Introduction to Microeconomics: Lecture Notes

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2024-06-09

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Preface

These are my lecture notes for a course called *Introduction to Microeconomics* that I have taught for over three decades.

The required textbook for my course is *Principles of Microeconomics* by N. Gregory Mankiw. Although Mankiw's book is excellent, I have constantly felt the need to make small adjustments. Until recently, I had been making these adjustments in the PowerPoint slides I use in the classroom. But the availability of new technology – especially *R*, *R Studio*, *quarto books*, and *Github* – has made it easy for me to gather my slides and give them an online form that actually resembles a textbook.

I would be happy to get feedback.

Chapter 1

Introduction to Economics

1.1 Chapter Outline

- What is economics?
- What is the use of economics?
- What are economists expected to do?
- How do economists do what they are expected to do?
- Why does the economist's method sometimes fail?
- What is macroeconomics?
- What is microeconomics?

1.2 What is Economics?

Economics is the study of our responses to scarcity, and the consequences of those responses.

Scarcity – in economics – is the fact that we can't always get what we want.

None of us has Aladdin's magic lamp.

1.3 What is the Use of Economics?

Scarcity compels us to come up with less wasteful ways of running our societies.

We all want progress, and we all want to reduce hunger, poverty and inequality. But our resources are finite. Therefore, we can't afford to run our societies

in wasteful and inefficient ways. That's where good economic policies have a crucial role to play. That's where the economist can contribute.

The goals of a nation should not be set by economists. In democracies, it is usually the job of the elected representatives of the people to determine the nation's goals. Once the goals have been determined, it is the job of the economist to outline the various policies by which the nation's goals may be reached (assuming the goals are reachable).

The economist must also predict the likely benefits and costs of each of the various policies by which the nation's goals may be achieved.

The people's representatives can then pick the policy they like best.

1.3.1 Wasted Resources: Stuck in Traffic

We waste a lot of time stuck in traffic. Economists would want to find a way to reduce this waste of time. Building more roads may not always be possible, may not solve the problem, and may be costly in any case. Charging car owners for the use of a road may be the way to go. Investing in or subsidizing public transport is another option.

1.3.1.1 Wasted Resources: Stuck in Traffic: News Item

Charging Drivers for Road Use Is Popular With Economists, Less So With Drivers By David Harrison, The Wall Street Journal, Aug. 29, 2021

1.3.2 Wasted Resources: Unemployment

What can we do to reduce this waste of resources? Cut taxes to encourage people to go shopping? Have the government spend more roads and bridges? Make overtime work illegal? Limit imports?

1.3.3 Wasted Resources: Environment Destruction

How can we ensure that the resources that sustain life on this planet are conserved?

1.3.4 Addressing Ethical Imperatives: Health Care

How can we ensure that people do not need to worry about something as basic as healthcare?

1.3.5 Addressing Ethical Imperatives: Inequality

How can we ensure that incomes are more equally shared?

This assumes that a more equal nation is what the people want. (Remember that it is not the economist's job to say what the nation should or should not want.)

Raise taxes on the rich? Invest in and subsidize higher education? Change existing laws to strengthen labor unions?

1.3.6 Addressing Ethical Imperatives: Intergenerational Mobility

How can we keep the American Dream—the idea that each generation lives better than their parents—alive? Universal Basic Income? Baby Bonds? Require politicians to raise election campaign money through small donations? Tuition-free college?

1.4 What Are Economists Expected to Do?

As we have just seen, when asked specific policy-related questions, the economist has to think hard and:

- Identify the list of the options available to society, and
- Make predictions of the consequences—costs and benefits—that would follow from each of those options.

The democratic process must then decide which option to pursue.

1.4.1 Government policies can make a difference: in ways good and bad: Examples

Government's Pandemic Response Turned a Would-Be Poverty Surge Into a Record Poverty Decline, By Danilo Trisi, Center for Budget and Policy Priorities, August 29, 2023

1.4.1.1 When Economic Policies Go Wrong: Joseph Stalin

Clearly, the stakes are very high in getting our economic policies right. The Soviet leader Stalin is believed to have caused about 40 million deaths during the 1930s in the then Soviet Union in an attempt to collectivize agriculture. For more on Stalin's policies and their effects see:

- *Harvest of Sorrow: Soviet Collectivization and the Terror-Famine* by Robert Conquest, Oxford University Press, New York, NY, 1986, ISBN 0195051807.
- *Bloodlands: Europe Between Hitler and Stalin* by Timothy Snyder, Basic Books, New York, NY, 2010, ISBN 978-0465002399.

1.4.1.2 When Economic Policies Go Wrong—Mao Zedong

During 1958-61 there was a famine in China that is estimated to have killed 30 million people. Those deaths were largely due to the Chinese leader Mao

Zedong's failed economic policy—grandly called "the great leap forward"—of the forced industrialization of China's agricultural economy.

For more on Mao's policies and the famine that they caused please read:

- Tombstone: The Great Chinese Famine, 1958-1962 by Yang Jisheng, Farrar, Straus and Giroux, New York, NY, 2012, ISBN 978-0374277932.
- Hungry Ghosts: Mao's Secret Famine by Jasper Becker, Free Press, New York, NY, 1996, ISBN: 068483457X.
- Mao's Great Famine: The History of China's Most Devastating Catastrophe by Frank Dikotter, Walker & Co., New York, NY, 2010, ISBN: 978-0-8027-7768-3.

1.5 How Do Economists Do What They Are Expected to Do?

1.5.1 Economists make simplifying assumptions

The simplifications help economists make predictions about the likely consequences of different policy options.

Economists usually disagree about their predictions. This is because different economists make different simplifying assumptions.

They try to use data to sort out their disagreements. If all goes well, economists may come up with unambiguous and useful advice for policy makers.

An actual economy is extremely complex. So, it is hard to think about how it would respond to, say, an increase in income tax rates. Therefore, it would be hard to make even a theoretical prediction of a tax hike's effect on, say, the unemployment rate.[1] So economists need to make simplifying assumptions in their analyses. They need to imagine a simpler economy because it might be easier to make a prediction for the simplified imaginary economy than for the complex actual economy.

These simplifying assumptions must be very carefully chosen, however, so that the hypothetical simplified economy is not too dissimilar to the actual economy, and is, at the same time, easier to analyze than the actual economy.

1.5.1.1 Predictions: Examples

- If income tax rates are increased, the nation's unemployment rate will increase.
- If Florida has a severe winter, the price of orange juice will increase.

[1] Remember, this is the sort of prediction that the nation might need.

- If the price of imported oil goes up, the nation's gross domestic product will decrease.
- If the tax per airline ticket is increased, the price of hotel rooms will decrease.

1.5.1.2 Predictions: Disagreements Are Inevitable

There is no universally accepted way for economists to decide which simplifying assumptions are the most appropriate. Different economists when asked the same question—say, How will an income tax hike affect unemployment?—may make different simplifying assumptions in their analyses. Therefore, they may end up making different predictions.

1.5.1.3 Data Helps to Sort Out Disagreements

When economists disagree, the right kind of historical evidence may help them decide which economist's prediction to trust. A large part of the economist's job is to dig up evidence from the past, and use the evidence to test the clashing theories that various economists may propose.

1.6 Why Does the Economist's Method Sometimes Fail?

We have just seen that different economists may give different answers (predictions) for the same question. Those disagreements can't always be sorted out. (Why?) This leaves the general public puzzled and annoyed.

1.6.1 Economists' Disagreements Can't Always Be Sorted Out

Often there isn't enough data. When there isn't enough data, one may not be able to choose between clashing theories or predictions.

Economists generally can't do experiments. Even if there is a lot of historical data, there is no guarantee that a study of the past will help in identifying the best theory or prediction. If you toss a coin ten thousand times, you would be no better at predicting the ten thousand and first toss as you were at predicting the first toss.

1.7 What Is Macroeconomics? What Is Microeconomics?

Macroeconomics deals with questions about variables that describe the economy of an entire nation. Microeconomics deals with questions related to individual

economic agents, such as households and firms.

1.7.1 Macroeconomics

Macroeconomics deals with issues related to data that give summary descriptions of the economy of an entire nation. A macroeconomist would ponder questions such as: What would happen to Uzbekistan's unemployment rate if Japan suddenly stops trading with Uzbekistan and what policy should the government of Uzbekistan then follow? The focus would always be on Uzbekistan as a whole.

1.7.2 Microeconomics

Microeconomics deals with questions related to economic variables that describe a sub-national entity, typically individual economic agents, such as households and firms.

1.7.3 Macro and Micro Are Related

One cannot really do macroeconomics without simultaneously doing microeconomics. One cannot analyze an economy without studying the behavior of the individual economic units that make up that economy.

Conversely, the decisions by individuals are often guided by their expectations about incomes, interest rates, inflation, and the like. And these expectations cannot be understood without an analysis of the economy as a whole.

However, in macroeconomics the microeconomic underpinnings are de-emphasized. Conversely, in microeconomics the macroeconomic foundations of people's expectations are de-emphasized.

This course focuses on microeconomics.

Chapter 2

The Gains from Trade

2.1 Chapter Outline

- Why study trade?
- Why Do We Trade?
  - Because our preferences are different
  - Because we are differently endowed with skills, technologies, and natural resources
    - Opportunity costs and trade
    - Comparative advantage and the gains from trade
    - Opportunity costs and technology
    - Graphing production possibilities
  - Because there are efficiency advantages to doing one thing rather than many things

2.2 Why Should We Study Trade?

People trade with each other—a lot. Do you know anyone who makes all the things he or she consumes? To understand our world we need to understand why people trade so much. We need to understand whether trade is good for us or bad for us. Understanding this is important precisely because we trade a lot.

2.3 Why Do We Trade?

- Because our preferences are different.
- Because we are differently endowed with skills, technologies, and natural resources.
- Because there are efficiency advantages to doing one thing rather than many things.

2.3.1 Why Do We Trade? Because Our Preferences are Different

Imagine a two-country world. Fishing is the only work people do. When people go out to catch fish, equal amounts of salmon and cod always get caught in the nets. The two countries are identical except for different preferences: People in one country like salmon and people in the other country like cod.

Naturally, this difference in preferences will lead to trade: the salmon lovers will export the cod they catch to the cod lovers, and vice versa.

But, this kind of trade is not very relevant to the world we live in. So, I'll move on.

2.3.2 Why Do We Trade? Because we are differently endowed with skills, technologies, and natural resources

2.3.2.1 Imagine a simplified version of our world

Imagine a world with:

- only two goods: potatoes and meat, and
- only two people: a potato farmer and a cattle rancher.

What amounts of each good should each of them produce? Should they trade?

2.3.2.1.1 Quick Detour

Why am I assuming a world with only two goods and only two people? We have seen in Chapter **??** that simplicity is often key to clarifying an idea.But in that case why not assume a world with just one good and/or just one person?

2.3.2.2 Make or Buy?

If you want something, should you make it yourself? Or should you make something else and then trade it for the thing you need?

To understand whether a person would make a particular thing or buy it from another person, we need to compare, for that person, the cost of making it with

the price of buying it (from the other person). So, let us begin with the cost of making a thing.

2.3.2.3 Opportunity Cost

In our story, the farmer can produce both meat and potatoes. However, as the farmer has a finite amount of the resources needed for production, a one-unit increase in his meat production will cause a decrease in his potato production The decrease in the farmer's potato production that is caused by a one-unit increase in his meat production is his opportunity cost of meat.

Note that the opportunity cost is not measured in dollars. The opportunity cost of additional meat production is measured by the amount of potato production that is sacrificed.

2.3.2.4 Opportunity Cost: Generalized

Stepping away briefly from our meat-potatoes example … The opportunity cost of obtaining some thing is everything that you'll have to give up to get that thing.

Can you apply the concept of opportunity cost to your own life? What is the opportunity cost, for you, of taking an additional math course? List all the activities you normally engage in every day. Think about all the sacrifices you will have to make if you were to enroll in an additional math course. That's your opportunity cost of taking an additional math course this semester.

2.3.2.5 Opportunity Cost and Trade: What if we were all pretty similar?

Suppose the opportunity cost of an ounce of meat is 3 ounces of potatoes for both Farmer and Rancher. Will they trade?

No. Trade would be pointless in this case.

One can easily imagine our Farmer making the following piych to our Rancher: "For me, the cost of making 1 ounce of meat is 3 ounces of potatoes. I'll buy 1 ounce of meat from you if you charge a price that is less than 3 ounces of potatoes. Deal?"

This is probably how our Rancher will respond: "For me, the cost of making 1 ounce of meat is 3 ounces of potatoes. So, I can sell you 1 ounce of meat only for a price that is more than 3 ounces of potatoes. So, sorry, no deal!"

This exchange illustrates the idea that trade is pointless when opportunity costs are the same for all producers.

Key idea: If people have similar opportunity costs for some commodity, then they would probably not trade in that commodity with each other.

2.3.2.6 Opportunity Cost and Trade: What if we were all pretty different?

Let's change our story a bit. Suppose the opportunity cost of an ounce of meat is 4 ounces of potatoes for Farmer and 2 ounces of potatoes for Rancher. Now, will they trade?

Yes! Rancher will offer to sell meat to farmer at a price between 2 and 4 ounces of potatoes per ounce of meat. Farmer will gladly accept. Both farmer and rancher will be better off.

One can easily imagine our Farmer making the following piych to our Rancher: "For me, the cost of making 1 ounce of meat is 4 ounces of potatoes. I'll buy 1 ounce of meat from you if you charge a price that is less than 4 ounces of potatoes. Deal?"

And this is probably how our Rancher will respond: "For me, the cost of making 1 ounce of meat is 2 ounces of potatoes. So, I can sell you 1 ounce of meat only for a price that is more than 2 ounces of potatoes. Deal!"

Rancher will offer to sell meat to farmer at a price between 2 and 4 ounces of potatoes per ounce of meat. Farmer will gladly accept. Rancher will increase his meat production … and, therefore, decrease his potato production. Rancher will sell meat to Farmer and get paid in potatoes.

Conversely, Rancher will offer to sell meat to Farmer at a price between 2 and 4 ounces of potatoes per ounce of meat. Farmer will gladly accept. Farmer will increase his potato production … and, therefore, decrease his meat production. Farmer will sell potatoes to Rancher and get paid in meat.

2.3.2.7 Opportunity Cost and Trade: Key Ideas

Our example suggests the following important ideas that connect opportunity costs and trade.

- If people have different opportunity costs for some commodity, then they will trade in that commodity with each other.
- For any commodity, the person whose opportunity cost is lower will be the seller and the person whose opportunity cost is higher will be the buyer.
- The price at which the trading occurs will be somewhere between the two traders' opportunity costs.
- When trade becomes possible, every producer increases his production of the commodity for which his opportunity cost is lower … and decreases his production of the commodity for which his opportunity cost is higher.
- Trade causes people to do more of what they do well and less of what they don't do well. This is the key reason why we trade so much.

2.3.2.8 Comparative Advantage

Key Definition: The producer with the lower opportunity cost in the production of a commodity is said to have a comparative advantage in the production of that commodity.

In our example, in potato production, Farmer has the comparative advantage. In meat production, Rancher has the comparative advantage.

Trade makes people specialize in the production of the good they have a comparative advantage in. In our example, Rancher has a comparative advantage in producing meat. Trade gives the rancher the incentive to expand meat production for sale (export) to the farmer. That is, trade gives the rancher the incentive to specialize in what he does best.

2.3.3 Comparative advantage and the gains from trade

Why Is Trade Good for Us? In our example, trade benefits both the Farmer and the Rancher by enabling each person to do only what he is better suited to do. Imagine what it would be like if you were required to produce everything that you needed. The situation would be similarly awful for a country that either chose not to trade with other countries or was forced to end all trade with other countries.

2.3.3.1 Theory of Comparative Advantage

The Theory of Comparative Advantage says that if each person specializes in producing what he or she has a comparative advantage in, then total production of every good can increase. As a result, trade can benefit everybody.

In our example, the theory says that if Farmer specializes in potatoes and Rancher specializes in meat, the total production of meat can be increased and the total production of potatoes can also be increased. As a result, if Rancher and Farmer then trade, they could both benefit. But is this theory true? Theory of Comparative Advantage—Proof Suppose Farmer increases his production of potatoes by 4 ounces. Then, according to Table 1, his production of meat must decrease by 1 ounce. Suppose Rancher increases his production of meat by 1.5 ounces. Then his production of potatoes must decrease by 3 ounces. Therefore, by making these two people specialize according to their comparative advantages, it is possible to increase the total output of meat by 0.5 ounces and of potatoes by 1 ounce. Wow! We have just witnessed a miracle—the miracle of trade. For an individual, it is impossible to make more of one good without making less of some other good. But for the world as a whole, it is possible to produce more of all goods simultaneously if we embrace trade. The Legacy of Adam Smith and David Ricardo Adam Smith In his 1776 book An Inquiry into the Nature and Causes of the Wealth of Nations, Adam Smith performed a detailed analysis of trade and economic interdependence, which economists still adhere to today. David Ricardo In his 1816 book Principles of Political

Economy and Taxation, David Ricardo developed the principle of comparative advantage as we know it today. Opportunity costs are related to technology Opportunity Costs and Trade We have just seen that opportunity costs are crucial for understanding trade What makes opportunity costs vary from person to person or from country to country? One answer is technology Technology Explains Opportunity Cost Key idea: Different people/countries may have different technologies and this causes them to have different opportunity costs

Let us now see a numerical example of how differences in technology lead to differences in opportunity costs

Production Technologies of the Farmer and Rancher Opportunity Costs of Farmer 1 ounce of meat → 60 minutes. 1 ounce of potatoes → 15 minutes. 4 ounces of potatoes → 60 minutes. Therefore, Farmer's opportunity cost of 1 ounce of meat is 4 ounces of potatoes. Opportunity Costs of Farmer 1 ounce of potatoes → 15 minutes. 1 ounce of meat → 60 minutes. ¼ ounce of meat → 15 minutes. Therefore, Farmer's opportunity cost of 1 ounce of potatoes is ¼ ounces of meat.

Opportunity Costs of Rancher 1 ounce of meat → 20 minutes. 1 ounce of potatoes → 10 minutes. 2 ounces of potatoes → 20 minutes. Therefore, Rancher's opportunity cost of 1 ounce of meat is 2 ounces of potatoes.

Opportunity Costs of Rancher 1 ounce of potatoes → 10 minutes. 1 ounce of meat → 20 minutes. ½ ounce of meat → 10 minutes. Therefore, Rancher 's opportunity cost of 1 ounce of potatoes is ½ ounces of meat.

Reminder: Opportunity Costs and Comparative Advantage Farmer has a comparative advantage in potatoes and Rancher has a comparative advantage in meat. Technological differences are an important reason why we trade To sum up, we have so far seen that Trade happens if and only if opportunity costs vary from person to person (or from country to country) Differences in technological abilities can lead to differences in opportunity costs If you are curious: Absolute Advantage and Comparative Advantage If Farmer can make an ounce of potatoes in less time than Rancher needs to do the same, then Farmer is said to have an absolute advantage in making potatoes On the other hand, as we have seen already, if Farmer can make an ounce of potatoes at a lower opportunity cost than Rancher can, then Farmer is said to have a comparative advantage in making potatoes If you are curious: Absolute Advantage and Comparative Advantage At one point, economists thought that two people would trade if and only if each had an absolute advantage in the production of some commodity. David Ricardo, a nineteenth-century British economist, later showed that absolute advantage is irrelevant. Two people would trade if and only if each had a comparative advantage in the production of some commodity.

Gains from Trade have Nothing to Do with Technological Superiority If you are curious: Absolute Advantage and Comparative Advantage If you are curious: Absolute Advantage and Comparative Advantage If you are curious: Absolute Advantage and Comparative Advantage Exercise: calculation of opportunity