

Economics 111 – Intermediate Microeconomics

Course Outline

Fall 2009

Introduction

What is economics?

A universal definition of what economics 'is' is almost impossible to come up with. Dictionaries say things like with "a social science that studies the production, distribution and consumption of goods and services", but this is too narrow to capture what current economics does, as is the notion that economics deals with "the allocation of scarce resources", though this is closer to the truth.

Perhaps the best definition is that modern economics is the use of a particular set of tools to try and understand outcomes in a variety of social setting. These tools are based on two important principles

- ❖ 'Behavioral principle': People respond to incentives
 - E.g. Wages, corporal punishment, taxes and benefits, risk of infection or injury, profits, sex, effort
- ❖ 'Environmental principle': Environments adjusts to achieve equilibrium
 - E.g. Prices, strategies

The Importance of Incentives and Equilibrium

The first of these principles is pretty intuitive, but is very important in understanding the world around us. If one doesn't think about how people respond to incentives, you can make some really silly errors. The following list shows cases in which policies **may** have unintended consequences

- Reducing rat population by paying people for rat pelts (lead to rat farming)

- Funding fire departments by number of call outs (stopped fire department installing smoke alarms)
- Paying fossil hunters per piece of bone they find (fossil hunters smash bones into tiny pieces)
- Paying architects a percentage of the cost of a project (artificially inflate the cost of the project)
- Paying medical professionals per treatment (reduces preventative medicine)
- Increasing wages to encourage people to work more (increase in income can lead people to 'buy' more leisure and work less)
- Making it hard to fire people to reduce unemployment (stops firms hiring workers, increasing unemployment)

The idea of equilibrium is harder to explain, but can be equally vital in understanding the effects of policies that we might want to implement. The following example illustrates the idea of equilibrium, and why it can be important.:

Everyone who lives in the town of Rotherham (pop. 200) works in the city of Sheffield. There are two roads that go between the two towns: A highway, which is longer, but has a very high capacity for cars and so never has any congestion. This route takes 1 hr, however many cars use it. The second is a small, direct road, which suffers from congestion. The time taken to use this road depends on the number of cars using it: specifically, the length of time taken is 30 minutes +1 minute per other car using the route. Imagine you are choosing which route to take: when would you take the small road and when would you take the highway? Presumably you would take the small road if it was quicker: in other words, if less than 30 cars were also taking the small road, you would want to take it as well, otherwise you would take the highway.

When is this system 'at equilibrium'? Well, if less than 30 people are currently using the smaller road, then everyone on the highway would rather have taken the small road, as it is quicker. However, if more than 30 people are using the small road, then everyone would rather take the highway. The only case in which everyone is happy with their decision is when exactly 30 people take the small road. In this case, this is what an economist would call the equilibrium outcome, with the implicit assumption that this is how things will work out.

Now imagine that the local council in Rotherham decides to improve the lot of its population by expanding the road between the two cities, to speed up commute time. They add an extra lane to the road in order to reduce congestion, meaning that journey times are now 30 minutes + 0.5 minutes per car.

What will the result of this improvement be? Well, if only the people who were currently using the small road continued to do so, journey times on that road would decrease from 1 hour to 45 minutes. But this is ignoring the *equilibrium* effect of the policy. Imagine that, before the improvement you were a highway user. After the improvement, you are going to see that using the small road would be much quicker, so you are going to switch to using this road. This process will continue until the new equilibrium is reached, where it takes the same time on the highway and the small road. This will be when 60 cars are taking the small road, and the travel time is once again 1 hr using either route. The benefit of the improvement is zero!

The Tools of the Economist

In this class, we will learn the tools that economists have developed in order to analyze the effect of incentives within the framework of equilibrium analysis. These will take the form of three sets of tools:

1. **Optimization:** We will generally assume that the agents in our model behave as if they are maximizing a well specified mathematical function that describes what they care about. In the case of individuals, this will be a utility function. In the case of firms, this will be profits. These agents will also have constraints – what they can afford in the case of individuals, and what is technologically feasible in the case of firms. We will therefore be making use of the mathematical tools of constrained optimization to understand the effect of incentives on behavior.
2. **Market Equilibrium:** We will actually make use of two different equilibrium concepts during this course. The first, which I call *market equilibrium*, thinks about the case in which firms and individuals trade goods and services at market prices. No individual firm or individual is big enough to affect these prices themselves, so they take these prices as given, and then choose how much to buy, sell and produce based on these prices. Market

equilibrium assumes that these prices adjust to create an equilibrium – the amount of each good that people want to buy is equal to the amount that people want to sell

3. **Game Theory:** Of course, there are lots of cases where the assumptions of small firms and individuals that have to take prices as given is not a good one (think Pepsi and Coke). In this case, the choices that an individual firm (or individual) makes will *directly* affect other agents, who will in turn change what they do, which will feed back onto the original agent. Examining such situations is the realm of game theory – the study of strategic interaction

The Tyranny of Economics

Between them, these tools can be, and have been, used to study a vast number of different phenomena - far beyond what you might think of as 'traditional' economics. While in the past, economics *did* tend to restrict itself to traditional topics (prices and quantities of goods, international trade, the effect of taxes, asset prices and the like), these days there seems to be no limit to the type of questions being addressed with these tools. This effect has been described as 'the tyranny of economics' and can be illustrated by looking at how economics articles have changed over time. Here is a typical selection of articles published in the *American Economic Review* in 1911:

- *Agricultural Credit in the United States* by E. W. Kemmerer
- *Will the Present Upward Trend of World Prices Continue?* by Irvin Fisher
- *The Report of the Tariff Board on Cotton Manufacturers* by Melvin T. Copeland
- *The Report of the Tariff Board on Wool and Woolens* by F.W. Taussig
- *Marketing of Agricultural Lands in Minnesota and North Dakota* by John Lee Coulter
- *Profit on National Bank Notes* by Spurgeon Bell

In contrast, some of the articles published recently include

- *The Impact of Legalized Abortion on Crime* by John Donohue and Steven Levitt
- *Corruption, Norms, and Legal Enforcement: Evidence from UN Diplomatic Parking Tickets* by Ray Fisman and Edward Mipguel

- *Racial Preferences in Dating: Evidence from a Speed Dating Experiment* by Ray Fisman, Sheena Iyengar, Emir Kamenica and Itamar Simonsen
- *A Theory of Rational Addiction* by Gary Becker and Kevin Murphy
- *Professionals (soccer players) Play MinMax* by Ignacio Palacios-Huerta
- *The Endowment Effect in Capuchin Monkeys* by Keith Chen, Venkat Lakshminarayanan and Laurie Santos

Limits of economics

While the breadth of subjects that economists have tackled has expanded over recent years, some have started to question whether there are fundamental flaws in the approaches that economists use. The failure of ‘mainstream’ economics to predict the recent financial crisis has only sharpened these criticisms.

Many (but not all) of the perceived problems with economics come from the assumption that people are rational agents who act in order to maximize a well specified utility function. Moreover, this utility function is usually assumed to be selfish, stable, reference independent and so on – assumptions that can seem absurd to non-economists.

The truth is that economics is based on models, or simplistic abstractions about how the world works. This has to be the case – it would be impossible to write down a solvable model that captured EVERYTHING that is happening in the world. A famous quote about models is the following:

“All models are lies: the art is telling useful lies”

(This is actually the title of a paper by two astrophysicists called Kilminster and Judd, so this is not a problem restricted to economics).

And in fact, the models that we study in this course have turned out to be *fantastically* useful lies in all sorts of situations (something I hope to make obvious throughout the course). However, these models do have their limitations, and these limitations can be important. Again, we will discuss some of these limitations as we go along.

Because the phenomena that economics tries to understand involve human behavior, which is inherently difficult to predict, the results that we get from our models carry more caveats than those that come from, say, physics. There are few hard and fast results which apply in almost all situations – in other words there are few equivalents of Newton’s laws, which are (very good, but incorrect) approximations of the way the world works that hold in a large number of different situations. A danger of a course such as this is that, in 10 years time you remember only vague generalizations such as “markets are good” or “minimum wages create unemployment” or “governments should not be involved in healthcare provision”. Nothing you learn in this course will allow you to make such sweeping conclusions. Rather, they will give you the tools to start getting involved in the debate.

Such generalizations are particularly dangerous in cases where economics is taken as ‘normative’, or making statements about what policymakers *should* do. This is distinct from ‘positive’ economics, which attempts to describe what people *do* do. The assumptions that are necessary to make normative statements from economic models are much stronger than those needed to make positive statements, and may in many cases be unjustified. Again, this is something that we will discuss as we go along.

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