INTRODUCTORY MICROECONOMICS

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Introduction

Part I

THE BASICS

(DRAFT)

CHAPTER 1

Overview of Economic Analysis

Welcome to your first college-level economics course. You might already have an idea of what we're going to get into in the class, particularly if you had a high school class in economics. If you are from South Carolina, you should have had a semester course in economics. High schools are also supposed to offer classes that teach "financial literacy," which probably includes how to balance a checkbook, how credit cards and mortgages work, etc.[1]

Do you remember anything from your economics or finance class? If you covered "supply and demand" along with a bunch of graphs, then you probably had a real economics class, and you've already got an idea of what we'll be doing in this class. However, if your school's football coach taught your economic class, then there's a good chance it wasn't really economics. (No offense to football coaches!) Regardless of your experience with an economics course prior to this one, I'll be teaching the class assuming you're new to studying economics.

The micro- and macroeconomics courses, along with the two introductory accounting courses, are "gateway" courses for the School of Business. This means that every student who wants to get a degree in the School of Business must take these classes. The faculty expect that you will show a basic understanding (i.e., get a passing grade) of this course material before moving on to courses in your chosen major. So even though economics might not be your major, what you'll learn in this class is important to building a good foundation for your later coursework.

1.1 Economics as a Social Science

Economists study choices that people make in an effort to deal with scarcity. Since we live in a world in which we aren't just born with everything we'll ever want or need (i.e., scarcity), we have to make lots of decisions for how to spend our limited time and income, for example, in order to make ourselves as happy as possible. As a college student, you may want to spend your time taking classes and studying, hanging out with friends, exercising at the gym, and sleeping. But you only have 24 hours each day. What choices do you make in balancing how you use your time? You probably have limited income, whether it's money your parents provide while you're in college, wages from a part-time job, or your winnings from sports betting. You have to make decisions on where to spend your money and where not to. You *prioritize*, making sure you have food and pay rent before buying a new skateboard or new shoes.

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[1] This is based on South Carolina regulation R.43-234, effective 25 May 2018, at ed.sc.gov/index.cfm?LinkServID=605ECD73-ACD2-2226-D69DE28436D6BBB0

Just as we can describe how scarcity might be experienced by the typical college student, the same struggle applies to "consumers" and "producers." That discussion will be the main focus of this class as we develop "supply and demand" models. "Society" faces scarcity too. You might think of society as a country like the United States, but it's really just a bunch of individual people. We have different levels of government (local, state, federal) all of which face scarcity. They have limited tax revenues, but many different things they'd like to spend on. Whether we talk about consumers, producers, or government bureaucrats, these are all people, and whatever their particular individual situations, they all have to deal with scarcity. The choices that these people make often involve or affect other people, so economics is fundamentally the study of behavior among people. This is why it's considered to be a *social science*

Economics is the only social science for which a Nobel Prize is awarded. More important than any of the specific topics discussed, an understanding of economic theory helps you to develop critical thinking skills with which you may analyze a world of interesting topics. Economists study a variety of issues, including marriage and divorce, drug addiction, prostitution, environmental degradation, political economy, and government policy. For example, your professor almost exclusively studies the economic and social impacts of legalized casino gambling. Any social phenomenon can be studied from an economics perspective.

If economics is a social science, why is the College of Charleston's Department of Economics housed in the School of Business rather than the School of Humanities and Social Sciences? Well, economics is closely related to business disciplines, too. (At roughly half of U.S. colleges, the economics department is in the business school.) The main difference you might notice between economics and other courses you take in the business school is that in economics we're trying to teach you more of a *way of thinking*, rather than tasks or skills for specific jobs in business.

When you later take courses in accounting, finance, marketing, and management, for example, you might recognize concepts from economics as sort of a theoretical foundation for other disciplines. You might think of accounting as the recording of business transactions. Accountants calculate firms' profit and losses, calculate tax liabilities, and so-on. In a sense, what accountants do should be representing the "economic reality" of business firms. Your marketing course will probably focus on consumers' behavior, and how businesses can appeal to consumers by providing information on the merits of their products. Management focuses on how to arrange the different input resources to effectively and profitably operate a business. Marketing and management very closely correspond to consumer theory and production theory, respectively, in economics. Finally, finance can be considered a branch of economics.

Another thing you will notice about this class, and other economics courses, is that we spend a lot of time talking about money and prices. But even though we'll focus a lot on prices in this class, just keep in mind that the ideas we're developing can be applied to all sorts of decisions, whether or not they involve money. *Economics is all around you.* Almost every decision you make has an economic element to it, whether or not it involves money.

The scientific method

Like the "hard sciences" (e.g., chemistry, physics, biology), economists use the scientific method in their research. But unlike things that happen in the hard sciences, like a rock falling at a particular rate given by some physics equation (the law of gravity), humans' behavior isn't always consistent. But that doesn't mean we can't study behavior and still find some fairly consistent patterns.

For example, when the price of gas increases, people will tend to buy less of it. This relationship between prices and consumption is called the "law of demand". Some people might ride a bike or walk more often; others might get rid of their gas-guzzling truck and buy an electric car. Not everyone reacts to higher gas prices in the same way, but in general people will buy less gas. A law in social science isn't quite as strong as a law in physical science. People don't behave completely consistently when prices increase; but gravity affects all rocks the same way.

One of the great things about being an economist is that you can study almost anything that interests you. For example, I study the economic impacts of legalized gambling, along with problematic gambling behavior. I've spent most of my career doing research on these issues, as well as serving as a consulting for industry and government organizations. Whatever an economist's research focus, all economists follow the same basic research method; it's the same "scientific method" you've probably already been exposed to, just adapted for a social science. Scientific research starts with some question of interest. The scientist proposes some theory or hypothesis (an idea about how the world works). Then a model is developed to test the theory. (A model is just a simplification of reality), and data are collected. The data are analyzed, and conclusions are drawn that can support or refute the initial hypothesis/theory.

Example: How online classes affect learning

Suppose you claim that when classes move online, students learn less in their classes. This is your theory. Your thinking might be that, when students aren't sitting in a physical classroom with the professor lecturing directly to them, and instead are sitting at home behind their laptops (with their cameras off), that they pay less attention to the lecture material. This leads students to be less effective in studying, and results in lower test/quiz scores in their classes.

In order to test your theory, you need to set-up a *model* of the behavior in question. When economists talk about models, they usually begin thinking in terms of regression analysis.[2] So your model of student achievement might be something like this: grades are a function of class format (in-person or online), hours studied for each class, paying attention, and various student characteristics. In order to test your model, you need to collect some data. For example, you could do a survey of students at the College, and ask them which classes were an online or in-person format, many hours they studied

[2] Regression analysis is a statistical technique to isolate the impact of different variables on a particular variable of interest. For business and economics students, you should cover this in MATH 250.

for each class, and to give some numerical score for how much they paid attention during each class. (Maybe a score of 1 indicates "not paying attention at all", and a score of 5 indicates "paying close attention for the entire lecture".) You would also want to collect some other data, such as each survey respondent's age, year in school, major, gender, overall GPA, and maybe SAT scores. Then you could run a regression to see how the different variables affect students' grades. If your variable on "online class format" is statistically significant and negative, then you would conclude that an online class format does negatively affect student performance.

Of course, this is a fairly crude model of student learning. We all know that there are other things that will affect your grades in different classes. For example, how interesting the professor's lectures will matter; the quality of learning materials will matter; whether the professor was a more lenient grader because of COVID; even the time of day the lectures are given might make a difference to how much you learn. Plus, there are any number of other variables about each individual student that could affect how they learn. All of these factors are effectively ignored in the study we described above. We call this the *ceteris paribus* assumption. It basically means "nothing else changes", or "everything else equal". We're effectively applying this assumption to any other potentially relevant variable that isn't explicitly included in our model. You'll see numerous examples of this assumption being used throughout this class, and in every type of economic analysis.

Most of the ideas we study in this book are based on economic research, much of it very old. For example, the model of international trade that we'll study later was almost fully developed by 1817 (the "Ricardian trade model"). Modern economic research is usually published in scientific journals. These journals have a peer review process, which means that other experts in the field review the study before it can be published. The purpose of the review process is to ensure that published studies follow a good research design, use good data and competent analysis, and that the evidence from the study lead its author to reasonable conclusions.

1.2 Implications of Scarcity

In the previous section I described the scarcity faced by a college student who wants to do lots of things, but only has 24 hours a day to do it. Similarly, you probably have a limited budget to spend each month, but would like to buy much more than your budget permits. Even though college students have it pretty easy, all things considered, they still face scarcity. The typical textbook definition of scarcity is that, "people have unlimited wants, but limited resources with which to fulfill those wants."

In your case, you want to be able to attend your classes and study outside of class. But you also want to sleep, spend time with friends, go to the beach occasionally, go out to some of Charleston's excellent restaurants and bars[3], and maybe even work a

[3] I know you wouldn't think of going to a bar if you're under 21 years old.

part-time job. Because you have limited time, you have to *prioritize*. (Remember that from p. 1?) When you prioritize, you make a *choice*. You reserve time for those activities that are most important to you. Hopefully that includes going to class, studying, eating and sleeping – at least, if doing well in school is a priority to you. When you come to the economics lecture each Tuesday and Thursday, you've chosen not to be somewhere else doing something else. This means you have prioritized economics class over some other activity.

When you look around the classroom after the first week of class, you'll notice the room is 30-40% less crowded. This means that roughly 1/3 of your classmates have decided they have activities that they have ranked as a higher priority than passing their economics class. (Please attend class!) Can you imagine why someone would do that?

It's a little simpler to think of scarcity when it comes to money or a budget. Let's say your parents pay your tuition, then give you $1,500 a month to cover whatever other expenses you might have. I'm sure you could easily find a way to spend three times that much each month. That's scarcity again. But if you only have $1,500 to spend, you need to prioritize, just like you do with your time. I'd guess you'd be sure to pay your rent, phone, and utility bills first. Those are like the basics that you need to be a college student. You'll also probably want to eat once in a while. But will you have enough money to eat a $200 dinner at Hall's? Or will you eat ramen noodles out of the microwave? Will you be able to buy new clothes? I'm sure you can imagine that, once your checking account approaches $0, you'll need to be more careful about decisions involving money.

As you might have found during your freshman year of college, it can be difficult managing time and money. These are obvious facets to scarcity with which you've probably already tangled. Think about your parents. They might have great salaries, but they face scarcity too, especially with you being in college! *Scarcity is <u>the</u> economic problem.* If we were in a world of plenty – where we all get everything we want with a snap of the fingers – then economics wouldn't exist as a discipline.

Think again about the decisions to attend the econ lecture Tuesday morning, or spending $750 on this month's rent. Those are both choices you make. By making them, you gave up something else. When you attend the economics lecture, it means you can't still be asleep in your bed. When you pay rent, maybe it means you won't have enough money to go on a ski trip this weekend.

Because of scarcity, we have to make choices. And each choice we make involves an *opportunity cost*. When you come to the econ lecture, you give up 90 minutes of sleeping in your bed. In that example, your opportunity cost is sleep. When you pay your rent, the opportunity cost is the ski trip. Another definition of opportunity cost is "tradeoff". The tradeoff when you attend class is some other use of your time. When you pay your rent, there's a tradeoff; you're sacrificing something else.

The same idea applies to other people, and to groups of people. If your fraternity or sorority spends $1,000 on a party, they'll have that much less for other activities or events. Similarly, if the City of Charleston installs new parking meters on all the streets, there's going to be a lot less money to spend on other things we may want.

Example: 55 mph speed limit

Think about an example from driving and traffic. (We'll consider the effects of seatbelts on traffic fatalities later in this chapter.) Back before most of you were born, in 1975 the federal government enacted a maximum speed limit of 55 mph (88.5 km/h) on interstate highways. This law was repealed in 1995, which again enabled states to set their own speed limits, with some restrictions. There was a lot of debate over repealing the 55 mph limit, with opponents arguing that "55 saves lives" (see Figure 1.1) and that allowing higher speeds would mean lower fuel efficiency for cars.[4]

Figure 1.1 Ad promoting a 55 mph federal speed limit

Consider this extreme argument: "If the 55 mph speed limit saves even one life, it's worth it!" Why is that *extreme*? Because it implies we should collectively incur *any* cost, no matter how high, to save a single life. Then why not have a 5 mph maximum to save even more lives? But even then, there could still be a deadly accident, maybe when Granny backs out of the driveway. Life is full of risk (or uncertainty). You risked your life if you traveled on a street or crossed one on the way to class today. Each of us individually and collectively (as a "society"), must take risks. In the case of speed limits, we have decided that it is worth some risk of a (hopefully low) number of traffic fatalities in order to get around quicker. You make that same choice individually every time you drive a car. You know there's a chance you'll be in a car wreck, but you knowingly take that risk in order to be able to move faster than walking.

Safety is a good thing, but there's a cost to it. What about "Drive 125, Save time!" Our time is valuable too. Imagine driving across Kansas on I-70, which is a flat, long, and straight highway. Driving 55 mph feels *so slow*, but that used to be the law.[5] Now on some Kansas interstates, the speed limit is 75 mph. There's a trade-off, isn't there?

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[4] See an old "55 Saves Live" TV ad at https://www.youtube.com/watch?v=0vlfe6NiYsE.

[5] During my high school years, I drove many times across Kansas, on a straight and flat I-70, to get to Colorado to ski. As teenagers, my friends and I saw no reason we should be driving so slowly. So we'd often "burry the needle", driving as fast as our cars would go. One of my justifications for driving faster than 55 mph was that it was safer to drive faster than everyone else compared to driving the same speed. In 1994 or '95 we were discussing the speed limit in a graduate micro-econ class at Auburn. I remember the Professor, David Kaserman, talking about his son speeding. I explained that it was safer to drive 85 than 55. The argument was that when you drive faster than everyone else, you only have to worry about the people in front of you. When you're driving 55, like everyone else, you have to worry about everyone around you, in every direction. Dr. Kaserman's response was, "I don't want you talking to my son."

If we want fewer fatalities, then we're going to spend more time on roads going slower. If we want to get places faster, there'll likely be more fatalities. Economics can't tell us what the *best* speed limit is. As economist Thomas Sowell said, "there are no solutions, only trade-offs".[6]

Imagine the "cost" to having zero traffic fatalities. We'd basically need to ban cars altogether. How about the cost of ensuring zero illiteracy, or zero crime? Crime is a bad thing, but we're willing to put up with some low amount of it. Our strategy is to have enough police to deter crime. If we wanted to *ensure no crime*, we'd probably need police everywhere, all the time.

We have to make tradeoffs. In your personal life, you have probably decided to attend classes and study once in a while. The cost is that you have less time for fun. As a society, we've decided we like to have cars to get around faster, and the cost is that there will be a small number of traffic fatalities. Think again about the argument, "lower the speed limit if it saves even one life." Don't you agree that this is an extreme position?

Example: Mask mandates for kids

In early February, 2022, a number of states began relaxing state-level mask mandates, so that individual businesses and school districts could begin making independent mask policies. Media reports suggested that the changes were the result of COVID (omicron) cases, which had declined by about 70% in the previous few weeks. One interesting aspect to this story was that these were all democrat-led states. (They included Oregon, New York, New Jersey, Connecticut, Illinois and Rhode Island.) The politics of this seemed strange, because President Biden and the Centers for Disease Control were still recommending masks be worn indoors.[7] Some political commentator suggested that the states' relaxing mandates was the result of polling data which have shown that American's are tired of wearing masks. Democrats are expected to get crushed in the 2022 election (as of spring 2022), due at least to some extent over continued mask mandates. Many citizens have grown tired of the mask mandates.

Interestingly, the head of one teachers' union (Randi Weingarten of the American Federation of Teachers) suggested that children should still be wearing masks until "the spread [is] low enough so that there's no dissemination or transmission in schools".[8] There it is again: the argument that we should incur *any cost to avoid even a tiny, miniscule risk*, even a slight chance of COVID spreading. What makes the argument particularly silly in this case is that children are the group least likely to have major complications from COVID. So even if a few COVID cases arise in schools, kids are unlikely to be seriously affected. The old, overweight, and others with comorbid conditions face the

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[6] See a brief interview of Sowell at https://www.youtube.com/watch?v=3_EtIWmja-4.

[7] Interestingly, during the State of the Union address on March 1, 2022, almost no politicians were wearing masks. How did it all of a sudden become safe to be unmasked, do you think?

[8] For more details, see reason.com/2022/02/08/randi-weingarten-mask-mandate-schools-teachers/

greatest risk – by far.[9] Yet, by mid-February 2022, only school kids were still being required to wear masks.[10]

During the debates over mask mandates, how much did you hear about the *costs* of wearing masks and the losses due to "virtual learning"? I can tell you from my experience teaching at the College of Charleston for over a decade that students are much worse off from having to "learn virtually". Finally, as of March 21, 2022, CofC no longer requires masks in all classrooms; faculty may request students wear masks in their classes, but otherwise masks are no longer required – maybe only until the next COVID variant begins its spread. (Which actually started happening in late March, 2022!)

1.3 Everyone is maximizing something

There are infinite different factors that affect your behavior. Among them are brain chemistry, upbringing, religious beliefs, influences of friends, willingness to take risks, and memories from past experiences. Economists take all of that as given; we do not attempt to understand the influences of these different factors like a psychologist might. In fact, economists have a fairly simple framework for understanding and explaining behavior or actions.

We begin with the assumption that human behavior (or action) is fundamentally *self-interested*. This just means that you have goals in your life, and you use your actions to try to achieve those goals. Put differently, *your behavior is aimed at making yourself better off, however you define it*.[11] Each person has different priorities – different things that make them happy. *Economists believe that each person is in the best position to decide what's best for them.*[12]

It's important to recognize that self-interested behavior isn't necessarily *selfish*. Self-interested behavior helps the actor, but can also help others. For example, you might donate your time or money to a charity like a church. This clearly helps other people, but it also helps you. How? Maybe you believe in karma, or maybe you just feel good when you help others. In contrast, selfish behavior helps the actor, maybe at the expense of others. Children often exhibit selfish behavior. For example, you've probably witnessed a kid trying to hang on to a toy just because someone else wants to play with it. When other kids lose interest, the selfish kid drops the toy and moves on to something else. While self-interested behavior can also be selfish, it's not necessarily.

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[9] This is based on studies on COVID data from March-December, 2020. For example, see cdc.gov/mmwr/volumes/70/wr/mm7010e4.htm, which reported that 75% of COVID deaths occurred in people over 65 years old, and 70% were among overweight and obese people.

[10] The Charleston County School District ended its mask mandate at schools on March 1, 2022.

[11] By "action" or "behavior", we mean it requires a conscious decision. Your heart beating and breathing are not actions or behavior.

[12] This applies to adults, not babies, toddlers, and children. Later, when we discuss consumers' behavior, this idea that each individual decides what's best for them is called "consumer sovereignty".

I know you probably don't care about the decisions I've made, but as an example… When I decided to become a college professor, I made that choice knowing that my income would probably not be as high as it would if I'd gone to work for a consulting firm that specialized in the gambling industry. But I liked teaching and doing research, and the ability to do research on whatever interests me. If I worked at a consulting firm, someone else would be telling me what I'd be working on. As a college professor I also have a lot of flexibility with my time. For example, I usually get to choose my class schedules. I wouldn't have so much control over my schedule working at a consulting firm. So when I chose to become a professor (and continue to be instead of taking a consulting job), I prioritized freedom and flexibility over money. You might not have made the same choice that I did, and that's fine. Each of us has different priorities.

You might really like the idea of spending all your time at the beach, swimming or surfing. But you recognize that over the course of your lifetime, you're going to want to get a job at some point. (Wouldn't you eventually grow bored day-after-day at the beach?) You don't want to be homeless, and you want food. You need an income.

Suppose you're at CofC majoring in accounting. You probably made this choice hoping it would improve your life. You being enrolled in the economics class might be indirectly the result of your decision to get a business degree. You might not have a particular interest in economics, but you know this class is a prerequisite for other courses in your degree program. So each time you show up to a lecture, that might not mean that you enjoy listening to my monotone voice or watching colorful scribbling on a white board. You might not even be interested in learning economics. But you show up to the lecture because it's consistent with your longer-term goal of getting a business degree. We can safely conclude that, all things considered, you view attending the economics lecture as the best use of your time each Tuesday and Thursday (insert our class time here).

Wow! Somehow, we went from your love of the beach to you ending up valuing these economics lectures more than anything else. How did that happen?

Rational Behavior

The discussion above is really an application of one of the fundamental assumptions in economics. Microeconomics is based, in large part, on the assumption that people make *rational decisions*. What exactly does this mean? After all, you probably have a friend or family member who may seem to make lots of irrational decisions. But that might just mean that you don't agree with their decisions.

The bar for rational behavior is a fairly low one. All we mean is that, prior to acting, people consider the *expected costs* and *expected benefits* of their actions. Since the goal of your behavior is to make yourself better-off, it means you'll only do something if you expect the benefits to outweigh the costs. Notice that this precludes behavior that you expect will harm you or otherwise make you less happy.

We can more formally express the economist's assumption that rational behavior requires that the expected benefit of an action exceeds the expected cost,

$E(B) > E(C)$

To summarize, then, economists assume that people are rational, in the sense that they compare expected costs and benefits before deciding on an action.

Suppose your roommate goes to J. Crew and buys a $30 t-shirt. We can surmise that they thought this was the best use of their $30. We also can assume that they expect the benefit they'll get from the t-shirt exceeds its $30 price, or the benefit they'd get from spending the $30 on something else. As another example, when you show up to the lecture, you demonstrate that you expect the benefits of attending to outweigh the costs. (Notice that neither the benefits nor the costs are in monetary terms.)

Our discussion has focused on behavior as being forward looking; expectations about costs and benefits are about the future. But what if your expectations are wrong? What if you come to the lecture expecting to learn a lot, but halfway through you realize it's been a waste of your time? Or you ate the rat sandwich at your favorite diner, only to be sick for three days after. There's nothing about behaving rationally that ensures your expectations will always be correct. That's fine. People learn from their mistakes. You won't order the rat sandwich next time. Maybe you'll skip class next time.

Most of your decisions include some degree of uncertainty or risk. You never know exactly what is going to happen. But as you get older, you begin to better anticipate costs and benefits of particular actions.

Economists rely so heavily on the assumption that individuals behave rationally, that in almost any situation, they give the benefit of the doubt to the individual actor. For example, there's even a respectable sub-field on the economics of addiction, in which a Nobel Prize winning economist has argued that becoming addicted can be seen as the result of rational behavior. For example, the choice to smoke one's first cigarette provides some short-term benefit, even though the person knows that smoking is potentially addictive and has longer-term health risks.[13]

The importance of the rationality assumption in economics is illustrated by Landsburg, in his *Armchair Economist*, chapter 2, "Rational Riddles". In that chapter, Landsburg argues that when you notice phenomena that you don't understand, you should always give the person the benefit of the doubt. They probably know more about their situation than you do as just an observer. For example, Landsburg questions why concert promoters for popular acts (Adele in Las Vegas, 2022?) don't increase ticket prices when shows sell-out within five minutes of ticket sales opening. Clearly, they could make a lot more money than they do. Rather than concluding that promoters are stupid, Landsburg suggests something else must be going on that the promoters know

[13] Gary Becker won the 1992 Nobel Prize in economics. Although his model of "rational addiction" is very mathematical, he explained, "Nothing in the analysis of forward-looking utility-maximizing behavior presumes that people know for sure whether they will become habituated or addicted to a substance or activity… Persons who become addicted because of bad luck may regret their addictions, but that is no more a sign of irrational behavior than is any regret voiced by big loses at a racetrack that they bet so heavily" (G. Becker, "Habits, addictions, and traditions", *Kyklos*, 1992).

but we don't. Perhaps the good publicity from selling-out shows quickly is beneficial or valuable. Maybe with lower ticket prices, shows attract a different demographic who is more likely to spend money on t-shirts and other "merch". His point is that, we should assume that the people in the business are being rational, and are generally making the best decisions to achieve their goals.

Let's consider some more "rational riddles" like Landsburg's. These are some of my favorite examples.

Example: 99¢ pricing

Okay, this is actually another one of Landsburg's examples. But why do so many stores do this, in so many different situations? You might understand 99¢ at the grocery store. There's a psychological explanation for it: people tend to focus on the first digit of prices, so that $2.99 looks a little better than $3.00, even though you know a penny doesn't really make a difference. Landsburg also speculates that having odd prices forces cashiers to make change for purchases. They might want to do this in order to prevent employees from steeling money, say, by not entering transactions into cash registers. Yet it seems surprising that stores like Target have some theory in mind when setting prices ending in "9". Regardless, research has shown that such prices to tend to stimulate demand for those products.[14]

Okay, but what about the rock shown in Figure 1.2? This is a real diamond ring that was offered on Costco's website. Would your psychological affection for the number 9 convince you to buy the ring at the listed price, but not if it was an even $820,000? That's a little difficult to believe. So why else would Costco price something so expensive this way? Try to give Costco the benefit of the doubt – that their pricing is rational. Can you think of a "rational" explanation for pricing the ring this way?

Take a look at real estate listings; you'll even find some houses listed with prices ending in 9. A friend of mine who's a former marketing professor at CofC had a plot of land listed in Duram, NC, for $249,999. When I asked her, she gave a good explanation for pricing it that way instead of at $250,000. She explained that all the 9s ensure the property will show up in a search if some lists $250,000 as a maximum price. Can you find any house listings ending with 99¢?

Figure 1.2 High-end 99-cent pricing

Emerald Cut 11.85ct
IF Clarity, G Color
Diamond
Platinum Solitaire Ring
- $819,999.99

Features: Only One Available,
IGI Value: $1,258,545

Source: Costco.com, 2/19/2016

[14] See E. Anderson and D. Simester, "Effects of $9 price endings on retail sales: Evidence from field experiments", *Quantitative Marketing and Economics* (2003).

Example: Questionable advertising choices

What's the purpose of advertising? Isn't it to get information to consumers about new products, why a particular product may be better than competitors' products? There are at least two different interesting questions that come to mind thinking about advertising. First, why do advertisers sometimes publicize how bad their products have been in the past? Second, why do some ads feature celebrities?

You'd think that advertisers would make a habit of only telling consumers what's good about their products. But in the past, there have been some really interesting exceptions to this. There's been a variety of companies advertising that they've been corrupt in the past, offered crappy products, or otherwise have done a poor job. Consider the following examples:

- Buick – advertising slogan, "This isn't your grandfather's Buick"[15]
- Domino's Pizza – ads show negative comments from consumer focus groups[16]
- Facebook – people were upset about how Facebook was using their data. FB ran ads trying to show they have integrity.[17]
- Uber – ad suggesting they're moving in a new direction[18]
- Wells Fargo – apology ad explains how they'll try to "earn back your trust"[19]

Why would these companies advertise how they'd done a bad job in the past? Can you think of a rational explanation? Maybe you'll consider using a product if its producer can admit when they have made mistakes. This strategy might create renewed confidence with consumers.

We won't spend time talking about each of these companies individually. However, it's worth mentioning Wells Fargo. They had been receiving bad publicity and government fines for years for shady practices. Why would anyone use Wells Fargo at all? Now we're turning it around to ask about the rationality of the consumers. One explanation is that it takes time and effort to change banks. So maybe if you hadn't been a victim of Wells Fargo's practices, you're not going to bother changing banks. Another explanation is that, if Wells Fargo happened to buy your mortgage, you might not really have a choice but to have a checking account with them.

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[15] Buick's "fresh look" ad is at youtube.com/watch?v=j761MNnFaeg.

[16] Domino's Pizza aired ads with some of the comments discussed in this longer video: youtube.com/watch?v=AH5R56jILag.

[17] One example of a Facebook ad is here: youtube.com/watch?v=Q4zd7X98eOs.

[18] Apparently, Uber had a data breach, and reports of sexual harassment had been resulting in bad publicity. This ad was an attempt to show things were changing: youtube.com/watch?v=WMZyw5lPKgE

[19] Wells Fargo's ad is at youtube.com/watch?v=qxExqOiCkPU. The bank has been fined repeatedly for engaging in shady and illegal practices that victimized their customers.

Figure 1.3 Kansas City Chiefs quarterback Patrick Mahomes earns over $40 million per year

Source: Chiefs.com

Next, think about television ads you've seen that feature celebrities. One long-running series is State Farm Insurance. Their ads feature the Kansas City Chiefs quarterback Patrick Mahomes (Figure 1.3). In 2020, Mahomes signed a contract with the Chiefs worth as much as $500 million (with incentives) over the next 12 years. You can bet that he's not cheap to hire to appear in commercials for State Farm. Suppose it's $1 million per commercial. Why would State Farm pay that much for Mahomes, who probably isn't an expert in insurance? Why not hire an actuary, who knows a lot about insurance? Why not just put a State Farm employee in the ads? See if you can come up with some explanations for why it makes sense for State Farm to pay Mahomes lots of money to be in their ads.[20]

Example: Prices on restaurant and bar menus

Have you ever noticed that restaurants always list prices on their food items and wines (by the glass or bottle), but they often don't list prices for soft drinks or beer? Establishments that sell liquor will often have a drink list where they might list the different types of tequila they sell, but they almost never list prices for liquor. Why not? What are some possible explanations for showing food prices, but not prices for beers?

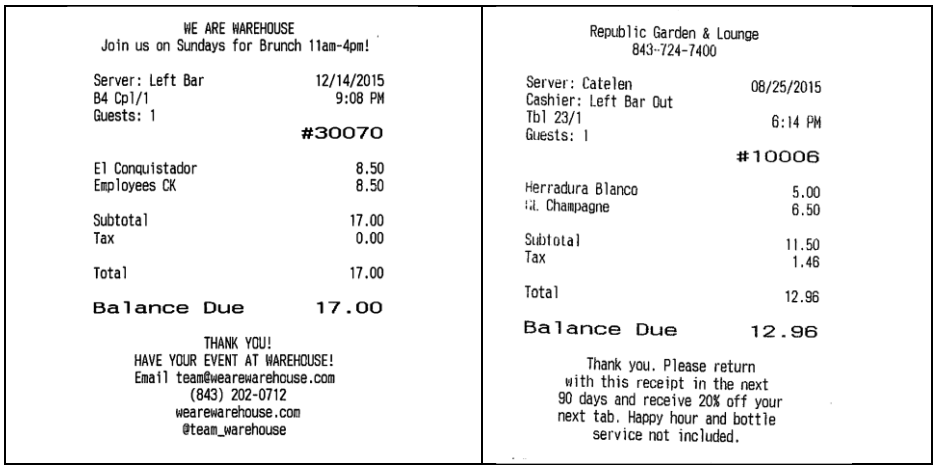
One possible explanation is that, when there are various types of beer available – all the same general product – by not showing prices, maybe the customer will tend to choose higher priced (i.e., better) beers. I suspect that some of you that have worked in restaurants or bars will have a variety of possible explanations.

Another interesting question is why some bars show taxes as a line-item on the receipt, while others seem to show prices with taxes "built-in". Take a look at the two receipts from Charleston bars shown in Figure 1.4. Both bars have to pay South Carolina sales taxes on liquor sales. These taxes, which are 16.5% on liquor drinks, are usually passed-on to consumers. From the receipts it looks like Republic passes the taxes to consumers, while Warehouse doesn't. What's going on here? Why does Warehouse present a check on which it appears the customer isn't being charged sales tax? Again, we should start with the assumption that the managers of these businesses know what they're doing. The answer here isn't obvious. But one explanation could relate to tips.

[20] Details about his Chiefs contract is from sportingnews.com/us/nfl/news/patrick-mahomes-contract-details-chiefs/135gtys5bd4gn1wrxm7nuz1v56. You can see some of Mahomes' ads at youtube.com/watch?v=8ESRNaR7aaU.

Do you think people might leave tips of different sizes (%) depending on what's shown on the check?

Figure 1.4 Receipts from Warehouse, which includes taxes in the prices, and Republic, which does not



WE ARE WAREHOUSE
Join us on Sundays for Brunch 11am-4pm!

Server: Left Bar 12/14/2015
B4 Cpl/1 9:08 PM
Guests: 1
#30070

El Conquistador 8.50
Employees CK 8.50

Subtotal 17.00
Tax 0.00

Total 17.00

Balance Due 17.00

THANK YOU!
HAVE YOUR EVENT AT WAREHOUSE!
Email team@wearewarehouse.com
(843) 202-0712
wearewarehouse.com
@team_warehouse

Republic Garden & Lounge
843-724-7400

Server: Catelen 08/25/2015
Cashier: Left Bar Out
Tbl 23/1 6:14 PM
Guests: 1
#10006

Herradura Blanco 5.00
Lil. Champagne 6.50

Subtotal 11.50
Tax 1.46

Total 12.96

Balance Due 12.96

Thank you. Please return
with this receipt in the next
90 days and receive 20% off your
next tab. Happy hour and bottle
service not included.

1.4 Incentives matter

A lot of economics, particularly the analysis of government policies, deals with how *incentives* affect people's behavior. An incentive is some type of encouragement or discouragement. For example, if the class syllabus indicates that you lose 5% of your course grade for every lecture you skip, that's an incentive to attend class (or a disincentive to skip). If you're late paying rent, suppose there's a $250 late payment fee. That's an incentive to pay on time.

Chapter 1 of Steven Landsburg's book, *The Armchair Economist*, begins, "Most of economics can be summarized in four words: 'People respond to incentives.' The rest is commentary". I agree. Most of what we'll do in this class is somehow related to incentives. In the first half of the class, we look at how consumers and producers behave. In the second half, we'll look at how people respond to various government policies, which can be thought of as incentives that change behavior.

One of the best illustrations of incentives is given by Landsburg in his discussion of seatbelt laws.[21] U.S. federal law began requiring seatbelts to be installed in all cars in the late 1960s, but it wasn't until the 1980s that individual states began mandating seatbelt use. South Carolina's seat belt law was passed in 1989. In what sense is a

[21] This discussion summarizes Landsburg's on pp. 4-5. Airbags would be a similar example.

seatbelt an incentive? Landsburg argues that it can be an incentive to be *less careful when driving*. How? It reduces the cost of driving carelessly. Let's analyze it.

What do you think was the goal of implementing seatbelt use laws? Probably to diminish traffic fatalities, right? And it makes sense that if you're in a traffic accident, wearing your seatbelt will reduce your chance of dying. Who could argue with seatbelt laws then? This logic seems fine. But it ignores the *incentive effect* of seatbelts. If I know I'm safer driving in my car with my seatbelt on, then maybe I start taking unnecessary risks. Have you ever read or written a text on your phone while driving? Have you taken your eyes off the road to mess with the stereo? Why would you take that risk?

Landsburg outlines two different effects that come from seatbelt use. One is the *direct effect*, that seatbelt use reduces the chance of dying in a particular traffic accident. But since you feel safer with a seatbelt on, you might engage in more risky behaviors. This *indirect effect* (or incentive effect) leads to more accidents occurring. More accidents, by itself, suggests more fatalities. In Table 1.1 we illustrate these two effects and their impact on traffic fatalities. As you can see by the arrows, these two effects have the opposite impact on the number of fatalities. This means that it's unclear whether seatbelt use will save lives, as they are intended to. Economists have studied the effectiveness of seatbelt laws, and results have suggested that the magnitude of the direct and indirect effects are roughly equal, meaning that seatbelts have not made a significant difference on traffic fatality rates. Interestingly, studies have also found that *pedestrian deaths have increased* since seatbelt laws were implemented.[22] Why do you think pedestrians have been worse off? Well, if car drivers are less careful, they're more likely to hit pedestrians in crosswalks, jaywalkers, etc.!

Table 1.1 Effects of seatbelt use on traffic fatalities

Effect Type	Description	Effect on Fatalities
Direct	Seatbelt reduces risk of dying in an accident	↓
Indirect (incentive)	Incentive to drive less carefully leads to more accidents	↑

[22] Landsburg cites the first such study: S. Peltzman, "The effects of automobile safety regulation", *Journal of Political Economy*, 1975. More recent studies, in contrast, have suggested that fatality rates have declined with seatbelt use. For example, A. Cohen and L. Einav, "The effects of mandatory seat belt laws on driving behavior and traffic fatalities", *The Review of Economics and Statistics*, 2003.

Landsburg suggests that many people are skeptical that wearing a seatbelt makes them less careful drivers. You might have been thinking that you don't intentionally drive worse just because you have a seatbelt on. But the incentive effect he's referring to can be really subtle. It might mean that you're willing to take your eyes off the road for just a few seconds longer than you might otherwise; maybe you frequently text while driving. Anyway, in order to show the incentive effect is real, he suggests we consider an incentive that works in the opposite direction of seatbelts.

Take a look at Figure 1.5. What if, instead of that fancy Jaguar logo on the middle of your steering wheel, there was a fancy spear pointed out at you? (I have cleverly coined this a "spearing-wheel".) Would that affect how you drive at all? I would hope you'd see that spear as some type of incentive! Let's reconsider Figure 1.5, this time thinking about the effect on traffic fatalities of the spearing-wheel. The direct effect is pretty obvious: If you wreck, you'll be impaled by the spear and die! So the direct effect increases traffic fatalities. But that's not the end of the story. Every time you get into the car, you'll see the shiny spear pointed at your heart.

Figure 1.5 Components of a "Spearing wheel"

Won't that be a really strong incentive to drive *really carefully*? You may never want to go over 5 mph! That's the indirect effect. It's the same type of incentive created by the seatbelt, just working in the opposite direction. (See Table 1.2.) Just as with seatbelts, how the spearing-wheel affects fatalities depends on which effect (direct or indirect) is stronger. I would expect the incentive effect to be strong enough to discourage many people from driving at all.

Table 1.2 Effects of spearing-wheel use on traffic fatalities

Effect Type	Description	Effect on Fatalities
Direct	Spear guarantees death if in an accident	⬆
Indirect (incentive)	Incentive to drive *extremely carefully*, leads to many fewer accidents	⬇

The point of this example is not to suggest that car companies should start offering the "spearing-wheel" as a high-end alternative to seatbelts. Rather, it is to show that we shouldn't ignore a policy's *incentive effect* if we want to better anticipate how a policy will actually work. It turns out that government policies, such as seatbelt laws, may not have their intended effects, often because of an incentive effect.

Can you think about other examples where there might be a hidden incentive effect? What about "diet foods"? Suppose you love tacos with sour cream, and eat them every day. In order to get healthy (suppose you're overweight, and want to lose weight), your New Year's resolution is to switch from 80% lean beef and regular sour cream to using 93% lean beef and "light" sour cream on your tacos. What will be the result? What are the two effects? The direct effect is that your switching ingredients to less fatty ones means each taco has fewer calories, which implies you will lose weight. But what about the incentive (indirect) effect? After switching ingredients, you may think, "Hey, tacos aren't nearly as unhealthy as I thought!" Then you proceed to eat two more tacos a day compared to before. Your weight increases.

As a similar example, what happens when you switch from smoking Camel (no filter) cigarettes to Camel Lights, but increase your smoking from a pack a day to three packs a day. Your risk of getting lung cancer increased.

1.5 Miscellaneous introductory concepts

Before we move on to a more structured development of microeconomic tools, there are a few other concepts that we should introduce. This section is going to be more of a list of different ideas with brief explanations. You'll see examples of each throughout the course.

Positive and normative statements

During the semester we're going to engage in a lot of analysis, most of which will result in some conclusion about how effective a particular policy is likely to be, for example. It's important to be clear when making conclusions that some statements can be proven right or wrong, while others are more a matter of opinion.

A *positive statement* is one that can be shown to be correct or incorrect. If your friend tells you that the sales tax rate in South Carolina is 6%, that's something you can look up and confirm. Whether the statement is correct or not, it's a positive statement because we can verify whether it's true or not.

In contrast, a *normative statement* is an opinion. Such statements will often be about what is "fair", or how someone thinks things "should be". Of course, that's subjective – we easily disagree with such statements. If your same friend tells you that "South Carolina taxes are too high", that's an opinion – a normative statement. You might agree with your friend, but it's not a statement that can be shown to be correct or not.

Why is this an important distinction? Later in the course we're going to use our analytical tools to study some controversial topics, including government policies such

as drug prohibition. It's important to be able to distinguish between conclusions we're making that can be shown analytically, versus opinions about what's good or bad, fair or unfair.

Example: What type of statement is it?

For each of the following statements, indicate whether it's positive or normative:

- This book sucks!
- Sales taxes on liquor drinks in Charleston are 16.5%.
- Sales taxes at Charleston bars are too high.
- The best wine is always the most expensive one.
- The minimum wage law causes unemployment.
- President Biden has been an ineffective leader.
- President Biden's approval rating has been decreasing in 2021-22.
- Government should do more to reduce inflation.

Remember, the distinction is based on whether a person could prove the statement correct or incorrect. (You don't actually have to prove it to determine whether it's positive or normative. Positive statements may be wrong.)

Economic efficiency

Economic efficiency is a very important concept in economics. Think back to the example of college students deciding how to use their time. You want to maximize your well-being, which might mean you need to attend classes and study, rather than going out with friends or surfing at the beach. In a way, this example gets at "economic efficiency". A simple definition of efficiency is getting the most out of your resources – time, or money, or inputs to production.

Technological efficiency means getting the most output, given the inputs used. For a student, it might mean getting the highest grades possible, given you're willing to study for eight hours a week. Said differently, if your goal is to get all B grades or higher, then you want to do that by using as little time and effort as possible. You want to minimize the "resources" used because you have other things you want to do with your time.

Now let's use an example more in line with material we'll be discussing later in the class. Suppose a car factory manager is trying to decide their production plan for the next month. The inputs to production at the factory might include steel, glass, plastic, machinery, and labor. If the factory manager wants to produce 50 cars in a month, technological efficiency requires that the cars be produced using as few input resources as possible. Alternatively, given the manager is willing to use a particular amount of inputs, their goal should be to get the most cars possible using those inputs.

Now think about "society" in general, or a particular country's economy. Doesn't it make sense that technological efficiency would be a goal in whatever is being produced?

After all, we live in a world of scarcity, which means we have limited amounts of various input resources. We want to get the most output possible.

A different type of efficiency is called *allocative efficiency*. This applies more to an overall economy. By allocative efficiency we mean that we'd like for the economic framework in an economy to be responsive to what people want to consume. In other words, we'd like a system that ends up producing the goods and services that people value, rather than crap they don't want. Ideally, we'd have enough food, clothing and shelter for everyone. We also like to have cell phones, computers and cars. Fortunately, these types of things tend to be widely available. (That doesn't mean everyone can afford everything – we still have scarcity.) But it's good that you can consistently find food at grocery stores. Imagine if, instead, most grocery stores had empty shelves, but shoe stores routinely had thousands of surplus pairs of shoes in all different sizes. Imagine how wasteful that would be of our scarce resources if there are way too many shoes for society members, but not enough food. We want a system that does a good job aligning production with the wants and needs of consumers. That's the idea of allocative efficiency – inputs are somehow allocated toward producing the stuff that people want.

Adam Smith is generally regarded as the "father of economics." He was arguably the first person to analyze the concepts that we now think of as "economics".[23] One of Smith's best-known ideas is the "invisible hand" of the market. The idea refers to the fact that individuals who are working in market economies, pursuing their own self-interest, end up achieving society's goals. For example, if people want more food, prices will tend to increase, making it more profitable for farmers to grow crops and ranchers to provide beef. The food producers end up helping society by producing more food, even though their main motivation was only to benefit themselves by making more profit. Smith explained,

> Every individual…neither intends to promote the public interest, nor knows how much he is promoting it… he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.[24]

Much of what we'll learn in this class about prices and markets deals directly with what Smith was referring to here.

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[23] His most famous book is titled, *An inquiry into the nature and causes of the wealth of nations* (1776).

[24] A. Smith, *The theory of moral sentiments* (1759), quoted from adamsmith.org.

1.6 Henry Hazlitt's "broken window"[25]

You may be required to read Henry Hazlitt's excellent book, *Economics in one lesson* (1946). Either way, it's worth discussing his main point here because it applies to almost everything we discuss in this class. I've adapted it to Charleston so it's more interesting.

One night after drinking at AC's, a group of (21 or older) CofC students was walking home on St. Philip Street. Because he's drunk and dumb, Donnie Dumbass (Figure 1.6a) decides to throw a brick through a window of the Brown's Court Bakery (1.6b).

The next morning, a group of concerned neighbors gathers near the bakery and begins discussing the destruction that occurred the previous night. In order to appear innocent, Donnie also shows up. When the people begin discussing the vandalism, Donnie says, "Y'all, this might be a good thing. Now they'll hire Window World to replace the bakery's $500 window. That means new spending of $500 and a job for Window World." It is true that $500 will now be spent replacing the window. But think about that…

How can destruction of property be a good thing? What else could the baker have done with the $500? It becomes clear that Donnie's reasoning is flawed. He has failed to consider what Hazlitt calls "the forgotten man".

It turns out, the baker had been planning to hire a carpenter to build a new $500 pastry display case for the bakery. Now that the baker must pay Window World to replace the window, the $500 now can't be used to hire the carpenter. The carpenter is "the forgotten man", because now he won't enter the scenario at all, and the display case will never be built. The crowd only considers "what is seen".

Figure 1.6a Donnie Dumbass often does and says dumb things

Figure 1.6b Brown's Court Bakery, on St. Phillip

[25] Hazlitt is discussing French economist Frédéric Bastiat's essay *Ce qu'on voit et ce qu'on ne voit pas* (1850).

What about the argument that there's new spending either way? Doesn't the $500 just go to Window World instead of the carpenter? So there'd still be a new job – a benefit to "the economy." In economics, it's important to always consider the *counterfactual* – what would have happened otherwise. (Think about opportunity cost in that context.)

While the spending is diverted from the carpenter to Window World, think about what started all this. A window worth $500 was destroyed. After the baker hires Window World, what is the end result? Society ends up with a window, instead of a window *and* a display case. We've lost the value of the display case, which now will never be produced. Even though there was employment created, society still lost wealth from the destruction.

Once you step back and think about it, it makes sense. It can't be beneficial for society to destroy valuable things. It doesn't matter if that destruction creates new demand for windows. Besides, it would be better to use new windows for new buildings, rather than replacing windows that were destroyed by dumbasses.

After explaining why society is worse off with destruction, Hazlitt goes on to explain that "good economics" requires us to consider not only the immediate benefits to one particular group of people (Window World in the example above), but also other people who might not now enter the picture (the carpenter). And we have to consider the costs and benefits in both the short- and long-run.

Example: Destruction from Russia's invasion of Ukraine

On February 24, 2022, Russia invaded Ukraine. If you were watching the news throughout the spring, you'd have seen a variety of videos showing the destruction of Ukrainian buildings, along with people who were injured or killed. With the destruction resulting from war, don't be surprised if you eventually hear a commentator suggest that, while the destruction has a catastrophic "human cost", there will be an "economic" silver lining: the need to rebuild will stimulate the Ukrainian economy.[26]

Think about how flawed that line of thinking is. To suggest that rebuilding Ukraine will be economically helpful is like Donnie suggesting that Window World will benefit from the brick being thrown through Brown's Court's window, while ignoring the loss to the carpenter who would've built the new pastry display case. In the case of war, replacing destroyed buildings is not the same as improving existing ones or building news ones. Clearly, war has an economic cost (destroyed property) that is not simply offset by the need to replace it. As Hazlitt explains, "No one burns down his own house on the theory that the need to rebuild it will stimulate his energies".[27]

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[26] While people are tragically losing their lives, the focus of such comments are on economic variables such as employment and gross domestic product. This focus does not mean that the commentator doesn't care about human life lost. That goes without saying. We want to focus here, too, more on fallacious statements about the economy.

[27] H. Hazlitt, *Economics in one lesson*, p. 27. (1946; Currency edition, 2020)

1.7 Examples of opportunity cost

Now we're going to start developing some of the key tools we'll need for later in the course. Back in section 1.2 we introduced the concept of opportunity cost. This may be the single most important concept in economics. The typical textbook definition of opportunity cost is "the highest-valued alternative use of resources used". Earlier we considered the decision to attend a lecture. When you come to a 75-minute economics lecture, you're giving up some other activity that you could've done with those 75 minutes. Would you have gone to the beach, or slept in, or taken another class instead? Whatever would have been your next-best use of that time is your opportunity cost of coming to the econ lecture.

Anytime we say "cost" in economics, we mean opportunity cost. It's important to distinguish between what economists mean when they say "cost" and what accountants mean. Full opportunity cost is comprised of two separate types of cost:

- *Explicit cost* is monetary costs, or accounting cost. It's how much money you spend on something.
- *Implicit cost* is any other cost or sacrifice one makes. Often this is the time spent on some activity.

Example: The cost of going to Cru Café for dinner

Have you been to Cru Café? It's a great restaurant over by Market Street. Their lunch is terrific, and so is the dinner. It used to be a lot cheaper than it is now, but everything in Charleston has become more expensive. Anyway, let's think about the cost of getting dinner at Cru. Remember we have to consider the full opportunity cost, which means the explicit plus implicit costs.

What are the explicit costs? This would be the amount of money you spend getting dinner, and paying for parking or an Uber. It's the money you pay. Next, we have to consider any non-monetary resources used. What's the biggest one of these? Probably the time you spend. Maybe it takes 2 hours to have your dinner. That's time that you could have spent studying economics. So when you go out to dinner at Cru, the implicit cost could be that you get a lower grade on your economics exam the next day.

Example: The cost of getting a degree at College of Charleston

You're in ECON 200 working toward an undergraduate degree at CofC. What's the cost of getting the degree? First list the explicit costs, then the implicit costs.

The explicit costs are those that require you to pay money. These would include tuition ($10,000 per year x 4 years), books ($2,000 per year x 4 years), and parking fees ($500 per year x 4 years). We're just making up some approximate numbers here for CofC, so don't worry if the numbers aren't exact. The total for these explicit costs is $50,000.

What about rent? For rent to be considered a cost of getting your degree, it has to be the case that *if you weren't going to CofC, you wouldn't have to pay rent*. Let's say if you weren't in college you'd be living at home with your parents, and they wouldn't make you pay rent. In this case, we'd consider your rent to be a cost of college – since you otherwise wouldn't have that expense. But if instead, if you weren't in college, you'd have a job in downtown Charleston and would be renting a similar place as you are now, then rent wouldn't be considered a cost of college. You'd be paying it anyway. For simplicity's sake, let's suppose you'd be paying rent even if you weren't in school, so that rent isn't a cost of college. (The same argument would apply to food.) Then your total explicit cost is $50,000.

Now for the implicit cost. What would you be doing if you weren't enrolled at CofC, taking classes? You'd probably have a job, right? So for the four years you're in school, you're sacrificing the income you'd have received from a job. Let's say that would've been $30,000 per year (which probably is about right for someone with a high school degree). When you decided to go to college for four years, you sacrificed $120,000 of income ($30,000 x 4 years) that you would've otherwise earned!

There could be some other implicit costs. For example, if you *hate* school, and sitting in lectures is like torture for you, then maybe you have to visit a psychologist each week. Your mental anguish suffered as a student would be an implicit cost. But there's also an explicit component, since you probably have to pay a fee to talk with a psychologist.

Ignoring your mental anguish caused by school, and any other potential implicit costs, we can approximate the cost of getting a degree at CofC at $170,000. That's the $50,000 in explicit cost, plus the implicit cost which we estimated at $120,000. Again, some of the implicit costs may not be measurable in money, but if they are, we'd add those amounts to our total.

In this example we assumed that you would've had a job paying you $30,000. But what if, after you get your "Studies studies" degree from CofC, your starting salary is still just $30,000? Does this mean the degree was a complete waste of time and money?[28] No. Unless the only reason you went to school was to increase your income. But aren't there some other benefits of going to college? What about:

- Social benefits – meeting new friends, being exposed to new ideas
- College lifestyle – you'll probably never have the opportunities you have in college again; you've got lots of freedom, and maybe financial support from parents
- Learning – hopefully you learn some interesting things in college

[28] One commentator, Shane Hummus, suggests that any degree with "studies" in its title is probably not useful for getting a job. His video is where I got the "Studies studies" example above. If you want to be agitated, see https://www.youtube.com/watch?v=1Rda2a5kdZg. He argues that the most useless degrees include three of the most popular majors at CofC. However, among other issues, Hummus doesn't seem to consider that many people do not get careers in the majors they chose in college.

- Career flexibility – even if your starting job doesn't pay well, perhaps the degree will give you a wider variety of opportunities for jobs later in life

Example: The cost of parking in Charleston

There's been a lot of debate over parking prices in Charleston recently. A couple of years ago the City doubled the prices for parking at meters. This increase posed financial stress on food & beverage workers, who were already struggling before COVID. Aside from meter parking, some parking spaces in Charleston (aside from driveways at houses) are privately owned. For example, in 2017 a parking space near Burns Ln and King St was for sale for $74,000! Why would a 8' x 12' plot of asphalt cost that much? Do you pay for parking at CofC? Your prof has to pay $750 per year to park in the Wentworth Garage. Why is parking so expensive here?

Example: Faculty salaries

"Equal work for equal pay" seems like it would be a sensible and fair way to compensate people in an organization. For example, you'd expect a company like Publix to offer the same starting salary for all cashiers. Lots of organizations probably have standardized pay scales. But let's look at academics, specifically at the College of Charleston.

Many of you are relatively new to the College. Even if it's your first semester here, you've probably already met four or five professors. Most faculty have a "terminal degree", which means the highest possible degree in their field. For many disciplines, this is the PhD (doctorate); for some artistic fields, there are other degrees, such as the MFA (master of fine arts). Different faculty went through different types of graduate school/training. But when we're hired at a university, we experience some degree of uniformity. The rank for new faculty is called "assistant professor". After six years of work at the assistant professor rank, faculty undergo a review to be promoted to "associate professor". After six years at the associate rank, there's another review, and potential promotion to the highest rank of "professor".

All faculty at CofC are expected to teach classes, publish research (or produce artistic output), and do service work, such as committee work, consulting, etc. Our effort is supposed to be split (adding up to 100% effort), so that teaching is the priority (50%), research is next (40%), and service is the lowest priority (10%).[29] Most faculty teach three classes per semester, regardless of their department.

Let's focus on new hires at the College. Given that faculty in different departments have fairly similar jobs, i.e, teaching three classes, engaging in research or artistic production, and service, what would you expect starting faculty salaries to look like? If

[29] This is my own priority listing. Faculty have some flexibility with their effort, but teaching is the highest priority at the College. Other types of schools, such as research-oriented institutions like Clemson, put much less importance on teaching.

you're an advocate of "equal work for equal pay", you might expect they're all the same, or at least pretty similar. Of course, there's no reason you should have thought about this much before now.

Table 1.3 lists salaries for assistant professors in various departments.[30] What jumps out at you? Why does an accounting professor make more than *twice* what most other faculty make (among those listed in the table)? Does this mean that what is taught in accounting classes is twice as important as what you'd learn in philosophy? Certainly not. Learning to write well and think critically are arguably much more important for most people than learning how to use t-accounts (in accounting). So then what explains the differences in salaries?

Table 1.3 Assistant professor salaries at College of Charleston[31]

Department or discipline	9-month salary
Accounting	$145,000
Art	$ 65,000
Classics	$ 60,000
Communications	$ 61,500
Economics	$ 70,000
Finance	$132,000
History	$ 65,000
Italian	$ 57,000
Philosophy	$ 65,000
Physics	$ 65,000
Psychology	$ 65,000
Sociology	$ 66,000

Think about how *opportunity cost* applies here. What do you think a person with a PhD in accounting would be doing if they weren't teaching at the College? Every company needs an accountant. So there are plenty of jobs outside the university. Then in order to attract accountants to teach at the College, they have to be offered salaries that are similar to what they could be earning elsewhere.

Now think about a professor of art, or philosophy. What types of jobs are there for these people, if they decided not to teach? The options are much more limited. An artist

[30] These salaries are not "standardized", as each faculty member can negotiate salary prior to accepting a job.

[31] These are estimated "new hire" salaries for selected roster faculty during the 2021-22 academic year. Estimates are based on public data from admin.sc.gov/transparency/state-salaries.

As an aside, the highest paid public employee in South Carolina is Shane Beamer, USC's football coach, who earns $1.1 million per year. Nine of the top 10 paid public employees in South Carolina have "athletics" in their titles, with salaries of $500,000 or more.

could produce and sell art, maybe have their own studio. But it's probably difficult to be successful in that line of work. What would a philosopher do outside the university? Maybe they could work as a journal or publishing editor. The lower salaries in those disciplines are a reflection that the job options outside of academics are more limited.

It may initially seem unfair that some professors can make twice as much as some others, especially since they're doing very similar jobs. Suppose administrators tried to impose a "equal work, equal pay" policy, so that the starting salary for all new assistant professors is $85,000 at CofC. How would that change things?

First think about what would happen to the quality of faculty in the Philosophy Department. If $65,000 is the average salary for philosophy professors in the United States, what kind of candidates will CofC get if it's paying $85,000 for those jobs? You should expect that we'd have a terrific-quality department, since we'd be paying salaries far above average. The same argument would apply in those other disciplines where market salaries are in the mid-60s.

Next think about the Accounting Department. If the average accounting faculty salary in the U.S.A. is $145,000, what type of people is CofC going to attract when it offers $85,000. Why would any accountant want to come teach here for that salary, when they could work anywhere else for 75% more money? You should probably expect to get really poor quality, incompetent accounting professors at that price.

Above I suggested that the main reason for the salary differential is the job market outside of academics. This is definitely a large part of the explanation. But there's also a *supply-side* cause. Graduate programs in accounting typically limit the number of students in their programs. (This may be due to business school accreditation restrictions.) This means there won't be a lot of people out there with accounting PhDs. As a result, when a position opens for a new accounting professor, the department may only receive 10 applications. For many other disciplines listed in Table 1.3, graduate programs do not limit the number of graduate students. The result is many more PhDs graduating than there are open faculty positions in any particular year. For example, it is not uncommon for us to receive 200 applications for an opening for an economics professor. The same is likely true for classics, physics, etc.

Is it fair that faculty in different disciplines earn such disparate salaries? That's one of those normative issues. Before you give an opinion, you should try to understand the reasons salaries are what they are.

After these various examples of opportunity cost, hopefully you're starting to get the gist of how economists think about "cost".

1.8 Modeling opportunity cost

The last thing we'll do in this chapter is develop a graphical model of opportunity cost. The model serves two purposes. First, it's a more structured presentation of cost. Second, the graphical model illustrating opportunity cost is exactly what we need to be able to analyze the benefits of international trade, covered in chapter 3.

If you took a high school course in economics, you may already be familiar with the "production possibilities frontier" (PPF) model, also called a "production possibilities curve". A PPF illustrates the maximum combination of two products that can be produced in an economy.

Why bother developing a model with just two goods, when we produce millions of products in the United States? We want to develop the simplest possible model that still enables us to analyze the concept at hand. We can understand the fundamental idea behind opportunity cost (i.e., trade-offs) by considering just two goods. The same concept would apply to three, or a million goods. The other reason we'll look at two goods is that two-dimensional graphs are really easy to draw and understand. Three- or more dimensions aren't nearly as easy.

There are a few simplifying assumptions that underlie the PPF model:

- Production uses a single input, labor
- There is full employment, or no unemployment
- Technology is fixed
- Two goods are produced, and consumers like both

Let's develop a PPF to model how a student (like you) could allocate four hours of time (labor) working or studying, in order to produce income and grades (goods). We'll make one more assumption, that you can't "split hours". So if you want to work, you have to do it in 1-hour increments; the same goes for studying.

When you work, your boss pays you for each hour worked. When you study, you learn more of the material for your class, and earn higher grades on quizzes and exams. Suppose the data in Table 1.4 shows the your "production table" from studying (S) and working (W) different combinations of time, for a total of 4 hours. Each row in the table represents one way you could allocate your time. For example, the first row shows that if you don't study and work four hours (0 S, 4 S), you'll earn 60% on your exam and $44 in income. Alternatively, you could study three hours and get 90% on your exam and work one hour and earn $11. Remember that we're assuming full employment, which in this case means you use all four hours to study and/or work.

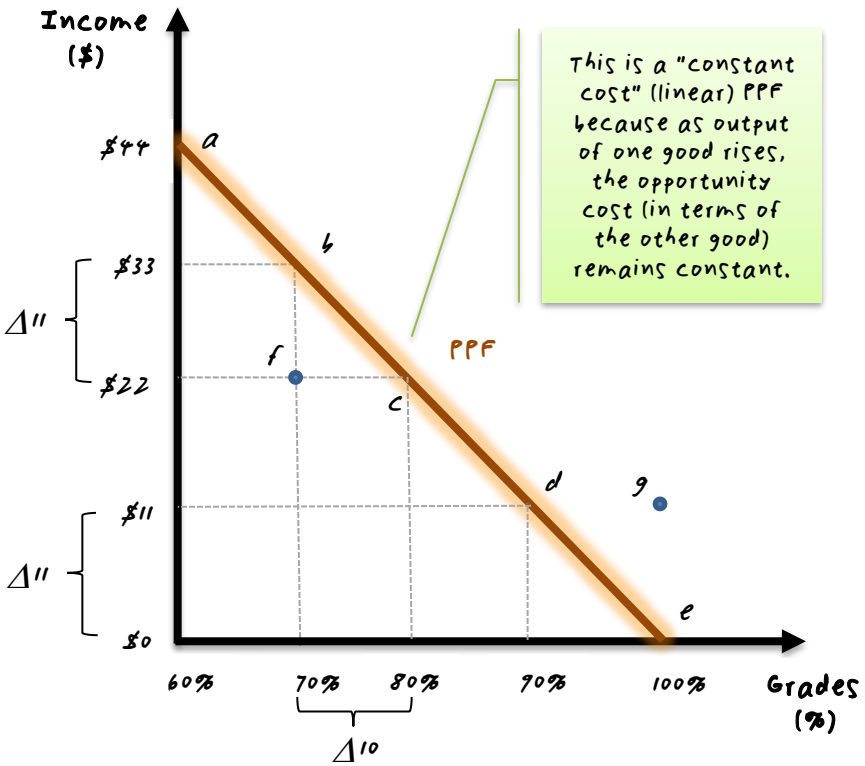
Table 1.4 A Student's "production table"

Hours Spent	Grade (%)	Income ($)	Corresponding Point in Graph 1.1
0 S, 4 W	60%	$44	a
1 S, 3 W	70%	$33	b
2 S, 2 W	80%	$22	c
3 S, 1 W	90%	$11	d
4 S, 0 W	100%	$ 0	e

We can see the opportunity cost of your time by looking at how the outputs change when you change how you allocate your time. For example, if you begin the semester by allocating your time as shown in the first row (0 S, 4 W), then your grade is 60% and you earn $44 per day. Then let's say you decide you want a higher grade. You can do this by shifting your effort from work to studying. So you move to the second row (1 S, 3 W). By doing this, your grade increases by 10%, from 60% to 70%. *What's the cost of increasing your grade by 10%?* It's what you give up by studying an extra hour. Since you have to cut your work time an hour, you lose $11. Your income falls from $44 to $33. So we can say that *the cost of a 10% increase in your grade is $11*.

Now we can transfer this information to a graph showing the PPF for the outputs of grades and income. Graph 1.1 shows the PPF corresponding to the data from Table 1.4. The endpoints of the PPF would be *a* (60%, $44) and *e* (100%, $0), from the first and last rows of Table 1.4. The other three rows from the table are also plotted.

Remember that we're assuming you've got four hours of time to divide between studying and working. The PPF shows your maximum output (grades and income), and since we're assuming "full employment", you'll end up somewhere <u>on</u> the PPF curve. This means that you won't produce at point *f*, under the PPF (70%, $22). That combination of outputs only takes three hours, not four. You also cannot produce at point *g* (100%, $11), since it would take five hours to produce.



Graph 1.1 A student's PPF for four hours of time

As you can see in the graph, each time you reallocate an hour of time between working and studying, you face a trade-off. For example, you can move from *b* to *c* (from 70%, $33 to 80%, $22). When you study an extra hour, you gain 10% on your grade, but it costs you $11 income. Notice that *each* 10% increase in grade costs another $11, and vice-versa. Suppose you started out producing on the *x*-axis, studying four hours and not working. You'd be acing your classes, but you'd have $0 for food. Soon you might grow tired of starving, and decide you should work for at least an hour. So you can move from *e* (100%, $0) to *d* (90%, $11). An $11 increase in income costs you 10%. For *each* $11 increase in income, you must sacrifice 10% of your grade. That's *opportunity cost*.

1.9 Up next...

We've set the stage to move into a more methodical development of economic theory. An understanding of the simple PPF model we developed in section 1.8 is critical for the model of international trade that we'll develop in Chapter 3.

Before we get there, it's useful to discuss economics in the context of how society is organized. In Chapter 2 we do this by discussing different forms of government and the relationship between individuals and government. This discussion is important to keep in mind later in the course when we discuss specific government policies how policies affect individuals' ability to make decisions for themselves.

CHAPTER 2

Economics and the "Big Picture"

In the first chapter you were introduced to some of the fundamental ideas in microeconomics. In the next few chapters, we'll start developing the key tool of microeconomics – the market model (specifically, supply, demand, and prices). After that, for about half the course, we'll apply the market model to a variety of policy issues. But before all that, it might be helpful for you to think about how economics fits into your "big picture." That's the purpose of this chapter – to give you some reasons why a college student should want to study economics.

For many of you, this course is a degree requirement, and I understand that you mightn't otherwise have chosen to take this class. But even if you don't think economics will have a direct impact on your career, it is important to understand that the concepts of economics apply to many important decisions you'll make in your lifetime. In fact, almost *every* decision you make likely has some economic element to it.

Many people think that economics deals just with money, or stock markets, or "business." But that's not the case. Many decisions you make involve *trade-offs*, and trade-offs are a foundation of economic theory. What do I mean by "trade-off"? The fact that you're reading this right now provides one example. By using your time to read this book, you've sacrificed the opportunity to do something else with your time, such as surfing at Folly Beach, working at your job, eating at a restaurant with friends, catching up on sleep, or watching a movie at the theater. Another example is studying, more generally. If you're taking four (or five, or six…) years to get a degree at the College of Charleston, guess what: You're sacrificing income that you could have made by working a full-time job. That's a huge trade-off. But each of you has apparently decided that getting a degree is worth the potential income you're sacrificing over your college years – not to mention the money you're paying for tuition and books.

It's worth emphasizing again that many economic decisions have no monetary element to them. Consider your decision to get involved in a committed relationship with a boyfriend or girlfriend. When you make the decision to get into an exclusive relationship, you're sacrificing the freedom to see other people. You might also lose some of the freedom you have living day-to-day life. These are just a few examples of trade-offs. But lots of your decisions involve some sort of trade-off, sacrifice, or "cost."

Once we develop the basic tools of microeconomics, we'll be using them to analyze a variety of public policy issues. That is, we'll try to better understand the effectiveness of government policies through the lens of economic theory. No academic discipline may be more important than economics is for helping you to analyze and understand public policy. But why should you care about public policy? Well, one reason is that as a citizen or resident of the United States, you're likely to pay a significant portion of

your lifetime income to various governments (federal, state, county, city) in taxes. By "significant," I mean a lot – probably over 1/3 of your income.[32] Think about that.

Right now, as a full-time college student, you may not really care about most public policy issues. I wouldn't blame you. But when you get out of college and start your career, someone is going to start take a significant amount of the income you earn. Don't you think you'll have an opinion on why your money is being taken and where it's being spent?

Most adults (voters) have opinions about political issues, but it's unclear how *informed* voters are. You're living in country where voters essentially control what government does. Many Americans take the right and responsibility of voting seriously.[33] Economics can help set you up with a very useful framework with which to consider different political issues.

Many people adopt the political views of their parents. Do you remember political discussions at home when you were growing up? Do you know why your parents had the political opinions they expressed? I know that my own political views were almost completely in line with my parents', until I was into my junior or senior year of college. In college you're likely to hear lots of opinions with which you disagree. But it's important to understand arguments and positions with which you disagree. It might even help you to better understand your own opinion. It's also sometimes fun to argue with people about issues, especially in college, where the expression of opinions is encouraged. However, once you leave college, voicing unpopular political views could be harmful to your career.

Now for an odd type of "warning" about your college professors. Many of us have dedicated our lives to teaching and the creation of knowledge (or art) in our chosen fields. We weren't directed by "bosses" to study a particular subject; we got to choose it. So most of us love our job and the subject we teach. Having lived and worked at a university most of our lives, many of us have a tendency to overestimate our knowledge on topics and issues *outside* our areas of expertise. Many professors have strong political opinions. Because of the professor-student dynamic, students are often deferential to professors' political opinions. But remember, they're just *opinions*! If you thought Trump was a good president or Hillary Clinton would've been a good president, you have a right to that horrible opinion![34]

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[32] For example, suppose you own a $300,000 house and have an annual income of $100,000. As a resident of Charleston, you will pay one of the highest income tax rates in the Southeast (~ 7%), and very high sales taxes (9% or more). This is in addition to federal income taxes (~ 20%). The property tax on your house will be around $2,000 per year.

[33] Interestingly, many economists view voting in elections as irrational behavior. Can you guess why that might be? Hint: It has to do with the costs and benefits of voting.

[34] I'm being facetious here. To be honest, I was surprised that these were the best candidates offered by the democrats and republicans in 2016. "Imagine Trump or Clinton rising to the top of any other profession" (adapted from P.J. O'Rourke, "No apparent motive", *The Atlantic*, 2001). But my point here is that my opinion about politicians shouldn't be important to you.

Even in classes where government policy is a major focus, you may decide that a particular perspective isn't important to you. That's okay. In this class you'll learn a framework through which to evaluate government policies. Sometimes our analysis might seem to favor democrats' policies; other times it might favor republicans' policies. I'm not interested in you developing sympathy to a political party, but I do want you to learn the fundamentals of economic analysis. You may decide that economists' emphasis on "efficiency" is less important to you than some other facet of a particular policy. Fair enough. But I at least want you to *understand* the economic approach to issues and get good grades on exams! Then after the class ends you can decide how important the economic perspective is in your overall thinking.

2.1 Economics versus politics

Many of the applications we'll discuss in this class are political issues or specific government policies. So it's important to distinguish between economics and politics. A political scientist is likely to offer a different definition of political science, but I think of it as the study of how a government is set-up and its mechanics, such as the process of making laws, how elections are held, and so on. Economics is more about understanding how people behave. Say government increases beer taxes; we might expect people to switch from beer to wine, spiked seltzers, or even marijuana, instead.

A useful way of thinking about economic analysis is that we are focused on understanding the *actual effects of a policy*, not just the intent of the policy. In Steven Landsburg's book, *The Armchair Economist*, he argues politicians often just focus on the benefits of their proposed policies, in order to increase support for the policy; they rarely discuss the costs. Economists try to understand both benefits and costs.[35]

The field of study that examines the interplay between politics and economics is often called "political economy" (or "public choice"). You can then think of this course as being in two parts. The first part deals strictly with developing the tools of economic analysis. The second part of the course deals with political economy, or applying these tools to policy analysis.

Economist Thomas Sowell summarized economics and politics:

> The first lesson of economics is scarcity: there is never enough of anything to fully satisfy those who want it. The first lesson of politics is to disregard the first lesson of economics.[36]

I like this quote because it emphasizes economists' concern with scarcity. Yet, politicians often promise free "stuff." Consider the popularity of "free healthcare" and calls for student loan forgiveness. But *someone* has to pay for free stuff…

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[35] Henry Hazlitt's book, *Economics in One Lesson*, hammers you with this point. Hazlitt's book is a good complement to this course.

[36] twitter.com/thomassowell/status/1113487088962424832

2.2 Important economic questions all societies must answer

In our society – or anywhere on Earth where people interact with each other – there are some very basic questions that have to be addressed if humans are to survive. Our lives are characterized by *scarcity*, as noted in the Thomas Sowell quote above. That is, we're not born having everything we want or need. As a result, most people decide to trade with each other to make their lives better. (Think about how difficult your life would be if you were completely "self-sufficient.") We'll talk a lot about specialization in production and trade later in the course. But for now, take a little time to think about the following questions:

- What types of things should be produced in society?
- Who should produce it, and how much?
- Who should consume what, and how much?
- How should these production and consumption decisions be made?

The above list of questions deals mainly with *markets*. You likely already understand important functions of markets, or at least you've experienced them. You've been able to buy food when you've been hungry; you have clothes and other necessities of life. Why? How did that happen?

In considering the above questions, undoubtably a number of other questions or issues will arise. For example, to what degree should the above questions be addressed using people's free will and individual decisions? To what degree should some individuals have the right to use coercion or force to compel others to act in certain ways?

What role did government play in your answers to the four questions above? How do you define government? When economists talk about markets and government, we typically assume that *government is the only institution with the legal right to use force against individuals*. For example, politicians can pass a law requiring you to pay income taxes. If you refuse to pay, they can confiscate your assets or put you in jail. (Of course, they may not personally enforce the law; that's a job for the police.) In this sense, politicians, bureaucrats, and regulators have the legal right to use force. Of course, the law usually spells out in fairly specific terms the degree of force that can be used, and by whom. In contrast, when we discuss markets (producers, consumers, and market transactions), we're always talking about *voluntary transactions*; there is no coercion or force used. If you decide to pay $1,000 for a new iPhone, that's a voluntary choice. Apple cannot *force* you to buy their products. In contrast, government *will force you* to pay taxes.

Even if you think I'm making government sound like a bad guy in the above discussion, most people and most economists believe there are important roles and functions of government. For example, in a well-functioning economy, government is usually tasked with protecting people's rights, including property rights. Government also typically provides national defense (i.e., a military).

What are (or should be) the functions of government? More specifically:

- What type of government is best?
- How should politicians get power? (e.g., elections, through monarchy, or coups?)
- What powers should government have?
- Should government power be limited? (If so, how?)

More generally, considering the earlier set of questions about markets and these questions about government: what's the right balance between individual freedom and government power?

Someone has to make decisions that address these questions. It could be a dictator like Castro in Cuba, Chavez in Venezuela or Kim Jong-un in North Korea, a king like Vajiralongkorn of Thailand, or President Biden in the USA. Of course, in each of these examples, there is a vast structure of agencies and bureaucrats that support whatever laws and regulations exist. In every country there's a mix between government institutions and functioning markets. An understanding of economics can help you identify which institutions and rules work, which don't, and why – in helping people to best deal with scarcity.

2.3 Free choice, private property rights, and government

In this course we'll focus mostly on how markets work, then discuss how a variety of government interventions (policies) affect market outcomes. While you may not have studied either markets or government in much depth, it is worthwhile for you to begin developing your *own* opinion about how individuals (exercising free choice) interact with government (the potential use of force). W*hat should be the roles free decision-making individuals and government coercion in society?* After you take this course, you'll be much better equipped to form your own opinion on this important question.

Let's begin by briefly analyzing two of the most important aspects of a *market economy* or "capitalism." First, each person has *free choice*, meaning they can make the choices and take actions they want – as long as these actions do not harm other people. We'll talk a lot about market transactions, which include production decisions (producers hire inputs to make products to sell) and consumption decisions (consumers buy the products made by the producers). Since individuals are free to act in their own interest, these transactions are assumed to be *voluntary and mutually beneficial*. If they weren't such transactions wouldn't take place at all. "Economic freedom" is another term meaning that people have freedom to buy and sell what they want, and otherwise engage in exchange with others without interference from government and as long as their actions don't harm others.

Also critical to a functioning market are *private property rights*. The enforcement of property rights is one of the fundamentally important functions of government. We should take a moment to explain what is meant by property rights. When you go shopping for clothes, maybe you decide to get a t-shirt from J. Crew. So you pay $25 for the shirt. Upon this transaction, the property right to the t-shirt is transferred from

J. Crew to you; your store receipt is evidence of it. This is a fairly straightforward example. When you buy a car, it's a little more formal. After you pay for the car, you or the dealership will submit paperwork to the government to register the car and pay property taxes on the car. You'll receive a title for the car a couple weeks later. The title is a legal document that indicates that you own the car. It also will show who lent you money to buy the car, if you got a loan. If someone decides to take your car without your permission, you can call the police and they will attempt to get your car back to you. The thief who took your car will be charged with a crime. This example illustrates government-enforced property rights. Similarly, no one has the right to take things from your apartment, or move into your apartment without your consent.

Think about the most fundamental property right: self-ownership. You own your body. This implies you can buy and sell what you want, consume what you want, and act how you want.[37] The caveat is that you cannot harm others with your actions. Similarly, other people do not have the right to punch, stab, or kill you. If someone punches you, call the police and the person will be charged with assault. One implication of self-ownership is that you are free to act, as long as you don't harm others.

There are a variety of interesting and controversial policy issues that arise from the concept of self-ownership. For example:

- Do you have the right to harm yourself?
- Should it be legal to drink soda, smoke marijuana, and inject heroin?
- Should it be legal for you to have an abortion?[38]
- Should you be able to accept a job that pays below the minimum wage ($7.25/hour in South Carolina)?

More specific to economics, property rights are important for helping to facilitate exchange and contracts. This is especially important with respect to the "means to production," such as capital resources like machinery and factories, natural resources such as land, and labor. If a company decides to build a factory, will its property rights over the building and equipment inside be enforced? How easy would it be for a gang of criminals to take-over the factory? Could a politician simply *expropriate* it?

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[37] This discussion is simplistic. But exceptions to this might include: (1) Your parents, if you're a minor, are legally responsible for you and your rights may be limited if you have a legal guardian; and (2) Government, which can legally require you to pay taxes, for example, and penalize you for not following its laws.

[38] This is obviously a controversial question, particularly after the U.S. Supreme Court overturned *Roe v. Wade* in June 2022, relegating the issue to the states. Through the lens of property rights, the abortion question hinges on whether a fetus is a person or not. Even libertarians, who are the staunchest supporters of individual self-ownership are split on this issue. Perhaps the most compelling pro-choice argument I've heard suggests that "individuals have rights, and individuals do not exist inside other people." If you're interested in this debate, see https://www.youtube.com/watch?v=BsUuTFRUWdY.

In order to better understand how government and markets interact, it is helpful to briefly discuss some different political systems. One way to keep the discussion concise and related to economics is to focus on how property rights are treated in different political systems. Let's consider *democracy*, *socialism*, *communism*, and *fascism*.[39]

Democracy

The United States government is often referred to as a democracy, which means individual voters determine who wins elections and which policies are passed as laws. We actually have a democratic republic; voters elect representatives to serve in government, rather than having voters pass laws directly. A republic form of government can be consistent with a market economy, in the sense that individual citizens vote for politicians with whom they agree. Similarly, consumers in the economy "vote with their dollars," buying goods and services they want produced.

Socialism

Some U.S. politicians claim to be socialists. Most notable is Senator Bernie Sanders from Vermont. Sanders has pointed to some wealthy Scandinavian countries – rather than Venezuela, for example – as examples of what he means by "socialist." But it's debatable whether there are any purely socialist countries. The key aspect of socialism as a theory is state (government) ownership of the *means of production*. So in a socialist country, government owns the capital (machinery, factories, raw materials, etc.) used in production, and possibly land and labor as well. If government owns the resources used to produce goods and services, then it presumably must have a large role in deciding what will be produced (and how much) and what won't be. (Recall that first list of questions from section 2.2.) This is the key contrast with free market capitalism, in which the means to production are owned privately by individuals.

Socialists often emphasize "equality" across members of society. For example, Senator Sanders commonly decries rich people having so much income and wealth, while there are other people in the United States struggling to have a decent standard of living.

Communism

Communism can be thought of as a more extreme version of socialism, since communism stresses the abolition of *all* private property (not just for the means of production). If no one owns property, it means everyone owns it. And that usually boils down to *government owns it*. While socialists focus on equality, communists seek a

[39] We could spend an enormous amount of time learning about different political systems. Our goal here, though, is to just get an idea for how markets and property rights might fit within different forms of government. For a discussion of capitalism, socialism, communism, and fascism, see Mr. Beat's videos, at youtube.com/watch?v=zhLa6I72K_g and youtube.com/watch?v=sQbFgszFaZg.

classless society. Under communism, government may have detailed plans for what will be produced and by whom, as well as having more control over who will consume what. Although it wasn't pure communism, many people refer to the "central planning" of the Soviet Union as an example.

Perhaps the most accessible and concise explanation of communism can be found in Karl Marx and Friedrich Engels' *The Communist Manifesto* (1848). One important motto of socialism and communism, "from each according to ability, to each according to need," was popularized by Karl Marx, although it was apparently originally worded differently.[40] Later in the course we will discuss the implications of production and consumption decisions being made by government officials, rather than free individual producers and consumers in markets.

Fascism

The term "fascist" has been thrown around quite a bit recently in political discussion in the United States. Italy's Benito Mussolini is the original, most famous fascist. A simple definition of fascism is hard to find. The key seems to be that under fascism, the group is more important than the individual. One commentator suggested that fascism can be described simply as, "conform to the group, or else." Fascists often focus on nationality and race. Fascist governments have usually been ruled by a powerful dictator (e.g., Adolf Hitler).

Recently, some people have claimed that former president Donald Trump is a fascist. While Trump might have been considered an economic nationalist, promoting U.S. industry over foreign competition (particularly China), apparently, experts would not consider him to be a fascist.[41] Besides, within the framework of the United States government it is difficult for a president to exercise much direct power over individual citizens.

Importance of property rights

Now let's return to the role of property rights in an efficiently functioning economy. I believe property rights are fundamental. You can think of the different forms of economy and government as being aligned a spectrum representing how important private property rights are in that system, particularly for the means of production. Listing these theories or systems from placing the most to least importance on property

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[40] See Luc Bovens, "'From each according to ability; to each according to need' – tracing the biblical roots of socialism's enduring slogan," *The Conversation* (theconversation.com), 4 Sept 2020. Bovens explains that the phrase "To each according to ability; To each according to works" appeared as an epigraph on a journal called *L'Organisateur* in 1829. The same phrases were in the 1936 Soviet Constitution.

[41] See Dylan Matthews, "Is Trump a fascist? 8 experts weigh in," *Vox*, 23 Oct 2020. Even more difficult to define fascism is the definition of populism. On this, see Yasmeen Serhan, "*Populism* is meaningless," *The Atlantic*, 14 Mar 2020.

rights, we'd have capitalism, socialism, and communism. (We can think of socialism and communism as both falling under fascism; capitalism would definitely not, since it emphasizes individualism.)[42]

Think about how property rights might relate to standards of living across different countries. Suppose you are an investor, or work for an investment firm, considering investing in a factory in a foreign country. Maybe you're going to buy 25% ownership of a Venezuelan rum distillery. You might do this because you believe they produce excellent rum, and you expect South American rum to become more popular in the future. What other things would determine whether you're making a good investment? Venezuelan laws with respect to property should be high on your list. If there is no enforcement of property rights, then government (or gangs, or anyone with guns) could just take-over the distillery and make it their own. Why would you invest in a country like that? There's a good chance you'll lose your investment. Venezuela used to be one of the richest South American countries. But since socialists have controlled the government, property rights have diminished. Sensible investors would avoid buying investments in a country like this. Even Venezuelans should be reluctant to build factories in their own country if government can simply expropriate (i.e., steal) individuals' property. A lack of property rights thus makes it difficult to produce and create wealth in a county, and at least partially explains why socialist and communist countries have typically had lower standards of living than more market-oriented economies in which property rights are protected.[43]

In this book and in the class I'll argue that an economic system in which (i) individuals are free, (ii) property rights are protected by law, and (iii) markets are allowed to function without government interference, provides the highest standard of living for the most people. But there are important functions for government aside from protecting property rights. This includes some cases in which free markets do not function efficiently. We'll discuss a few of these cases toward the end of the class.

Markets, based on free exchange, occur naturally; they're not the invention of someone. So you might be surprised to learn that people just doing what they want (as long as they're not harming other people) would be the best system. Indeed, many people are critical of free markets, "capitalism," and corporate America. While a market economy might be relatively efficient, it isn't necessarily "equitable" or "fair." Most people seem to think politicians and government can do a lot to make our lives better. It is surprising sometimes just how much belief people have in government and how

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[42] Our discussion avoids addressing how violent different regimes have been. On this, see John Stossel's video, "The Deadly ISMS" at youtube.com/watch?v=AcJk64UdxIQ. Also check out Matt Kibbe's more detailed YouTube series, "The Deadly Isms," at youtube.com/watch?v=NkHStde5rrk.

[43] For a short discussion of Venezuela, check out John Stossel's video, "Venezuela IS Socialism," at youtube.com/watch?v=_WQgTRBugRg.

critical they are of business and markets.[44] Politicians' promises of free stuff is difficult to resist. Think about "free health care" or college debt forgiveness. Who could argue against programs like that? Stay tuned…

The discussion above focuses on "big picture" economic and political frameworks. But most of us probably think more about individual policies promoted by specific politicians or the major political parties in the United States. Remember all the chatter by politicians ahead of the 2020 election? Almost all federal government politicians and most state-level politicians identify with the two major U.S. parties (democrat, republican). One could argue that the two parties really have the same policy views, and that their differences are really just matters of degree. For example, members of both parties agree that we should have national defense, a minimum wage law, and any number of other policies. They differ in how much they should be funded. Republicans typically want more spending on national defense than democrats; democrats want more spending on social programs than republicans.

My point is that there does not seem to be much disagreement between democrats and republicans on their *theory of government*. While you might already have more sympathy for one political party than another, I encourage you to investigate other parties with which you may not be familiar. It's easy to find more information about libertarians, socialists, and even Andrew Yang's new "Forward Party." Try to step back and think more abstractly about what *should be* the role of government and individuals' freedom in our society. You might find it entertaining to take one of the many "political quizzes" online, which indicate where you lie on the political spectrum.[45]

2.4 Top-down or bottom-up?

In the previous section we looked at different political theories, with a focus on the role of private property rights. This is one way of thinking about the roles of individual freedom and the role of government and its use of force. We can step back and think about the organization of society more generally as being either "top-down" or "bottom-up."[46]

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[44] I recommend reading Robert Higgs' essay, "Hate corporations and love governments – an ideological monstrosity, at blog.independent.org/2017/01/19/hate-corporations-and-love-governments-an-ideological-monstrosity/.

[45] I wouldn't take the results too seriously, but these quizzes can be interesting. One example is the Nolan Chart (nolanchart.com/survey-php), which has a libertarian bias to it. Another one is the Political Compass (politicalcompass.org/), which plots you across "economic" and "social" spectra. Othes include polquiz.com and politicappersonality.org. These are just a couple of examples, and I haven't looked at them too thoroughly. If you find these interesting, you might also like Mr. Beat's video on political quizzes (youtube.com/watch?v=xgxJyVt2XzA).

[46] In Paul Rubin's book, *A student's guide to socialism: How it will trash your lives* (2020), he explains that this dichotomy is fundamental in the contrast between freedom and socialism. This section is inspired by Rubin's discussion.

"Top-down" means that government makes and enforces the rules. Politicians decide what rights the people have, what regulations there will be, etc. In this type of society, the rulers (government) get to make the decisions for the rest of us. It's in this sense that society is "top-down"; those people at the top rule over the rest of us. If you favor more control by government in your everyday life, then you'd likely favor a more top-down approach to organizing society. The simplest example of a top-down government is a dictatorship.

In contrast, a "bottom-up" society refers to the situation in which individuals are more-or-less free to do what they want (as long as their actions don't harm others). The power of government comes from the people. The United States was set up as a bottom-up society. Our Constitution begins, "We the people of the United States…", which indicates the government comes from the people.[47] Of course, the U.S. government has expanded dramatically since its inception, but it's still true that voters can change who has power through elections.

It can be difficult to imagine all of the different complications that might arise in a society organized either as top-down or bottom-up. But it can still be helpful for you to think about this and which direction you'd lean.

2.5 How would you organize a new society?

What if you were in charge of designing a new society, how it would work, and the "rules of the game"? Suppose your design had to be detailed enough to answer those eight questions from section 2.2. Maybe to make it a little easier, you could imagine a small island with just a few thousand inhabitants. What would you propose? Would Donald Trump or Hillary Clinton be your ideal political leader?

Maybe first you'd want to start by thinking about the goals you would have for the people in society. Wouldn't you want people to have happy lives and a good standard of living? What rights would people have? What rules and laws should they have to follow? You might believe that human nature is mostly good, and that when people are free to interact with each other, the result is usually mutually beneficial. But in a free society, some people will take advantage of other people. So there's probably some role for a legal framework, along with the need for someone to enforce the laws. How would you balance freedom and government, economic efficiency and fairness?

Milton Friedman, a famous economist, commented, "fairness means somebody has to decide what's fair."[48] Friedman was an advocate for freedom and was very skeptical of government. He has said, "nothing does so much harm as good intentions," referring to government policy. Yet, many people believe government is fundamentally good, and that its use of force is limited only to situations when clearly force is needed (e.g., police arresting criminals). Politicians such as Rep. Alexandria Ocasio-Cortez and Sen.

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[47] Rubin (2020, p. 15) makes this point, which I repeat here.

[48] For an interesting interview (in the 1970s) with Milton Friedman, see youtube.com/watch?v=yqrBa09jiAI.

Bernie Sanders seem to view government as an organization that overwhelmingly does good.

I realize that, at this point in your college career, you probably have not considered the "ideal society". That's fine. But start considering this based on what you do know or your intuition. We'll re-visit this issue at the end of the semester and see if your thinking has changed at all.

Philosopher John Rawls developed a framework for thinking about "justice as fairness," which dealt with how members of a society relate to one another.[49] In his 1971 book, *A Theory of Justice*, Rawls provided an interesting thought experiment that is worth trying. He suggested that the principles of justice (e.g., the rules of society, the role of government, etc.) should be established from behind a "veil of ignorance," with respect to who you are or will be. Rawls explained, "No one knows his place in society, his class position or social status, nor does anyone know his fortune in the distribution of natural assets and abilities, his intelligence, strength, and the like." In other words, consider the rules of society, the role of individual freedom and government if you didn't know that you would be a college graduate with a good foundation for a successful career. What if, instead, you were a homeless person? Or a person with limited abilities to earn a good standard of living? *Consider how you'd design a "just" society if you didn't know what your position would be in that society.*

This initial framework is what Rawls called "the original position." What you come up with would ideally be "fair" – however you conceive that – to every person, whether they're smart or dumb, attractive or ugly, athletically talented or clumsy, have rich or poor parents, etc.

In your framework, would people be free? Would business be allowed to make profits? Would you "de-fund police"? What about a social safety net? Would people in your society be guaranteed a minimum income so they could afford food and basic housing? Would health insurance or health care be "free"? Should people be treated equally under law, or should government be used to promote equality in results? How did you account for *scarcity*? If government provides something like healthcare to people, who pays for it?

Some people would argue for a minimal role for government, perhaps limited to the enforcement of contracts, provision of national defense, and maybe some minimal social safety net. Others would see a much larger role for government, such as providing health care, a guaranteed "living wage" for all workers, and limits to CEOs' salaries.

The U.S. Constitution outlined the rights of people and limits of the federal government's power. How does your "original position" compare to the United States, or to other countries you're familiar with? You can see this is a difficult exercise. But after you take this class, hopefully you should be a little more comfortable with it.

Obviously, there'd be much more to designing a society than understanding the economics of it. But you'd at least need a solid understanding of how markets work,

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[49] A more technical (but still brief and accessible) discussion can be found at sevenpillarsinstitute.org/glossary/justice-as-fairness/.

and how they react to government policies. Even if you're never in the position to "design a society," having an understanding of basic economics is fundamental to being an informed citizen and voter. In his essay, "Why Does Johnny So Rarely Learn any Economics," economist Paul Heyne argued that most people do not understand how an economy works, so they should not have input in making the rules affecting the economy. That might even apply to a lot of our politicians!

If all of this society design talk is too abstract for you, let's come back to some more concrete, timely questions (timely at least for spring 2020 through spring 2022; and probably again in the future). These are questions that *someone* has to address:

- Can/should the government require employers to require their employees to get COVID-19 vaccines?[50]
- Can/should government mandate that you wear a facemask in public?[51]
- Can/should government mandate individual citizens get vaccines?
- If government can mandate vaccinations and the use of masks for COVID, can it for the flu, or the common cold?

How about these more "local" issues?

- Can/should the City of Charleston require everyone to wear masks indoors, in order to prevent the spread of COVID?
- Can/should your friend be able to require you to wear a mask when you're inside their apartment?
- Can/should the City of Charleston require men to wear condoms when having sex in order to prevent the spread of STDs?
- Can/should the City of Charleston ban Uber and Lyft, or food trucks from operating in Charleston?
- Should you be jailed for using marijuana or cocaine?

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[50] The answer is "no." The U.S Supreme Court ruled this in January 2022. For commentary on the Court's decision, see The Editorial Board, "A split Supreme Court decision on vaccine mandates, *Wall Street Journal*, 13 Jan 2022. The Court ruled that the Biden Administration's Occupational Health and Safety Administration (OSHA) did not have the authority to mandate that large employers require their employees (roughly 85 million people) to get vaccinated. States and Congress *do* have the authority.

In its discussion the *WSJ* Editorial Board wrote, "Had the Court blessed OSHA's mandate on private employers, the message to regulators would have been that they can do whatever they want as long as they call it an emergency." The Court did uphold a vaccine mandate on health-care workers (about 10 million people), arguing that their health was "in the interest of the health and safety of individual who are furnished services."

[51] Also of interest, in January 2022, the court system in New York is dealing with state-level mask mandates. At the state-level, it appears there is the authority to mandate the use of masks during a declared "state of emergency." See Jimmy Vielkind, "New York mask mandate reinstated in State appeal," *Wall Street Journal*, 25 Jan. 2022.

There are, of course, many more local political issues that we could ask about here. The point of these questions is that have to start developing some *logically consistent theory* about the appropriate use of legal force (i.e., government) in society. Who should be able to use force, and when? And to what extent should we have freedom of choice? These are complicated and important questions.

2.6 Up next...

As we move on to develop microeconomic models, at times we'll get into some tedious technical details. But these are important details to developing models to help you tackle some of the "big picture" issues we've discussed in this chapter. Hopefully this chapter has shown you how economics can be helpful in better understanding society, or at least has spurred your interest in economics.

In Chapter 3 we'll discuss how specialization increases production, and how we can all benefit from exchange/trade.

CHAPTER 3

Specialization, Productivity, and Trade

Are you self-sufficient? Will you be once you graduate college and start your career? What would your life be like if you were truly self-sufficient? Should we start this chapter with a fourth consecutive question? Just imagine the glory…completely self-sufficient! Well, sorry to tell you, but your life would be miserable, a complete shit-show, if you even made it past day one. You'd be living like a hippie in the woods, and definitely "off the grid", like it or not. Self-sufficiency would mean that you grow your own food, or maybe trap some squirrels when you can. And you'd need to get used to rainwater to drink. Nope – no more Fuji water for you. It would mean that you have to build your own shelter. You'd probably have a crappy little shack made of sticks and palm fronds, if you're lucky. (Or maybe the shack in Figure 3.1?) What about clothes? No more Vineyard Vines polos or lululemon tights. You'd probably be in a loincloth, or maybe you'll be too damn lazy and say "fuck it", and just walk around naked. And communicating with your friends? Forget it. You wouldn't be able to build yourself a cell phone in a billion years. Prepare yourself to talk to people – in person. (You probably wouldn't even be able to build yourself a cup phone since you can't build yourself a cup). Need we go on? It'd be a grim picture for your future. You don't want to be self-sufficient!

Figure 3.1 Your future "house" if you try to be self-sufficient

Source: gq.com/story/californias-vanishing-hippie-utopias

Most everything you have you have because of *specialization and trade (*or *exchange)*. Think about it. Now, maybe it's not obvious because you're a college student, and most of what you have your parents gave you. But think about your parents. How did they get what they have? They're not self-sufficient. How do they get clothing and food? How did they get a place to live (and for you to live when you were a kid)? They have all that because of exchange, or more precisely, because of *specialization and trade*.

What do your parents do for work? Suppose your mom is a lawyer. This means she specializes in doing legal work. She spends her days writing contracts, representing clients in trials, doing legal research, or working as a court judge. She spends most of her time working as a

lawyer. Someone pays her (U.S. dollars) to do this work. She might have been hired by a law firm; clients of the firm pay the firm, and the firm pays her an hourly rate for her efforts. Or she might work independently, and have her own office. Clients pay her directly. Either way, she specializes in providing legal services. Suppose this work pays her $100,000 per year. So your mom specializes in providing legal services. The more legal work she does, the better she gets at it. She's probably better and more efficient than 99.5% of the public at working on legal issues. It makes sense for her to focus on legal work, and they use the money she earns to buy food, clothing, housing, education for her kid(s), and her annual trip to Vegas to play slot machines, from other people who have specialized in producing those things. This process is called specialization and trade. In this example, your mom gets paid to specialize in providing legal services. Your family's standard of living is much higher working this way, than if your parents instead tried to produce everything that your family consumes.

We're all better off specializing and trading with other individuals. Once you graduate from college, you're going to specialize in some profession (e.g., education, accounting, nursing, management, psychology), get paid for your work in that narrow field, and then buy stuff from other people, who are all specializing in their own narrow careers. This makes everyone better off!

So far we've given simple examples for why you might not want to aspire to self-sufficiency, and why specializing in a particular line of work will help you achieve a higher standard of living. These ideas are the fundamentals behind why international trade is beneficial to its participants. But let's get into a little more detailed explanation for what's going on. First we'll explore how specialization affects productivity. Then we'll discuss more about how exchange benefits us. Later, we'll put it together in a model of international trade using the PPF model we developed in Chapter 1.

3.1 Specialization and productivity

In our previous example of the lawyer, we used the term "specialization" in the context of a person choosing a particular career. Now let's generalize a little more and discuss specialization in the context of the production of a particular product, rather than an individual choosing a career.

Let's think about car production. Cars are complicated machines. There's the frame and body, the engine, transmission, the interior upholstery, airbags, and an electrical system, etc. Each of these "areas" of production would be complicated for any individual person to learn. Not knowing much about the car production process, let's simply and assume that a car can be built in 100 distinct steps or tasks. (For example, the tires/wheels need to be put on the axles; the doors must be attached to the frame; the paint must be applied to the body; the different electrical components must be wired.)

Now let's consider two different ways of organizing the production process in a car factory. We'll call these (unimaginatively) Factory A and Factory B. Suppose each factory employs 100 workers, all similarly experienced and skilled. (This is an application of our *ceteris paribus* assumption introduced in Chapter 1. We're "holding

constant" the workers' skills, or more precisely, assuming they're all the same, so that we don't have to deal with that variable.) Further assume that both factories are equipped with similar equipment, have the same parts suppliers, and so on. The only difference between Factory A and B is the production process.

In Factory A, each worker has their own space in the factory, and each works individually on their own car. So there are 100 cars under production at any one time, and each worker is focused on building their own car. This means that each worker must learn how to build an engine, how to weld metal together for the frame and body, how to work with leather upholstery, how to do wiring, and how to paint a car body. You can think of these workers as being "self-sufficient", in the sense that all workers perform all 100 production tasks.

In Factory B, the workers are specialized. That is, each worker focuses on only *one* of the 100 production tasks involved in building cars. Think of an assembly-line process. A conveyor belt brings a car frame down the line, and you are responsible for installing the tires/wheels onto the axles. That car moves down the line and someone else installs the windshield. Another car frame comes by you and you install the tires/wheels onto that car. The other 99 workers have similarly focused tasks.

In Table 3.1 we summarize the factories' organization. After a week of production, with all 100 workers going at it full-time in both factories, which factory would you expect to produce more cars? Why?

Table 3.1 Two factories with different production formats

Factory	Production Format	Number of Workers	Tasks per Worker	Output per week (cars)
A	"Self-Sufficient"	100	100	?
B	"Specialized"	100	1	?

Almost certainly, Factory B will produce many more cars. What is the key explanation for that? Think about one worker. If you're the person who installs the tires/wheels, what do you think happens to your ability at that task as you repeat it all day, every day? You probably get very good at that one task. The more you repeat the task, the quicker you'll get at it. You'll also make fewer mistakes, and maybe figure out even more efficient ways to do your task. In other words, you "learn". Taking less time to do a task means that the cost of production will decrease for each car.

Now think about the workers in Factory A. Each of these people might be a very hard worker. But they're not going to achieve the kind of learning that the workers in Factory B do – they've got all 100 tasks to worry about!

It might not seem obvious at first how much a difference specialization can make in an individual's productivity. Take a break and check out this video, "Amazing Skills Fast Workers" https://www.youtube.com/watch?v=XaYaFfwBU04, which is a bunch of random clips of people performing precision work tasks extremely quickly. Imagine you trying to do any of these tasks for the first time; how long would it take you to get as good as these people?

Adam Smith (1776; first mentioned in section 1.5) provides one of the first explanations for why specialization or the division of labor increases productivity:

> First, the improvement of the dexterity of the workman necessarily increases the quantity of the work he can perform, and the division of labour, by reducing every man's business to some one simple operation, necessarily increases very much the dexterity of the workman. Secondly, the advantage which is gained by saving the time commonly lost in passing from one sort of work to another, is much greater than we imagine. Thirdly, the invention of a great number of machines which facilitate and abridge labour, and enable one man to do the work of many. Men are much more likely to discover easier methods of production when the whole attention of their minds is directed toward that single object, than when it is dissipated among a great variety of things.[52]

Example: Division of labor in various industries

You should be able to identify how the division of labor (specialization in production) leads to increased efficiency in any industry. Think about the following:

- College football teams
- Fine dining restaurants
- College faculty and courses

Which would be a better way for Clemson to organize their football team with 85 players? Similar to Factory A or B above? Suppose all the players are generally athletic. Should the coach have all the players train in all different positions? Should each player practice throwing, in case they need to be the quarterback? Should they all practice kicking field goals? How would a team of "generalists" compare to a team where each player focuses on one particular position or purpose? So the quarterback only practices throwing the football and running it. The kicker kicks – and that's about it. How is productivity measured in a football game? Points scored! Who would win the game? Hopefully it's obvious to you that the team of specialists will absolutely destroy the team of generalists. Why? Specialization! Each player refines his skills in his particular

[52] This "quote" paraphrases from A. Smith, *The wealth of nations*, *op. cit.*, book 1, ch. 1 (pp. 9-11 in the original edition, 1776; pp. 17-20 in the Liberty Classics edition, 1981), and R. Schumacher, "Adam Smith's theory…in the history of economics", *Erasmus Journal for Philosophy and Economics*, 2012.

position and gets really good at it. The quarterback might be able to throw amazingly accurate passes, but can't kick the ball 10 yards. That's fine!

Now repeat the exercise, thinking about a great restaurant like in Charleston, like Fig. Obviously workers specialize there. One person stays behind the bar to mix drinks. One chef is on the grill, and another is on cold items like salads. Each person in the restaurant has a particular, very focused, job. Instead, imagine how crazy it would be if "generalists" worked there. So you'd have the same person act as your host, your waiter, bartender, and cook; then they'd clean the dishes after. The place would be horribly inefficient, not to mention inconsistent.

As a last example, think about your experience at the College, and compare it to elementary school. Do you remember first grade? You had a generalist teacher – the same teacher taught you basic math, reading, and whatever else you covered. Now that you're in college, imagine how horrible it would be if the same professor tried to teach you molecular biology, stoic philosophy, microeconomics, and painting. All your classes would probably be horrible. After all, how could one person be very knowledgeable in all of those disciplines?

3.2 Benefits from exchange

When we say "exchange," we might be referring to a simple example, like when Beavis and Butt-head want to trade candy bars after trick-or-treating on Halloween. Why would kids trade candy? Begin your thinking with our earlier assumption that people – even kids – are self-interested. Suppose Beavis wants to trade his Snickers bar for Butt-head's Zero bar. What can you say about which each boy values more? If both kids are willing to trade candy bars, then we know:

- Beavis prefers Zero to Snickers
- Butt-head prefers Snickers to Zero

We don't need to know why, exactly, the boys have these preferences. What we can infer from them voluntarily trading is that *each boy prefers what the other has to what he has*. Because of this, when they trade, both boys are made better-off. We call this a mutually beneficial trade. With this, and almost all exchanges, economists assume they're voluntary. So we can describe their candy bar trade as being a *mutually-beneficial, voluntary transaction*.[53]

Now let's get more general. Suppose you like to shop at Publix. Why do you do that, instead of producing your own food? Because Publix has relationships with

[53] When we're talking about "market transactions" or the "free market", we mean transactions that are voluntary, not coerced. In this example, no one is forcing the kids to exchange candy bars at gunpoint. Of course, much of government policy related to economics is based on coercion. For example, you're forced to pay taxes (or go to jail). We'll discuss how government policies affect voluntary behavior in free markets later in the course.

farmers, ranchers, factories, and other food producers. Those people are much better than you at producing food. So you buy food from them; this way you have time to study, go to classes, maybe work a part-time job, and spend time with your friends, rather than spending all your time trying to delay starvation.

When you buy a box of Count Chocula cereal at Publix for $4, what can we say about why you and Publix are willing to trade? You value the cereal more than the $4, and Publix values the $4 more than the cereal! Isn't that simple? So why would it be any different when you buy an Audi car from Germany, a tank full of gas produced from Iranian oil, or a dark and stormy using Venezuelan rum (only if you're ≥ 21 years old)? It shouldn't be!

Recall our earlier example in which your mother is a lawyer. She uses her time to specialize in the production of legal services, for in which she becomes very efficient and well-paid. Then she uses that money to buy housing, food, clothing, etc., from other people who are good at producing those things. We can extend that same idea to states or countries. If the United States specializes in producing cars, wheat, financial products, and beer, and other products for which it is relatively efficient, it can trade those products for things like coffee, clothing, snow skis, etc., from other countries who are relatively good at producing those things.

In the previous paragraph, you might have noticed that I talked about your mom as getting paid with money, then she goes out to buy other stuff with that money. But in the example of the countries, they used *barter*, or trading goods for goods. It's really the same thing as selling products for money, then using the money to buy products from others. But when we remove money from the example, it's a little simpler to think about. This is how we're going to model trade between countries – as if it's barter.

3.3 A brief history of trade theory

Economists are famous for never agreeing with each other, particularly on policy issues. One common joke is that, "if you put 10 economists in a room, you'll get 11 opinions". For many policy issues, you will get starkly different opinions among economists. There is one area of economic policy that is a clear exception to this – most economists agree. The issue is on international trade. Consider a fairly recent opinion survey of 40 economists that included this statement[54]:

> Trade with China makes most Americans better off because [...] they can buy goods that are made or assembled more cheaply in China.

Do you think Donald Trump would agree with that statement? Hellz no! What about most Americans? What percent would you guess would agree with the statement?

[54] The quote about 10 economists and the survey question are from S.N. Slavov, "9 out of 10 economists agree...", American Enterprise Institute, at aei.org/economics/9-out-of-10-economists-agree/.

Among the economists surveyed, the number who agreed was 100%! The idea that "free trade", or international trade without restrictions, is the best policy is widely accepted among economists, regardless of their other policy opinions or political party affiliations. Think about it. The statement above about China is basically the same argument that I gave about your mom working as a lawyer then buying other stuff from other people. Why would the theory change just because we introduce Chinese people into the equation?[55]

Despite the fact that most economists agree that free trade is beneficial, many politicians and U.S. citizens seem to disagree. Donald Trump wasn't the only person who was against trade with China. Prior to the 2016 election, Hillary Clinton also came out in opposition to international agreements that promote free trade. Many voters were also sympathetic with that view. But why, especially when economists are nearly unanimous on the issue? The economic theory of trade hasn't advanced much since 1817. If economists' views on trade are over 200 years old, how come they haven't convinced the public? I'd guess that many people don't believe in unrestricted free trade because (1) economists haven't been particularly convincing, but also (2) the theory of international trade is quite complicated.

We're going to discuss the two major ideas in international trade theory. These were the theory of *absolute advantage*, by Adam Smith (1776), and the theory of *comparative advantage*, by David Ricardo (1817). Of course, there have been countless books and journal articles on international trade since 1817, but those mostly deal with minor improvements on the basic theories of trade we'll be discussing here.

To fully understand international trade, we're going to use the production possibilities frontier (PPF) model that we first developed in Ch. 1. (Recall Graph 1.1, when we modeled how a student could split their time between studying and working.) Later in the book, after we develop supply, demand, and a few other concepts, we'll discuss international trade policy in more depth.

Assumptions of the PPFs used in trade models

David Ricardo's *theory of comparative advantage* (1817) is the framework within which economists understand the benefits of international trade. As with any model, we need to first outline the assumptions used. Several of these are the same assumptions we used in Ch. 1. In order to keep our model of trade as simple as possible, let's assume:

- Production uses a single input, labor
- There is full employment, or no unemployment
- Technology is fixed
- Two goods are produced, and consumers like both

[55] Introducing people of a different nationality doesn't change the analysis at all. But what's different about talking about people within the United States versus international trade? The main difference is *politics*. We'll discuss the politics of trade and trade policy later in Ch. 11.

- Two countries in the world
- Constant opportunity costs
- Technology is fixed
- Same quality of goods produced in different countries

The first four items in this list should look eerily familiar, at least if you studied Ch. 1. (See section 1.8 if you don't believe me.) Along with just two goods, we're also going to assume there are only two countries in the world. We want to keep it simple, and we only need two countries and two goods to model how international trade works. Adding more countries or goods would complicate the model, with no benefit. The assumption that people like both goods being produced implies that more production and consumption is better than less. We're going to add the assumption that production is "constant cost", so that the PPFs are linear. This will make our analysis easier, since much of it requires calculating the opportunity cost of each good in each country. As in Ch. 1, the assumption of full employment means that each country will be producing at some point on its PPF. Finally, the assumption that technology is fixed allows us to keep the PPFs stationary in the model.

Smith's theory of absolute advantage

To fully understand trade theory, it's important to start with the concept of *absolute advantage*. A standard definition is that "a country has the absolute advantage in producing a good if its workers can produce the good using fewer resources than another country uses". For example, if Chile can produce more raspberries per farm worker than Ecuador can, then Chile has the absolute advantage in raspberry production.

If we were to begin with the assumption that both countries have the same number of workers, we can restate absolute advantage to mean that one country produces *more raspberries* than the other country. This is a bit simpler, I think, than the definition in the previous paragraph. Either way, absolute advantage refers to the productivity of workers in a particular industry compared to another country.

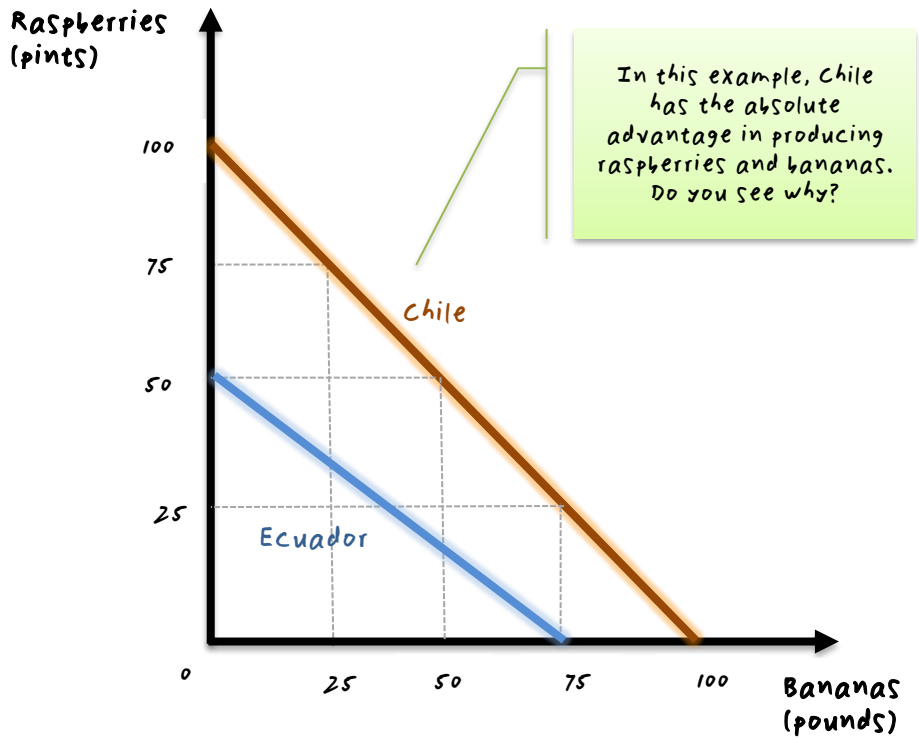
Adam Smith posited that *two countries can benefit from specialization and trade if one country has the absolute advantage in producing one good, and the other country has it in producing the other*.

The intuition behind this model of trade is that countries can benefit from trade if each country can produce more of something than the other country. That would seem to make sense. If Chile can produce more raspberries *and* bananas than Ecuador, it might seem as though the two countries couldn't benefit from trading with these products

with each other. How could Chile benefit if it produces everything more efficiently than Ecuador?

It turns out that Smith's theory, as commonly understood, isn't exactly correct.[56] We'll go into detail later. But the theory of absolute advantage is how many laypeople, probably including Donald Trump, seemingly think about trade.

Now let's translate the concept of absolute advantage into a PPF model. In Graph 3.1 you can see the PPFs for Chile and Ecuador. Remember that these curves represent the maximum combinations of raspberries and bananas that can be produced in each country. If Chile wants to produce more raspberries, it would need to move some of its workers out of the banana farms and into the raspberry farms. We're going to be most interested in the endpoints of the PPFs. The endpoints can be interpreted as the maximum amount of that produced that can be produced if all the workers in the country work in that one industry. We can see that if all Chilean workers are at the raspberry farm, they can produce a maximum of 100 pints of berries (and zero pounds



Graph 3.1 PPFs in Chile and Ecuador

[56] Schumacher, *op. cit.*, argues that economists have mischaracterized Smith's theory of trade.

of bananas). Or, if all the workers are in the banana fields, they can produce 100 pounds of bananas, and zero raspberries.[57]

Based on our discussion of absolute advantage and the PPFs you see in the graph, who has the absolute advantage in producing raspberries (*R*)? In other words, if all the workers in each country produce only *R*, which country can produce more?[58] It's Chile. We can see this because Chile's PPF hits the *R*-axis further away from zero (100) than Ecuador's does (50).

Next, let's look at banana (*B*) production. Who can produce more *B* if all the workers in each country work at the banana fields? Again, in this case, Chile has the absolute advantage since their PPF's intercept on the *B*-axis is further from zero (100) than Ecuador's (75).

According to Adam Smith's theory of absolute advantage, can Ecuador and Chile benefit from specialization and trade? No. Since Chile is better at producing both goods, Smith reasoned, these two countries cannot benefit from trading these two goods. How could Chile benefit by trading with someone who's worse at producing everything?

Let's consider another example. Look again at Graph 3.1, but now let's suppose Ecuador's PPF had endpoints at 50 *R* and 115 *B*; Chile's PPF stays the same. In this case, who would have the absolute advantage in *R*? In *B*? (Draw Ecuador's new PPF if it'll help you see it.) Now Ecuador has the absolute advantage in *B*, but Chile still has it in *R*. In this case, Smith would say that these countries *could* benefit from specialization and trade. They could benefit by each country specializing in the product for which they have the absolute advantage. Chile would produce only *R*, and Ecuador would produce only *B*. Then they'd trade those two goods, and both countries should be able to consume more *R* and *B* than they could in the absence of specialization and trade. We haven't shown the actual trade in Graph 3.1, but we'll show all the steps after we fully develop the theory.

Ricardo's theory of comparative advantage

David Ricardo improved upon Smith's theory in his 1817 book, *Principles of Political Economy and Taxation*. Ricardo showed that Smith's theory of absolute advantage was far

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[57] Chile could produce any number of combinations, given by the various points on their PPF. For example, if they produced at the midpoint of their PPF, they'd have 50 pints of raspberries and 50 pounds of bananas. For simplicity, we're going to focus just on the endpoints. This will be important because we're going to need to calculate the opportunity costs of producing each good. We're making this task easier by assuming that the PPFs are linear (i.e., constant cost PPFs), but the result is that both countries specialize completely. This means each country will produce only one type of good. This is, of course, a very unrealistic result. But if we get rid of the constant cost assumption, we'd have curved PPFs, which would make the model more realistic (e.g., both countries would probably produce some of both goods), but calculating the opportunity costs along curved PPFs would be very complicated.

[58] Remember, you can think of it either as pints of raspberries produced per worker, per month; or, assuming Ecuador and Chile have the same number of workers, which country can produce more raspberries.

too narrow in identifying the conditions under which specialization and trade could be beneficial.[59] Ricardo developed the theory of *comparative advantage*, an extension to Smith's theory of absolute advantage.

In fact, the difference between the two theories is really just a matter of substituting a few words. Below you can again see Smith's theory from p. 52. Then we've crossed out a few words and replaced them with terms of Ricardo's theory:

> David Ricardo
> ~~Adam Smith~~ posited that *two countries can benefit from specialization and trade if*
> comparative
> *one country has the ~~absolute~~ advantage in producing one good, and the other country has*
> *it in producing the other.*

Now you need one more definition. A country has the comparative advantage in producing a good if *it can produce a good at a lower opportunity cost, in terms of another good, compared to the other country*. This is interpreted to mean that, to have a comparative advantage in producing raspberries, for example, the opportunity cost of each pint of *R* in terms of *B* must be lower than in the other country.

Figuring this out is a bit complicated, but we've already had an example of calculating opportunity costs. Remember our PPF model of studying and working from Ch. 1? In that example, each $11 of additional income *cost* 10% of your grade; and each 10% increase in your grade costs $11 of income. In other words, when you shifted your production toward income, you have to give up class grades.

Now let's repeat the analysis for Graph 3.1, and identify the opportunity cost of producing *R* and *B* in Ecuador and in Chile. Since our PPFs are linear, the opportunity costs can be identified fairly easily, by using the PPF endpoint values. Look at Chile. Suppose Chilean workers are currently producing only *B*, so that Chile is on its PPF along the *x*-axis. Here they produce 100 *B*, and zero *R*. They can choose to produce *R*, and can produce up to 100 pints *R*. If they decide to do that, they move along their PPF from the *x*-axis to the *y*-axis. In doing so, they gain 100 *R*, but must give up 100 pounds of *B*. (Remember, they cannot produce beyond the PPF.) From this we can say that, in Chile, 100 *R* costs 100 *B*.

You'll soon see that our analysis will be much easier later if we put the opportunity cost in terms of just 1 *R*. We can do this by dividing both sides of the equation by 100, like this:

$$\text{In Chile, } \frac{100}{100}R = \frac{100}{100}B, \text{ which gives us: } 1R = 1B$$

[59] It's probably not worth directly quoting Ricardo here; the language is even more difficult to read than Smith's. The model we develop here is a fairly simple version of their wordy discussions. If you'd like to read more, see D. Bernhofen and J. Brown, "On the genius behind David Ricardo's 1817 formulation of comparative advantage", *Journal of Economic Perspectives*, 2018.

In the calculation above, we just set endpoints of the Chilean PPF equal to each other, then simplified because we want to see opportunity cost in terms of 1 *R*. Our result means that each *R* produced in Chile has an opportunity cost of 1 *B*.

Now we do the same thing for bananas; calculate the (opportunity) cost of *B*, in terms of *R*, in Chile.

In Chile, $\frac{100}{100}B = \frac{100}{100}R$, which gives us: $1B = 1R$

We now have all the information we need for Chile. Let's do the same thing for Ecuador. Just set the Ecuadorian PPF endpoints equal to each other, then simplify:

In Ecuador, $\frac{50}{50}R = \frac{75}{50}B$, which gives us: $1R = 1.5B$

and, $\frac{75}{75}B = \frac{50}{75}R$, which gives us: $1B = 0.67R$

We finally have enough information to determine who has the comparative advantage in producing which good, so we'll know if Chile and Ecuador can benefit from specialization and trade (according to Ricardo). To determine comparative advantage, remember that we need to know who has the lower opportunity cost of the good, in terms of the other good, compared to the other country.

Let's start with raspberries. From the calculations above, in Chile, 1 *R* costs 1 *B*; in Ecuador, 1 *R* costs 1.5 *B*. So Chile has the lower opportunity cost of raspberries, in terms of bananas, compared to Ecuador. This means that *Chile has the comparative advantage in raspberry production*.

What about bananas? In Chile, 1 *B* costs 1 *R*; in Ecuador, 1 *B* costs 0.67 *R*. This means Ecuador can produce bananas at a lower (opportunity) cost, so *Ecuador has the comparative advantage in banana production*.

We can now see that Chile and Ecuador can, in fact, benefit from specialization and trade, since each country has the comparative advantage in one of the goods. This is true even though Ecuador has the *absolute disadvantage* in producing both goods.

Calculating the opportunity costs for two goods in two countries can sometimes be confusing. If you'd like to try another example before moving on, see the appendix to Ch. 3. The appendix also discusses some ways to check your work.

The intuition

Now that we've discussed how to calculate opportunity costs and identify comparative advantage, what's the intuition? To put it into everyday language, we're basically saying that when a country has the comparative advantage in one product, it doesn't have to make as large a sacrifice of other goods, compared to the other country. But if the two countries are both using just labor to produce, and if they have the same

number of workers, then why would they be able to produce different amounts, or at different levels of efficiency?

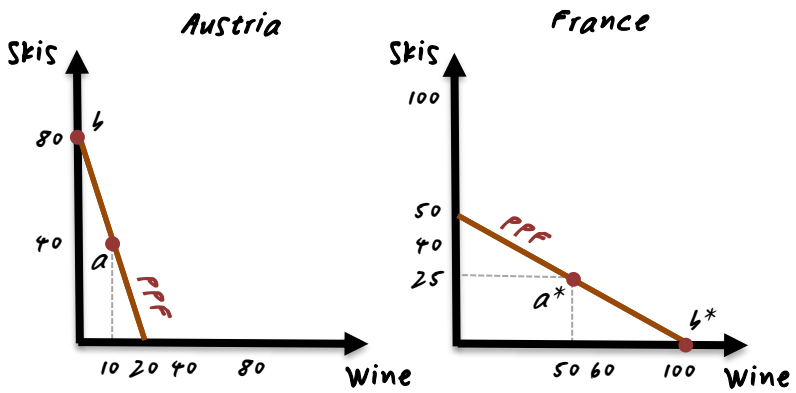
Perhaps Chile's long shape, where it has more tropical areas compared to Ecuador, makes it particularly well-suited for raspberry production. Similarly, maybe Ecuador has more of a rainforest climate that makes it particularly suitable for growing bananas. It's also possible that Chileans have a long history of raspberry production in their country, so that generations have passed-down their knowledge, making them particularly efficient in growing raspberries.

Example: Comparative advantages of states and countries

A lot of wheat is grown in Kansas because the land is flat, and the weather is warm and rainy for the growing season. Oranges grow easily in Florida because it's warm and sunny; oranges don't grow in Minnesota. Sugar maple trees are abundant in Vermont, which explains why the state is the top U.S. producer of syrup. West Virginia is a major producer of coal in the United States because there happens to be lots of coal in the ground there. South Africa is an efficient producer of diamonds because they actually have diamonds in the ground. A similar story can be told for different crops, minerals, metals, and other natural resources produced around the world. Natural resources and climate are important factors in comparative advantage, but we don't need to know the "why" to be able to show the benefits from specialization and trade.

3.4 The Ricardian trade model

We're now ready to show the Ricardian model from initial production points, to specialization of production, to trading of goods for goods. We'll use a new example. In Graph 3.2, we have Austria and France, who produce snow skis (*S*) and wine (*W*). The *PPF*s are shown in brownish color. You'll notice that each graph has points labeled *a* and *b*. France's points also have an asterisk (*) next to them; this way we can see which points in France (*a**, *b**) correspond to the same points in Austria (*a*, *b*).



Graph 3.2 Specialization in the Ricardian trade model

The labeled points on the graph (a, a^*, b, b^*) correspond to two distinct steps in the model. Later we'll add a third step which represents the physical trade of goods.

Step 1

We start by assuming each country is self-sufficient, that is, not trading with the other country. If the countries are self-sufficient, it means they can only consume what they produce in their own country, given by their own PPF. Points a and a^* in Graph 3.2 correspond to the initial production and consumption points in the model. These points were chosen arbitrarily, to be at the midpoint of each PPF.[60] You can see that at a, Austria is producing 40 pairs S and 10 cases W; at a^*, France is producing 25 pairs S and 50 cases W. We'll know these countries are better off after trade if they can consume more after trading than they could when they were self-sufficient.

Step 2

Now we need to determine whether the countries can benefit from trading. To do that, we need to check whether each country has the comparative advantage in one of the goods.[61] We start by calculating the opportunity cost of each good in each country. Setting this up as in our previous example, we get:

In Austria, $\frac{80}{80}\,S = \frac{20}{80}\,W$, which gives us: $1\,S = \_\_\_\_\,W$

and, $\frac{20}{20}\,W = \frac{80}{20}\,S$, which gives us: $1\,W = \_\_\_\_\,S$

In France, $\frac{50}{50}\,S = \frac{100}{50}\,W$, which gives us: $1\,S = \_\_\_\_\,W$

and, $\frac{100}{100}\,W = \frac{50}{100}\,S$, which gives us: $1\,W = \_\_\_\_\,S$

If you did your calculations correctly, your answer for the four blanks should be (in order): 0.25, 4, 2, and 0.5. You can conclude that Austria has the comparative

[60] In reality, production would depend, in part, on what consumers like in each country. But use choosing these starting points arbitrarily doesn't affect our outcomes.

[61] You might notice that I'm not asking about absolute advantage. This is because it's the relative slopes of the PPFs, not their absolute distance from zero, that determines whether the countries can benefit from trade.

advantage in skis (1 *S* costs them ¼ *W*, but costs France 2 *W*) and France has it in wine (1 *W* costs France ½ *S*, but costs Austria 4 *S*).

You can also use the two checks we mentioned in the appendix. Notice that in each country, the calculated opportunity costs are inverses of each other (1/4 and 4/1 in Austria; and 2/1 and 1/2 in France). Our result is also consistent with the slope-check. Austria has the steeper PPF, and the comparative advantage in *S*; France has the flatter PPF and the comparative advantage in *W*.

Now that we know the two countries can benefit from specialization and trade, we show them specializing production in the product for which they have a comparative advantage. Austria will move along their PPF from *a* to *b*, which represents complete specialization in *S*. Similarly, since France has the comparative advantage in *W*, they'll move along their PPF from *a** to *b**, completely specializing in *W*.

The reason individuals or countries trade is to increase their standards of living. In this example, the people in Austria and France would like to be able to *consume more skis and wine than they can produce on their own*.

Let's see what has happened to "worldwide production" (in our model, assuming there are only these two countries). Let's compare the total production of skis and wine at points *a* and *a**, when each country is self-sufficient, to that at *b* and *b**, when each country specializes its production. Table 3.2 shows that overall production of both goods increased – just from specializing production.

Isn't that amazing? Why does this happen? Go back and read that quote from Adam Smith in section 3.1. When people focus on more narrow production tasks, their productivity increases. It works for individuals, and groups of individuals, such as those that live in the same country. Specialization is the foundation of the benefits from trade.

Table 3.2 Total production comparison

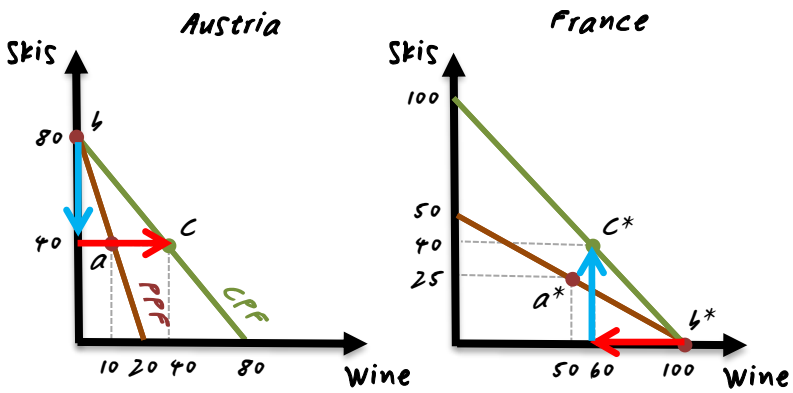
Country	Self-Sufficient (a, a*)	Complete Specialization (b, b*)
Austria	40 S, 10 W	80 S, 0 W
France	25S, 50 W	0 S, 100 W
Total Production	65 S, 60 W	80 S, 100 W

Step 3

The third step is the most complicated in the model. It requires the countries to agree on the terms of trade, or a rate of trading skis for wine at which they can both potentially benefit. This is illustrated by the *CPF* (green curves in Graph 3.3); the resulting consumption points are *c* and *c**.

The Austrians and French won't agree to trade *S* for *W* unless they both expect to benefit. In this sense, international trade is no different from when you buy a box of Count Chocula from Publix. If Austrians produce and export *S* to France in return for some *W*, they'll benefit. But they have to be able to get more *W* from France for each *S* exported than Austria could get by just producing *W* themselves (by moving back along the PPF). Similarly for France, for each case of *W* they export, they're going to want to get more *S* from Austria than they could get by just producing *S* on their own (again, by moving back along their PPF).

First, let's find the *range of prices* at which both countries would potentially benefit from trading. We can state this range in terms of 1 *S* or 1 *W*; let's use 1 *S*, since skis are on the *y*-axis. One country's going to put a minimum limit on how many cases of *W* must be traded for each pair of *S*. The other country will put the maximum limit on how much *W* will be given for each *S*.



Graph 3.3 Consumption possibilities and trade triangles

Who will be exporting *S*? It'll be Austria, since they have the comparative advantage and have specialized their production in *S*. For each *S* exported from Austria, we need a lower and upper limit on how many cases of *W* will be traded – and potentially make both countries better-off. Think for a second about who should set which limit. Since Austria's giving up their *S*, are they going to want to put a lower- or upper-limit on the amount of *W* they receive in return? In order to benefit from the trade, Austria will insist on some minimum amount of wine they'd be willing to accept from France, in return for each *S* exported. What is that minimum amount? *It's what they could do on their own, by just moving along their own PPF*. We saw in Graph 3.3 that if Austria gives up a pair of *S*, it can produce 0.25 cases of *W* by moving along their own PPF. Austria would be *worse off* trading with France if France doesn't give them at least 0.25 *W* for each *S* that Austria exports.

France, then, will set the maximum amount of *W* that they'd be willing to give up for *S*. To determine that amount, we can look at their PPF. If France wants to get *S*, they can produce some by moving along their PPF, which shows each *S* costs them 2 *W*. Clearly, France will be worse off trading with Austria if they must sacrifice more than 2 *W* for each *S* they import from Austria.

We can summarize this range of potentially mutually-beneficial voluntary trade:

1 ski will trade for between 0.25 and 2 units of wine.
(Austria, France)

(This is probably the most difficult part of the whole model.) Take a few minutes to see what's going on. You can get the information for the range (0.25, 2) by just looking at the opportunity costs we calculated at the beginning of Step 2, above. Look for the cost of 1 *S* in Austria and in France. (I didn't give you the answers above, but you should've calculated them!) That's where these two numbers came from. Again, it's just telling you the cost of skis in each country.

The next step in the model is to decide on a specific terms of trade (or trade price). This is determined somewhat arbitrarily in our model, but in reality, it would be the result of negotiations between the consumers in both countries. We know that, for the consumers in both countries to benefit, the terms of trade must fall within the range we calculated above. To make it easy, let's suppose they agree to trade at a rate of 1 *S* for each 1 *W*. We use this information to draw the *consumption possibilities frontier* (CPF), which is shown in green in Graph 3.3.

The CPF for Austria is derived by starting at their production point, *b* (80 *S*, 0 *W*). If they were to export all 80 *S* to France, then how many cases of *W* could they import at the 1:1 ratio? The answer is 80. We then draw the CPF with endpoints at 80 *S* and 80 *W*. Now look at France. They're producing wine; at *b** they are producing 100 *W*. If they were to export all 100 *W* to Austria, how many *S* would they expect to import? The answer is 100 *S*. So the French CPF is drawn from 100 *S* to 100 *W*.

The last step (finally!) is to illustrate a specific number of skis and wine to be traded. We're going to choose a number arbitrarily, but again, it would be a number for which both countries agree and expect to benefit. They've already agreed to trade at a ratio of 1:1, so let's say they agree to trade 40 *S* for 40 *W*.

To begin the actual trade, suppose Austrians loads a truck with 40 pairs of skis and drive west to France. Once the skis are unloaded, the French put 40 cases of wine of wine in the truck, and tell the driver to go back to Austria. This trade is represented in Graph 3.3 by the blue and red arrows. When Austria exports the 40 *S*, they change from having 80 units to only 40 units at home. The blue arrow for France (representing imports of 40 *S*) corresponds to Austria's blue arrow. Similarly, France exports 40 *W*, illustrated by the red arrow, and goes from having 100 to 60 cases *W* at home. The red arrow on the Austrian graph illustrates their imports of 40 cases *W*, which moves them from zero to 40 cases wine.

After the trade occurs, we can confirm that both countries are better off. Compare points *c*, *c** to *a*, *a**. In each country, consumers are getting more of at least one good, compared to when they consumed along their own PPF. Specialization and trade have enabled all consumers to move beyond the limits of their own PPFs! This is proof that trade is beneficial to both countries.

The "trade triangle" in each country includes the red and blue arrows and the CPF as the third side. The size and shape of the two curves should be identical. Do you see why? If you practice this model, make sure your trade triangles are identical.

Figure 3.2 Donnie Dumbass is confused!

Donnie has the most problems with this model – out of all the models covered in the book – because calculating opportunity cost is difficult for him. One problem is that he doesn't read carefully, and thinks that the word "absolute" is more important than "comparative." When he tries to calculate opportunity cost, he does it in his head. There's no reason to do that. Paper is cheap, so just write it out. Set-up your calculations the way you were shown above; write it down. Repetition will help you learn!

3.5 Winners and losers from trade

At the beginning of the chapter, I explained that almost all economists agree with free trade (i.e., trade without government restrictions) is the best trade policy. But many politicians (e.g., Donald Trump) and voters disagree. This might be because it takes us complicated graphs to explain why trade is beneficial. In Chapter 11 we'll discuss international trade policy, particularly restrictions on imports, and we'll get into some of the common objections to free trade.

For now, let's discuss who benefits and who is harmed by the process shown in Graphs 3.2 and 3.3. The main point of the model was that consumers are able to consume beyond the limits of their countries' PPFs. So we know consumers in each country benefit. What about producers?

Each country has two industries: skis and wine. If production of one good increases, the number of jobs/workers in that industry will increase. Obviously, then, if production falls so will the number of jobs in an industry. Now take another look at Graph 3.2. Austria was initially producing at *a*, representing 40 *S* and 10 *W*. When Austrians began specializing in ski production, it meant some new jobs were created in the ski industry, since ski production increased from 40 to 80. But what about the

Austrian ski industry? The specialization in skis meant that production fell in the wine industry, and jobs were lost. You can think of it as some workers leaving the wine industry and going to work instead in the ski industry.

Chances are, the workers who had to leave the wine industry and move to the ski industry were not happy about having to make the move. If they were initially working in the wine industry, it means they preferred that job (for whatever reason) over working in the ski industry. So the wine workers are worse off through the process. The owners of Austrian wine vineyards are also worse off, since their businesses closed down when Austria moved from point *a* to *b* as it specialized.

The story is similar in France. Which workers and business owners are made worse off in France because of specialization and trade? You can see it clearly in Graph 3.2.

We can conclude from this analysis that specialization and trade benefits consumers, helps some industries/workers, but hurts other industries/workers. If some people benefit, and some are harmed, why do almost all economists agree that free trade is the best policy?

Remember in Chapter 1 we described *scarcity* as the reason economics exists. Scarcity means we don't have everything we want. The opposite of scarcity could be called *abundance*; we have everything we want. Ideally, our society would have an abundance of all goods and services.

Now think of the different groups we just discussed (consumers, the ski industry and workers, and the wine industry and workers). Which group's interests are consistent with society's interests (i.e., abundance)? It's the consumers! Again, the key point of the Ricardian trade model is that consumers are able to consume beyond the limits of their country's PPF. In fact, trade enables consumers to have more choices, higher quality products, and lower prices. So what about the industry and workers? If you owned a ski company, would you rather there be many other ski manufacturers competing for sales among consumers (abundance), or few or no other ski companies (scarcity)? You'd want there to be scarcity in *your* industry. Less competition among ski sellers means you can keep ski prices and wages higher.

In short, *consumers' interests are generally consistent with the overall interests of society (abundance), while sellers' interests are in having scarcity of what they're producing.* In the case of trade, the benefits to consumers are greater than the harm to industries/producers who lose out in the process.[62] Right now we're applying this "rule" just to international trade, but it applies equally to all sorts of different markets.

3.6 Up next...

I'd recommend you practice working through the Ricardian trade model a couple of times. In Appendix 3 I've set up another problem for you to practice. See if you can work it through.

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[62] We'll show this more rigorously when we discuss international trade policy in Chapter 11.

By now you should understand the benefits of exchange, both among individuals and among countries. We'll use this understanding to develop our main model in economics: supply and demand (i.e., markets). We'll start by developing the supply side of the market in Chapter 4, then demand in Chapter 5. We put them together to understand how prices and production quantity are determined in Chapter 6.

It is critical that you pay close attention to the next few chapters; they are fundamental to the course. The Ricardian trade model we just did is important, but understanding the market model we develop next is *much* more important.

Appendix 3

The appendix provides some more technical details that will help you better understand comparative advantage. There's also another example that you should try to work through.

3A.1 Technical details

There are two simple checks you can use to make sure you're determining comparative advantage correctly. The first one lets you know if you've calculated opportunity costs incorrectly, and the second one is way to determine comparative advantage without calculating opportunity costs. You still need to know how to calculate the opportunity costs as we did in section 3.3, so just think of these as checks on your work, not a replacement for the analysis we already did.

First, you can check your opportunity cost calculations by changing them from decimals to fractions. (Note that I will always give you decimals that are easy to transform to fractions.) Go back to Graph 3.1. Let's look at Ecuador again. We had 1 $R = 1.5\ B$ and 1 $B = 0.67\ R$. If we convert the decimals to fractions, we get:

$$1\ R = 3/2\ B$$

$$1\ B = 2/3\ R$$

Now look at the fractions. Notice that they're inverses of each other. (Flip 3/2 over and you get 2/3.) This is important! This must <u>always</u> be true when you're calculating opportunity costs for two goods within a particular country. Why? Because the first equation reflects the cost of *R* in terms of *B*, and the second equation reflects the cost of *B* in terms of *R*. They're like two sides of the same coin. If your fractions aren't inverses of each other, then you've calculated the opportunity costs wrong; go back check your work.[63]

The inverse check for Chile (again, from Graph 3.1) is simple: $1\ R = 1\ B$. The transformation to fractions is just $1\ R = 1/1\ B$ and $1\ B = 1/1\ R$. Clearly, those fractions are inverses of each other.

Second, if you aren't able to (or aren't asked to) calculate opportunity costs, you can still determine comparative advantage by looking at the slopes of the countries' PPFs. Whichever country has the steeper PPF will *always* have the comparative advantage in the *y*-axis good, and whoever's PPF is flatter will *always* have the

[63] It is also possible that your fractions are inverses, but you still did the calculations wrong. If you calculated opportunity costs for Ecuador as $1\ R = ½\ B$ and $1\ B = 2\ R$, those are inverses of each other, but the numbers are wrong.

comparative advantage in the *x*-axis good.[64] Again looking at Graph 3.1. Chile has the steeper PPF, and the comparative advantage in *R*; Ecuador has the flatter PPF and the comparative advantage in *B*.

Why does this check work? In general, a relatively steep PPF means that the country can get more of the *y*-axis good by sacrificing a particular amount of the *x*-axis good (compared to the other country).[65] So they have the comparative advantage. Similar reasoning applies to the flatter PPF.

Some technical details about absolute and comparative advantage

Earlier we noted that absolute advantage deals with the *distance* of the PPF from the origin (0). So what does comparative advantage describe about the PPFs? Since we're looking at the PPFs' endpoints, we're really looking at their *relative slopes*.

The model we're developing is complicated; it might be the most complicated model we use all semester. So before we move on to show the entire trade model, try to answer the following questions – and explain your responses!

(1) Is it possible for one country to have the *absolute advantage* in both products?

(2) Is it possible for one country to have the *comparative advantage* in both products?

(3) Is it possible for *neither* country to have a *comparative advantage* in either product?

Try to at least think through those questions before moving on. If you can answer them all correctly, you're definitely ready to move on.

Briefly, the answers are: (1) Yes; see Graph 3.1 for an example. Chile has the absolute advantage in producing both goods. (2) No; if you have the comparative advantage in one good, you must have the comparative *disadvantage* in producing the other. Answering "yes" to this question would be like saying that one country's PPF could simultaneously be steeper and flatter than the other country's PPF. (3) Yes; but the only case in which this would be true is when the countries' PPFs are the same slope.

Example: Trade between Brazil and Ethiopia

Working through the Ricardian trade model requires some practice. If you're still not comfortable with what we did in section 3.3 or 3.4, it's worth practicing with another example. Take a look at Graph 3A.1, which illustrates Brazil and Ethiopia and their PPFs for coffee (*C*) and shoes (*S*).

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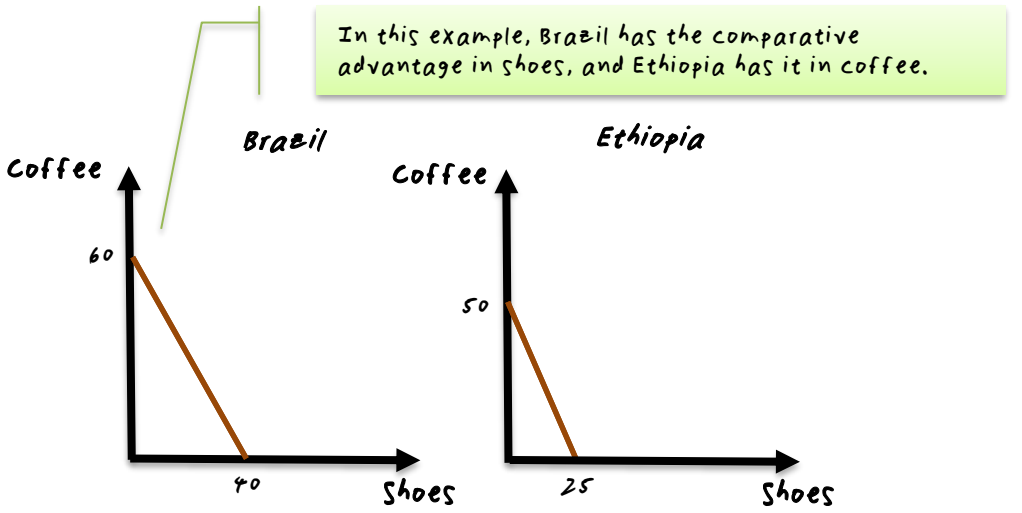
[64] This assumes the PPFs are shown on graphs with the same scale on the axes.

[65] As a specific example, look again at Graph 3.1. How much *R* does each country gain when they sacrifice 75 *B*? Chile gains 75 *R*, and Ecuador gains only 50 *R*; so Chile has the comparative advantage in *R*.



Graph 3A.1 PPFs for Brazil and Ethiopia

First, who has the absolute advantage in *C* production? How about *S*? (Brazil has the absolute advantage in both goods.) Next, calculate the opportunity cost of producing *C* and *S* in Brazil and in Ethiopia. You should set up the problem as shown below.

In Brazil, $\frac{60}{60}C = \frac{40}{60}S$, which gives us: $1C =$ _____ S

and, $\frac{40}{40}S = \frac{60}{40}C$, which gives us: $1S =$ _____ C

Remember, we're dividing both sides of the equations so that we can state the opportunity costs in terms of 1 unit *C* and 1 unit *S*. You should get 1 *C* = 0.67 *S*, and 1 *S* = 1.5 *C*. We can show these as fractions too. When we do this, we rewrite:

$1C = 2/3\,S$ and $1S = 3/2\,C$

The fractions are inverses of each other, which implies the calculations were done correctly.

Now calculate the opportunity costs of *C* and *S* in Ethiopia.

In Ethiopia, $\frac{50}{50}C = \frac{25}{50}S$, which gives us: $1C = \_\_\_\_ S$

and, $\frac{25}{25}S = \frac{50}{25}C$, which gives us: $1S = \_\_\_\_ C$

You should get 1 C = 0.5 S, and 1 S = 2 C in Ethiopia. This can be rewritten as

$1C = 1/2\ S$ and $1S = 2/1\ C$

As with Brazil, Ethiopia's opportunity costs are inverses of each other; so we can be confident the opportunity cost calculations are correct.

Who has the comparative advantage in coffee? In shoes? Brazil has the lower opportunity cost for *S*, and Ethiopia has the lower cost for producing *C*. These countries can benefit from specialization and trade. This is true even though Brazil has the absolute advantage in both goods.

Try the remaining steps of the model (section 3.4) on your own!

Part II

MARKETS

CHAPTER 4

Supply, Marginal Cost, and the Firm

It seems like a few people understand basic economics. This includes politicians, who so often seem to promote economically ignorant policies. Why are so many people clueless about economics? Politics may be the answer; the "rational ignorance" of voters may be another.

If you retain anything from this class, I hope you will have an understanding of the basic market model: how supply and demand work, and how prices and quantities are determined. Beginning with this lecture (and following with the next two) we develop the basic market model. This material is critical for understanding the material in the rest of the course.

In this section we develop the supply side of the market, focusing on why the supply curve is shaped the way it is, and what causes it to change. We'll be discussing technical and definitional issues in the next few lectures. During these sections, please ensure that you understand the jargon as it is introduced. Some of it can be confusing, so you must be very diligent in studying. *Do not underestimate the importance of this material.*

Once we develop the supply and demand curves, then we put them together to reveal how market prices and quantities are determined and how they adjust. We can then analyze a variety of interesting public policy issues.

- **Supply**
  - Supply represents the maximum quantity individuals or firms are willing to produce/sell at various prices
    - the law of supply states that, *ceteris paribus*, price is positively related to quantity supplied, for any good or service
      - so if P↑ $\Rightarrow Q_S \nearrow$
      - a supply curve (S) can be drawn to illustrate the law of supply
  - Ex: Food truck tacos; S of tacos is shown in Figure 4.1

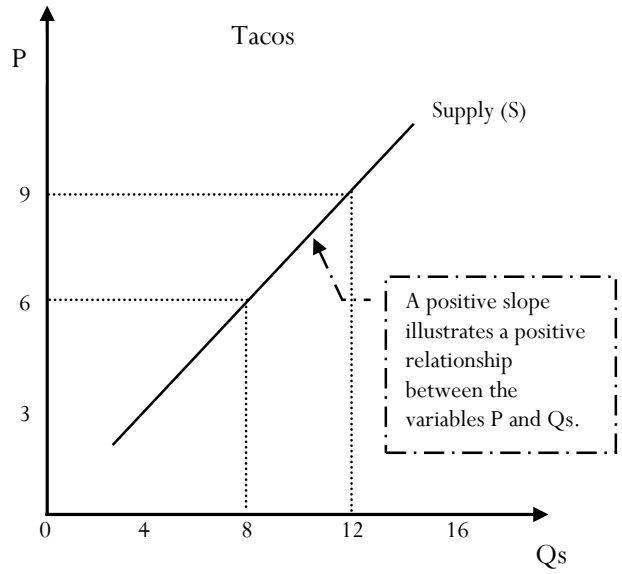


Figure 4.1. Supply curve (S)

- the higher the price, the longer you'd be willing to stay open, hire more workers, etc.

- An easy explanation of the supply curve's slope
  - as P↑, selling becomes more profitable, so firms want to supply more
    - profit = selling price minus cost of production
  - consider your "supply of labor": if your wage ↑, you're probably willing to work more hours
    - opportunity cost of studying, partying, etc., ↑
- Entrepreneurship is extremely important
  - risk-taking in opening a business is done for the potential of profit (to make money)
  - if there were no profits, or if government taxes them heavily, there will be little incentive for people to be creative or take risks
- The supply curve as a marginal cost (MC) curve
  - as $Qs \nearrow$ the opportunity cost of production ↑
    - in order to increase taco production from the food truck, you must use better equipment, more productive (and expensive) workers, etc.
    - stay open later, pay workers overtime, etc.

- **Determinants of Supply**
  - A <u>change in quantity supplied</u> (ΔQs) refers to a <u>movement along the supply curve</u>, caused <u>only</u> by a change in price (ΔP)

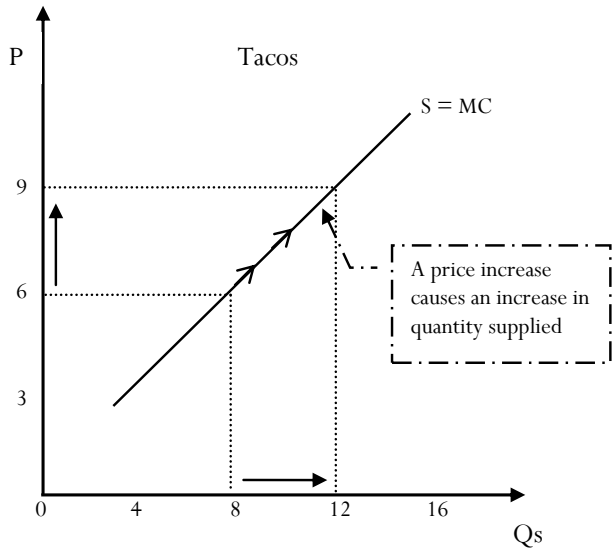


Figure 4.2. Increase in quantity supplied (Qs) due to a price increase

- Any change other than P that affects S causes a <u>change in supply</u> (ΔS), a <u>shift of the supply curve</u>
  - see Figure 4.3
  - an increase in supply, $\underset{\rightarrow}{S}$, is a rightward shift <u>of the entire curve</u>
    - at a particular price (holding P constant), now producers are willing to sell a greater quantity,

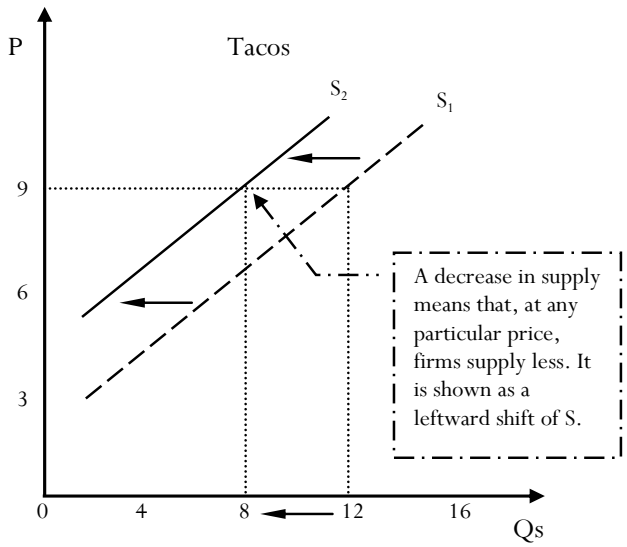


Figure 4.3. A decrease in supply (S), due to a change in a non-price determinant

        - or to be willing to sell a particular quantity (holding Q constant), now producers will accept a lower price
    - a decrease in supply, $\overset{S}{\leftarrow}$, is a leftward shift <u>of the entire curve</u>
  - There are five "shift factors" for the supply curve:
    - Δ in number of sellers
      - number of sellers increases, then supply increases; vice versa
    - ΔP of labor or other inputs
      - if input P↑, then $\overset{S}{\leftarrow}$; vice versa
      - it is helpful to think of S and MC; if the MC↑, then S falls (shifts left/vertically higher; $\overset{S}{\leftarrow}$)
    - technological advances will cause $\overset{S}{\rightarrow}$
      - if government bans a technology, then $\overset{S}{\leftarrow}$
    - ΔP of substitutes in production
      - a corn farmer: if P_{wheat}↑, then $\overset{S_{corn}}{\leftarrow}$, as the farmer switches to wheat
    - ΔP expectations
      - two periods: current and future
      - producers will supply less in the current period if they expect future P to be higher; supply more in the future period
  - We can go from an "individual" supply curve to a "market" supply curve by summing horizontally the individual supply curves
    - at each P, we want to add the Qs of all individual producers in the market, the total of which is the market supply curve

- **Supply vs Quantity Supplied**
  - "Supply" or S refers to the *entire curve*
  - "Quantity supplied" or Qs refers to a *point on the curve*

- **Application: The U.S. Auto Industry**
  - Let's consider GM, Ford, and Chrysler in light of firms' costs, and profit and loss.
  - "Profit" and "loss" are important signals to firms and investors.
    - if the firms are making losses, they *should* eventually go out of business – and be allowed to
      - a firm with a negative profit (i.e., loss) is *reducing the value of society's scarce resources*
    - giving them taxpayers' money isn't going to change their long-term profitability

        - it "enables" the inefficient production
        - reduces their incentive to improve
    - Initiated under President Bush and continued with Obama, the federal government provided loans and purchased stock in GM and Chrysler (2007/08)
        - "Government Motors" cost taxpayers $11 billion (of the $49.5 billion provided to GM)[66]
        - government sold all GM shares by Dec. 2013
    - GM recalled over 30 million cars in 2014,[67] which cost the company over $4 billion[68]
        - ethical questions arose about why there wasn't a recall sooner for ignition switch problems that GM apparently knew were linked to driver deaths
        - should taxpayers have been forced to bail out the company?
    - Consider some fines imposed on auto firms by the U.S. government
        - GM: $900 million settlement in 2015
            - ignition switch design flaw
            - blamed for killing at least 125 people
        - Toyota: $1.2 billion settlement in 2014
            - sudden acceleration case
            - 400 wrongful death lawsuits
        - Volkswagen ordered to pay $2.8 billion in 2016
            - diesel cars programmed to cheat on emissions tests
            - number of deaths?

[66] http://www.reuters.com/article/us-autos-gm-treasury-idUSBREA3 T0 MR20140430

[67] http://www.thecarconnection.com/news/1092550_roundup-all-the-gm-recalls-of-2014

[68] http://money.cnn.com/2015/02/04/news/companies/gm-earnings-recall-costs/

- **Sunk Costs**
  - These are costs that should be ignored – they are beyond recovery at the moment of decision
    - Ex: whether to finish your college degree
    - Ex: road trip to Miami Beach
    - Ex: chasing losses at a casino
  - Rational decisions are made at "the margin," looking into the future, not the past

Deriving the Supply Curve from the Firm's Cost Curves

In this section we go into more detail in explaining why the supply curve has a positive slope and how firms make production decisions in an effort to maximize profit. This material is more concise than the typical textbook presentation; for more details, see a principles text's chapters on perfect competition.

- **Marginal Cost and Average Cost**
  - Consider production costs for the taco food truck, illustrated in Figure 4.4, which initially decrease as Q increases
    - there is some initial "learning," by cooks so MC tends to fall initially, up to 3 units
      - we use small Q, to keep the math simple
    - there may also be efficiencies from hiring additional workers (e.g., specialization)

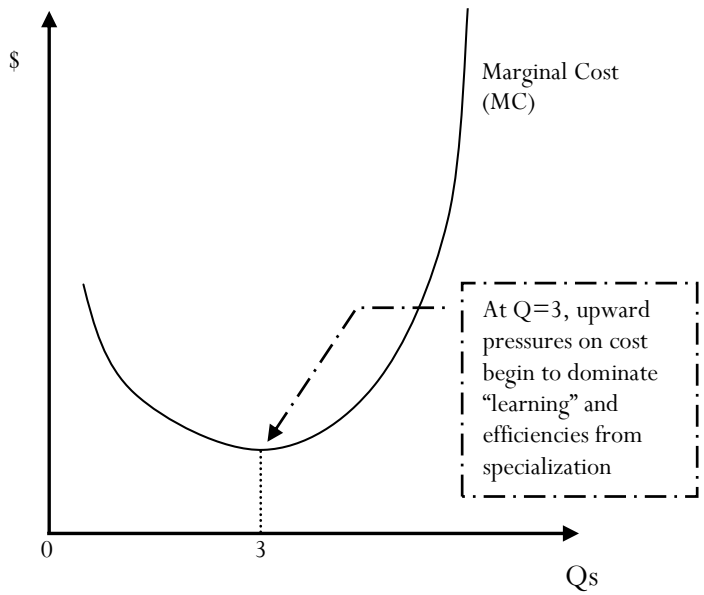


Figure 4.4. Marginal cost (MC) of production

- Eventually, MC begins to increase, as some cost effects begin to dominate the learning and efficiencies
  - overcrowding (workers must wait to use the stove)
  - overtime or hiring workers for late shifts
  - the need to hire more talented/expensive workers
  - necessity to purchase more efficient capital
  - need for more managers or layers of management
- Each factory (e.g., food truck) has some theoretical physical limit, in terms of quantity of production
  - at this point, the MC would become vertical
  - Ex: Consider growing a crop in a small area like a trash can; to increase Q, MC is going to rise
  - marginal product of labor ($MP_L = \Delta TP/\Delta L$) increases initially, then begins to fall off
- Next consider what average cost (AC) would look like, given the shape of the MC curve
  - think about marginal GPA (current semester) and your average GPA (overall)
  - mathematically, $MC = \Delta TC/\Delta Q$ and $AC = TC/Q$
  - see the data in Table 4.1, which could represent a typical MC curve

Table 4.1. Production costs

Q	MC (=ΔTC/ΔQ)	TC (=ΣMC)	AC (=TC/Q)
1	$10	$10	$10.00
2	9	19	9.50
3	6	25	8.33
4	8	33	8.25
5	12	45	9.00

  - If you plot the data in Table 4.1, it would result in something like Figure 4.5

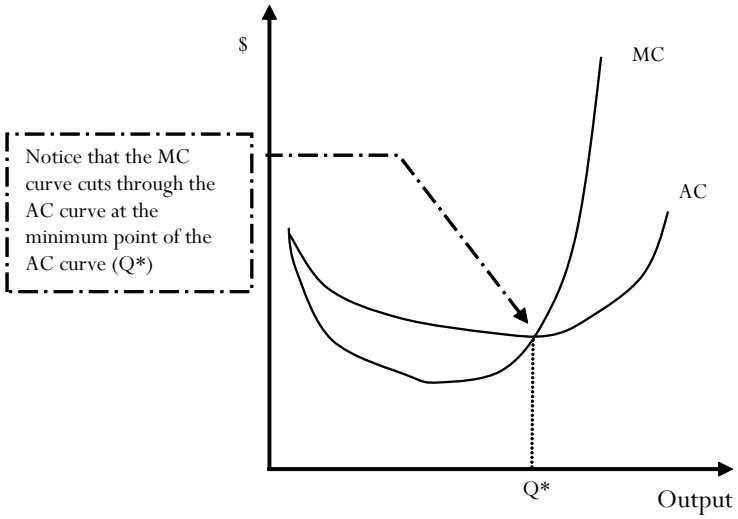


Figure 4.5. Marginal and average cost curves

- **Production Decisions and Profit Maximization**
  - Consider how a profit-maximizing firm decides whether or not to open for business
    - compare AC to P; understand that P=AR=MR
      - open if P ≥ min AC
  - If the firm can *potentially* make a profit, it can determine the profit-maximizing Q by comparing MC to P (again, keep in mind P=AR=MR)
    - profit maximization occurs where *P=MC*
  - "Break-even" example (Figure 4.6)
    - in economics this actually means the market average rate of return (say 5 or 6%), so firms are earning a "normal rate of profit"
    - in this situation, there is no incentive for the firm to leave the industry
    - there's also no incentive for new firms to enter this industry

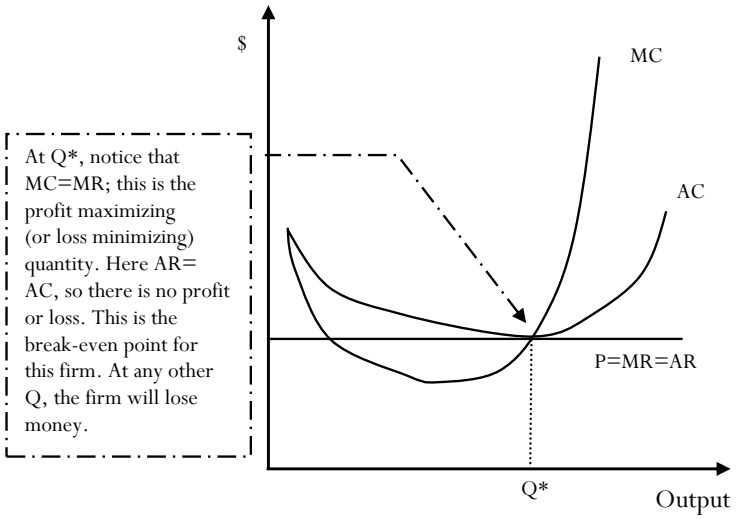


Figure 4.6. A firm breaks even producing at Q*

- if the market price and firm's cost curves are as shown above, and the firm does not produce at Q* (where MR=MC), then it earns an economic loss, as shown below in Figure 4.7

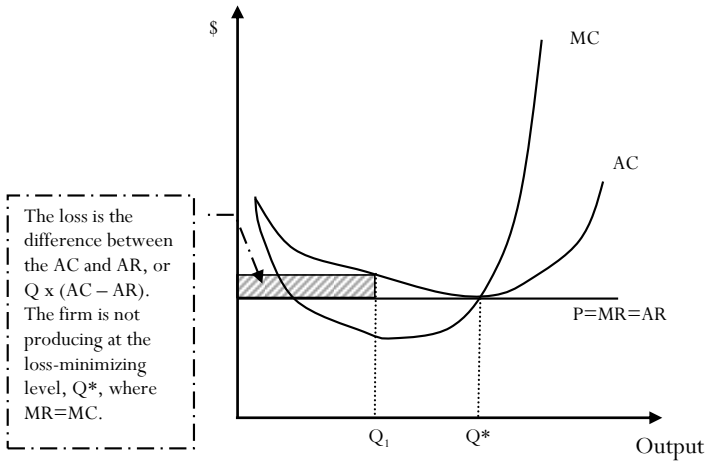


Figure 4.7. A firm suffers an economic loss producing at Q_1

- In Figure 4.8 we shift the AC slightly higher and look again; even if the firm follows the profit-maximization rule (produce Q where MR=MC), it still earns a loss
  - the loss area would be larger at any other Q

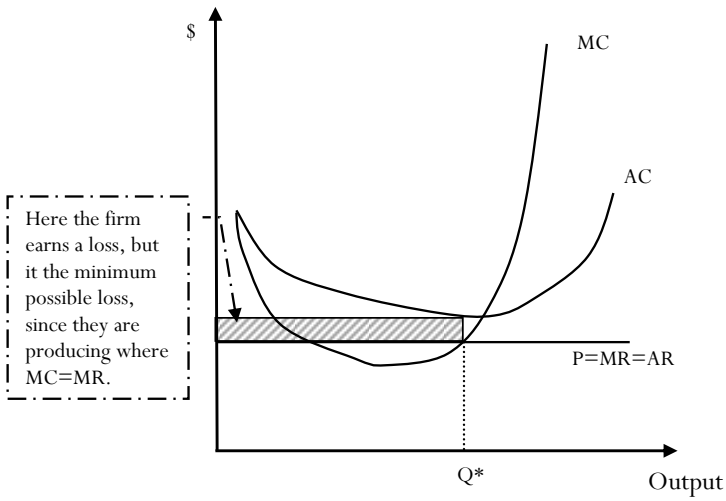


Figure 4.8. A firm earns a loss at Q*

- In some cases, it may be in the firm's best interest to remain open even if it is losing money
  - this would be true if the average variable cost (AVC) was lower than P, at Q*
    - AVC isn't shown in any of these figures, but the TC discussed earlier is composed of variable (labor) and fixed cost (capital) components
  - in this case, the firm can't cover its AC, but it can cover the variable portion, so producing loses less money than shutting down
  - Ex: suppose daily revenue is $100, variable costs are $40 per day, fixed costs are $80 per day
    - produce and lose $20; shut down and lose $80
- The firm shown in Figure 4.9 earns an "economic profit" in excess of the "normal rate of profit"

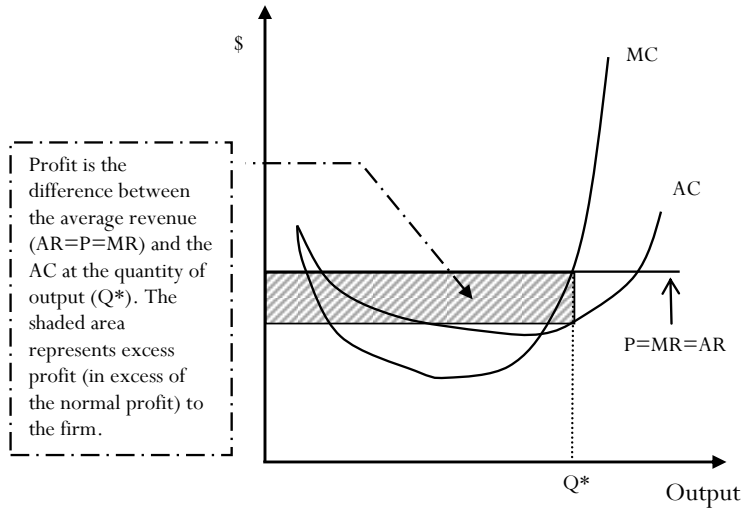


Figure 4.9. A firm earning economic profit

- if existing firms in an industry are making a profit then new firms will be attracted to the industry

- **Deriving the Supply Curve**
  - If the firm always produces at the profit-maximizing quantity (where MR=MC), whatever the market price, then it is easy to derive the S curve
  - S *is* the MC curve above the minimum of the AC curve
    - recall that each firm produces up to the point at which P=MC in order to maximize profit
    - also recall that a supply curve indicates the maximum quantity a firm is willing to produce or sell at each P
  - The dark-shaded MC curve in Figure 4.10 is the S curve

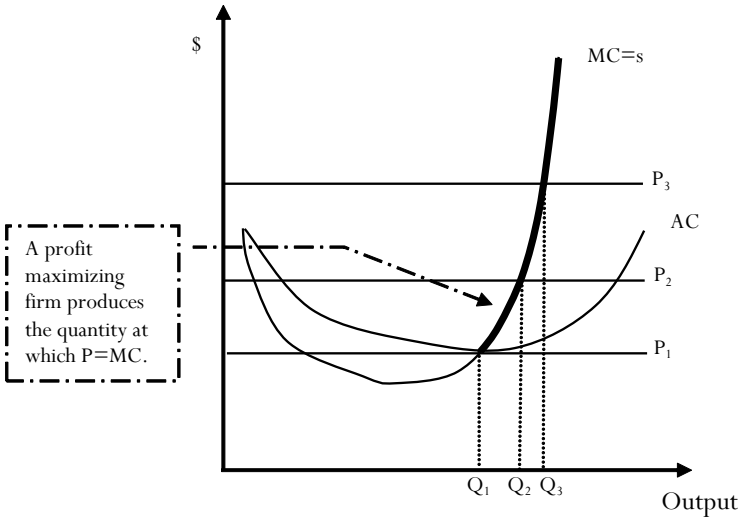


Figure 4.10. The supply curve is part of the MC curve

- **Firm Profit and Long-Run Equilibrium**
  - Summing all firms' individual supply curves (s) yields the market supply curve (S)
    - since economic profits will attract entry into the industry, $\Rightarrow \underset{\rightarrow}{S}$, and losses will cause exit from the industry so that $\underset{\leftarrow}{S}$, then in the absence of other supply changes or changes in demand, in the long-run, the market will look like the Figure C.A8
    - suppose 5 identical firms operate in the market, as pictured in the right panel of Figure 4.11
    - suppose the initial price is P_1; the firm would earn an economic profit
    - this attracts new firms to the industry, which increases S (rightward shift), pushing P down
    - new firms continue entering the industry until the price falls to where all firms in the industry are earning the normal rate of profit
    - the long-run equilibrium is shown in Figure 4.11, where Qe=25

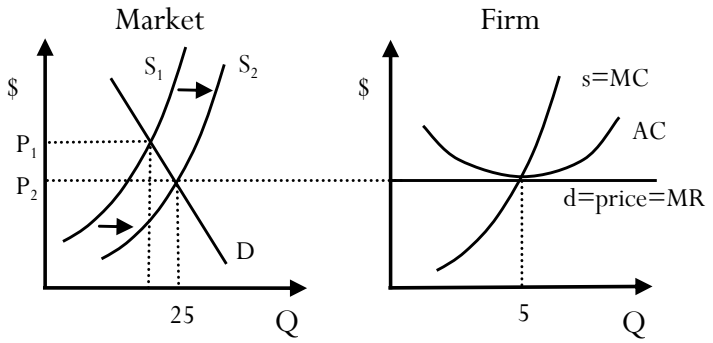


Figure 4.11. The industry and an individual firm in long-run equilibrium

- **Rates of Profit Across Industries**
  - As noted above, the normal rate of profit within an industry is maybe 5-6%
  - The rate is likely to be similar across industries
    - firms earning less profit will leave the industry
    - if firms in the industry are earning above the inter-industry average rate of profit, more firms will be attracted to the profitable industry
  - In a 2013 survey about profits, the public seemed to think the average company makes a 36% profit (!)[69]
    - data from this survey suggest that the average profit rate across 212 industries was 6.5%

- **Perfect Competition**
  - The market shown above is what economists call "perfect competition"
    - firms in competitive markets are "price takers"
      - they can sell as much as they want at the market price (Pe), but none at any price higher than Pe
    - the product is homogeneous
    - since their products and prices are the same, firms do not advertise in competitive markets
    - market entry and exit are free of barriers
  - This model of a perfectly competitive market is a benchmark for comparison
  - Ex: stock markets, commodity markets, gasoline?
    - but markets for other goods are usually not perfectly competitive

[69] https://www.aei.org/publication/the-public-thinks-the-average-company-makes-a-36-profit-margin-which-is-about-5x-too-high/

- **Monopoly**
  - This is the opposite extreme of perfect competition
    - a monopoly market has only one seller
    - to maximize profit, the monopolist chooses the Q where MR=MC, and charges the willingness to pay associated with that Q, found on the D curve
  - Compared to a perfectly competitive market, a monopolistic market will have higher prices and fewer transactions (less output), as in Figure 4.12

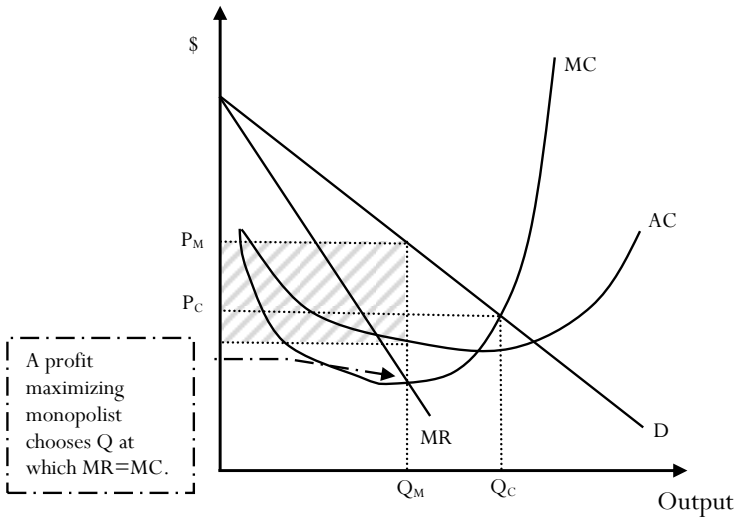


Figure 4.12. A monopolist's price, quantity, and profit, compared to a competitive market

  - We discuss monopolies later in the course under "market failures"

- **Input Costs and the Supply Curve, Revisited**
  - Look back in Lecture C, "determinants of supply"
    - does this appendix help you understand why, when input prices rise, S of the good using the input falls?
      - if not, study more!
  - The supply curve is just a cost curve, and when $\overset{S}{\leftarrow}$, it means marginal costs are higher

CHAPTER 5

Demand, Marginal Benefit, and the Consumer

In this chapter, we develop the demand curve and explain its slope and causes for change. Just as with supply, understanding what causes changes in the demand curve is critical for under-standing how markets work.

- **Demand**
  - Demand is the maximum quantity an individual is *willing and able* to purchase at various prices
    - don't confuse "need" with "demand"
  - The law of demand states that, *ceteris paribus*, price is negatively related to quantity demanded, for any good or service
    - so a price increase causes quantity demanded to fall: P↑ ⇒ $\overset{Qd}{\nwarrow}$
    - vice versa, P↓ ⇒ $\overset{Qd}{\searrow}$
    - a D curve can be drawn to show the law of demand (the relationship between P and Qd)
  - Suppose Figure 5.1 illustrates your demand for tacos
    - aside from the fact that it reflects the law of demand, why intuitively would you expect a demand curve to have a negative slope?
    - what happens to marginal benefit (the benefit of each additional unit) of consumption as $\overset{Q}{\rightarrow}$?
      - law of decreasing marginal benefit (MB)

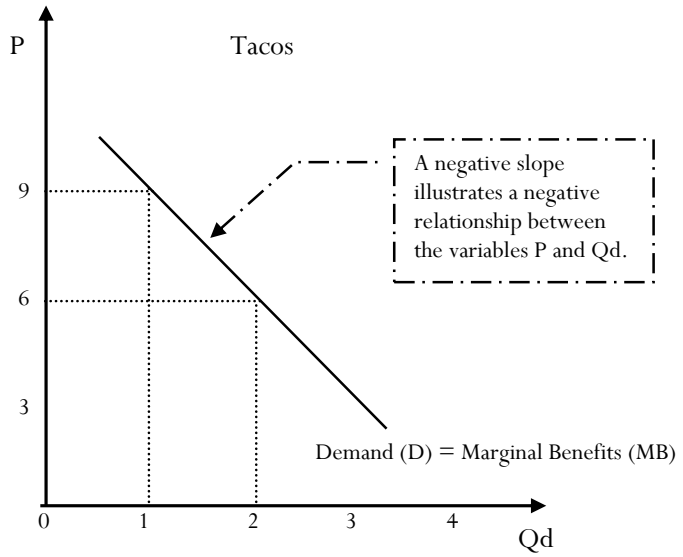


Figure 5.1. Demand curve (D) or marginal benefits (MB) curve

- Ex: If you're stranded in the desert without water
  - how much benefit would the first glass give?
  - what about the second, third, and additional glasses of water?
  - if you graph this "marginal benefits" curve, what happens as $\underset{\rightarrow}{Q}$?
  - based on this, what would happen to a person's willingness to pay for these different glasses of water?

- **Determinants of Demand**
  - A <u>change in quantity demanded</u> (ΔQd) refers to a <u>movement along the demand curve</u>, caused <u>only</u> by a change in price (ΔP)
    - P↑ ⇒ $\underset{\nwarrow}{Qd}$; so then if P↓ ⇒ $\underset{\searrow}{Qd}$
    - see Figure 5.2

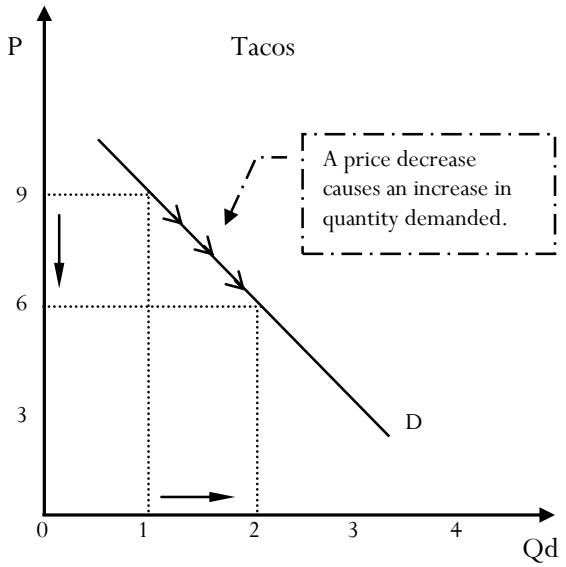


Figure 5.2. Increase in quantity demanded (Qd) due to a decrease in price

- Any change other than price that affects demand causes a <u>change in demand</u> (ΔD – a <u>shift of the demand curve</u>)
  - an increase in demand, $\underset{\rightarrow}{D}$, is a right shift
    - see Figure 5.3
    - at a particular P (holding P constant), now buyers are willing to purchase a greater Q
    - or to be willing to purchase a particular Q (holding Q constant), now consumers are willing to pay a higher P
  - a decrease in demand, $\underset{\leftarrow}{D}$, is a left shift

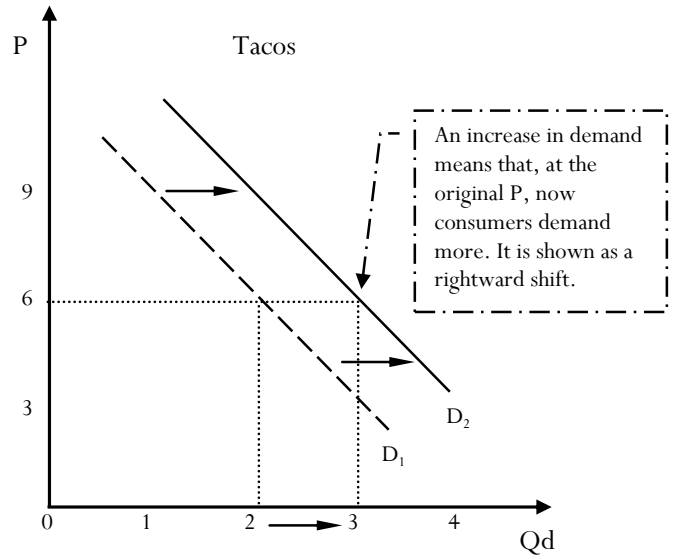


Figure 5.3. An increase in demand, due to a change in a non-price determinant

- There are five "shift factors" for the demand curve:
  - Δ in the number of consumers
    - if it rises, so will D; vice versa
  - Δ in tastes and preferences
    - Ex: fads, medical evidence, etc.
  - ΔP expectations
    - if you expect in the future P will ↑, current $\overset{D}{\rightarrow}$
    - Ex: if you expect gas prices to be higher next week, you'll fill up your tank now (current demand will increase)
  - Δ in consumer income
    - "normal goods" are those for which $\overset{D}{\rightarrow}$ when income ↑
      - Ex: latest iPhone; meals at FIG in Charleston, Chinaco tequila; new video games
    - "inferior goods" are those for which $\overset{D}{\leftarrow}$ when income ↑
      - Ex: Spam; Yugo cars; lunches at a college cafeteria; generic brand foods
  - ΔP of related goods; for two goods, A & B…
    - when P_A↑ and $\overset{D_B}{\rightarrow}$, A and B are substitutes
      - Ex: Coke & Pepsi; gasoline & air travel
    - when P_A↓ and $\overset{D_B}{\rightarrow}$, A and B are complements
      - Ex: camera & film; textbooks and tuition; DVDs & DVD players;

gasoline & SUVs

- We can go from an "individual" demand curve to a "market" demand curve by summing horizontally the individual demand curves
  - at each P, we want to add the Qd of all individuals in the market; the result is the market D curve

- **Demand vs Quantity Demanded**
  - "Demand" or D refers to the *entire curve*
  - "Quantity demanded" or Qd refers to a *point on the curve*

- **Consistency is Important in Using Graphs**
  - Always label all axes and curves!
  - Think of an increase in D or S as a rightward shift of the curve; a decrease is a leftward shift
  - An increase in Qd or Qs is rightward movement along the curve; a decrease is leftward movement along the curve

CHAPTER 6

Market Equilibrium and Price Adjustments

In this chapter we put together supply and demand curves, to see how markets work and how prices are determined. This section assumes you have a thorough understanding of the previous two. Much of the remainder of the course relies on an understanding of this section.

- **Market Equilibrium**
  - Putting S and D on the same graph illustrates a "market"
    - the intersection of S & D is called <u>equilibrium</u>
    - the equilibrium price (Pe) is the price at which Qd=Qs; this is called the equilibrium quantity (Qe)
    - see Figure 6.1
  - If P>Pe, then there is a <u>surplus</u> in the market (Qs>Qd)
  - If P<Pe, then there is a <u>shortage</u> in the market (Qs<Qd)

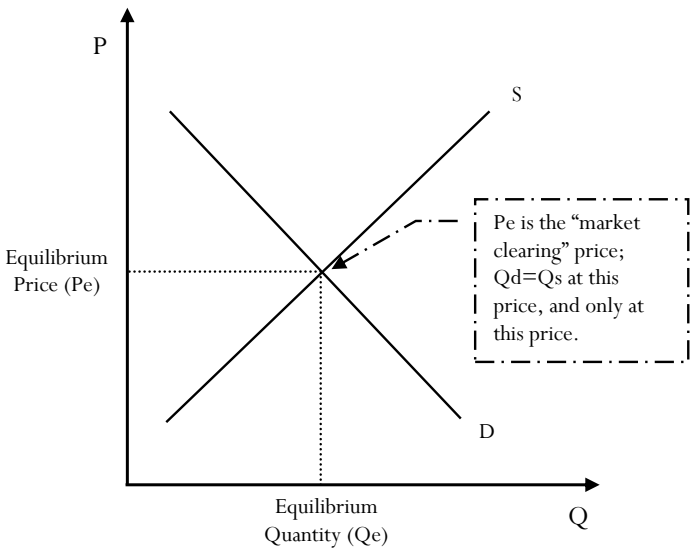


Figure 6.1. Market equilibrium

- **Mutually Beneficial, Voluntary Transactions**
  - These are "good" for society
    - the more of these, the better; when this number is maximized, we have efficiency – the best possible outcome for that market

- Market transactions are the result of self-interest
  - consumers want to maximize their utility or benefits from consumption (and a limited budget)
  - sellers want to maximize their profits
    - Adam Smith's famous passage:

      "It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest"[70]

- How many mutually beneficial voluntary transactions occur at each price?
- At P>Pe, which side of the market is "unsatisfied" (i.e., can't find someone else to transact with)
- Who's "unsatisfied" when P<Pe?
- We discuss the benefits from market transactions in more detail in Ch. 7

- **How Changes in S or D Affect Equilibrium P & Q**
  - Changes in D or S will cause the Pe and Qe to change
    - when $\underset{\rightarrow}{D}$, Pe↑ and $\underset{\rightarrow}{Qe}$; when $\underset{\leftarrow}{D}$, Pe↓ and $\underset{\leftarrow}{Qe}$
    - see Figure 6.2: when $\underset{\rightarrow}{S}$, Pe↓ and $\underset{\rightarrow}{Qe}$
    - when $\underset{\leftarrow}{S}$, then Pe↑ and $\underset{\leftarrow}{Qe}$
  - Like a thermometer reflects temperature, prices reflect the reflect relative scarcity of goods and services
    - a high price does not "cause" scarcity, it is a reflection of scarcity

[70] *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776, book I, ch. II)

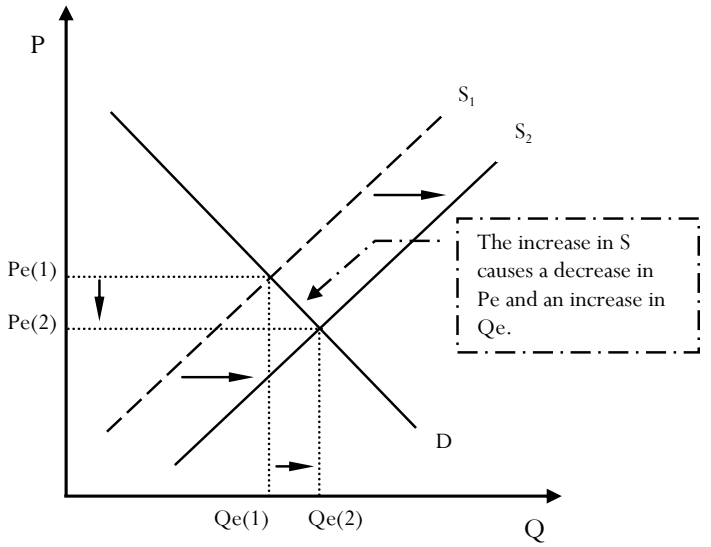


Figure 6.2. An increase in supply (S) causes a decrease in Pe and an increase in Qe

- Aside from finding the new P & Q, you must understand *how* P & Q adjust
  - this applies, generally, when P ≠ Pe (when there is either a surplus or shortage)
- Consider Figure 6.3, which illustrates a $\underset{\rightarrow}{D}$ for cars
  - once $\underset{\rightarrow}{D}$, Pe(1) is no longer an equilibrium; there is an immediate shortage in the market
  - both suppliers and consumers will respond
    - consumers, noticing they can't find the car at any of the dealers, will start offering more money to get the car, or to be put at the top of the waiting list; they might even start offering sticker price or higher
    - sellers, who notice that they cannot keep the car in stock at the original price, and that consumers are coming in and offering higher prices, will of course raise their prices

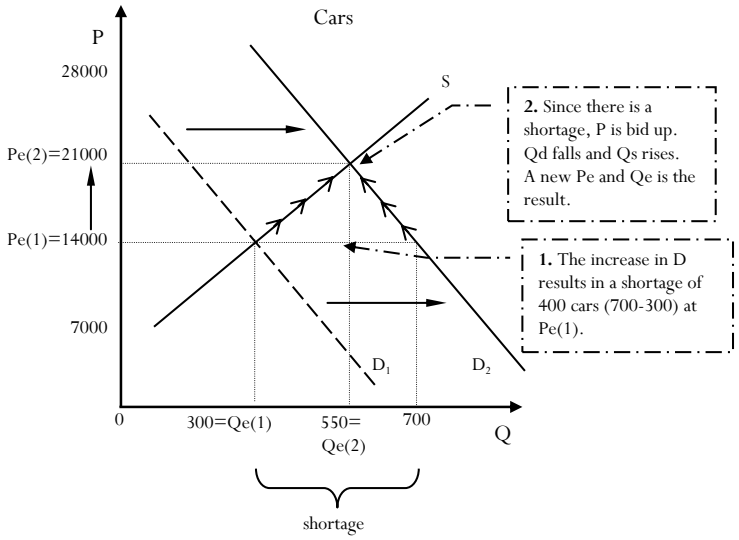


Figure 6.3. An increase in demand causes an immediate shortage at Pe(1), causing a price adjustment

- the price is bid-up by consumers and producers, and P↑, as $\underset{\nearrow}{Qs}$ while $\underset{\nwarrow}{Qd}$
- eventually, the shortage is eliminated as the price adjusts

- What would happen to P & Q if S rises in the market?
  - at the original price, the S increase would create a surplus
  - now with excess supplies, the dealers slash prices, and put things "on sale"
  - consumers see advertising, know they can get a good deal, and bid price down
  - as P↓, $\underset{\swarrow}{Qs}$ and $\underset{\searrow}{Qd}$; eventually the surplus disappears

- **Changes in S & D Simultaneously**
  - The analysis becomes more difficult
    - you can only determine the direction of change in one variable (either Pe or Qe), not both
    - the direction of change in these variables depends on the relative magnitude of the curve shifts
    - it's easy to analyze if you remember the individual effects of ΔS and ΔD on Pe and Qe
    - so if $\underset{\rightarrow}{D}$ and $\underset{\rightarrow}{S}$ simultaneously, then you know $\underset{\rightarrow}{Qe}$, but the ΔPe is indeterminate
      - if $\underset{\rightarrow}{D}$ more than $\underset{\rightarrow}{S}$, then P↑ since the demand effect would dominate the supply effect on P

- **"Perfect Competition" and the Market Model**
  - We're making a few assumptions; refer back to the Appendix to Lecture C…
    - "many" consumers and producers → no individual control over P
    - homogeneous goods and services
    - consumers and producers are "informed"
  - These obviously don't apply to most markets; some are closer than others to perfect competition
  - This is a "benchmark" which we use to judge the efficiency of market outcomes.

CHAPTER 7

Economic Efficiency in Markets

This is the most important chapter in the course. It is critical that you attend all sessions for this lecture. Now we put together all of the previous topics to develop a more in-depth understanding of why markets are "efficient," and why the individual participants benefit from market transactions.

Once you've studied the material for this lecture, you should be able to discuss this sensibly: *"What is the function of prices and profits in allocating scarce resources to suppliers and consumers in a market economy?"* Everything in the course until now has been leading up to this issue. If you understand this, you probably understand more about economics than 95% of the U.S. population.

- **The Functions of Prices and Profits**
  - Prices represent information to producers trying to decide what, how much, and how to produce
    - prices and profits signal to suppliers which goods & services are valued by consumers
      - profit is the key incentive for producers
    - prices are instrumental in determining the quantity produced
      - to maximize profits, each firm produces up to where P=MC, as shown in the Ch. 4
      - this issue is discussed in the "Springfield farming lecture" (below)
    - the "how to produce" deals with using K and L; we won't discuss this decision much
  - Prices provide important information to consumers, too
    - they signals the relative scarcity of goods & services
    - prices allocate goods & services only to the consumers with the most intense demand for the products
  - Prices serve a critical allocative function in markets, determining who will produce and consume
    - input resources are allocated only to low-cost firms who can make a profit at the market price
      - if a firm earns losses, it won't be able to pay for inputs into the long-run
    - goods & services to the people with the greatest expected benefit and willingness & ability to pay
    - the result is "allocative efficiency"

- **Consumer Surplus and Producer Surplus**
  - In Lecture E we briefly discussed mutually beneficial voluntary transactions
    - we now look into more detail how market participants benefit
  - CS and PS are critical concepts of "welfare economics" that we will use for policy analysis later in the course
    - Note that these "surpluses" have nothing to do with Qs>Qd; this is a completely different concept
  - Consumer surplus (CS) is the difference between the maximum consumers are willing to pay (indicated on the D curve), and what they actually pay (P)
    - think about it if you were unaware what the price is, and you decide you want a taco; how much would you be willing to pay?
      - then you find the food truck and see the P
    - CS is the area under the D curve above the price line (see Figure 7.1)
    - CS is a benefit to consumers, consistent with common sense: consumers like lower prices

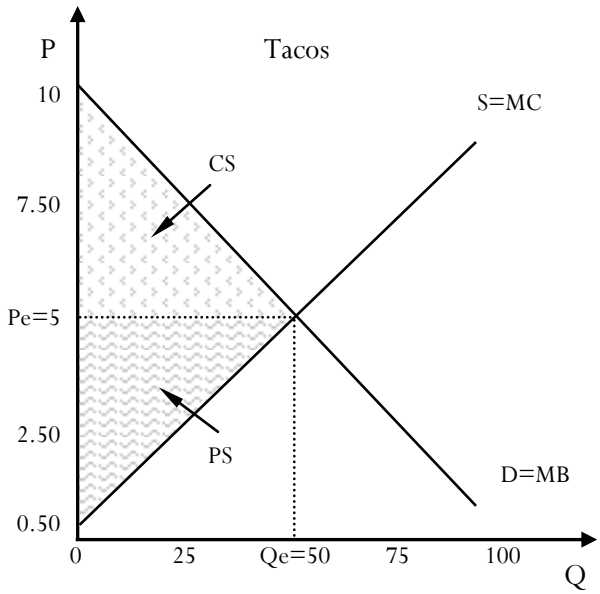


Figure 7.1. Consumer and producer surpluses at Pe

    - CS is "in your face" at some retailers
      - Ex: Ross, Big Lots, Marshall's, Burlington: price tags "compare at $12; our price $8"
        - $4 CS in this example, if you value it at $12
        - value is subjective; you may value it at $0
      - Ex: Figure 7.2 shows a Ross tag (with a typo?)

Figure 7.2. A price tag from Ross as an illustration of CS

- Producer surplus (PS) is the difference between what sellers actually receive (indicated by P) and the minimum they would be willing to accept (MC curve)
  - PS is the area above the S curve below the P line
  - PS is a benefit to producers – it's profit; consistent with the idea that sellers like higher prices
- Calculating CS and PS values in Figure 7.1
  - area of a triangle = ½ (base)(height)
    - CS = ½ (50)(5) = $125, assuming D intersects the P axis at $10
    - PS = ½ (50)(4.50) = $112.50, assuming S intersects the P axis at $0.50
- Using CS and PS
  - PS and CS are measures of the welfare of those groups, so the "total surplus" (PS + CS) is a measure of total social welfare
    - the larger the total surplus, the better
    - at any P≠Pe, the total surplus must be lower than at Pe
  - one reason people may think "profit" is taking advantage of people is that PS is clearly visible
    - firms have to report profits and pay taxes; consumers don't have to report CS to the IRS
    - CS is perhaps less tangible, but no less real

- **"Springfield Farming Lecture"**
  - Here we examine some individual farmers' production decisions to see how government production decisions would differ from market decisions
    - This lecture is extremely important, so I've written it out…
    - It's based on a brief discussion from Landsburg's *The Armchair Economist*, pp. 93-94

Springfield Farming: Efficiency in Production and Consumption

We wish to consider a simple economy with two farmers. Whether government or the individual farmers make the production decisions can have an enormous impact on the outcome for this market. By extension, this example will help you understand the relative likely performance of market-oriented versus government-run economies. A fundamental point to this analysis is that prices serve a critical function in well-functioning markets.

1 "Socialist" economy

First consider a socialist world, in which there is no private property ownership, and no markets. A czar (dictator) will determine who produces and consumes and in what quantities. For simplicity, let's assume that wheat is the only good produced and consumed in our economy. (Although we only consider one good, the analysis would apply to all goods produced.) Looking at production only, say that Willie and Flanders are the only two wheat producers. Remember that since there is no private property, we assume the farmers simply produce the quantities they're assigned, and they are paid based on the costs they incur or the time they spend.

If you were the "wheat czar" in charge of assigning the production quantities for the farmers, how would you go about it? Suppose that you are a benevolent dictator and your goal as wheat czar is to *minimize total cost of aggregate wheat production*. You are concerned with economic (productive) efficiency. That is, you want to produce a given amount of wheat for the minimum possible total cost (*TC*). Suppose your superior tells you that you are responsible for producing 6 bushels of wheat this year. Given this goal, how would you assign wheat production to the two farmers? (Notice that we must *assume* some quantity of wheat to produce. How would we know the correct amount?)

In order to obtain your goal of efficiency, you must look at the *marginal production costs* for the two farmers. Recall the marginal cost (*MC*) curve and the characteristics of its up-sloping section (i.e., $MC \uparrow$ as $Q \uparrow$, since as producers increase quantity, they must bid away more resources from alternative uses, pushing prices up). Now, given the information in the Table F.1, we can see how to make the production decision.

Recall that your goal is to minimize the total cost of producing 6 bushels of wheat, whoever produces them. Suppose you tell Willie to produce all of it; *TC* of production in this case is $25. This would certainly be better than having Flanders produce all the wheat—it would cost him $33. But remember that we're not focusing on the costs to particular farmers. Rather, we care only about the total society wide cost of producing the wheat.

So let's say you initially decide to have Willie produce all the wheat. Notice that the *MC* to him of that last bushel is $7. If you were to have Flanders produce one bushel (his first), it would cost him only $2. So why not have Willie produce only 5 bushels and let Flanders produce 1 for the total of 6 bushels. This will save society $5: we decrease

our cost by $7 by having Willie *not* produce his 6th bushel, but we add a cost of $2 since Flanders will now be producing his first bushel. The *TC* is now only $20 ($18 *TC* for Willie, and $2 *TC* for Flanders), instead of $25, when Willie was producing all the wheat. We can do the same thing again – continue substituting Flanders' (cheap) wheat for Willie's (expensive) wheat. When do we stop substituting?

Table 7.1. Production costs for wheat in Springfield

Bushel	**Willie**		**Flanders**	
#	MC	TC	MC	TC
1	$1	$1	$2	$2
2*	$2	$3	$3	$5
3	$4	$7	$4	$9
4	$5	$12	$6	$15
5	$6	$18	$8	$23
6	$7	$25	$10	$33
7	$8	$33	$12	$45

* For example, to produce the second bushel, Willie must incur a $2 *MC*. This means that his total cost (*TC*) increases by $2; since the *MC* of the first unit was $1, his *TC* for producing two bushels is $3.

It turns out (you should make sure you understand how) the total production cost of 6 bushels of wheat is minimized – recall that this is our goal – when the *MC* of production for the two farmers is the same. Therefore, we want to assign a production level for which the *MC* of all producers is the same. Think about why this makes sense. What happens when we continue the substitution beyond this point? Suppose we are having Willie and Flanders produce 3 bushels each and then we decide to have Willie produce only 2 and have Flanders produce 4 bushels. How does this change our total production cost? We save $4 by having Willie *not* produce the 3rd bushel, but we increase our cost by $6 since Flanders will now be producing a 4th bushel – our total cost *increases* by $2. You should convince yourself that the best production allocation, from "society's" perspective, i.e., minimum total production cost, is to have each farmer produce 3 bushels of wheat. (Understand that the fact that both farmers are producing the same quantity [3] is purely coincidental; the equal *MC* is what is important for minimizing *TC*.) At any other combination of quantities, *TC* will be higher than the $16 at 3-3.

How likely are you (the wheat czar) to pick the correct quantity of production or the levels for each farmer? How would you know the farmers' *MC* curves? This would be impossible, especially in an economy where there are millions of goods and producers. Aside from quantities of production, how would you decide *which* goods to produce? Resources are limited. What we have is an "information problem," a result of *the absence of markets (and therefore price and profit signals)*, which makes it impossible for a socialist economy to work.

Suppose you go ahead and assign production levels for the wheat farmers. Then, after the wheat is harvested, you have to decide who gets to consume the wheat. How would you do this? Again, we don't have markets or prices. But in theory, you'd like to give

the first bushel to the person that has the highest marginal utility (*MU*) of wheat, the next bushel would go to the person with the next highest MU_{wheat}, and so on, until everyone's MU_{wheat} is equal (recall that $MU \downarrow$ as $Q \uparrow$). But how could you possibly know everyone's MU_{wheat} – and for every other good? Efficiency in consumption, i.e., having the goods go to the people who value them the most, is very difficult without some mechanism other than a guess by the dictator. It would be good if we could have people express the levels of their desires.

So far we've illustrated how a socialist economy would ideally function: we'd have the lowest-cost producers producing our goods, and we'd have the goods going to the people who most desire them. We've also identified a few of the reasons why this is impossible to do with government direction.

2 Market economy

Now we'll consider a market economy (without czars directing production or consumption) with freely moving prices. In such an economy, we have millions of individual decision-makers. There are (assume) no government officials telling the citizens what or how much they should produce or consume. People produce things based on the expected profit (price minus cost of production), and buy things based on their desires and ability to pay. In our first example, we assumed a czar told the farmers how much to produce. Without someone telling the farmers they need to grow 6 bushels, won't there be a wheat shortage (or surplus)? How will they know how much to produce?

The answer to this question is the reason why a free market economy is the most successful economic framework in history. If we have prices, which are determined, as you know, by the interaction of supply and demand, efficient production of wheat – and every other product – is assured. How? Consider our wheat farmers Willie and Flanders. Suppose they have the same *MC*s as in the socialist economy we considered earlier. Do we want them to produce 6 bushels of wheat, like we were told to in the socialist economy? We don't know. No person could ever know how much wheat we *should* produce. Only the market can determine this. The interaction of self-interested individuals determines the "correct" amount of wheat production.

Suppose that as a result of the interaction between suppliers and consumers, the current market price of wheat is $6 per bushel. How much wheat will be produced in the market? To answer this, we must understand the incentives in a market economy. People are assumed to only have a concern for their own well-being. In the case of the farmers (and the producers of all goods), they want to maximize their profits. They could care less about "social efficiency" (minimizing total cost of aggregate production), which *was our only goal as czar*. How, then, would individual farmers decide how much to produce? Given the market price of $6, and using our previous production table, consider Table F.2.

How much wheat will each farmer produce? We'll look at Willie. (Similar logic would apply to Flanders and every other farmer and producer in every market of the

economy.) First notice that, for each bushel of wheat grown, the farmer can sell it for $6. Willie is trying to maximize his profit. He must decide how much wheat to produce. Willie decides whether or not to produce the first bushel of wheat by comparing the price he can receive (his benefit) to the *MC* (his cost). Since he is rational, he will produce that first bushel only if *MB*>*MC*. The price (or marginal benefit) is $6, and his *MC* is $1, so profit is $5. So he plants the first bushel. Should he plant another? He'll receive $6

Table 7.2. Market price and production costs for wheat

Bushel #	**Price / Bushel***	**Willie**			**Flanders**		
		MC	TC	Unit Profit	MC	TC	Unit Profit
1	**$6**	$1	$1	$5	$2	$2	$4
2	**$6**	$2	$3	$4	$3	$5	$3
3	**$6**	$4	$7	$2	$4	$9	$2
4	**$6**	$5	$12	$1	$6	$15	$0
5	**$6**	$6	$18	$0	$8	$23	-$2
6	**$6**	$7	$25	-$1	$10	$33	-$4
7	**$6**	$8	$33	-$2	$12	$45	-$6

* We assume that the wheat market is large enough so that neither Willie nor Flanders can affect the market price of wheat. This is certainly a realistic assumption for many markets. Unit profit is the bushel price minus the marginal cost.

for that bushel, too, and it will cost him $2 to produce. For the second bushel, Willie will earn $4 profit ($6-2). It is then rational for him to plant the second bushel. He would keep making the production decision in this manner – comparing marginal benefit with marginal cost. *TC* is not relevant for his marginal production decision. How many bushels, then, will Willie plant? He would plant up until *P*=*MC*. From the table above, Willie should plant 5 bushels – just up to where *P*=*MC*. He would not, however, plant a 6th bushel, since it would decrease his profits. If he plants 5 bushels, his total profit is $12 ($5+4+2+1+0). If he continues planting, say up to 6 bushels, he'll earn a negative profit on the 6th bushel – his total profit there would be $11, less than when he produced only 5 bushels. All wheat farmers will go through a similar decision process. And each will produce up to where *P*=*MC*. If there is only one market price (and we're assuming there is), what conclusions can you make?

Willie will produce 5 bushels and Flanders will produce 4 to maximize profits. Recall that all farmers are concerned only with their individual profits. When we went through the production decisions above, there was no mention of social cost or total cost of production. At the market price of $6, 9 bushels are produced. But look: if we produce 9 bushels, when Willie produces 5 and Flanders produces 4, that *is* the minimum total (social) cost of producing 9 bushels! The *MC* for all farmers is equal. The greedy farmers have actually achieved social efficiency – the czar's goal – without even thinking about it and without any government intervention! Their only goal is to maximize profit, which they do by producing up to where *P*=*MC*. The only information they need is their

own costs – which they are sure to know better than some czar. This illustration shows that the existence of prices and profits leads us to a socially efficient (cost minimizing) production solution.

A key point worth emphasizing here is that the price in the market was a key signal for the farmers to decide how much to produce. When government tries to make these decisions without the help of the price signal, they will get potentially disastrous results. Historically, countries whose governments tried to make all production decisions have not fared well. [71]

As for consumers, consider an alternative to a czar deciding who gets what. Instead, if we have a market and a price of $6, then only those who are willing and able to pay $6 (or more) will receive any wheat (say bread). We expect consumers to buy wheat until their MU_{bread} (in dollar terms) becomes equal to the market price of bread. Given we would expect that the MU_{bread} will decrease as consumption increases, the result on the demand side will be analogous to the production side. Individuals will buy additional bread as long as the MU_{bread} is greater than or equal to the price. Then the MU_{bread} of all consumers will be equal, and equal to the price of bread. This result represents efficiency in the consumption of wheat/bread.

3 Markets, prices, and profits

Only the most efficient producers survive in a market economy. And only those consumers who are willing and able to pay a particular price will receive the product. This ensures that those who have the most intense desires will get the goods. Is it fair that some people have the desire but not the ability to pay? Consider how people obtain the "ability to pay". People who provide valuable goods or services to the market earn income with which they can buy goods and services. For example, brain surgeons provide a service that not many people can, and they are paid well for their skills. Bill Gates had a very important role in the development of the computer industry; he has been rewarded. But people who try to sell 486 computers would not be expected to do well in today's world. If a person is able to make a profit – by selling something that is valued by society – then that person gains increased purchasing power.

Bringing all of this together in a standard market diagram, we can illustrate how input resources and final goods and services are allocated. The most efficient producers are those who are willing to supply the good at the lowest price. Since producers maximize profit, then at a given market price, only those with relatively lower costs will be willing to supply. These suppliers are represented on the left part of the supply curve below *Pe*. The consumers who have the most desire and ability to pay are represented on the left part of the demand curve, above *Pe*. Anytime our market is not in equilibrium (at *Pe* and *Qe*), the actual quantity traded is less than it would be at *Pe*. This point is illustrated in Figure 7.3, below.

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[71] A classic essay on the importance of price signals is Ludwig von Mises' "Economic Calculation in the Socialist Commonwealth" (1920).

- **Economic Efficiency: Transactions Approach**
  - The people who engage in transactions in the market are represented by:
    - the low MC producers (lower left-hand side of S)
    - the high MB consumers (upper left-hand side of D)
    - see Figure 7.3

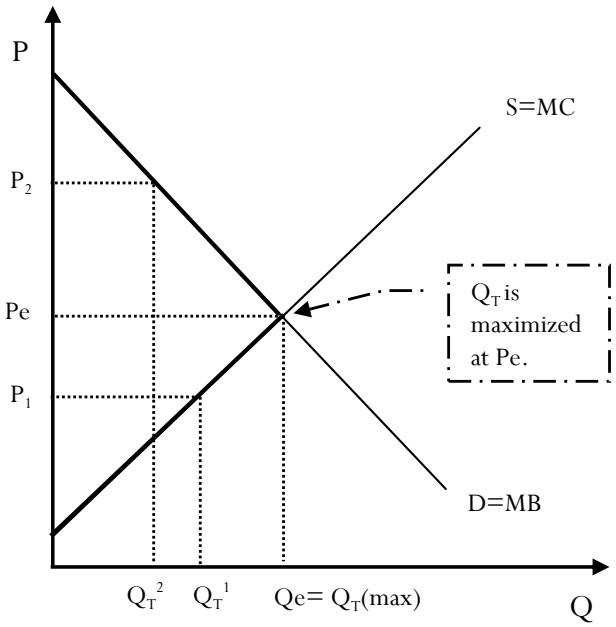

Figure 7.3. The quantity of transactions (Q_T) at various prices

  - There are <u>no unsatisfied people in the market at Pe</u>
    - i.e., there isn't anyone in the market who wants to trade but can't find a partner
    - quantity of transactions (Q_T) is maximized at Pe
      - all sellers willing to sell at Pe can sell all they want
      - all buyers willing to pay Pe can buy all they want
    - this doesn't necessarily guarantee an "equitable" allocation of resources, but it is "efficient"
  - Make certain you understand why the *number of mutually beneficial, voluntary transactions* is maximized at Pe
    - this relates to government laws that affect prices, which we discuss in a later lecture

- **Economic Efficiency: Cost-Benefit Approach**
  - Recall that MB=D and MC=S; we can see economic efficiency from a "societal perspective"
  - See Figure 7.4

- for the 4th unit, the MB of consumption > MC of production, so we should increase production & consumption – it produces a net benefit

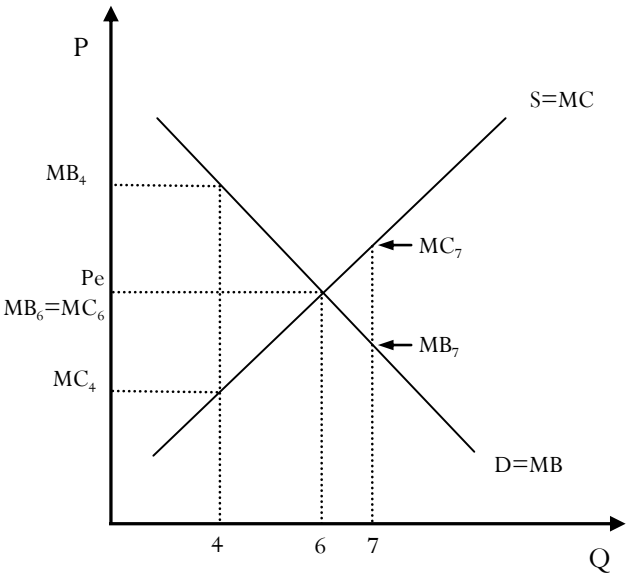

Figure 7.4. Cost-benefit approach to economic efficiency

- for the 7th unit, however, MC>MB, so it's not in society's interest
- The socially optimal level of production/ consumption is where MC=MB, always at Pe
- MB of consumption = MC of production for 6th the unit

- **Net Surplus from Market Transactions**
  - Related to the costs and benefits of production and consumption from above, it is useful to consider the *total benefits and costs* from market transactions
  - See Figure 7.5, which shows the taco market again
    - total benefit from consuming the 50 tacos is area A+B+C
      - total area under D, up to Qe
      - ($5 x 50) + ½ ($5)(50) = $375

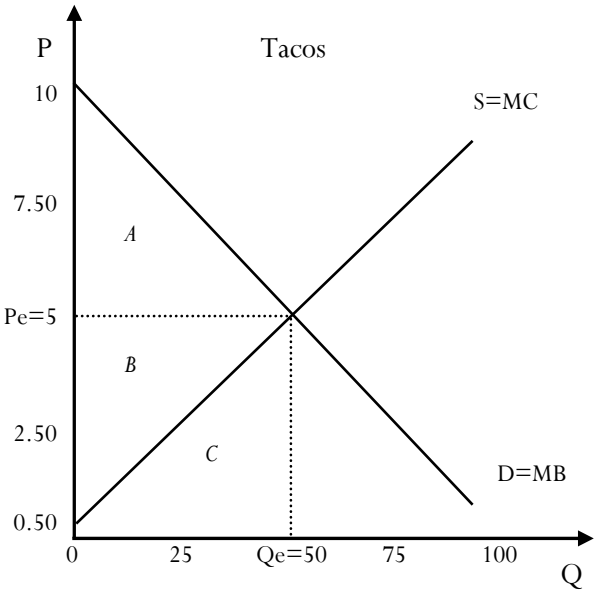

Figure 7.5. Net benefit to society of the taco market

- total cost of producing the 50 tacos is area C
  - area under S, up to Qe
  - ($5 x 50) – ½ ($4.50)(50) = $137.50
- net benefit to society from the taco market is area A+B
  - $237.50 (calculated $375 - $137.50)
  - this is split between consumers (CS = area A) and producers (PS = area B)

- **Foundations of a Market Economy**
  - Freedom of choice is important so that individuals can pursue their own interests
    - the market produces what people want
    - in contrast, consider a "socialist" system where government makes production and consumption decisions without the aid of price signals
  - Private property rights (and enforcement) are important so that producers know their investment will be theirs tomorrow
    - who would want to build a factory in a country whose government could nationalize it?
  - Competition is an extremely important component of market economies
    - it forces producers to make better products
    - you must satisfy consumers to do well

        - consider which doctors serve you better: those where insurance pays it (regular doctor, hospitals), or those where insurance doesn't cover (plastic surgery or vision correction)
    - how about private versus public schools
        - why do teachers' unions oppose competition?
- Entrepreneurship is taking risks to open a business, or the creativity to try something different
    - risky
    - taxes penalize success and reduce incentives


Figure 7.6. Two very specialized stores in Charleston, selling honey and jerky; who would've guessed they'd survive?

        - you take 100% of your losses, but only keep 60% of your gains (if taxes are 40%)
- Profits are the key incentive for producers
    - profitable firms tend to satisfy consumers' desires
    - profitable industries attract new firms
    - unprofitable firms close down, to the benefit of society
        - this frees up scarce resources for higher-valued uses
        - Ex: horse-drawn carriage industry
    - why do politicians sometimes vilify "profit" (e.g., banking, oil companies), while also having sympathy for failing companies (e.g., auto industry)?

- **Hazlitt, "How the Price System Works" (Ch. 15) and "The Function of Profits" (Ch. 22)**
    - In the chapter, "How the Price System Works," Hazlitt discusses Robinson Crusoe's world
        - individuals & societies must allocate scarce resources; they face trade-offs
        - we are best served by specialization and trade

- In the long run, if productive resources are free to move among industries, we should expect about the same rate of profit in all industries – why?
- The market and "invisible hand" tend to reward those who produce things valuable to society
  - "to those who do not, the invisible hand shows them its middle finger" (Todd Buchholz)
- Profits represent incentives to produce; if you limit profits, then you limit the incentive to produce things that people want
- From Hazlitt's chapter, The Function of Profits:

  "One function of profits, in brief, is to guide and channel the factors of production as to apportion the relative output of thousands of different commodities in accordance with demand. No bureaucrat, no matter how brilliant, can solve this problem arbitrarily. Free prices and free profits will maximize production and relieve shortages quicker than any other system. Arbitrarily fixed prices and arbitrarily limited profits can only prolong shortages and reduce production and employment."

- Profits do not result only from higher prices; the introduction of efficiencies in production are a key to increasing profits (i.e., doing it better or more cheaply)

- **What About Equity?**
  - We've talked a lot about efficiency, and markets are good at bringing about efficient outcomes
  - What about equity? If you don't have any money, you don't "demand" anything
    - D is willingness *and ability* to pay
    - shouldn't we be more concerned with people who can't afford everything?
  - Everyone makes choices and must prioritize
    - someone with a low income will probably not want $50 dinners at FIG; he has higher priorities
      - if given a gift certificate for FIG, he'd probably prefer to have cash to pay for something else
  - Concern for the poor is commendable
    - but blaming markets is misguided
    - wealth transfers can help most directly and efficiently
      - taxes
      - charities
  - Government policies often fail to meet their goals
      - Ex: inefficiencies, unintended consequences, corruption

- **Flaws in Consumers and Voters**
  - Certainly, markets do not function perfectly, but they do work pretty well
    - what's the alternative?
  - Mike Munger makes a compelling argument that "every flaw in consumers is worse in voters"[72]
    - consumers have limited information about the products they purchase
      - but they learn from mistakes
    - voters know almost nothing about how their candidates will act
  - Examples Munger discusses:
    - asymmetric information
    - monopoly
    - seductive and misleading advertising
    - free stuff
  - This suggests we should have at least as much faith in consumers and markets as we do in politicians and government

[72] http://www.learnliberty.org/blog/every-flaw-in-consumers-is-worse-in-voters/

Part III

GOVERNMENT POLICY

CHAPTER 8

Price Controls and Resource Allocation

In this chapter, we analyze government policies that affect prices directly. Given we have already discussed the efficient results from markets, you might be surprised that price controls are ever enacted. In this section, the distinction between politics and economics should become apparent.

Since this is one of our first looks into political issues, I should stress that what is important here is not the particular conclusions we find. What is important is that you understand how to perform economic analysis of government policy actions. Generally, our economic analysis will suggest that government usually does not choose very effective means to achieve its goals.

In most cases, price controls are enacted to transfer wealth to a particular group of people at the expense of everyone else. We'll show why popular government price controls are usually a very inefficient way to achieve their goal. Being a good economist means looking for better alternative ways to achieve a goal – even if you do not agree that the goal is a legitimate one. Whether or not we should attempt to transfer wealth from one group to another is a normative issue.

Government policy is a topic worth understanding; you will probably pay close to half of your lifetime income to the government. You will be taxed on almost everything you do, so it's worth consideration. This is the first section where government policy is the primary focus.

- **Rationing Mechanism**
  - The market price is a rationing mechanism
    - society faces scarcity, and must somehow allocate the resources to certain people, necessarily excluding others, both on the production and consumption side of the market
      - input resources (land, labor, capital, and managerial skill) are allocated to the firms with the lowest cost of production, i.e., those in the lower left part of the S curve
      - final goods are allocated to the consumers who expect to get the most benefit from consumption, i.e., those in the upper left part of the D curve
  - If we do not use the price mechanism to allocate scarce resources, then *some other criterion must be used*
    - for each price control case, think of what criteria will ultimately allocate the scarce resources
    - will that be better or fairer than the price mechanism?

- we're going to take for granted the goal of these policies, though they could be easily argued against

- **Price Ceilings**
  - A price ceiling is a law that makes market transactions above a particular price illegal
    - generally implemented with the stated intent of helping consumers
    - for a price ceiling to be effective (or binding), it must be set <u>below Pe</u>
      - don't be confused; it might look like a "floor"
      - see Figure 8.1
    - a certain outcome of all effective price ceilings is a shortage (Qd>Qs)
    - a price ceiling may encourage wasteful consumption, by pushing price down
    - the number of mutually beneficial, voluntary transactions (Q_T) <u>must fall</u> as a result of a price ceiling (that's bad)

- **Price Floors**
  - These make transactions below a certain price illegal
    - goal is to help producers; but harms consumers

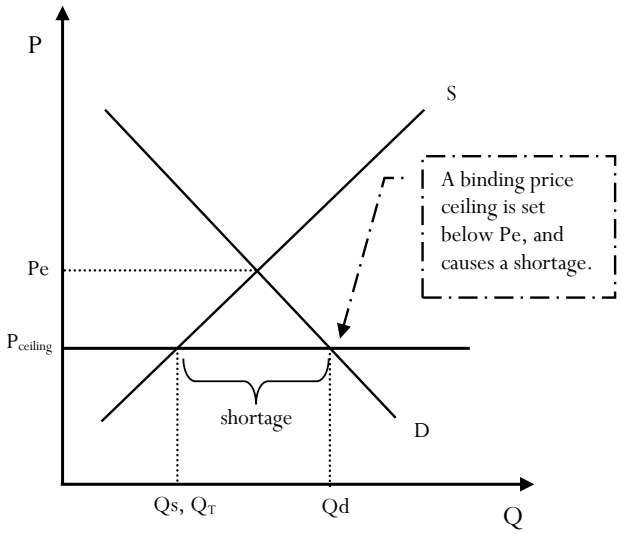

Figure 8.1. Binding price ceilings create shortages and reduce voluntary transactions

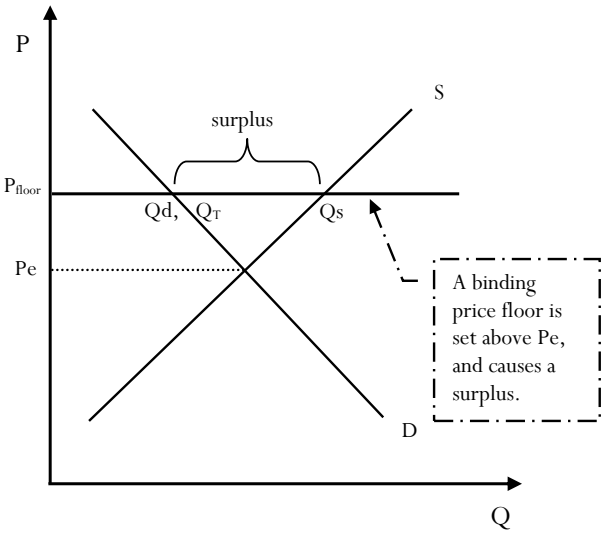

Figure 8.2. Binding price floors create surpluses and reduce voluntary transactions

- to be effective (binding), the price floor must be set <u>above Pe</u>
  - don't be confused; it might look like a "ceiling"
  - see Figure 8.2
- a certain outcome of all effective price floors is a surplus (Qs>Qd)
- a price floor encourages over production (a waste of resources), by pushing prices up
- again in this case, Q_T must fall as a result of this policy, relative to Pe

- **General Effects**
  - Recognize that these clearly reduce overall welfare in society since they reduce Q_T
    - someone must be worse off, since transactions are prevented
    - there will be unsatisfied people in the market now
      - with a price floor, designed to benefit *sellers*, there won't be enough buyers (Qs>Qd), so sellers are unsatisfied
      - with a price ceiling, designed to benefit *buyers*, there won't be enough sellers (Qd>Qs), so buyers are unsatisfied
  - Price controls bring unintended side-effects
  - If these policies harm society overall, why does government impose them?
    - people tend not to understand what happens when these laws are enacted
    - they tend to sympathize with the politicians' arguments in favor of the policies

- Lobbying incentives are very important in explaining why we have price controls (as well as many other laws)
  - the harm from the policy is usually dispersed among a lot of people, so they have no real incentive to lobby against the policy
  - the benefits from the policy is usually concentrated, and that group has a very strong incentive to lobby in favor of the policy

- **Steps for Analyzing Policy Impacts**
  - Determine the intent or goal of the policy
    - how do the politicians sell it?
  - Analyze the policy to determine its likely economic effects
  - Determine whether the policy achieves its goal
  - What are possible alternatives that may more effectively achieve the goals of the policy?

- **Rent Control Laws**
  - Price ceiling on apartment rental rates
  - The intent is to make housing affordable for college students and poor people
  - These tend to be popular in college towns and in large cities
    - would it be good for Charleston?
    - just because they're popular, does that mean they're helpful?
  - Rent controls cause shortages
    - more applicants than available apartments
    - will the students and the poor end up with the apartments?
    - key deposits, bribes, discrimination, poor maintenance, etc.
    - see the 2003 HUD ad on housing discrimination[73]
  - A better alternative would be direct (cash) subsidies; dormitories

[73] https://www.youtube.com/watch?v=YXxCYkquRYs

- **Anti-Price Gouging Laws**
  - Usually implemented during declared states of emergency[74]
  - Prices for water, lumber, gas, etc., may go up after a natural disaster
  - Price gouging in SC means that after a state of emergency is declared, the price of a good or service is "much higher" than the average price 30 days prior to the state of emergency[75]
    - Ex: Charleston price increases after Hurricane Hugo: bags of ice went up to $10; plywood went up to $200 per sheet; gas went up to $11/gallon
    - Charleston mayor signed law punishing price gouging (30 days in jail, $200 fine)
  - After Katrina, a Kentucky man bought 19 generators and drove to Mississippi to sell generators for twice what he paid
    - he was arrested and held by police for 4 days, and the generators were confiscated and never got used by hurricane victims
  - A price ceiling will create a shortage; who gets water?
    - whoever waits in line?
      - a person wanting to refill the swimming pool or build a tree house is just as likely to get supplies as a person needing drinking water or lumber to repair his roof
    - by lottery or quota?
  - Allowing the P to ↑ freely is the *best* policy, because it comes with two important incentive effects[76]
    - consumers have a higher incentive to conserve the water since it's more expensive; don't refill your swimming pool yet…
    - suppliers have a strong profit incentive to get more water in stock quickly
  - Suppose after a flood, Lowe's increases its stock of water pumps without raising prices, while Home Depot doesn't increase stocks?
  - What should you send to help natural disaster victims?

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[74] The examples below are from Gwartney et al., *Economics: Private and Public Choice* 13th edition (2010, pp. 84-85).

[75] See http://www.consumer.sc.gov. Search for keyword "price gouging," click on the first result and a pdf opens.

[76] See John Stossel, "In Praise of Price Gouging" (2005)

Figure 8.3. During the flooding in South Carolina in October 2015, Lowe's had a large stock of water pumps and other flood-related supplies and equipment – at regular price

- **Outrage Over Pharmaceuticals**[77]
  - In September 2015 there was widespread outrage over a young entrepreneur whose company bought the production rights of the drug "Daraprim"
    - the drug has been unchanged for 62 years
    - about 2,000 people take the drug
    - the price of the drug was promptly increased from $13.50 to $750 per pill
  - Hillary Clinton said, "Price gouging like this in the specialty drug market is outrageous."
  - One month later, a competitor began offering a similar pill for just $1 per pill[78]
    - a great example of how profit attracts new producers

- **Gas Price Ceiling**
  - These have been enacted several times in the U.S., with the predictable result of shortages
    - waiting in line is a "deadweight loss" – a cost to consumers not offset by gains to someone else
    - the higher price is a transfer of wealth, but the waiting cost is a societal loss
    - why do gas prices jump when there's trouble in the Middle East?

[77] This discussion is based on a 2015 article in the *New York Times*, http://www.nytimes.com/2015/09/21/business/a-huge-overnight-increase-in-a-drugs-price-raises-protests.html?_r=0.

[78] http://fortune.com/2015/10/23/turing-daraprim-cheap-alternative/

- **Agriculture Price Supports**
  - Price floors on agricultural products are very popular; consider one for milk
  - Political argument might be that farmers are important in America's history, and markets are "unfair" to them
  - A price floor creates a surplus
    - government must guarantee that farmers can sell their milk at the price floor price, otherwise they have inventory they can't sell
    - government must buy and destroy the surplus milk, or otherwise take it off the market
    - this is a very inefficient way to transfer wealth to farmers – creating an incentive to overproduce; something else cannot now be produced
  - Why not just send them a check each year?
    - why subsidize them in the first place?

- **Minimum Wage Laws**
  - These are very politically popular
    - goal is to help poor, unskilled, uneducated workers
  - Federal minimum wage is $7.25, since July 2009
    - many states have minimums above the federal level
    - cities can implement higher wages
    - if a state has no minimum wage law, the federal still applies

Table 8.1. State minimum wage law rates, as of July 2018

State	Min. Wage	State	Min. Wage
Alabama	none	Nebraska	$9.00
Alaska	$9.84	Nevada	$8.25
Arizona	$10.50	N. Hampshire	none
Arkansas	$8.50	New Jersey	$8.60
California	$11.00	New Mexico	$7.50
Colorado	$10.20	New York	$10.40
Connecticut	$10.10	N. Carolina	$7.25
Delaware	$8.25	North Dakota	$7.25
Florida	$8.25	Ohio	$8.30
Georgia	$5.15	Oklahoma	$7.25
Hawaii	$10.10	Oregon	$10.75
Idaho	$7.25	Pennsylvania	$7.25
Illinois	$8.25	Rhode Island	$10.10
Indiana	$7.25	**S. Carolina**	**none**
Iowa	$7.25	South Dakota	$8.85
Kansas	$7.25	Tennessee	none
Kentucky	$7.25	Texas	$7.25
Louisiana	none	Utah	$7.25

Maine	$10.00	Vermont	$10.50
Maryland	$10.10	Virginia	$7.25
Massachusetts	$11.00	Washington	$11.50
Michigan	$9.25	West Virginia	$8.75
Minnesota	$9.65	Wisconsin	$7.25
Mississippi	none	Wyoming	$5.15
Missouri	$7.85	D. C.	$13.25
Montana	$8.30		

Source: http://www.ncsl.org/research/labor-and-employment/state-minimum-wage-chart.aspx#Table

- CA, MA, and NY have scheduled increases until they reach $15.00
- Why not raise it to $25 or $30, or $100?
- Minimum wage laws are price floors on wages paid to "unskilled labor"
  - creates a surplus of labor (unemployment) because there are more job applicants than jobs
    - are the least skilled, experienced and educated people (the people most in need of help) the ones likely to get the jobs?
  - a surplus of labor means that employers can discriminate on non-price basis
  - workers are replaced with capital (see Figure 8.4)
    - fast food workers have gone on strike to get higher wages
    - at Charleston airport, most parking lanes are "express" – no humans
    - at Atlanta airport, trash compactors replace some workers
- As with the dairy case, government must "buy" the surplus – it has unemployment insurance programs for those who can't find jobs
  - it would be better to offer cash subsidies or subsidized education or job training
  - there's debate over whether it really creates any significant unemployment
- Should we have a lower minimum wage for teens?
  - Obama's past economic advisor Larry Summers has endorsed this in the past
  - only 1% of full-time workers earn the minimum wage; 90% of them are age 16-20
    - maybe a crappy job would be a strong incentive to stay in school
    - at least these people could get some job experience

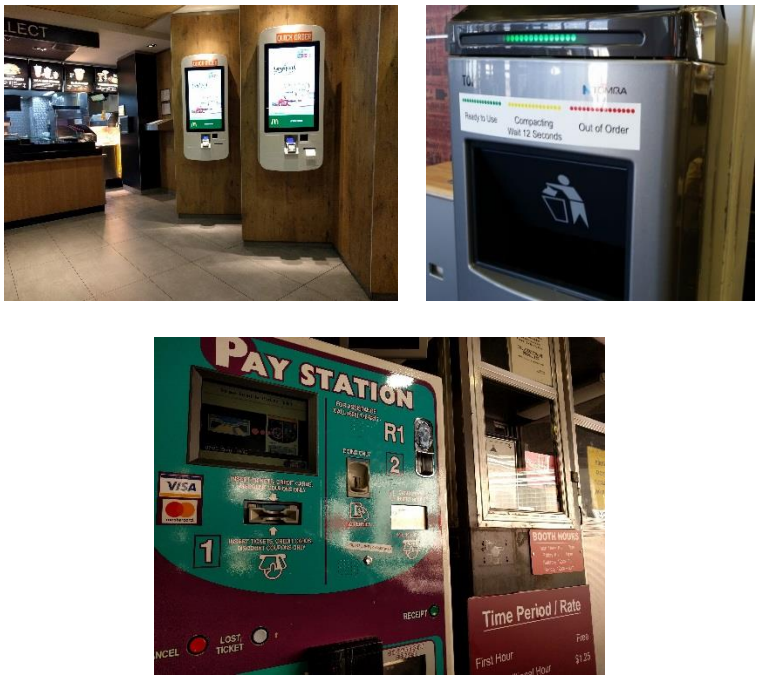

Figure 8.4. Examples of capital replacing labor: a kiosk at McDonald's in Amsterdam, a trash compactor at the Atlanta airport, and parking pay station in Asheville, NC

- Henry Hazlitt had a good discussion of minimum wage laws (p. 135):

  "The first thing that happens when a law is passed that no one shall be paid less than [$400] for a forty-hour week is that no one who is not worth [$400] a week to an employer will be employed at all. *You cannot make a man worth a given amount by making it illegal for anyone to offer him anything less.* You merely deprive him of the right to earn the amount that his abilities and situation would permit him to earn, while you deprive the community even of the moderate services that he is capable of rendering. In brief, for a low wage you substitute unemployment. You do harm all around…"

  - if the minimum wage is $400 per week, and we offer $300 per week in unemployment benefits, we're asking people to work for $100 per week
  - states with higher employment benefits have higher rates of unemployment, and individuals tend to be unemployed longer

CHAPTER 7

ELASTICITY AND DRUG CONTROL POLICY

Now that we've developed the basics of supply, demand, and price determination, we'll look in a bit more detail about what the slopes of the curves imply. "Elasticity" is the responsiveness or sensitivity of one variable to changes in another variable. While this section is rather short and slightly technical, there are some interesting applications for these concepts.

- **Price Elasticity of Demand**
  - "Elasticity" is the sensitivity of one variable to changes in another variable
    - in terms of S & D, it means the slope of the curve
  - The price elasticity of demand, $\varepsilon_d = \frac{\%\Delta Qd}{\%\Delta P}$
    - this number will always be negative, so we simply drop the sign
    - demand is "elastic" if $\varepsilon_d > 1$, which means consumers are very sensitive to changes in P
    - demand is "inelastic" if $\varepsilon_d < 1$, which means that consumers are not very sensitive to changes in P
    - demand is "unit elastic" if $\varepsilon_d = 1$
    - Ex: insulin probably has a very inelastic or steep D curve
      - for a 10% price increase, there is probably a very small decrease in Qd, maybe 1%
        - in this example, $\varepsilon_d = 1/10 = 0.10$, which is less than 1
      - people who take insulin are not responsive to the price change because they *need* insulin
    - Ex: Exxon gasoline probably has a very elastic or flat D curve
      - for just a 5% increase in price, suppose they see a 20% decrease in sales; then $\varepsilon_d = 20/5 = 4$; since $4 > 1$, it's elastic
      - people buying gas are very responsive to prices because they can easily go buy it across the street where it's cheaper
    - Ex: Coke will have more elastic demand than "soft drinks" generally
  - The "midpoint method" or "arc elasticity" is the best way to make the elasticity calculation
    - % change is calculated as the "difference/ average"
    - if old price is 5 and new price is 7, % change is calculated 2/6 = 0.333
  - Determinants of ε_d
    - number of close substitutes (more ⇒ more elastic)

        - a particular brand will have more elastic D than the good generally
    - necessity versus luxury (luxury goods ⇒ more elastic D)
    - time horizon (longer time ⇒ more elastic D)
    - proportion of price to income (higher ⇒ more elastic)

- **Price Changes and Total Revenue**
    - The ε_d is important information for businesses that must decide which P to charge
        - you can't simply think that total revenue (TR) will increase if you just raise P
            - what if people quit buying the product?
    - Figure 9.1 illustrates the effect of price changes on TR, in the case of inelastic D
        - as a result of the 200% price increase, there is a 33% reduction in Qd (ε_d=33/200=0.17; but if price had dropped from $6 to $2, ε_d=50/67=0.75)
            - using the midpoint method, ε_d =(2/5)/(4/4)=0.4/1=0.4 (inelastic)

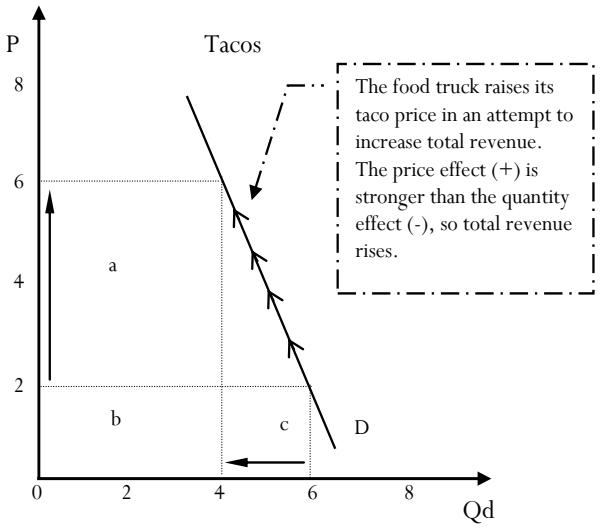

Figure 9.1. Change in total revenue due to an increase in P, with inelastic demand

        - notice that if the taco truck raises price from $2 to $6 each, it receives more money per taco, and they don't lose too many sales
            - TR before the P↑ was b+c ($12=6 x $2)
            - after the ΔP, TR is a+b ($24=4 x $6)
            - to increase TR (with inelastic demand), ↑P

        - if D is very flat, then TR ↑ when P↓

- **The Federal "War on Drugs"**
    - Mr. Mackey's disclaimer: "Drugs are bad, mkay."
        - discussing a policy such as drug legalization is not the same as advocating drug use
        - drug use may, in fact, be harmful; but it does not follow that a legal ban on drug use will minimize harms
    - The market for "drugs" probably has very inelastic D
        - some users become addicted
        - others take drugs even when it's illegal, so they probably don't care much about money price
    - The government focuses on capturing suppliers
        - this increases the cost of supplying drugs, so S falls
        - the result is a huge increase in P, but not much of a decrease in Q
        - do you think this encourages the more or less violent dealers to remain in the business?
            - if you already face a life sentence for dealing, what's the marginal penalty for killing your competitors too?
        - why focus on the S side rather than D side?
    - Drug use in the U.S. is very prevalent, even after spending hundreds of billions over 30 years
        - marijuana use rate is much higher in the U.S. (36%) than in countries that have decriminalized
            - marijuana has been tolerated in Holland for decades (20% prevalence rate)
            - in 2001 Portugal decriminalized <u>all</u> drug use (7% marijuana use prevalence rate)[79]
        - the war on drugs tends to make the drugs more potent, as dealers/users want to keep bulk down (less likely to get caught with more potent drugs)
    - Federal government classification of drugs, research, and propaganda are political and questionable
        - research on ecstasy or MDMA[80]

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[79] For an analysis of the Portugal experience with decriminalization, see http://www.tdpf.org.uk/blog/drug-decriminalisation-portugal-setting-record-straight.

[80] A very interesting documentary aired on ABC in 2005. It described the development of MDMA and how the federal government handled it. The scientific understanding of the drug has certainly advanced since then. If interested, see http://www.youtube.com/watch?v=DNpFqJcJcps.

- commercials about marijuana & auto accidents[81]
- DEA lists marijuana as a Schedule I drug[82]:
  "Schedule I drugs, substances, or chemicals are defined as drugs with no currently accepted medical use and a high potential for abuse. Schedule I drugs are the most dangerous drugs of all the drug schedules with potentially severe psychological or physical dependence."

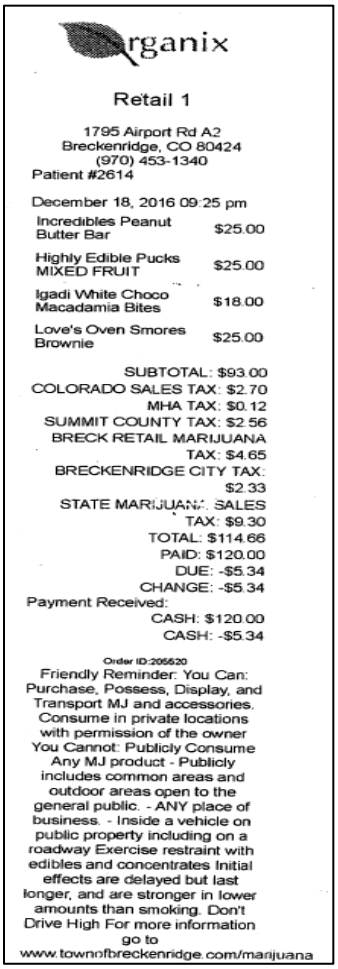
    - Ex: heroin, LSD, *marijuana*, MDMA

- Marijuana enforcement has been relaxed since 2009
  - in 2009 Obama ordered the DEA not to raid medical marijuana shops in states where they are legal (according to state government)
  - in 2013 Attorney General Eric Holder moved to stop seeking mandatory sentences for nonviolent drug offenses
  - in 2014 the DEA requested that the FDA study marijuana, in considering a downgrade from Schedule 1
    - the FDA argued that there is no accepted medical use in treatment in the US, so the DEA decided to keep it in Schedule I (August 2016)
    - public choice would have predicted this: they have their turf to protect
  - in 2015 three U.S. senators introduced a bill to stop prosecution of medical marijuana use, and to re-classify marijuana as a Schedule II drug[83]

[81] http://www.youtube.com/watch?v=MKCYDrur_WI

[82] http://www.dea.gov/druginfo/ds.shtml

[83] https://www.congress.gov/bill/114th-congress/senate-bill/683



rganix

Retail 1

1795 Airport Rd A2
Breckenridge, CO 80424
(970) 453-1340
Patient #2614

December 18, 2016 09:25 pm

Incredibles Peanut Butter Bar	$25.00
Highly Edible Pucks MIXED FRUIT	$25.00
Igadi White Choco Macadamia Bites	$18.00
Love's Oven Smores Brownie	$25.00

SUBTOTAL: $93.00
COLORADO SALES TAX: $2.70
MHA TAX: $0.12
SUMMIT COUNTY TAX: $2.56
BRECK RETAIL MARIJUANA TAX: $4.65
BRECKENRIDGE CITY TAX: $2.33
STATE MARIJUANA SALES TAX: $9.30
TOTAL: $114.66
PAID: $120.00
DUE: -$5.34
CHANGE: -$5.34
Payment Received:
CASH: $120.00
CASH: -$5.34

Order ID:205620
Friendly Reminder: You Can: Purchase, Possess, Display, and Transport MJ and accessories. Consume in private locations with permission of the owner You Cannot: Publicly Consume Any MJ product - Publicly includes common areas and outdoor areas open to the general public. - ANY place of business. - Inside a vehicle on public property including on a roadway Exercise restraint with edibles and concentrates Initial effects are delayed but last longer, and are stronger in lower amounts than smoking. Don't Drive High For more information go to www.townofbreckenridge.com/marijuana

Figure 9.2. A receipt for edibles sold in Colorado

- State governments have moved toward legalization or decriminalization of marijuana, despite federal law[84]
  - around 30 states have medical marijuana laws
  - about 16 have "decriminalized" marijuana
    - still illegal, but it's an administrative offense, not criminal offense (small fines)
- as of 2018, AK, CA, CO, DC, OR, MA, ME, NV, and WA have legal recreational use
- Different countries (e.g., Portugal, Holland) have different, more effective strategies
  - enforcement (USA)[85]
  - education
  - treatment
- Trump appointed Sen. Jeff Sessions (R-AL) as Attorney General
  - Sessions has said, "Good people don't smoke marijuana"
  - one April 2017 headline said, "Jeff Sessions says he's 'surprised' Americans aren't embracing his anti-marijuana stance"
  - he appears to want to re-escalate the failed "war on drugs"[86]
    - in May 2017, Sessions reversed AG Holder's 2013 policy of not seeking mandatory minimum sentences for non-violent drug offenses
    - Trump has attacked Sessions, but he's still AG

- **Elasticity of Supply**

[84] See http://norml.org for information on state-level marijuana laws.

[85] For an interesting video on drug policy, see https://www.youtube.com/watch?v=wJUXLqNHCaI.

[86] For a discussion of harsher sentences for drug trafficking, see https://www.youtube.com/watch?v=3uyn8Qw0J7c.

- This concept is similar to ε_d except it deals with supply: $\varepsilon_s = \frac{\%\Delta Qs}{\%\Delta P}$
- The main determinant for ε_s is the time period
  - longer time, easier to change production quantities
  - labor contracts might affect production
  - apartment S is fairly steep; factory output is flatter

- **Other Applications of Elasticity**
  - Later we'll analyze excise taxes, relying on an understanding of elasticity of supply and demand

CHAPTER 10

EXCISE TAXES AND DEADWEIGHT LOSSES

Excise taxes are very common, and their effects are interesting. Although the tax is legally imposed on either the buyer or seller, the actual burden of the tax has nothing to do with the legal burden.

An efficient tax would not change behavior at all. An example would be a lump-sum tax, say of $1,000 per year per U.S. citizen. These taxes do not change behavior, and so they are efficient. However, they are extremely *regressive*. That is, the tax places a heavier burden on a poor person than on a rich person. This is because $1,000 is a much greater proportion of a poor person's income. For this reason, among others, lump-sum taxes are not as popular as excise and other types of taxes.

Excise taxes are inefficient because they are placed only on certain goods. As a result, they tend to distort behavior by discouraging consumption of those goods. The reduction in these transactions causes losses in CS and PS – reductions in social wealth.

Our analysis in this lecture is relatively complicated, but it is useful to analyze tax revenues and related "deadweight losses."

- **Excise Taxes**
  - Everyone is familiar with the sales tax; it's 6% in SC
    - Charleston County adds 3%
    - this was just increased from 2.5% in May 2017, thanks to voters
  - Excise taxes are similar to sales taxes, but are imposed on specific items, not all items
    - Ex: City of Charleston adds a 2% hospitality tax on prepared meals and beverages (this is why you pay a 11% tax at restaurants)
    - Ex: SC adds a 5% liquor tax at bars & restaurants
      - total tax on your liquor drink at the bar: 16%!
  - Most excise taxes we'll look at are set at the state-level, but there are also federal excise taxes
  - "Sin taxes" are taxes on alcohol, cigarettes, gambling, etc., and are often very high
    - states set their own cigarette taxes
      - SC increased its cigarette tax from 7¢ to 57¢, on July 1, 2010
      - goal is to raise revenue and deter smoking, especially for young people
    - the federal cigarette tax was raised from 39¢/pack to $1.01/pack in April 2009

Table 10.1. State excise taxes on cigarettes (2018)

State	Tax (¢)	Rank	State	Tax (¢)	Rank
Alabama	67.5	40	Nebraska	64	41
Alaska	200	15	Nevada	180	21
Arizona	200	15	N. Hampshire	178	22
Arkansas	115	34	New Jersey	270	10
California	287	9	New Mexico	166	25
Colorado	84	38	New York	435	1
Connecticut	435	1	**NYC**	**585**	
Delaware	210	14	N. Carolina	45	47
Florida	133.9	30	North Dakota	44	48
Georgia	37	49	Ohio	160	26
Hawaii	320	5	Oklahoma	103	36
Idaho	57	45	Oregon	133	31
Illinois	198	20	Pennsylvania	260	11
Indiana	99.5	37	Rhode Island	425	3
Iowa	136	29	**S. Carolina**	**57**	**45**
Kansas	129	32	South Dakota	153	27
Kentucky	60	43	Tennessee	62	42
Louisiana	108	35	Texas	141	28
Maine	200	15	Utah	170	23
Maryland	200	15	Vermont	308	6
Massachusetts	351	4	Virginia	30	50
Michigan	200	15	Washington	302.5	8
Minnesota	304	7	West Virginia	120	33
Mississippi	68	39	Wisconsin	252	12
Missouri	17	51	Wyoming	60	43
Montana	170	23	D. C.	250	13

Source: http://www.taxadmin.org/assets/docs/Research/Rates/cigarette.pdf. Tax rates as of January 1, 2018.

- Gasoline is taxed in every state (from around 15-55¢ per gallon)
  - the federal tax is 18.3¢/gal.
  - SC state tax increased on July 1, 2017, after a few years of debate
    - now 20.75¢/gal., to increase 2¢ each July 1 until it reaches 28.75¢
    - Alaska has the lowest tax; SC is second lowest
- Luxury items are often a target for excise taxes
  - President Bill Clinton threatened a 100% luxury car tax back in 1995 during a trade dispute with Japan[87]
  - A 10% tax on yachts priced over $100K in 1990 was estimated to cost thousands of jobs[88]

[87] http://articles.latimes.com/1995-05-17/news/mn-2817_1_white-house

[88] http://www.nytimes.com/1992/02/07/business/falling-tax-would-lift-all-yachts.html

- **Tax Burden (or Incidence)**
  - Usually the government puts the legal responsibility for remitting the tax money on the sellers
    - there are relatively few sellers compared to consumers – easier to keep track of the money
    - public perception that sellers are "rich," and they should pay the tax
  - The application of an excise tax to our market model is very simple if you understand what the S and D curves represent
  - If an excise tax (τ) is placed on the suppliers, then it affects the S curve like any other additional cost would
    - S would shift vertically higher (S falls)
    - to be willing to supply the same Q after the tax is imposed, the seller would need to receive the original selling price, plus the tax amount, from the consumer

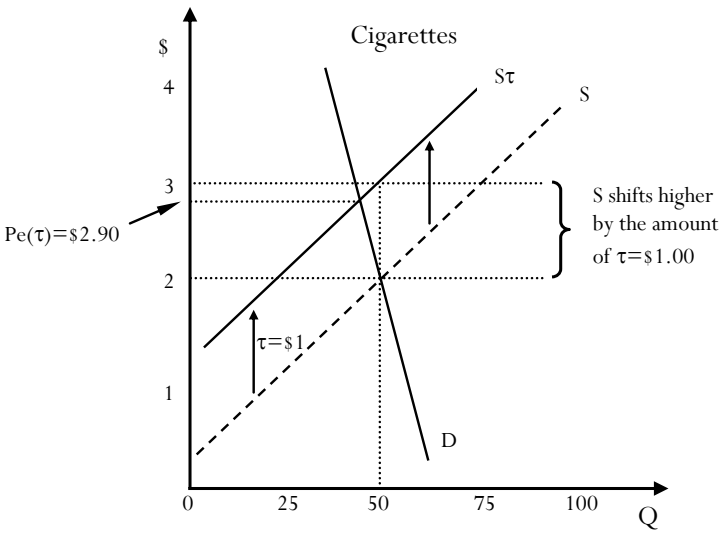


Figure 10.1. An excise tax with a statutory burden on sellers

    - Figure 10.1 illustrates a $1 per-pack tax on cigarettes
      - original Pe is $2.00; new Pe is $2.90
      - effectively, 90¢ of the tax comes from consumers' pockets, since they now pay more
      - sellers can shift most of the tax to consumers
  - Relative tax burden is determined by the relative elasticities of supply and demand
    - whoever is less sensitive to price changes will bear more of the tax

- the actual tax burden does <u>not</u> depend on the <u>statutory burden</u> (who's legally required to pay the tax)

- To find the tax burdens we compare the new situation (with τ) to the old one (without τ)
  - Figure 10.2 illustrates "sliding the tax wedge in from the left"
- The consumer's burden is the new price they pay (P_b) minus the original equilibrium price (before τ)
  - here it's \$2.90 – \$2.00, or **90¢**
- The seller's burden is what's left (it's a \$1 tax per pack, and the consumer bears 90¢), or **10¢**
  - it's the new price they receive from consumers (\$2.90), minus the \$1 tax paid to government, leaving sellers with \$1.90 after the tax (P_s)
  - since they used to get \$2.00 and now they get \$1.90, the sellers are paying 10¢ of the tax
- How exactly does the relative tax burden depend on the elasticities of supply and demand?
  - the steeper curve will carry a heavier burden
  - try drawing other examples similar to Figure 10.2, to convince yourself how this works

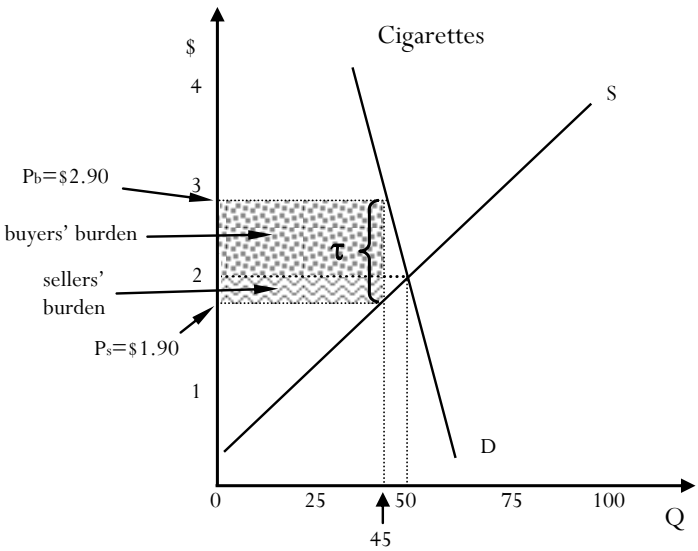


Figure 10.2. Analysis of actual excise tax burden

- Finally, consider the FICA tax in your paycheck
  - the "Federal Insurance Contribution Act" is to fund Medicare and the Social Security program

- this is split; the employee and employer each pay half of the 15.3% tax (7.65% each)
  - 6.2% social security tax, on first $128,400 income (for 2018)[89]
  - 1.45% Medicare tax on entire salary
- does the 50-50 split between employer & employee really matter?
  - supply of labor is probably more inelastic than demand for labor
    - employees end up bearing most of the employment tax

- **Deadweight Losses (DWL)**
  - A deadweight loss represents a loss of societal wealth
    - loss to one group/individual that's not simultaneously gained by someone else
    - a tax is different –a transfer of wealth
    - DWL is lost CS and PS because fewer transactions will take place
  - Figure 10.3 illustrates the DWL from the cigarette tax we were discussing above
    - the size of the DWL will depend on the ε_d and ε_s
    - what happens when either becomes more elastic or inelastic?

- **Relatively Efficient & Inefficient Excise Taxes**
  - The sizes of the tax revenue rectangle and the DWL triangle both depend on ε_d and ε_s
    - Figure 10.4 shows the same per-unit tax as in Figure 10.3, but just with a more elastic demand curve
    - more elastic S or D, then lower tax revenue and larger DWL, *ceteris paribus*
  - Given S & D, what happens when the size of the per-unit tax is varied?
    - a very large tax may result in lower tax revenue, if the number of transactions falls by a large amount

[89] http://www.ssa.gov/oact/cola/cbb.html

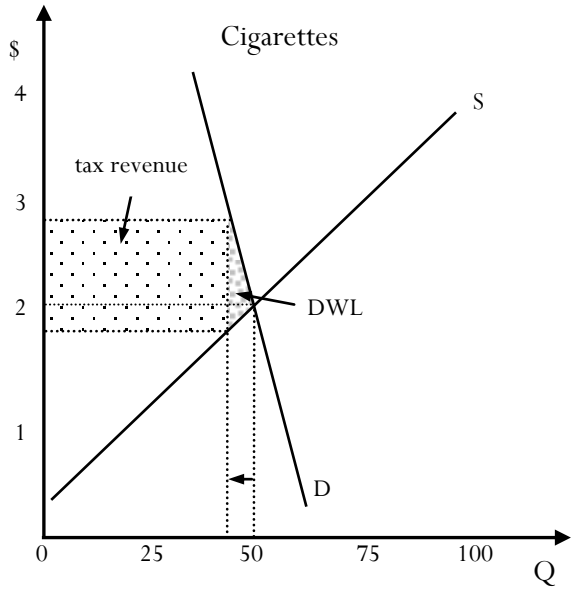


Figure 10.3. Deadweight loss from an excise tax on cigarettes

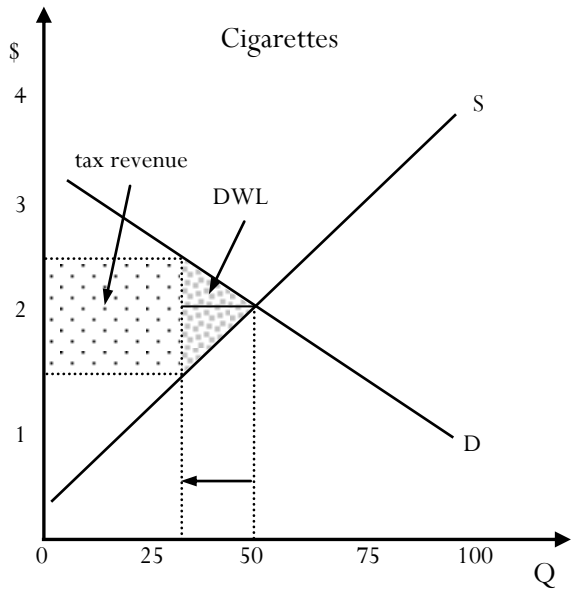


Figure 10.4. The DWL triangle increases in size when S or D becomes more elastic

CHAPTER 11

PROTECTIONIST TRADE POLICIES

This section is an extension of Chapter 3; it discusses trade policy using the concepts of CS, PS, and DWL. In the development of the Ricardian trade model we learned why trade benefits both parties involved. (At least both parties must expect to benefit, otherwise they wouldn't agree to the trade. This does not preclude their expectations being wrong.)

Economists argue that "free trade," or trade free of government interference or restrictions, is the best policy – even if it's unilateral. But Donald Trump exclaimed, "Tariffs are the greatest!" Who is correct? If trade is as good as economists claim, why would government ever want to prevent it? The answer to the question is the same one that explains much of government policy: to give favors to one group at the expense of others.

In the case of international trade, government imposes many barriers, including tariffs, quotas, and other regulations affecting imported products.

In 2018, President Trump began following through on his campaign promises to shake-up trade. As of summer, he had imposed tariffs on imported steel and aluminum, and washing machines. In July, he continued to make threats to restrict imports. He tweeted, "Tariffs are the greatest!" He has also proposed a bailout for farmers who are expected to be harmed because of retaliatory tariffs from China and the European Union.

Trump appears to believe that his strategy of imposing trade restrictions, particularly tariffs, will eventually lead to more open markets, or a greater ability of U.S. manufacturers and farmers to sell their products abroad. On July 25, Trump announced that he had reached an agreement with the EU to seek zero tariffs, subsidies, and non-tariff barriers on all non-auto industries. It will be interesting to watch to see if Trump's strategy works. One thing is certain: Trump is taking a very different approach to trade than many of his predecessors!

Before studying this section, it might be helpful for you to review consumer and producer surplus. These are key variables that we will use to evaluate the welfare impacts of trade restrictions.

- **Landsburg, "The Iowa Car Crop (Ch. 21)**
  - A nice short story that illustrates that trade is merely a form of technology
  - He suggests that much of the opposition to trade might simply be an irrational dislike for foreigners
  - There is a strong belief among laymen that international trade is a "win-lose" game
    - but we've already shown that trade is win-win, a "positive sum game"
    - yet, it's easy to see why people would misunderstand

- "sweatshops" and "outsourcing" as political issues
- Is trade a "jobs" issue?
  - no; trade has no real effect on the level of employment
  - but it does affect the distribution of employment across industries
  - if you want government to help one industry, you can, but you must harm another industry to do it
    - don't forget this when you hear lobbyists arguing for a policy to help their industry

- **Modeling International Trade Restrictions**
  - We can use the supply-demand model to investigate the effects of trade restrictions
    - recall the concepts of CS and PS
    - in the model the S and D curves are "domestic"
    - we assume the country is "small" so actors don't have any effect on the world price (P_W)
      - P_W may differ from $P_{No\ Trade}$
  - Moving from self-sufficiency to free trade
    - compare the initial case to the new case (Figure 11.1)
      - CS and PS changes; overall (net) change
  - When $P_W > P_{NT}$, what happens if you go from "no trade" to free trade?
    - there will be excess domestic supply

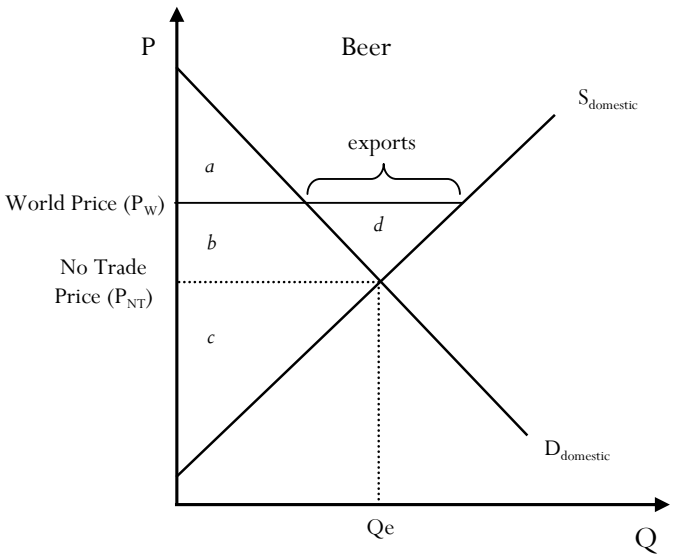


Figure 11.1. Welfare effect of eliminating a trade ban ($P_W > P_{NT}$)

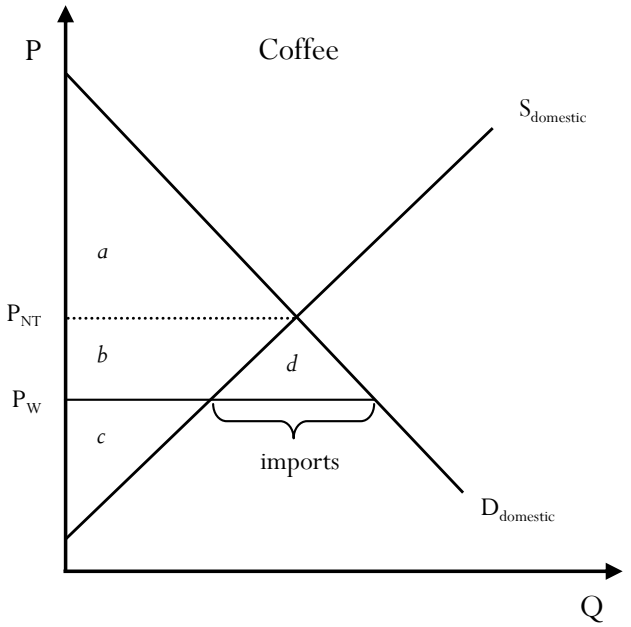


Figure 11.2. Welfare effect of eliminating a trade ban ($P_W < P_{NT}$)

- since the world market is in equilibrium, our excess domestic supply is exported
- PS↑, and CS↓, but the overall (net) effect is positive

- What about when $P_W<P_{NT}$? (Figure 11.2)
  - there will be excess domestic demand; we import
  - PS↓, CS↑, and total surplus ↑

- **Import Tariffs**
  - We can use the same basic model to analyze the effects of an import tariff
  - A tariff is simply a tax on imported goods, paid by the importing firms to the domestic government
    - for import tariffs, $P_W<P_{NT}$, so there are imports
    - the tax effectively increases P_W (to $P_{W+\tau}$) in the country imposing the tariff
    - the tariff causes an increase in domestic production of 20 units (from 40 to 60),
    - a decrease in domestic consumption of 20 (from 115 to 95),
    - and a decrease in imports of 40 (from 75 to 35, calculated 115-40 to 95-60)

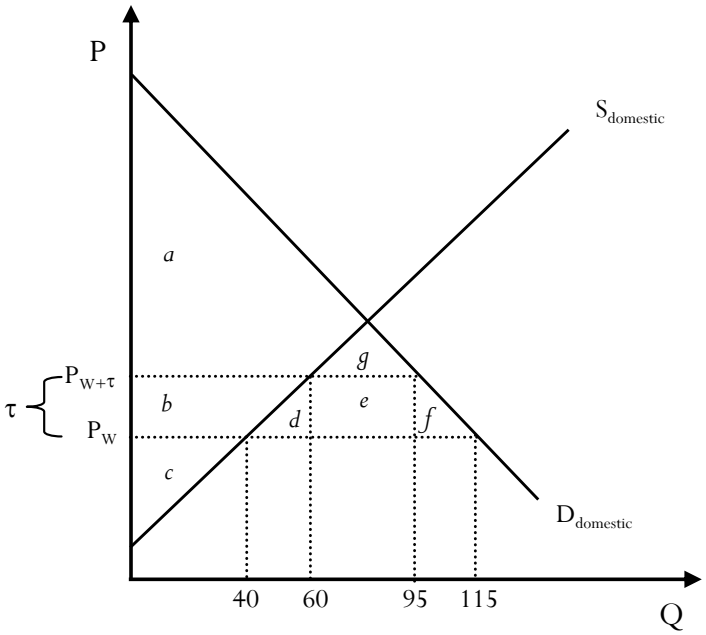


Figure 11.3. Welfare effects of a tariff of τ per unit

- What happens to each group?
  - increase in PS (*b*)
  - increase in tariff revenue (*e*)
  - decrease in CS (*b*+*d*+*e*+*f*)
  - so the net effect is a DWL of (*d*+*f*)

- **Import Quotas**
  - These are limits on the quantities of imported goods
  - They can have effects equivalent to tariffs
    - but quotas are generally worse since quantity imported cannot increase
    - P is more likely to rise under a quota than a tariff
  - Overall the welfare effect from quotas is similar to that from tariffs
    - there's a DWL

- **Bureaucratic Waste and Trade Regulations**
  - Consider how much effort (time, money) is put into developing and enforcing trade restrictions
    - See the U.S. International Trade Commission website for a glimpse at the complexity of tariffs
    - www.usitc.gov, click "Tariff Search Tool", and search for your favorite product

        - Schedule 1 is for "most favored nations"; 2 is for non-WTO countries
    - Tariffs raise little money for the government
    - Enforcement costs are significant
        - people on docks; paperwork; lobbying

Trade has been a key issue in recent elections. Interestingly, both Donald Trump and Hillary Clinton came out in opposition to international agreements that promote free trade. Other current political issues that relate to trade include trade deficits, oil independence, and immigration.

It's interesting that we so often hear people telling us to "buy American to save U.S. jobs," to become "energy independent," or to see restaurants boasting that their product is locally sourced. It's easy to sympathize; help your neighbors. But trade is not about jobs, and international trade is fundamentally the same as exchange between any two people – if the exchange is not coerced, and if the consumption of the traded goods benefits those involved without harming others, then the world is better-off when a trade occurs, regardless of the nationalities of the parties involved. Trade is fundamentally a "positive sum" game.

This section develops a formal model to illustrate why trade is beneficial, and why we shouldn't be too concerned about imports or trade deficits, despite what politicians may say. Later in the course we consider trade policies, but only after we develop some important analytical tools. The important take-away from all of this is fundamental: exchange makes both parties better off. Why would government restrict it?

        - consider Bill Gates, and typing and programming; he might be better than you at both, but he likely has a comparative advantage (compared to most people) in programming
    - Why would a country have the comparative advantage in some goods?
        - resources, climate, technology, labor, productivity
        - but comparative advantage can change over time

- **Common Objections to Trade**
    - During the 2016 presidential debates, both major political parties appeared to oppose free trade
        - During 2018 Trump started imposing tariffs on a variety of goods, and is still working on re-negotiating or scrapping the NAFTA; yet, he still says the goal is free trade
            - democrats and republicans have been critical of the tariffs
            - prelude to a "trade war"?
            - [we discussed tariffs above]
    - Domestic producers in some industries object to free trade
        - they want to keep their prices and wages high
        - they have a strong incentive to lobby for restrictions on trade
    - Consumers like free trade because they get more options, higher quality, and lower prices
        - but they don't have an incentive to group together and lobby for free trade
    - Which group is more aligned with the interests of society?

        - producers like scarcity; consumers like abundance
        - trade policy is a good example of government giving one group a benefit at the expense of others
    - Why does everyone worry about trade deficits?
        - they think that exports equal "jobs", and imports equal job losses
            - this ignores the shift in employment across industries
            - trade has no impact on the unemployment rate overall
        - "outsourcing" and immigration are not new, but they have been important in recent elections
    - Trade is a cooperative activity – a "positive-sum" game
        - yet many mistakenly believe it's zero- or negative-sum
        - international trade is fundamentally the same as going to Target; you go there because you don't want to have produce all that stuff yourself
    - Consider the U.S. government putting trade sanctions (restrictions) on countries like Cuba, Iran, N. Korea, and Russia
        - these policies are intended to punish; why would the U.S. government impose similar policies – restricting trade – on its own people?
    - Trade restrictions may be politically popular, but they aren't good economics!

- **Arguments Typically Used to Support Trade Restrictions**
    - Trump is a protectionist, and has been sympathetic to restricting imports
    - Most are simply lobbying strategies by domestic producers who want government to restrict competition from foreign firms
        - national defense
            - this one is perhaps reasonable in limited cases
            - but everyone from oil, steel, autos, tries to use this argument
            - Trump has used this as a justification for imports on steel and aluminum[90]
            - computer chips? (COVID shortage)
        - infant industry
        - anti-dumping
        - patriotism ("buy American!")
            - Ex: before the 2012 summer Olympics, it was discovered that the U.S. athlete's outfits were made in China; Nevada Senator Harry

[90] https://piie.com/commentary/op-eds/trump-has-announced-massive-aluminum-and-steel-tariffs

Reid suggested that the uniforms should be burned and replaced with U.S.-made uniforms[91]

- cheap foreign labor
  - but wage rates reflect productivity
- "unfair" trade practices
  - government subsidies
  - lax environmental or labor standards in the other country

- **Cost of Jobs Saved by Protectionism**
  - In 2002 the Federal Reserve Bank of Dallas published estimates of the cost per U.S. job saved by import restrictions[92]
    - average cost is *$231,000 per worker per year*, in 2002 dollars
  - Overall, these restrictions cost consumers $100 billion per year ($320 per U.S. resident)
  - Consider U.S. sugar jobs, which cost $826,000 to protect each year (Table 11.1)
    - more recent analysis suggests the sugar quota costs U.S. consumers $3-4 billion per year[93]
    - it'd be more efficient to just write those workers a check and let them stay home
  - Understand the politics of "import protection" versus "wealth transfer"

"The High Costs of Protectionism"

The average cost of protecting an American job is $231,289, in the 20 industries listed below. The total cost to U.S. consumers is over $100 billion annually, over $300 per person per year. Aside from causing higher prices for protected goods, import restrictions also cause higher prices in "downstream" industries (that use the protected products as input resources).

These data are reproduced from the Dallas Fed's 2002 *Annual Report*. The estimated costs would be much higher now, if the data were adjusted for inflation.

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[91] https://www.washingtonpost.com/blogs/2012-heavy-medal-london/ post/us-olympic-uniforms-spark-fury-in-congress/2012/07/13/gJQA BvJmhW_blog.html?utm_term=.d01a0f473f51

[92] From the Federal Reserve Bank of Dallas, 2002 Annual report, "The Fruits of Free Trade," available at https://www.dallasfed.org/fed/annual/~/media/documents/fed/annual/2002/ar02.pdf.

[93] http://www.aei.org/publication/big-sugar-costs-us-consumers-3-7-billion-every-year-in-higher-prices-and-has-killed-127000-jobs-since-1997/; for a more detailed analysis, see http://www.usnews.com/opinion/ economic-intelligence/2014/09/05/sugar-price-supports-have-hidden-costs-for-economy-consumers.

Table 11.1. Estimated cost, jobs saved by trade restrictions (2002)

	Protected industry	Jobs saved	Total cost *(millions $)*	Annual cost per job saved
1	Benzenoid chem.	216	$297	$1,376,435
2	Luggage	226	290	1,285,078
3	Softwood lumber	605	632	1,044,271
4	Sugar	2261	1868	826,104
5	Polyethylene resins	298	242	812,928
6	Dairy products	2378	1630	685,323
7	Frozen conc. OJ	609	387	635,103
8	Ball bearings	146	88	603,368
9	Maritime services	4411	2522	571,668
10	Ceramic tiles	347	191	551,367
11	Machine tools	1556	746	479,452
12	Ceramic articles	418	140	335,876
13	Women's handbags	773	204	263,535
14	Canned tuna	390	100	257,640
15	Glassware	1477	366	247,889
16	Apparel/textiles	168,786	33,629	199,241
17	Peanuts	397	74	187,223
18	Rubber footwear	1701	286	168,312
19	Women's non-athletic footwear	3702	518	139,800
20	Costume jewelry	1067	142	132,870
Totals		***191,764***	***$44,352***	
Weighted average cost per job saved				***$231,289***

Source: *Annual Report*, Federal Reserve Bank of Dallas (2002, p. 19)

CHAPTER 12

MARKET FAILURE: EXTERNALITIES AND PUBLIC GOODS

In the first part of the course, we've concentrated on markets, how they work, and the effects of government policies. These discussions assumed that markets were "perfectly competitive." In most cases, markets lead to relatively efficient outcomes.

There are some situations, however, in which free markets do *not* lead to efficient outcomes. One example would be a monopoly (a market with just one seller), which restricts quantity and raises price above what the competitive market would be. Two other examples are externalities and public goods, the primary subjects of this lecture.

We'll discuss the issues along with theoretical methods of "solving" the problems. Although these solutions may be difficult, if not impossible, to implement in the real world, the policy implemented should be designed to approximate the theoretical solutions as closely as possible.

The material in this lecture represents perhaps the most interesting policy issues that we cover in the class.

- **Common Property Ownership**
  - When everyone owns something, no one owns it
  - Look at the roadside, or a public restroom for example; no one has the incentive to take care of these
  - Air, rivers, some bodies of water, etc., are not owned
    - it is the lack of private property rights that leads to externalities problems (especially the negative ones)
    - think about elephants in Africa vs. cows (ivory vs. beef); what explains why one is near extinction while the other is not?
      - countries that have privatized elephants have higher growth rates[94]
- **Externalities**
  - Rational behavior is the result of individuals considering the MC and MB of an action
    - but they're generally only concerned with the costs/benefits to *themselves*, not to others
    - when there are no externalities present, then the market looks like what we've studied in the first part of the course; everyone's happy

[94] See McPherson and Nieswiadomy, "African Elephants: The Effect of Property Rights and Political Stability," *Contemporary Economic Policy* 18(1): 14-26 (2000).

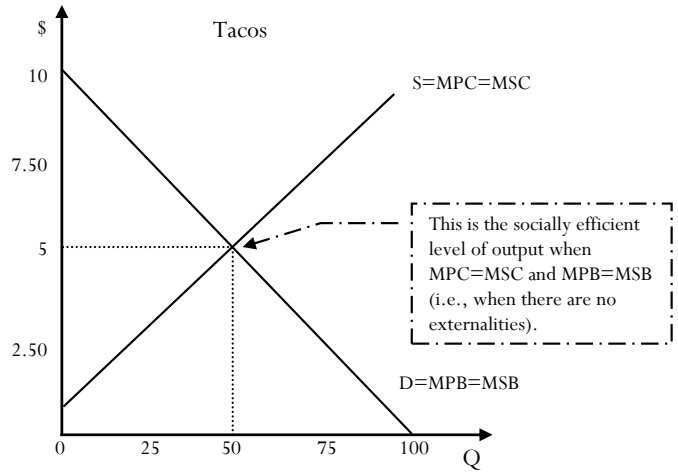

Figure 12.1. A market with no externalities present

- An externality is a third-party or "external" effect of someone's action
  - these occur anytime MPB≠MSB or MPC≠MSC
    - it's the standard model, but we distinguish between private "P" and social "S" in the above
  - for an overview, see *The Economist* article, "State and Market"
- Externalities can either be positive or negative, and can either be "production" externalities or "consumption" externalities
  - negative production externality: MSC>MPC
    - Ex: pollution from factories
    - Ex: the 2010 BP oil spill in the Gulf of Mexico
      - however, there was regulation of the industry… so is it only a "market" failure?
  - negative consumption externality: MSB<MPB
    - think of it as a "negative social benefit"
    - Ex: cigarette smoking
    - Ex: violent video games, such as GTA
  - positive production externality: MSC<MPC
    - Ex: technology spill-over
    - Ex: I-pad and applications
      - companies producing apps benefit from development of I-pad
  - positive consumption externality: MSB>MPB
    - Ex: education
    - Ex: landscaping services
- Suppose the production of cars has toxic smoke as a byproduct
  - this represents a negative production externality

- "marginal external damage" is another name for it

- MSC>MPC
- the damage caused by the smoke implies the total cost to society (the social cost) is greater than the production cost to the factory
  - but the factory doesn't take that cost into account when deciding how much to produce
- see Figure 12.2
  - the factory overproduces from a social perspective
  - but the socially efficient level of production is *not* zero, even though pollution is a bad thing
    - the socially efficient level of murder or theft probably isn't zero either
    - it would be far too costly to ensure zero of these bad things happened

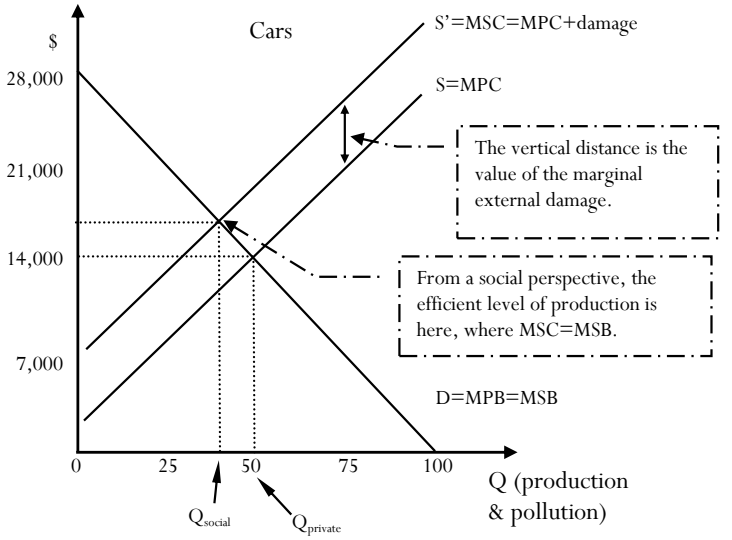

Figure 12.2. Air pollution from the car factory represents a negative production externality

- **The Coase Theorem**
  - As long as property rights are defined, then the externalities problems disappear, assuming low bargaining costs
    - Ex: at the movie theater, turn off your phone!

Figure 12.3. Signs at movie theaters asking you to shut up and not use your phone during the movie

- Ex: traffic at Lockwood and Bee St. downtown (see Figure K.4)

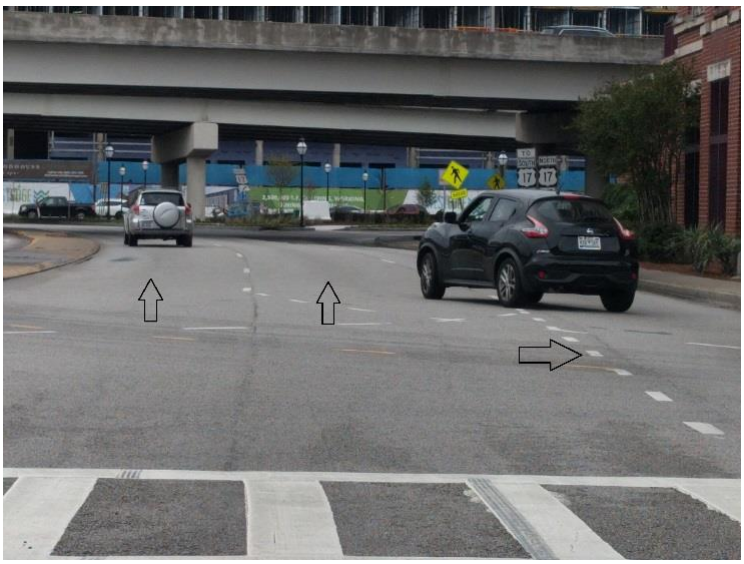

Figure 12.4. The painting of the dashed white line through the intersection effectively assigned "property rights" to the lanes

- This implies that a judge who is deciding a case involving a polluting factory and the harmed neighbors really "doesn't matter"
  - *the judge's decision is irrelevant, as long as the property right to the air is given to one party or the other*
  - consider two examples to see why we get this counter intuitive conclusion
    - whether the judge sides with the factory or the neighbors, what amount of pollution results?
    - see Figure 12.5
- This helps to emphasize the importance of private property rights for markets to work

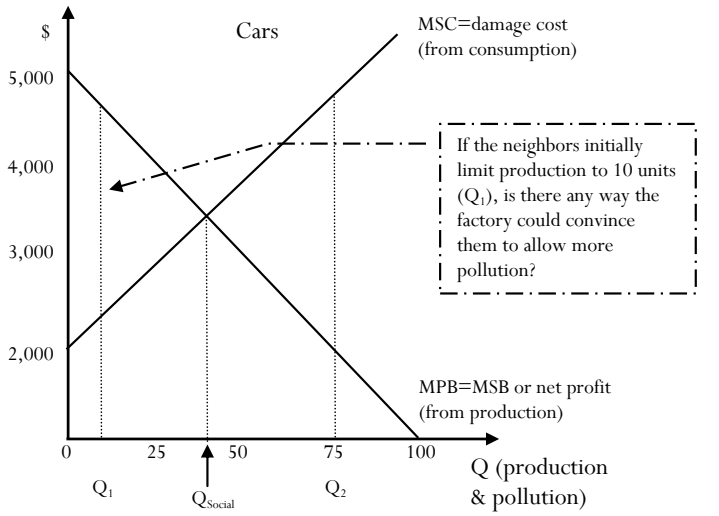

Figure 12.5. Negotiations bring about the socially-optimal amount of pollution, whoever is given the property right to the air

- The problem with this is that, generally, bargaining costs are not "low"
  - still, government could represent the neighbors, while an organization of factory owners represents the production side

- **Policy Options for Externalities**
  - The key to solving externalities problems is to use government to make the MSB=MPB and MSC=MPC
    - this is called "internalizing" the externality
    - want to make the producer of the externality feel its effects
  - You could try "moral suasion" – make people feel bad for harming others
    - this is not likely to be very successful
  - Direct regulation is the most common policy, but it's not necessarily efficient
    - require scrubbers on smokestacks
    - force kids to go to school
    - no smoking in public places
    - drunk driving laws
    - 2017 ban on "tiny beads" in cosmetics[95]
  - Pigouvian taxes and subsidies
    - for negative externalities, the creator is taxed for the damage caused to others

[95] http://www.rsc.org/chemistryworld/2016/01/us-bans-microbeads-personal-care-products

        - this causes the MPC curve to shift up to be equal to the MSC curve (if it's done properly)
        - on his own, the polluter will now choose to produce less (the socially optimal level?)
    - for positive consumption externalities, the behavior is subsidized
        - so the individual chooses to consume more
    - the problem is putting a dollar value on the externality – it's not easy
- Marketable permits (or "cap and trade") are perhaps the best method for allocating "pollution rights"
    - should these be allocated via auction or lottery?
    - should the permits be transferable or not?
    - these help ensure the scarce resource (the right to pollute) is allocated efficiently

- **Public Goods**
    - These are defined very specifically, as having two characteristics
        - non-rival in consumption
        - non-excludable (prohibitively costly to exclude consumers)
            - then the MC of providing the good to an extra person may be zero
        - Ex: national defense, fireworks displays, radio/TV waves
    - If a good isn't both non-rival and non-excludable, then it's otherwise classified (see Table 12.1)
        - private goods have neither characteristic
        - "common resources" are rival but non-excludable
        - "natural monopolies" are non-rival but excludable

Table 12.1. Classification of goods

	Excludable	Non-excludable
Rival	*Private*	*Common resources*
Non-rival	*Natural monopoly*	*Pure public*

    - The "free rider" problem is the major reason government is called upon to provide public goods
        - if a good is non-excludable, then private firms cannot make people pay for using the product – so they aren't going to make a profit
        - the government can get around this by…taxing
    - Even though the government is called upon to provide public goods, it is difficult, if not impossible, for them to determine the socially optimal level of the goods

        - elections might help to determine an approximate optimal level, but rarely is an election about one particular issue alone
    - These are some goods that government often provides; are they "public"?
        - police & fire protection[96]
        - roads
        - health care
        - education
        - national defense
        - water & electricity
        - fireworks displays
    - If the above examples are not "public goods," does this mean government should not provide them?
        - that is a separate issue, one on which reasonable people can disagree
        - the point is that private markets *could* provide them efficiently if they're not purely public

- **Optimal Quantity of Public Goods**
    - We can provide a theoretical explanation for the optimal quantity of public goods provision by government
    - However, it would be extremely difficult to achieve this optimal amount in reality.

[96] Dorchester County, SC, adopted an ordinance with a fee schedule for rescue operations involving non-residents. The ordinance was passed in July 2015, and is available here: https://www2.municode.com/library/sc/dorchester%20county/codes/code_of_ordinances. The fee schedule is not attached, but a draft showed an hourly charge of $305 for "heavy apparatus" including fire engines, as well as "extrication with the use of hydraulic tools and landing zone" for $2,335. These fees are apparently charger after-the-fact. In contrast, see an interesting example of fire protection provided to non-residents of a Tennessee county, only if an annual fee is paid in advance: https://www.youtube.com/watch?v=PwJrPa8Ps7A.

CHAPTER 13

THE FEDERAL INCOME TAX SYSTEM

The U.S. federal income tax system is an absolute mess. In fact, compliance and enforcement can employ an entire (socially wasteful) profession. The tax code is filled with arbitrary and ever-changing rules and regulations, incomprehensible to taxpayers and the politicians who write the rules.

In 2009 President Obama vowed to reform the tax code. Nothing substantive happened during his 8 years. President Trump vowed to reform the tax code, and the Tax Cuts and Jobs Act of 2017 was enacted on December 22. The Act reduces marginal tax rates for most taxpayers. Usually, promises for significant tax reform are laughable. But the tax cuts for 2018 were perhaps Trump's most important accomplishment so far.

It is interesting to note that sometimes Presidents' staff members cannot or do not follow tax law. Of course, President Trump hasn't released his own tax returns, so we have no idea how well he's followed the rules. In February 2017, Trump appointed Rep. Mick Mulvaney (R-SC) as Director of the Office of Management and Budget, despite his admitting to failing to pay taxes related to a "household employee."[97] Will you be surprised if other examples arise? Several members of Obama's Cabinet admitted to cheating (well, "making mistakes") on their taxes. Tim Geithner who as Treasury Secretary (2009-13) oversaw the IRS is one example.[98] Tom Daschle and other Cabinet appointees withdrew their nominations because of potential "tax problems." Of course, many other examples could probably be cited; these are just those cases that received a lot of publicity.

Politicians gain power by manipulating the tax code, and they are not likely to give up this power by simplifying the system in any significant or permanent way. But there are some good alternatives to our current income tax system.

- **The Federal Income Tax**
  - Here we show the tax tables for single taxpayers.
    - it's different for married couples
  - Our focus is on marginal tax rates – the rate of tax on the next dollar you earn
    - the marginal tax rates apply to "taxable income," which is gross income minus exemptions and deductions

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[97] https://www.washingtonpost.com/news/powerpost/wp/2017/01/ 18/trump-budget-nominee-failed-to-pay-15000-in-taxes-related-to-household-employee/?utm_term=.6bcb5ea4bade

[98] http://abcnews.go.com/Business/story?id=6704526

- Changes resulting from the Tax Cuts and Jobs Act of 2017 are illustrated in Table 13.1

Table 13.1. Comparison of key tax law variables, 2017-18, individual taxpayer

	2017	**2018**
Standard deduction	$6,350	$12,000
Exemptions (each)	$4,050	n/a
Child tax credit (each)*	$1,000	$2,000
Highest marginal tax rate	39.6%	37%

* The child tax credit phases out with income. For 2017, the credit is reduced $50 per $1,000 income over $75,000. In 2018, the phaseout begins with income over $200,000 (http://turbotax.intuit.com/).

- See Tables 13.2 and 13.3 for what the federal income tax brackets looked like in 2001 and 2017

Table 13.2. Federal income tax table, individual taxpayer, 2001

Taxable Income	**Marginal Tax Rate**
$0 – 27,050	15%
$27,051 – 65,550	27.5%
$65,551 – 136,750	30.5%
$136,751 – 297,350	35.5%
$297,351 and above	39.1%

Table 13.3. Federal income tax table, individual taxpayer, 2017

Taxable Income	**Marginal Tax Rate**	**Tax Amount** (rounded to the nearest $)
$0 – 9,325	10%	10% of taxable income
$9,326 – 37,950	15%	$932.50 + 15% of amt. over $9,325
$37,951 – 91,900	25%	$5,226 + 25% of amt. over $37,950
$91,901 – 191,650	28%	$18,714 + 28% of amt. over $91,900
$191,651 – 416,700	33%	$46,644 + 33% of amt. over $191,650
$416,701 – 418,400	35%	$120,910 + 35% of amt. over $416,700
$418,401 and above	39.6%	$121,505 + 39.6% of amt. over $418,400

Source: https://taxfoundation.org/2017-tax-brackets/

- Calculating your income tax is not simple…
  - Ex: let's calculate the tax burden for a person with taxable income of $80,000 in 2001
    - suppose income goes up at the same rate as inflation (38% over the time period), so that income in 2017 is $110,570

Your tax in 2001 is calculated:

= ($27,050 x 0.15) + ([$65,550-27,050] x 0.275) + ([80,000-65,550) x 0.305

= 4057.50 + 10,587.50 + 4,407.25 = **$19,052.25**

Average tax rate is tax paid/taxable income, or 23.8%

Your tax in 2017 is calculated:

= $18,714 + ([110,570-91,900] x 0.28)

= $18,714 + $4,667.50 = **$23,381.50**

Average tax rate is 21.3%

  - The average tax rate decreased from 23.8% to 21.3% for this worker
    - so the tax regressivity has decreased
- Now let's see what happens for the same person in 2018
  - Accounting for inflation, the same person's income would be $113,840 in 2018
  - the 2018 tax table is shown in Table 13.4
    - Trump had wanted just 3 brackets (12%, 25%, 33%), but couldn't make it happen

Table 13.4. Federal income tax table,
individual taxpayer, 2018

Taxable Income	Marginal Tax Rate
$0 – 9,525	10%
$9,526 – 38.700	12%
$38,701 – 82,500	22%
$82,501 – 157,500	24%
$157,501 – 200,000	32%
$200,001 – 500,000	35%
over $500,000	37%

Your tax in 2018 is calculated using income in these brackets: 10%, 12%, 22%, and 24%:

= $952.50 + $3,501 + $9,636 + 7,521.60
= **$21,611.10**
Average tax rate is 19.0%

- **Debate over Corporate Tax Cuts in 2017**
  - For 2018 the corporate tax rate decreases from a 35% top rate (graduated) to a flat 21%
    - the corporate tax rate cut is permanent
  - The personal income tax cuts (illustrated in 2018 vs 2017 tax tables, above) are set to expire in 2025
    - this was one of the main criticisms of the bill in media coverage
    - from CNN: "But here's the thing: After 2025, all individual tax cuts are set to expire. At the same time, corporate rate cuts are made permanent under the bill."
  - Astonishing example of incompetent media reporting
    - during the debate in late 2017, I never saw *anyone* consider the fact that in 2024 or 2025, the story will be "individual tax rates are set to increase in 2025, unless Congress and the President act to keep tax rate cuts in place"
      - there would be enormous political pressure for them to act to keep the cuts in place
      - in this sense, this compromise was a very good political move for proponents of the 2017 Act
  - Trump and the republicans deserve credit for making this happen, politically
    - disclaimer: I like the plan because I'll have a lower tax rate, and much higher child tax credit

- In July 2018, some members of the House of Reps began efforts to make the individual tax cuts permanent after 2025[99]
- Given that most people will be seeing higher take-home pay, I'd expect the Act to be more popular than the media expects

- **State Taxes**
  - State governments get their revenue from property taxes, sales taxes, and, in most states, income taxes
    - 37% of state tax collections (U.S. overall)
  - Table 13.5 shows state income taxes, lowest rate and highest rate, for 2018
    - South Carolina, and several other states, have very low incomes for their highest tax bracket threshold
      - might as well call it a 7% flat tax…
    - some states tax only dividend and interest income (i.e., from investments)
  - When you add federal and state income taxes, sales taxes, property taxes, etc., you may very well pay ¼ to ½ of your overall income in taxes
    - consider your situation in Charleston: 20% federal income tax, 6% state income tax, 9% sales tax, various excise taxes, property taxes, etc.

Table 13.5. State income tax rate ranges (2018)

State	Low rate (%)	High rate (%)	State	Low Rate (%)	High rate (%)
Alabama	2.0	5.0	Nebraska	2.46	6.84
Alaska	none	--	Nevada	none	--
Arizona	2.59	4.54	N. Hampshire	5% (div/int inc)	
Arkansas	0.9	6.9	New Jersey	1.4	8.97
California	1.0	13.3	New Mexico	1.7	4.9
Colorado	4.63	(flat)	New York	4.0	8.82
Connecticut	3.0	6.99	N. Carolina	5.5	(flat)
Delaware	2.2	6.6	North Dakota	1.10	2.90
Florida	none	--	Ohio	1.98	5.0
Georgia	1.0	6.0	Oklahoma	0.5	5.0
Hawaii	1.4	11.0	Oregon	5.0	9.9
Idaho	1.6	7.4	Pennsylvania	3.07	(flat)
Illinois	4.95	(flat)	Rhode Island	3.75	5.99
Indiana	3.23	(flat)	**S. Carolina**	**3.0**	**7.0***
Iowa	0.36	8.98	South Dakota	none	--
Kansas	3.1	5.7	Tennessee	3% (div/int inc)	
Kentucky	2.0	6.0	Texas	none	--
Louisiana	2.0	6.0	Utah	5.0	(flat)
Maine	5.8	7.15	Vermont	3.55	8.95

[99] https://www.washingtonpost.com/business/house-gop-launches-push-for-permanent-individual-tax-cuts/2018/07/24/f6ed7e62-8f6b-11e8-ae59-01880eac5f1d_story.html?noredirect=on&utm_term=.e3e76af07ef1

Maryland	2.0	5.75	Virginia	2.0	5.75
Massachusetts	5.10	(flat)	Washington	none	--
Michigan	4.25	(flat)	West Virginia	3.0	6.5
Minnesota	5.35	9.85	Wisconsin	4.0	7.65
Mississippi	3.0	5.0	Wyoming	none	--
Missouri	1.5	5.9	D. C.	4.0	8.95
Montana	1.0	6.9			

* The highest rate of 7% in SC is applied to taxable income above $14,860. States vary in their income brackets, standard deductions, etc.
Source: https://taxfoundation.org/state-individual-income-tax-rates-brackets-2018/

- **Income Taxes and Incentives**
  - Income taxes will potentially affect incentives, as Laffer noted
    - the Laffer curve shows tax revenue as a function of tax rate (Figure 13.1)
    - Laffer was a motivating force behind Reagan cutting MTRs in the early 1980s

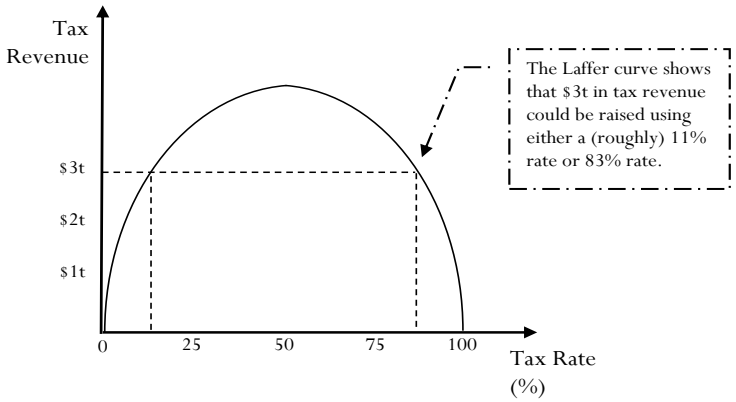

Figure 13.1. The Laffer curve shows the relationship between tax rate and tax revenue, through the tax disincentive to work

      - the major problem with Reagan's economic policies in the 1980s weren't on the tax side, it was the inability to cut government spending
      - this idea has been coined "trickle-down" or supply-side economics
      - it is legitimate in theory, but politicians have put a spin on it
  - Do higher taxes make you want to work less?
    - the highest MTR in the early 1960s was 92%

- **What's "Fair"?**
  - People disagree on what's fair
    - the Occupy Wall Street protest group was upset about the top 1% of income earners

        - slogan "we are the 99%"
    - others might argue that everyone should pay the same tax rate
- Do the "rich" pay their "fair share" of federal income taxes?
    - the top 0.1% (160,000 families) hold 22% of America's wealth[100]
    - at the other end, NTU suggests that 34% of 2015 *tax returns* paid $0 income tax
- Consider the amount of the federal personal income tax revenue paid by income class (Table 13.6)
    - are the top 1% paying enough?
    - of course, that's normative

Table 13.6. Who paid what percentage of federal income taxes in 2015?

Percentiles, ranked by AGI	AGI threshold on percentiles	Adjusted Gross Income Share	% of federal personal inc. taxes paid
Top 1%	$480,930	20.7%	39%
Top 5%	$195,778	36.1%	60%
Top 10%	$138,031	47.4%	71%
Top 25%	$79,655	69.0%	87%
Top 50%	$39,275	88.7%	97%
Bottom 50%	<$39,275	11.3%	3%

Note: AGI is Adjusted Gross Income
Source: National Taxpayers Union, https://www.ntu.org/foundation/tax-page/who-pays-income-taxes

- **Tax Politics**
    - How likely are we to see higher "taxes on the rich"?
        - half the population doesn't pay taxes – what are they likely to vote for?
        - are reductions in government (deficit) spending likely, when half the people don't pay taxes?
    - We have a "progressive" tax rate structure
        - this means the average tax rate (ATR) increases as income rises
            - but if marginal tax rates (MTR) increase as income increases, so must ATR
    - A "regressive" tax would be one where the average tax rate increases as income *falls* – most people think that would not be fair
    - "Vertical equity" and "horizontal equity" are important principles in tax theory, most economists agree on these

[100] http://www.economist.com/news/finance-and-economics/ 21631129-it-001-who-are-really-getting-ahead-america-forget-1

    - vertical equity: people with higher incomes should pay a higher percentage in taxes
    - horizontal equity: people with the same incomes should pay the same in taxes

- **Compliance Costs**
    - One of the major problems with the current system is "compliance costs" or "excess burden"
        - recently estimated at $262 billion[101]
            - value of 7 billion hours of time, worth about $229 billion at average wage rate
            - $34 billion in software & tax services
        - about 8% of total government revenues ($3.316 trillion in 2017)
    - Some groups have a strong incentive in keeping the tax system complicated
        - tax accountants and lawyers
        - Intuit, the creator of Turbo Tax software, spent $11.5 million over 5 years, lobbying Congress to keep the federal system complicated[102]
        - yet the IRS apparently favors simplification[103]
    - Consider alternative forms of taxation
        - Fair Tax (national sales tax) is becoming more popular[104]
            - I like this idea a lot
        - flat-rate income tax
            - but what is the definition of "income" or "taxable income" – that can be manipulated by politicians
        - a major benefit of changing the income tax is a decrease in "excess burden" or tax collection costs
        - a major change should also tie politicians' hands and make it more difficult for them to give out political favors to their friends and campaign contributors

ARTICLE 2022 about Intuit lobbying. Heaviest advertiser during 2022 NFL playoff games. Superbowl too?
https://theconversation.com/the-irs-already-has-all-your-income-tax-data-so-why-do-americans-still-have-to-file-their-taxes-175777

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[101] https://www.ntu.org/foundation/detail/tax-complexity-2017

[102] http://abcnews.go.com/Business/turbotax-lobbies-lawmakers-tax-code-complicated/story?id=18882377

[103] https://fairtax.org/articles/irs-boss-koskinen-backs-tax-reform-calls-system-a-mess

[104] See http://fairtax.org/ for information.

CHAPTER 14

PUBLIC CHOICE (AND OTHER RANDOM DRAFT INFO)

If we have extra time, we can cover some more current events and policy issues. I will provide handouts in class, or webpage material, as needed. As of this writing (January 2023), don't worry about this section; it's completely disorganized.

End-of-semester note:

Hopefully you feel like you have developed some useful tools in this class. I hope that you are able to better analyze current economic events, government policies, and politicians' rhetoric.

The next course in the economics sequence is ECON 201, Principles of Macroeconomics. Even if you are not required to take it, I would highly recommend it. That class gives a good foundation of what most people think of when they hear "economics." It basically covers "the economy" – inflation, economic growth, interest rates, recessions, etc.

I hope you enjoyed this course!

** BIDEN PROPOSES $10,000 STUDENT LOAN REBATE. **

For the last chapter, I think a discussion of emporiophobia, property rights, etc., is appropriate.

These quotes in this section have better context at the end. Ask the kids if they've reconsidered their thinking on the role of government in society, after a brief discussion of how markets work and some government policies…

Of course, we haven't discussed things like international relations, the use of force at a national level (national defense), etc.

- **"Emporiophobia"** [105]
  - The benefits of free markets and trade are easily distorted or misunderstood, and many people distrust or dislike "markets"
    - this may be if people see sellers' profits as coming at the expense of consumers, as if they must be losers in the exchange
  - Distaste for the market may also come from media
    - Ex: capitalism and the movie *Wall Street*
    - Ex: from *The Founder* (movie):

      "Business is war. It's dog eat dog, rat eat rat. If my competitor were drowning, I'd walk over and put a hose right in his mouth."

      - yes, sellers compete with each other for customers, but they do it by making better products that people want to buy, not by knocking off their competition
        - except in the black market for drugs, for example, where normal competitive practices are illegal
  - Common dislike of international trade
    - consider Trumps rhetoric about trading with China, that we're "getting killed" by our trade deficit
      - suggests trade is "zero-sum"
      - 2018 tariffs are a results of this thinking
    - Ex: T. Boone Pickens' ("The Pickens Plan") says that our purchase of foreign oil is the "largest transfer of wealth in history." His website explains[106]:

      "In addition to putting our security in the hands of potentially unfriendly and unstable OPEC nations, we are jeopardizing our economy. In 2013, we imported 1.35 billion barrels of oil from OPEC at a cost of $147 billion. Over the next 10 years, this addiction will be $2 trillion. In the history of mankind, no country has ever sent this much wealth out of its borders."

    - Our own Sen. Lindsey Graham sympathizes with this view, according to his statement during the "happy hour" debate among republican presidential candidates (8/6/15):

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[105] Much of this section is based on P. Rubin, "Emporiophobia (Fear of Markets): Cooperation or Competition," *Southern Economic Journal* 80(4): 875-889 (2014).

[106] See http://www.pickensplan.com/the-plan/. The website appears to only be updated during presidential election seasons; there were quite a few updates during 2016. The "largest transfer" quote was on the webpage in 2008; the longer quotation was from August 2017, and still appeared in July 2018.

"…we're going to become energy independent. I am tired of sending $300 billion overseas to buy oil from people who hate our guts. The choice between a weak economy and a strong environment is a false choice."

- but it's not a "wealth transfer"; we get something of greater value than the money we spend! (Otherwise we wouldn't buy it.)

- Politicians love to blame bad outcomes on markets, even when government had a hand in making things worse

Some people have argued that this is one of the reason that economics has been called "the dismal science" – that everything has its cost.

Carlyle

STUDY AIDS

CHAPTER 15

MULTIPLE-CHOICE QUESTIONS

The test questions presented here are good examples of how I write multiple choice questions. But you should not expect to see these specific questions on exams. The exams may also include short answer questions and graphical problems.

Your best strategy for preparing for exams is to make sure you *understand the concepts*, rather than memorizing stuff. I urge you not to attempt to memorize these test questions, but rather, try to understand why the correct answers are what they are.

If you have questions about any of these, feel free to come talk to me during office hours, or ask me in class.

Note that some of these questions may not be directly related to material we cover in class this semester.

Example Test Questions over Chapters 1-6
[answers are provided after question 19]

1. If the price is not currently at the equilibrium price, what can you say about the number of transactions that will occur in the market, relative to the number of transactions that would occur at P_e?
   a. The number of transactions will be higher than at P_e as long as the price is lower than the equilibrium level.
   b. The number of transactions will be higher than at P_e as long as the price is higher than the equilibrium level.
   c. The number of transactions is maximized at the P_e, so any other price will result in fewer transactions.
   d. Since the economy is based on greed, less greed means higher well-being. This implies that the lower the price, the more transactions will occur.

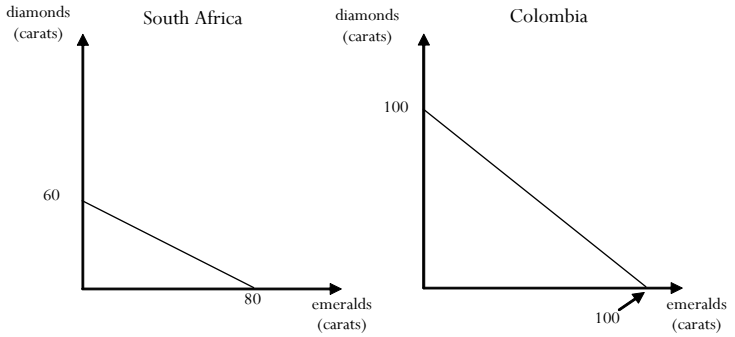
2. If quantity demanded equals quantity supplied, then
   a. prices signal less scarcity in the market.
   b. there may be a shortage in the money market.
   c. demand is downward sloping.
   d. there cannot be a shortage or a surplus.
   e. supply is greater than quantity demanded.

3. Suppose plague-killed cows are a major input in the production of Erby's restaurant's sandwiches. Further, assume that Erby's sandwiches and stomach pumps are complementary goods. What would you expect to happen *in the market for stomach pumps* if the supply of plague-killed cows decreases?
   a. P increases, Q falls
   b. P increases, Q increases
   c. P falls, Q falls
   d. P falls, Q increases

4. If supply decreases and demand decreases, the following will happen:
   a. equilibrium quantity rises
   b. P rises
   c. P falls
   d. equilibrium quantity falls
   e. [none of the above]

5. John's income increases and as a result his demand for Widespread concert tickets increases. Which of the following follows from this statement?
   a. Widespread concert tickets are inferior goods for John.
   b. Widespread concert tickets are normal goods for everyone in the economy.
   c. Widespread concert tickets are inferior goods for everyone in the economy.
   d. Widespread concert tickets are normal goods for John.
   e. Widespread concert tickets are good for economists.

Please refer to the following figure for questions 6 & 7. Two countries, Colombia and South Africa, are producing diamonds and emeralds.



6. If South Africa and Colombia each specialize in the good that they have the comparative advantage in, South Africa will produce _____ and Colombia will produce _____ .
   a. diamonds, diamonds
   b. diamonds, emeralds
   c. emeralds, diamonds
   d. emeralds, emeralds
   e. [none of the above]

7. Which of the following ratios is a suitable terms of trade?
   a. 3d : 1e
   b. 3d : 5e
   c. 3d : 2e
   d. 3d : 3.5e

8. Marginal utility (or marginal benefit)
   a. is constant so long as price is constant.
   b. can be fixed in the short-run.
   c. is total utility divided by the number of units consumed.
   d. declines as quantity consumed increases over a given period of time.

9. Suppose tacos and burritos are substitute goods. If the supply of tacos decreases, what happens in the market for burritos?
   a. P increases, Q falls
   b. P increases, Q increases
   c. P falls, Q falls
   d. P falls, Q increases

10. Which of the following ***does not*** increase or decrease (shift) demand?
   a. a decrease in the price of a substitute good
   b. a change in income
   c. a surplus
   d. [all of the above shift demand]

11. If the consumers and producers of computers suddenly expect the market price to fall drastically next month, which of the following can you say should most likely happen this month?
   a. price falls
   b. quantity falls
   c. price rises
   d. quantity rises

12. What kinds of factors determine comparative advantage?
   a. differences in technology and resource endowments
   b. legislation arising mainly from the European Economic Community (EEC)
   c. different consumption preferences
   d. [none of the above]

13. In *the market for cameras*, an increase in the price of film would cause a
   a. decrease in quantity supplied.
   b. decrease in price.
   c. decrease in demand.
   d. [all of the above]

14. Exchange arises in a free market as a result of
   a. government planning.
   b. individuals' inherent self-interest.
   c. the warm friendly feeling it generates.
   d. random behavior.

15. Ester, a rational human being, will eat carrots until
    a. the total benefit is equated to the total cost.
    b. the marginal benefit of the last carrot equals the marginal cost of the last carrot.
    c. the marginal benefit of the last carrot is infinite.
    d. the full cost is minimized.
    e. [none of the above]

16. As a good becomes more plentiful (or less scarce) in the market
    a. government should enact a law to prevent the price from rising.
    b. the price of that good should increase to reflect the decreased scarcity.
    c. the price of that good should decrease to reflect the decreased scarcity.
    d. a shortage of the good will result.

17. The *ceteris paribus* assumption is that we assume…
    a. everything else changes in the same direction.
    b. everything else changes in the opposite direction.
    c. everything else remains constant.
    d. everything else changes in completely unpredictable ways.

18. An increase in supply is shown as a _____ the supply curve. After something changes to increase supply, then for sellers to still be willing to produce and sell a particular quantity, they _____.
    a. leftward shift of ; insist on higher prices from consumers.
    b. rightward shift of ; are willing to accept lower prices from consumers.
    c. movement rightward along ; must see an increase in demand.
    d. movement leftward along ; must see a decrease in demand.

19. The law of decreasing marginal utility means that
    a. as consumption increases, the total benefit from consuming falls.
    b. as consumption increases, the additional benefit from consuming one more unit is less than the benefit from the previous unit.
    c. as consumption increases, the consumer gets the same amount of benefit as she did from each previous unit of consumption.
    d. as consumption increases, the total benefit the consumer gets from consuming additional units increases at an increasing rate.

Answers to Example Test Questions over Chapters 1-6

1c, 2d, 3c, 4d, 5d, 6c, 7d, 8d, 9b, 10c, 11a, 12a, 13d, 14b, 15b, 16c, 17c, 18b, 19b

Example Test Questions over Chapters 7-11
[answers are provided after question 15]

1. A $1.50 excise tax on cigarettes (to be legally paid by suppliers) will
   a. raise the market price of cigarettes by exactly $1.50.
   b. raise the market price of cigarettes by more than $1.50.
   c. raise the market price of cigarettes by less than $1.50.
   d. will decrease the demand for cigarettes.

2. Economic theory predicts that a minimum wage law will result in
   a. a higher standard of living for all Americans.
   b. lower unemployment for low-skilled workers and higher average wages.
   c. higher wages for some low-skilled workers, but unemployment for others.
   d. full employment and reduced poverty.

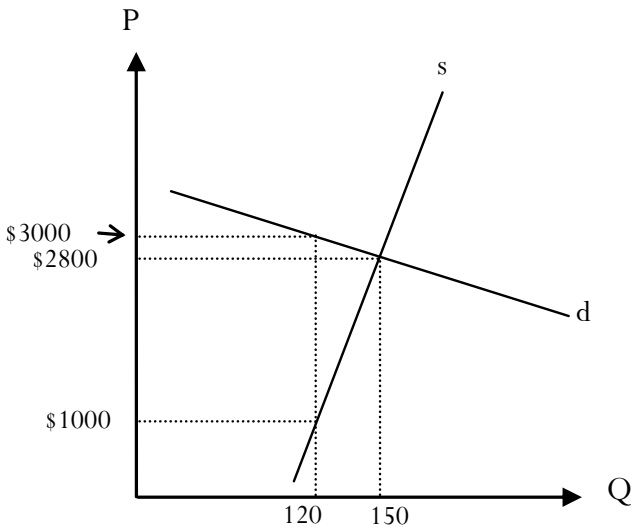
3. The condition for productive efficiency in a particular industry, i.e., producing a given quantity of output at the minimum total cost, is $MC_A = MC_B = \cdots = MC_N$, where *N* is the number of firms producing. (This means the marginal cost of production for all firms must equal.) If this condition is <u>not</u> met, the total cost of producing a given quantity in the market *could be decreased* because
   a. the total cost is minimized only where the quantities produced by all firms are equal.
   b. the total cost for all firms must be equal; this occurs where the marginal costs for all firms equal.
   c. the last unit from one firm (with higher *MC*) could be given up in exchange for an additional unit of output from another firm (with lower *MC*).
   d. the last unit from the firm with the lowest *MC* could be given up in exchange for an additional unit from the firm with the highest *MC*.

4. Although lawmakers legislated a fifty-fifty division of the payment of the FICA tax,
   a. the employee now is required by law to pay a larger percentage of the tax than the employer.
   b. employers are no longer required by law to pay their portion of the tax.
   c. the same outcome would occur if the entire tax had been levied on only the employee or only on the employer.
   d. the employer now is required by law to pay a larger percentage of the tax.

5. Suppose a market was originally at its equilibrium. If the government imposes an effective price floor or ceiling, the quantity of mutually-beneficial, voluntary transactions
   a. will rise, since scarcity is the catalyst for these government policies.
   b. will increase as the result of a price ceiling, but decrease as under a price floor.
   c. cannot be predicted.
   d. will remain unchanged, since there can be only one equilibrium quantity.
   e. must decrease as the result of either policy.

6. Price floors tend to ignore the interests of _____; price ceilings act to promote the interests of _____.
   a. producers; producers
   b. consumers; consumers
   c. consumers; producers
   d. producers; consumers

As a part of her (unsuccessful) 2003 campaign for California governor, porn star Mary Carey proposed an excise tax on breast implants, arguing that it would raise millions of dollars of revenue for the state. In support of her proposal, she offered the following graphical analysis in a press conference. (Okay, she didn't really show this graph. But go with it.) Use the information provided in the figure to answer questions 7 – 9.

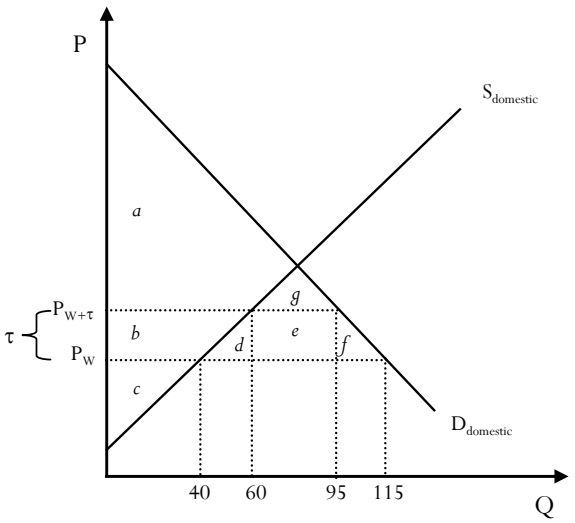


7. According to the figure, on which party has the excise tax been legally placed?
   a. buyers
   b. sellers
   c. both equally
   d. neither
   e. [This cannot be determined from figure.]

8. If the tax was imposed only in California, many potential consumers would probably just go to other states to have the procedure, thereby avoiding the tax. What effect does this issue have on the figure shown above?
   a. This would make the supply curve fairly inelastic, as it is shown.
   b. This would make the demand curve fairly elastic, as it is shown.
   c. This would make the supply curve fairly elastic.
   d. This would make the demand curve fairly inelastic.

9. What is the amount of the excise tax (per procedure) being charged by the government?
   a. $200 b. $1000 c. $1800 d. $2000 e. $3000

The figure below illustrates the domestic market for Chia Pets. Suppose a tariff is imposed on imported Chia Pets. Use the figure to answer questions 10-11.



10. By how much does the quantity of imports change as a result of the tariff being imposed?
    a. imports decrease by 40
    b. imports increase by 75
    c. imports decrease by 35
    d. imports decrease by 75

11. What is the effect on domestic producers as a result of the tariff being imposed?
    a. producers gain f.
    b. producers gain b.
    c. producers gain e.
    d. producers gain e+g.
    e. producers gain c.

12. Suppose you're selling moonshine. If you lower price 10% and Q_D rises by 15%, then the elasticity of demand is _____ .
    a. unit elastic
    b. $\varepsilon_d > 1$
    c. $\varepsilon_d < 1$

13. If demand is more elastic than supply, then who will bear a greater share of the excise tax burden?
    a. It depends on the statutory tax burden (i.e., who is legally required to send the tax money to government).
    b. The consumer will bear a greater portion of the tax burden ONLY if the consumer is legally required to send the tax to the government
    c. The consumer will bear a greater portion of the tax burden regardless of who sends the tax revenue to the government.
    d. The producer will bear a greater share of the tax burden.
    e. The producer and consumer will likely equally share the tax burden, since that is the only fair solution.

14. You work the door at the Rooftop Bar, and your boss has asked you to calculate the elasticity of demand for entrance to the bar. On two otherwise identical Friday nights, you implement different cover charges. On the night when you charge $5, 200 people enter the bar. On the night when you charge $3, 400 people enter the bar. Using these two data points and the midpoint method, calculate the elasticity of demand (ε_d). Based on your answer, and assuming that the ε_d remains the same at all prices, how should the bar adjust its cover charge if its only interest is in increasing total revenue from the cover charge?
    a. It should raise prices, since demand is inelastic.
    b. It should lower prices, since demand is elastic.
    c. It doesn't matter since demand is unit-elastic.

15. Why would you be more likely to see racial discrimination occurring in rent-controlled cities, compared to non-rent-controlled cities?
    a. If, as the result of the rent-controls, landlords cannot allocate apartments based on price, they must use some form of non-price rationing.
    b. Statistically, rent-controlled communities simply have more racists.
    c. Rent-control laws are most prevalent where there is a high proportion of whites; these are the people most likely to discriminate against other races.
    d. There is no legitimate reason to expect any difference in racial discrimination between rent-controlled and non-rent-controlled cities.

Answers to Example Test Questions over Chapters 7-11

1c, 2c, 3c, 4c, 5e, 6b, 7e, 8b, 9d, 10a, 11b, 12b, 13d, 14b, 15a

Example Test Questions over Chapters 12-14
[answers are provided after question 14]

1. A negative externality exists when
   a. private costs equal social costs.
   b. social costs exceed private costs.
   c. private costs exceed social costs.
   d. the quantity produced is too low.

2. The South Carolina income tax reaches its highest bracket of 7% at an income of around $14,000. Most people can simply think of this as a…
   a. flat tax of 7%.
   b. trivial tax which is not likely to affect them.
   c. being included in federal income taxes, so they don't have to worry about it.
   d. the same thing as the 7% state sales tax.

3. The idea that clearly defined property rights are sufficient to internalize an externality is called the
   a. Coase theorem.
   b. law of diminishing returns.
   c. internalizationality theorem.
   d. "shame spiral" theory.

4. A progressive tax system is one in which
   a. individuals with a higher income pay a greater dollar amount of taxes.
   b. individuals with a lower income pay more tax dollars.
   c. individuals with a higher income pay a higher average tax rate.
   d. people with a low income pay a higher average tax rate.

5. Public goods are unique in that
   a. all people can consume them jointly.
   b. everyone pays a different price for them.
   c. they are both rival and excludable.
   d. only the poor are allowed to consume them.

6. According to public goods theory, must "health care" be provided by government for it to be provided efficiently?
   a. No, since health care is rival and excludable.
   b. Yes, since health care is non-rival and non-excludable.
   c. Yes, since having a healthy population is consistent with the public good.
   d. No, since having people live too long is inconsistent with the public good.

Suppose the government is considering adopting an income tax based on daily earnings, and there are two proposals for what the tax rate schedule should look like. These are listed in the columns below, (1) and (2). Use the information in the table to answer questions 7-9.

Income	*Marginal Tax Rate (schedule 1)*	*Marginal Tax Rate (schedule 2)*
$0 – 10	10%	20%
$11 – 20	30%	20%
$21 – and above	80%	20%

7. Which tax rate schedule is "progressive"?
   a. MTR schedule 1.
   b. MTR schedule 2.
   c. [neither 1 nor 2]

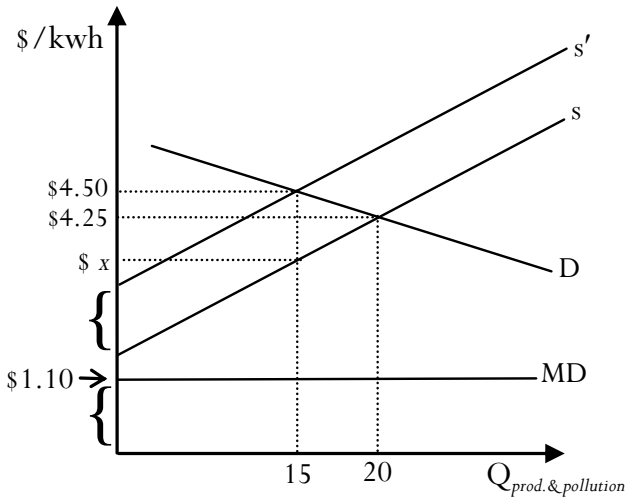
8. If you have income of $30, what's your approximate tax due under each schedule?
   a. Schedule 1: $12; Schedule 2: $6
   b. Schedule 1: $24; Schedule 2: $6
   c. Schedule 1: $80; Schedule 2: $20
   d. Schedule 1: $40; Schedule 2: $12

9. Would you expect any difference between the two tax rate structures, in terms of their effects on a person's incentive to work harder to earn a higher income?
   a. Neither tax rate structure should affect the incentive to work, since people need to earn income.
   b. The MTRs listed in (1) would tend to discourage work and productivity, as marginal tax rates rise sharply as income rises.
   c. The MTRs listed in (2) would discourage work and productivity; since the MTR does not rise with income, the worker is not likely to feel that they are helping society by paying their fair share of taxes.
   d. What is Walker talking about? People love taxes! That's the only reason people want to work – to pay taxes!

10. When externalities exist, buyers and sellers
    a. neglect the external effects of their actions but the private market equilibrium is still efficient.
    b. do not neglect the external effects of their actions and the private market equilibrium is efficient.
    c. neglect the external effects of their actions and the private market equilibrium is not efficient.
    d. do not neglect the external effects of their actions and the private market equilibrium is not efficient.

11. Merton Miller, a Nobel laureate in economics has written that if the current tax system was revised (e.g., changed to a flat tax or national sales tax), "armies of tax lawyers and accountants would lose their jobs and be forced to enter productive employment." This sentiment reflects what idea from the lecture on taxes?
    a. Taxes are not fair.
    b. Tax compliance costs are very high.
    c. Taxes should be raised on wealthy people.
    d. Republicans are corrupt.
    e. The current tax system is the "least bad" tax system possible.

Mr. Montgomery Burns' nuclear power plant (in Springfield) pollutes a nearby river. The pot-smoking, womanizing, and tax-cheating Mayor Quimby wishes to decrease the amount of pollution into the river. Given this information, along with the information in the graph below, answer questions 12 & 13.



12. What should the value of "$ *x*" be in the figure above?
    a. $4.00 b. $3.75 c. $3.40 d. $3.15
    e. [This can't be determined.]

13. What is the socially efficient level of production/pollution?
    a. 0
    b. more than 0, but less than 15
    c. >20
    d. 15
    e. more than 15, but less than 20

14. The tax principle of "vertical equity" says that
    a. all people should pay the same dollar amount in taxes.
    b. individuals with lower income should not pay any taxes.
    c. individuals with higher income should pay more in taxes.
    d. people who live in democracies should not have to pay taxes.

Answers to Example Test Questions over Chapters 12-14

1b, 2a, 3a, 4c, 5a, 6a, 7a, 8a, 9b, 10c, 11b, 12c, 13d, 14c