Notes #1: Introduction and the Four Factors of Production

1. Introduction

A. Why Study Economics?

Many non-economists—and some economists—berate economics as being unnecessarily difficult. Real-world economic problems, some people contend, can be solved using nothing more than common sense. There’s even an economics textbook on the market subtitled “The Science of Common Sense.”

This is just silly. In economics, common sense alone, without a clear grasp of a theory that can help make sense of complicated problems, usually leads to erroneous and sometimes destructive conclusions. In his influential work Principles of Economics, first published in 1890, the great English economist Alfred Marshall wrote:

\[\text{It is doubtless true that much of the [study of economics] has less need of elaborate scientific methods, than of shrewd mother-wit, of a sound sense of proportion, and of a large experience of life. But on the other hand there is much work that is not easily to be done without such machinery. Natural instinct will select rapidly, and combine justly, considerations which are relevant to the issue at hand; but it will select chiefly from those which are familiar; it will seldom lead a man far below the surface, or far beyond the limits of his personal experience.}\]

\[\ldots\ldots\text{"That which is not seen" is often better worth studying than that \text{"which is seen."} Especially this is the case if we are . . . concerned less with immediate causes, than with the causes of causes . . . even a business training does not always lead a man to search far for those causes of causes, which lie beyond his immediate experience . . . For in doing that, everyone must perform rely on the powerful machinery of thought and knowledge that has been gradually built up by past generations. (8th ed., p. 642)}\]

“That which is seen, and that which is not seen;” here Marshall quotes Frédéric Bastiat, (in a pamphlet of that title, which is assigned reading for Chapter 2) and before him, St. Paul (2 Corinthians 4). That which is seen, that is, the “facts” that jump in our faces, or are thrown in our faces, frequently are pretty worthless in trying to figure out what is going on around us. Some people say, “Let the facts speak for themselves.” The problem is, the facts are usually silent.1 It’s not enough to know the facts; you need to know how the facts are related, and which facts matter and which ones don’t. In order to think clearly about economics, you will need more than a clear mind! You will need to learn a way of thinking about economic issues that will let you see the hidden things, that will let you “peel the onion” and get to the facts, and the relationships between facts. Learning these things is the purpose of this course.

Learning to see, and understand, "that which is not seen" will be the primary goal of this course.

B. What is economics?

If you have had any experience with economists, you know that many people think we are perverse. (NOT perverted--there's a difference! Look it up.) Not wanting to disappoint you, I'll begin by telling you what economics is not. First, it's not "common sense," as I've already noted. If it were, then we'd all be in better shape than we are, because people wouldn't make so many obviously wrong choices. It's also not about money. Money is a part of it, to be sure, but even where there is no money, the basic economic problems still exist, in the same form. Nor is it a course in practical business methods and it certainly isn't a how-to-get-rich-quick scheme. (If it were, I'd charge a lot more.)

OK, so what is it?

Economics is the science of scarcity. Scarcity is the condition of having unlimited human wants but limited resources. Living in a world of scarcity means that we can never have everything we want. When we have to choose to have one thing, we implicitly choose not to have something else. So . . . Economics is also the study of choice.

Everyone wants more. More what, you say? Not food; you get enough of that. Or water. Or clothes. Or dogs or cats or pencils or junk mail. But how about world travel? A bigger house? Or a nicer house, or better neighborhood? Or maybe just a prettier color paint on your bedroom wall? My great-grandparents, who lived a century ago in houses without central heat, running water, or electricity, who had to ride a horse or walk to travel anywhere, and who worked with their hands to earn a meager living, could have hardly imagined the unending rush of goods and services that flows around me. Surely their wants could have been fully satisfied by only a fraction of the goods found in any city today. But, their great-grandson . . . well, his expectations are higher, after all; expectations tend to rise to meet incomes. In essence, human beings are "wanting machines." We may be erratic and unpredictable in most things, but one thing about us is certain, and that is that we want. Frank Knight, an important economist of the early twentieth century, said that "What people want is not the satisfaction of their wants. What they want is better wants." No sooner than you will graduate and get a better job than you will find a way to spend your increased income. Scarcity exists not just because the world’s physical resources are finite, but also because people's wants are infinite. We often express this by saying that people prefer more to less.

1 I owe this gem to a professor of mine, Dr. Duane Graddy.
Let’s think about this. Even if every American drove a Toyota Prius or rode a bike, we’d still have problems with the supply of natural resources. People want more. Always. The demands for energy and food and air conditioning and nail polish and you-name-it in China (est. pop. 1.2 billion, about 4 times that of the USA) are growing and will continue to grow. The idea that only Americans can become gross consumers of stuff is nonsense. Just like my great-grandparents, who would be satisfied with only a few of the consumer goods I regularly use, the parents of China’s youth are finding that their kids are becoming voracious consumers. If you grew up without even an outdoor privy, why, having a flush indoor toilet exceeds your wildest expectations. But when you grow up with one, your expectations are different. And bigger.

C. Economic goods, free goods, and bads

Economic goods include almost all goods we consume. Free goods are very few; sunshine, when the sun is shining, air, and water are the main ones; people can have all they want and never run out. Clean air and clean water, however, are not free. Even sunshine isn’t entirely free. If you want to live where the sun shines nearly every day, it selcom rains, is rarely too hot or too cold, and stay in the continental United States, you’ll have to move to southern California. Unfortunately, when you do you will meet millions of other people who share your preference, and if you want a spot of real estate on which to live and enjoy the sun, expect to pay a price well in excess of $200,000. The sunshine is free, but the land isn’t; it’s limited, or scarce, and so its owners can charge a price for it. In fact, since the sunshine is valuable—because people like it—but no one owns it, the landowners effectively charge for the sunshine. Land in the northern Yukon will command a much lower price, and it has nothing to do with the soil quality.

People will pay a positive price to obtain goods to avoid bads. Consuming a good makes a person feel better, i.e., it increases utility. A back massage is a service. The distinction is often irrelevant, and sometimes I'll use the terms goods and services interchangeably. If you ride a taxicab to work, you've purchased a service. But if you buy a car and drive it to work, the car is a good. Why do we purchase goods? Because we expect them to provide us with a flow of services over time. Why did you buy your computer—so it could just convert an unpredictable but potentially devastating large loss due to an accident into a smaller, predictable loss in the form of auto insurance premiums. In essence, people pay the insurance company to take their risk of loss away from them, just as trash collectors take away trash for us.

First, how are goods different from services? If you can drop it on your foot, it's a good. If you can’t, it’s a service. Peanut butter is a good; a back massage is a service. The distinction is often irrelevant, and sometimes I'll use the terms goods and services interchangeably. If you ride a taxicab to work, you've purchased a service. But if you buy a car and drive it to work, the car is a good. Why do we purchase goods? Because we expect them to provide us with a flow of services over time. Why did you buy your computer—so it could just sit on your desk? Of course not. You bought it because of what you could do with it, or what it could do for you—i.e., for the services it provides.

Bads can be physical items or services, too. Garbage is a bad. How can you tell? Because people pay for trash collection, i.e, they "pay a positive price to avoid" it. The risk of a loss due to an auto accident is a bad, too. That’s why people buy auto insurance. That way, they can have all they want and never run out. Clean air and clean water, however, are not free. Even sunshine isn’t entirely free. If you want to live where the sun shines nearly every day, it selcom rains, is rarely too hot or too cold, and stay in the continental United States, you’ll have to move to southern California. Unfortunately, when you do you will meet millions of other people who share your preference, and if you want a spot of real estate on which to live and enjoy the sun, expect to pay a price well in excess of $200,000. The sunshine is free, but the land isn’t; it’s limited, or scarce, and so its owners can charge a price for it. In fact, since the sunshine is valuable—because people like it—but no one owns it, the landowners effectively charge for the sunshine. Land in the northern Yukon will command a much lower price, and it has nothing to do with the soil quality.

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D. Rationality and Optimization

Economists are infamous for their assumptions, which are sometimes unrealistic. One of the cardinal assumptions of modern economics is that of rationality, or rational behavior. Virtually all economic theory and reasoning starts with the assumption that people behave rationally, defined as:

When faced with a choice among several alternative uses of a particular resource, each of which confers benefits and imposes costs, a rational individual will always make that choice that he believes will make him best off, that is, provide the maximum net benefits, given available information and the individual’s preferences.

What? Simply put, if you are given a choice among three different things you can do this afternoon, and they all cost the same (in time and money), you will rationally choose the one you like the best. If the costs or benefits are not the same, you will take this into consideration, and choose the one which you believe makes you best off, on balance. “Rational” does not mean “smart” or “wise.” Rational people can, and do, often make terrible blunders. Rationality implies merely that they do not intend to make mistakes.

We often call this process—of making rational choices—optimization. The idea is straightforward. People go about their business choosing to do this or do that. The common thread in all these choices is that people always try to get the best deal for themselves. Whether it’s shopping online because prices are cheaper, or going to a convenience store for an exorbitantly expensive—but convenient—jug of milk, or buying stock in company X rather than company Y because they expect X’s stock price to rise faster.

2 An old, and mildly funny, joke, goes like this: Three men shipwreck on a desert island; an engineer, a chemist, and an economist. For food, all they have is a large canned ham. Trying to open the can, first the engineer, and then the chemist, try everything they know, but have no success. The economist just watches, smiling. Finally the exasperated chemist says to the economist, “All right, how would you open it?” To which the economist responds, “First, assume a can opener....” Well, economists think it’s funny.
2. The Four Factors of Production, or Productive Resources

You can't make something out of nothing. Specifically, you have to use at least some of each of four categories of "things" to produce any good or service. These four categories are the factors of production, or productive resources. Below, each of the four is (1) named, (2) defined, (3) illustrated by one or more examples, and (4) the name given to any payment made for that factor is given. The sum of all these factor payments comprise the total cost of production of a good.

Land includes all natural resources, that is, all resources not produced by human activity. The term "land" is a holdover from the early days of economic thought, when agriculture was the main enterprise and the land its primary natural resource. Examples include raw virgin land (of course), air and water, wild animals, minerals, and—perhaps surprisingly—human talent. Talents are those abilities which are inborn and hence not acquired, as opposed to skills, which are acquired. (The difference is that an increase in computer programmers' incomes will lead more people to acquire the skills needed to be a programmer, but it will have no effect on the level of basic talent for that type of work which some people are born with and others not.) A star professional athlete, actor or actress, or model differs from also-rans primarily because of the advantage of better inborn talent which no amount of practice or training can eliminate. If training and practice were all that were necessary to be a movie star, then thousands of young hopefuls would be stars. The factor payment made for the use of land in a production process is called a rent.

Labor is any raw, unskilled, human effort. Even highly skilled workers—such as economists—must perform some labor in doing their work. While producing forecasts of future inflation rates, for example, a great deal of skill is needed, but some plain old effort is needed, too. Some occupations, such as picking strawberries, required much labor and very little skill. Factor payments made for the use of labor are called wages. This term is meant to include all compensation for labor, such as salaries, fringe benefits, etc.

Capital is any improvement to land or labor which makes it more productive. Capital is thus a change in the form of a resource which renders it more useful. There are two types of capital, physical capital and human capital. (NOTE: Your author prefers to list these as two separate factors, giving him five in all. I don’t know why.) Physical capital consists of physical resources that have been made more useful, such as trucks, computers, drill presses, and movie cameras. Human capital is produced when people acquire education and training—i.e., skills—and thus become more productive workers. You are engaged in producing human capital right now.

Entrepreneurship involves doing "extraordinary" things to make a business succeed. One textbook defines it as "the particular talent that some people have for organizing the resources of land, labor, and capital into the production of goods, and for seeking new business opportunities." It cannot be easily measured in units, as can the other three factors. Entrepreneurs received their factor payment, called normal profit, as a residual after all the other factors have been paid. (Normal profit is thus a cost of production. It's not the same as economic profit, which we'll take up in Econ II.) Since entrepreneurship often involves some difficult, stressful, and risky behavior, profits need to be large enough to induce entrepreneurial activity.

Specifically, entrepreneurship involves three different activities:

1) Initiative and making non-routine business decisions
2) Bearing uncertainty—somebody in an economy must bear the uncertainty of any new business project, because it is impossible to know in advance whether or not it will succeed. Someone must stand willing to "pay the bills," that is, bear the costs, if it fails. The lure of potential profits is necessary to get people to do this.
3) Arbitrage involves moving a resource from a low-valued use to a higher valued use—buying low and selling high. A dynamic economy needs people to do arbitrage in order to direct scarce resources to the most valuable uses. Otherwise, resources get stuck in low-productivity uses and output, incomes, and living standards suffer.

For a simple example of arbitrage, consider two cities, Anthracite City (A) and Bedrockville (B). City A produces coal in abundance, while B produces none. Let the price of coal be $20/ton and $25/ton in A and B, respectively, and let the cost of shipping a ton of coal from one city to the other be $2/ton. Thus, residents of A are encouraged to use coal for any purpose as they value that use at $20 per ton. In B, however, uses of coal which are valued at less than $25 per ton are discouraged. Now, say you are in B with your new college degree and no job. If you can arrange the financing, you can buy coal in A at $20/ton, hire a trucking firm to haul it to B for $2/ton, and sell it at any price above $22/ton and make a profit. You'll thus decrease the supply of coal in A and increase it in B. This will cause the price to rise in A and fall in B. Ultimately, the prices will converge and, except for the $2/ton shipping charge, become equal, because as long as they remain different there is a profit to be captured. (This illustrates the law of one price, or price equalization principle which we'll take up later.) Residents of B benefit here because they can get cheaper coal, of course, but A residents pay more. But the only reason why B residents treated coal as if it were more "precious" than A's was that prices were skewed. After arbitrage, residents of both cities consider coal to be equally scarce, which is as it should be.

These profits are not permanent. As the price of coal converges toward equality, profit opportunities vanish. High profits act as an incentive to buy and sell the coal, but they don't last forever. And note that it is the act of profit-seeking itself that eliminates the profit.

Another example of arbitrage is finding yourself a better job and moving your labor and talent and human capital resources to a more productive, higher-paying, use.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Definition</th>
<th>Factor Payment</th>
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<tbody>
<tr>
<td>Land</td>
<td>Any natural resource, not produced by human activity</td>
<td>Rent</td>
</tr>
<tr>
<td>Labor</td>
<td>The raw, unskilled effort component of any human activity</td>
<td>Wages</td>
</tr>
<tr>
<td>Capital</td>
<td>An improvement to land or labor which makes it more productive</td>
<td>Interest</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>The &quot;extraordinary&quot; activities required to make a business succeed. Includes risk-bearing, initiative, non routine business decisions, and arbitrage</td>
<td>Normal Profit</td>
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