are Jones's costs of production? Suppose Jones decides to produce only lager. He can make 10 gallons. But he sacrifices the opportunity to make 5 gallons of stout. That's his cost of brewing 10 gallons of lager. For each gallon of lager, he sacrifices the opportunity to make 1/2 gallon of stout. (Suppose, instead, that he brews only stout. He can make 5 gallons, but he would sacrifice the opportunity to make 10 gallons of lager. For each gallon of stout, he gives up the chance to make 2 gallons of lager.) If Brown makes only stout, she can make 4 gallons, but she sacrifices the opportunity to make 3 gallons of lager. For every gallon of stout, Brown sacrifices 3/4 of a gallon of lager. (Likewise, 1 gallon of lager costs Brown 4/3 gallons of stout.)

Let's put this information in Table 2-1 (below).

Now we are prepared to ask the critical question: Who produces lager at a relatively lower opportunity cost? It's there in the table—Jones does. He sacrifices only 1/2 gallon of stout, while

Comparative advantage: the ability to produce something at a lower cost, compared to somebody else.

Table 2-1

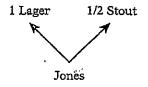


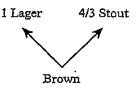
Brown gives up 4/3 gallons of stout, to brew a gallon of lager. Jones is the lowest opportunity cost producer of lager, compared to Brown. In the economic way of thinking, Jones has a "comparative advantage" in lager production. He is relatively more efficient at producing lager, compared to Brown.

Our conclusion that Jones is more efficient at brewing lager probably doesn't come as a surprise to you. But get this. Brown is more efficient at producing stout, compared to Jones! Notice Brown produces a gallon of stout at a cost of 3/4 of a gallon of lager; it costs Jones a whole 2 gallons of lager to make a gallon of stout. Brown is the lowest opportunity cost producer of stout, compared to Jones. Stout brewing is Brown's comparative advantage.

We can imagine their own choices as if they each face a fork in the road. Choosing one path means sacrificing the other. Jones has a choice—brew stout or lager. Brewing a gallon of stout (pursuing that path) means sacrificing the next-best opportunity—brewing 2 gallons of lager (the forsaken path). Brown also faces a similar choice, but her costs are different. Brewing a gallon of stout costs her only 3/4 of a gallon of lager. That's what we mean by opportunity cost.

Efficiency, exchange, and comparative advantage





### The Gains from Specialization and Exchange

With a little analysis, we've found that Jones is clearly the least-cost producer of lager, Brown of stout. What would happen if each were to *specialize* in the activity each is relatively more efficient at doing and trade between each other? Suppose, for example, that Jones and Brown run into each other at the home brewery supply store in town and discuss their brewing experiences. After some negotiation, they agree to try the following arrangement: Jones will produce only lager, Brown only stout, and they'll trade on a one-for-one basis. Jones will trade 3 gallons of his lager for 3 gallons of Brown's stout.

Three months pass and Jones bottles 10 gallons of lager;
Brown bottles 4 gallons of stout. Each specialized completely in the product of his or her comparative advantage. Notice, in Figure 2–1, that they are originally constrained by their own production possibilities frontiers. But, when they trade 3 lagers for 3 stouts; each enjoys a combination of beers that lies beyond his or her own original frontier. Jones has more of what he wants—his wealth has increased—as he now enjoys 7 gallons of lager and 3 gallons of stout. He could not have done that on his own. Brown's wealth increased too, as she now enjoys 3 gallons of lager and 1 gallon of stout, which she could not have accomplished on her own.

Think of choice as standing at a fork in the road.

Specialization and exchange expand people's production possibilities.

Specialization: the pursuit of one's comparative advantage.

Law of comparative advantage.

### vvny specialize:

Specialization is another word for "following one's comparative advantage." We now understand the incentive. People specialize because they can increase their wealth by doing so. Specialization allows producers to expand their possibilities by trading for something that is more costly for them to produce on their own—the rules of the market economy allow people to trade their private property rights in this manner. This is so fundamental to the economic way of thinking that economists have called this insight the "law of comparative advantage." Comparative advantage explains the incentive to specialize and the economic growth that results. It explains why people forsake being "a jack of all trades" for highly specialized activities such as those undertaken by accountants, nurses, entertainers, pilots, carpenters, dental assistants, longshoremen, teachers, plumbers, and even designated hitters. People expect to enjoy greater wealth (more of what they value) by specializing in activities in which they believe themselves to have a comparative advantage. If you have ever asked yourself, "What major is best for me, and what opportunities will I enjoy after I graduate?" you've asked a question about your own comparative advantage.

### From Individual Trade to International Trade, and Back Again

In our story it is clear that both Jones and Brown gain by specialization and exchange. Although neither of them has heard of the "law of comparative advantage," they are nevertheless eager to follow its principle. David Ricardo, the British economist and a successor to Adam Smith, was among the first to articulate the law of comparative advantage in his 1817 book *Principles of Political Economy and Taxation*, where he applied it chiefly to the issue of international trade. We see, however, that it actually applies to specialization and exchange in general. If we wish, for example, we could say that the Jones household "exported" lager and "imported" stout, paying an "exchange rate" of one lager for one stout. Similarly, the Brown household exported stout and imported lager at the same exchange rate. We could go a step further than that. We immediately notice that each party ultimately pays for its imports with its exports.

But even arguments are subject to diminishing returns, and we might push our luck if we pursue this line of thought much further. We said earlier that Jones lives on Elm Street, Brown on Oak. One wonders if we would gain any additional insight, or just add confusion, were we also to say, "Elm Street imported stout from Oak Street, and Oak Street imported lager from Elm Street." What does it even mean to say, "Elm Street traded with Oak Street"? It means nothing more than Jones traded with Brown.

Strictly speaking, streets don't trade, nor do neighborhoods. Individuals trade and benefit, not the streets.

What if Jones lived in Kansas and Brown in Pennsylvania, and Jones and Brown met virtually on an Internet home-brewing forum and made the same deal? Perhaps we could say that "Kansas imported stout from Pennsylvania" and the like, but does that provide more insight or confusion? It still means nothing more than Jones traded with Brown. Like streets or neighborhoods, states don't trade and benefit. People trade, typically across city, county, and state borders.

What, then, does it mean when we say that the United States trades with Finland, Germany, Canada, or Asia? It means U.S. citizens trade with citizens of another country. Finland doesn't produce and export Nokia cell phones. People do. There's nothing necessarily wrong with the terms interstreet trade, intercity trade, intercounty trade, interstate trade, international trade (or, perhaps someday, even intergalactic trade, though the authors have their doubts about that possibility). Economists are often called upon to discuss complex international trade issues and do so with various degrees of sophistication. It is convenient to say that the United States trades with Finland, for example. It would be prudent to keep in mind, however, that this is a shorthanded expression for a fantastic number of exchanges among a huge number of people, many acting in the name of larger organizations, across different regions and political borders.

Efficiency, exchange, and comparative advantage

Only individuals choose!

### Transaction Costs-

Certainly it gets quite complicated, and we'll have ample opportunity to discuss international exchange policies in a later chapter. But our insights remain unshaken. Voluntary trade is mutually beneficial; otherwise, it wouldn't be undertaken. In a private property system, people have strong incentives to specialize because comparative advantage generates personal wealth. The rules of the game encourage those activities.

Our story discussed and compared opportunity costs of production. But aren't there also costs of finding that other trader? We intentionally assumed those costs were low. Jones and Brown lived in the same community. Were Jones and Brown to live in different parts of the country, the discovery of an exchange opportunity is not so apparent. Physical distance might add a hurdle to trade; so, too, does ignorance of existing trading opportunities. We call these transaction costs. Transaction costs are the costs of arranging contracts and agreements—trades in general—among interested parties.

Transaction costs are just as real, just as important impediments to the production of additional wealth, as any other kind of cost. The Web forum effectively lowered the transaction cost when we considered the example of Jones and Brown living in

Middlemen expand the range of opportunities available to us.

Kansas and Pennsylvania. Without it they might not discover their potential opportunities for trade.

### Incentives to Reduce Transaction Costs: Middlemen

Suppose you own 10 shares of Google stock and want to sell. You could go around to your friends and try to peddle it, or you could put an ad in the newspaper. But it is very likely that you would obtain a higher price—even after paying the commission—by using the services of a middleman, in this case a stockbroker. No doubt if you advertised long enough and wide enough you could find a buyer willing to pay the price the stockbroker obtained for you. But it is not likely that the cost of your search would be less than the broker's fee. Moreover, new technology has allowed Internet brokers to emerge and compete against traditional brokers by substantially lowering their fees and commissions.

"Getting it wholesale" is a popular pastime for many people who think that they're economizing. Perhaps they are. If they enjoy searching for bargains (and many people do), then they may well gain from their activities. That's their choice. Free markets allow for those buying strategies. But for most people, retailers are an important low-cost source of valuable information. Market competition among suppliers and middlemen encourages them to find ways of informing potential customers and reducing their transaction costs. The retailer's inventory reveals something of the range of opportunities available, information that is often difficult to obtain in any other fashion.

Much the same is true of job-placement agencies. People frequently resent the fee charged by private agencies for finding them a job. Unless they had expected the information obtained through the agency to be worth more than the fee, they presumably would not have used the agency's services. But they choose to use it. However, as soon as they have established contact with a suitable employer, the agency seems useless—as it now is, of course—and its fee begins to look like an unwarranted imposition.

A large part of the middleman's bad press stems from our habit of comparing actual situations with nonexistent better ones. The exchanges we make are rarely as advantageous as the exchanges we could make if we knew everything. So we conclude that the middleman takes advantage of our ignorance. But why look at it that way? Using the same argument, you could say that doctors take advantage of your illnesses and that they should receive no return for their services because they would be unable to obtain a return if you were always healthy. That is both true and irrelevant. We are neither always healthy nor all-knowing. Physicians and middlemen are consequently both producers of real wealth, for they create more desirable options for us.

### Middlemen Create Information

One of the continuing themes of this book will be that supply and demand in the free-market process creates prices—information—that allow people to evaluate the scarcity of different goods and services and better coordinate their production and consumption plans. The capacity of participants in the market to generate high-quality information at low cost is one of its most important but least appreciated virtues. Middlemen are important agents in this process. The process reveals their comparative advantage.

Some markets, like stock markets and commodity markets, are "well organized," which means that the bids and offers of many prospective buyers and sellers have been brought together to create a narrow price range for a fairly uniform good over a wide geographic area. Other markets, like the market that even the least practiced eye can see operating in a singles bar, are much less well organized: The precise good to be exchanged and the terms of the exchange have to be negotiated for each separate transaction, and transaction costs are consequently very high. The market for used furniture is relatively unorganized: Transactions take place at prices that vary greatly, because buyers and sellers are not in extensive contact. The market for retail groceries, on the other hand, is far along toward the well-organized end of the spectrum, so that prices for ground beef will vary much less over a given area than will used-furniture prices.

It is sometimes said that stock markets and commodity markets are more nearly "perfect" than retail grocery markets and used-furniture markets. This is a misleading way to describe the difference, because it implies that the latter markets ought to be changed (perfection is better than imperfection). Such a proposal only makes sense, however, if the costs of improving the markets are less than the gains from less costly exchanges made possible by the improvement. It is often the case, however, that we simply don't know of any way to improve a particular market except at transaction costs too high to make it worthwhile. Moreover, some efforts to "improve" markets through government action look suspiciously like efforts to promote special interests. We'll encounter some examples in Chapter 9.

Every price is a piece of potentially valuable information to other people about available opportunities. The more such prices there are, the more clearly and precisely they are stated, and the more widely they are known, the greater will be the range of opportunities available to people in the society. The greater will be their wealth, in short. Is that not what we finally mean by an increase in wealth? It is a wider range of available opportunities, the ability to do more of whatever it is we want to do.

Middlemen are specialists in the organization of markets and hence in the creation of valuable information. They presumably specialize in this way because they think they have a comparative advantage in information production. Just consider eBay, the Internet auction site. Its developers have discovered a way of Efficiency, exchange, and comparative advantage

Middlemen have the kind of comparative advantage that lowers our transaction costs.

Buying milk from a grocer is an <u>alternative</u> way of producing milk for yourself. lowering transaction costs and producing valuable information for those people who choose to use its services. In short, middlemen—whether they fully realize it or not—tend to lower the hurdles that get in the way of exchange, which in itself provides further opportunities for others to specialize and exchange. Thanks to the grocer-middleman, the Seattle accountant finds an alternative way of obtaining milk for the family. After all, she is free to raise and milk her own dairy cattle. But she chooses not to. She'd rather pursue her own comparative advantage and trade a small portion of her income for the services of the local grocer. She doesn't have to learn how to raise her own dairy cattle. Nor does she have to drive to Wisconsin to purchase milk directly from the source. The local grocer arranges all those deals and thereby relieves the accountant of such burdens, not to mention the burden of the dairy farmer cooperative trying to find buyers for thousands of gallons of milk.

### Markets as Discovery Processes

Such are the incentives of the market system. Economists rarely, if ever, know what someone else's comparative advantage is outside of the market-exchange process. In fact, economists aren't necessary for markets to work well! Individuals in markets pursue what they think is their comparative advantage. Individuals assess their own costs and benefits and act accordingly. Economists try to explain the principles and logic that guide people's choices. Our graphs help shed some light on the logic that others use out there in the real world. In nonmarket systems, where property rights are not held and traded by individuals, but instead are owned by "society as a whole," a central economic planner—attempting to produce and deliver goods and services for the betterment of society as a whole—would have to draw up graphs and do all these mind-numbing calculations for millions of individuals and plans and projects—and where would he obtain all the necessary information to do it rapidly and productively?

In the real world, people pursue their comparative advantages simply by choosing the option that they find most attractive, all things considered. Serena Williams tried acting, but returned to tennis; R. L. Stine writes children's horror stories rather than American history textbooks; Jay Leno hosts *The Tonight Show* rather than manage a Harley-Davidson plant; Oprah has the power to become a madam of a legal brothel in Nevada, but remains a successful talk show host. Americans buy shirts made in Asia, and Asians purchase grain from the United States because, in each case, they believe that is the best way to obtain what they want. Comparative advantages, and the efficiencies that they engender, are discovered not on the chalkboard but through real market exchanges of property rights.

In most of these decisions, relative prices provide fundamental information. We consider our various abilities and the wages we can command at the different tasks we are capable of performing

. Comparative advantage is discovered in markets.

and choose the job that we think will best further the projects in which we are interested. Students want to know, for example, the kinds of careers and opportunities available to them, as well as the constraints, with their political science degree, nursing degree, or philosophy degree. None of this implies that people pay attention exclusively to prices, or that they are in it "only for the money," which would be an absurd and impossible way to behave. It means rather that relative prices guide people's decisions when other things are equal. American clothing stores find Asian products less expensive than domestically produced shirts of similar quality. Asian farmers choose not to raise wheat because they know that they could not raise enough to earn a satisfactory living, given the fact that they could not sell it above the price at which U.S.-grown wheat is available. In short, they behave as if the least costly way to achieve a given goal is the most efficient way. And in doing so they continuously coordinate these processes of cooperative interaction and mutual accommodation that comprise the economy.

Efficiency, exchange, and comparative advantage

### An Appendix: ECONOMIC GROWTH: SPECIALIZATION, EXCHANGE, AND THE RULE OF LAW

Believe it or not, except for a tiny handful of privileged people, poverty has been the rule rather than the exception throughout almost all of human history. One of the big questions in economics, therefore, is not what keeps people poor, so much as what has enabled some to become rich. Why was it that a few nations situated on the protruding northwest corner of the great Asian landmass suddenly, about 300 years ago, embarked on the process that we now call economic growth? Why did it happen? Why did it happen first in Europe and for a long time afterward outside of Europe only in nations founded on a European heritage?

Poverty is not the same as scarcity!

### Searching for an Explanation of Economic Growth

What exactly happened? Adam Smith, surveying the situation toward the end of the eighteenth century, summed up the matter in the first chapter of *The Wealth of Nations*:

It is the great multiplication of the productions of all the different arts, in consequence of the division of labour, which occasions, in a well-governed society, that universal opulence which extends itself to the lowest ranks of the people.

In other words, wealth came from the huge increases in production caused by the division of labor. Economic growth was a

<u>Division of labor</u> is another term for <u>specialization.</u>

consequence of the evolution of commercial society, a society in which everyone specializes and then lives by exchanging.

The most distinguished nineteenth-century student of economic growth employed a different terminology but delivered a similar verdict. Karl Marx attributed the enormous increases in production that had occurred in some countries in the eighteenth and nineteenth centuries to development of the system of commodity production. By commodities Marx meant goods produced for profit by private owners of scarce resources rather than for use, which is what occurs, of course, when the division of labor has thoroughly extended itself through society. What Smith called commercial society Marx referred to as bourgeois society. In case you thought that Marx had nothing good to say about such a society, here is what he and Friedrich Engels wrote in *The Communist Manifesto*:

Marx agrees with Smith! .... on this point. The bourgeoisie, during its rule of scarce one hundred years, has created more massive and more colossal productive forces than have all preceding generations together. Subjection of Nature's forces to man, machinery, application of chemistry to industry and agriculture, steam-navigation, railways, electric telegraphs, clearing of whole continents for cultivation, canalisation of rivers, whole populations conjured out of the ground—what earlier century had even a presentiment that such productive forces slumbered in the lap of social labor?

Marx thought he saw deep flaws in a society characterized by private ownership and production for profit, flaws that would ultimately destroy the system. But he had no doubts about its ability to produce wealth. And in the century and a half since the publication of *The Communist Manifesto*, the productive achievements of bourgeois or commercial society have dwarfed the achievements that Marx and Engels observed in 1848.

### The Evolution of Rules That Encourage Specialization and Exchange

But to say that nations grew wealthy by practicing specialization makes the issue seem much more simple than it is. If specialization is the solution to the problem of poverty, one might well ask why every nation doesn't adopt the division of labor and thereby become wealthy. The answer is that "nations" don't actually "adopt" systems as complex as a commercial society. And neither do individuals. Adam Smith once again put the matter succinctly, this time in the second chapter of *The Wealth of Nations*:

The division of labour, from which so many advantages are derived, is not originally the effect of any human wisdom, which foresees and intends that general opulence to which it gives occasion.

The division of labor evolves over time, slowly and gradually, by an evolutionary process that no one designed or even intended. Particular individuals expect to obtain advantages from specializing, so they specialize in specific ways. Their decisions facilitate the decisions of others. Meanwhile, still other individuals are advancing their interests by contributing to the development of social institutions that make exchange easier by lowering transaction costs.

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Money is one such institution, and an especially crucial one, as we shall discuss later in the book. But crucial though it is, no one invented the institution of money. It evolved in the same way that the division of labor evolved, through individuals acting to further the projects in which they happened to be interested and encountering others whose interactions generated a monetary system. One of Adam Smith's teachers, Adam Ferguson, correctly observed in his work An Essay on the History of Civil Society, published in 1767, that "nations stumble upon establishments, which are indeed the result of human action, but not the execution of any human design"; that communities often experience "the greatest revolutions where no change is intended"; and that even government officials "do not always know whither they are leading the state by their projects."

This is not to say that foresight is unimportant, much less that government has nothing to contribute toward the development of a successful economic system. Adam Smith certainly did not believe that. It is only "in a well-governed society," he maintained, that we see the evolution of extensive specialization, increases in production, and "universal opulence." Government must maintain conditions that allow the evolution of a commercial society. As Smith stated in the 1755 manuscript that served as the basis of *The Wealth of Nations*: "Little else is requisite to carry a state to the highest degree of opulence from the lowest barbarism, but peace, easy taxes, and a tolerable administration of justice; all the rest being brought about by the natural course of things."

Thus we return once more to the important concept introduced in Chapter 1, the *rules of the game* and their economically most important feature, clearly defined and adequately defended property rights. People will not invest for the future, organize useful projects, or initiate any other costly undertakings in the absence of reasonably secure property rights. In practice this means at a minimum that governments must protect the members of a society against theft and robbery by other individuals, maintain a reasonably fair and predictable judicial system to settle disputes among individuals, and somehow assure citizens that government will not itself engage in arbitrary acts of plunder. Those of us who have lived all our lives in societies characterized by "the rule of law" usually don't realize how rarely governments have lived up to these standards.

Reasonably secure property rights and their important corollary, freedom to exchange those rights, are necessary conditions for the evolution of a successful commercial society, in which people cooperate effectively in creating and using resources to serve one another's wants, so that economic growth

Efficiency, exchange, and comparative advantage

Complex social institutions
evolve—without a blueprint in
advance,

Private property rights and the rule of law.

occurs. In the absence of these conditions, poverty is assured, except, perhaps, for a tiny minority that is able to enjoy affluence by wringing it from the labors of the vast majority.

Other factors matter, too. Climate can be a major aid or impediment to a people's endeavors to better their condition. Natural resources make a difference, even if not as large a difference as many have supposed. And war has made a huge difference, largely by destroying the wealth of the warring nations, but also by subjecting some people to the tyranny and exploitation of others. But if we choose to look backward in order to ask what ought to be done now, one large part of the answer seems clear. Governments must establish the rule of law, so that individuals within the boundaries of their control can expect to enjoy the benefits (and pay the costs!) of their own efforts and investments. A commercial society cannot develop successfully in the absence of the rule of law.

### Once Over Lightly

The exchange of a good is fundamentally an exchange of ownership, an exchange of property rights. Property rights are an important part of the "rules of the game," in this case rules that clarify who owns what and how the property can be used. A social system with clear property rights and few restrictions on exchange generates money prices that help people who are pursuing their comparative advantage to discover in exactly which direction their advantage lies. Market processes inform people of their opportunities and thereby lead to discoveries of efficient ways of creating net benefits for their participants.

A good is anything whereby more of it is preferred to less, and a bad is just the opposite: anything whereby less of it is preferred to more. A scarce good is a good that can be obtained only by sacrificing some other good, something else that a chooser values. We contrast that with a free good, which is a good that can be obtained without any sacrifice. A scarce good, then, is acquired through an act of choosing, selecting, incurring some kind of trade-off; a free good is not an object of choice. Economics, being a theory of choice, focuses on the production and exchange of scarce goods. There would be no economic problem were we to live in a world without scarcity.

The term opportunity cost is often used in the economic way of thinking to emphasize that the cost of an action is the value one places on the next-best opportunity that one sacrifices when making a choice.

Wealth, in its broadest sense, is whatever people value. People voluntarily exchange property rights because they feel it is an efficient way to create personal wealth. Voluntary exchange always involves the sacrifice of what is less valued (input) for what is more valued (output). It is never an exchange of equal values. Exchange is as much a wealth-creating transformation as is

manufacturing or agriculture. In fact, exchange is an alternative

way of producing something.

Economic efficiency depends on valuations. Although physical or technological facts are certainly relevant to the determination of efficiency, they can never by themselves determine the relative efficiency of alternative processes. When considering a project or activity, decision makers tend to ask themselves whether or not the project or activity is worth the cost. This is another way of asking whether they feel the activity is economically efficient, for the concept of economic efficiency weighs the expected additional benefits against the expected additional costs.

Disagreements about whether some process or arrangement is efficient are at root disagreements about the relative weights that should be given to different people's evaluations. They are therefore often disagreements about the rules of the game or about who should have what rights over which resources.

Comparative advantage is determined by opportunity costs. People specialize in order to exchange and thereby further increase their wealth. They specialize in activities in which they believe themselves to have a comparative advantage. They exchange for goods and services that they believe are too costly to produce themselves. The increase in wealth can be illustrated with the help of the production possibilities frontier. The "law of comparative advantage" holds whether individuals are engaged in local trade or international trade.

A great deal of economic activity is best understood as a response to the fact that information itself is a scarce good, which adds to transaction costs—the costs of arranging contracts, agreements, and trades. The cost of producing information is not the same for everyone. If a system of appropriate incentives is allowed to evolve—particularly the market process—people will specialize in the production of those kinds of information in which they have a comparative advantage.

The much-abused "middleman" is in large part a specialist in information production and thereby the lowering of transaction costs. That's the middleman's comparative advantage. Just as the corner grocer enables prospective buyers and sellers to locate one another, so, too, does an eBay or an Amazon.com. Middlemen—those who feel they have a comparative advantage in providing the kinds of information that reduce transaction costs—coordinate market exchanges across regions, integrating local markets into the larger economic system.

The rules of the game help determine the ways we can cooperate (and compete) with one another. A rule of law that recognizes—private property rights allows the freedom to exchange and provides incentives for individuals to specialize in the activities of their comparative advantage. Market specialization, and the rise of the division of labor, creates the conditions for economic growth and helps explain why wealth is greater in some nations as opposed to others.

Efficiency, exchange, and comparative advantage