Lecture Notes: Chapter 3: Thinking Like an Economist

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Understanding Macroeconomics

In a way, learning an intellectual discipline like macroeconomics is similar to learning a new language or being initiated into a club. Economists' way of thinking allows us to see the economy more sharply and clearly than before. (Of course, it can also cause us to miss certain relationships that are hard to quantify or hard to think of as purchases and sales; that is why economics is not the only social science, and we need sociologists, political scientists, historians, psychologists, and anthropologists as well.) In this chapter we will survey the intellectual landmarks of economists' system of thought, in order to help you orient yourself in the mental landscape of macroeconomics.

Economics: Is It a Science?

If you are coming to economics from a background in the *natural sciences* you probably expect economics to be something like a natural science, only less so. To the extent that it works, it works more or less like chemistry, though it does not work as well. Economic theories are unsettled and poorly described. Economists' predictions are often wrong.

If you hold these opinions, you are half-right. While economics is a science, it is not a *natural* science. It is a *social* science. Its subject is not electrons or elements, but human beings: people and how they behave. This subject matter has several important consequences. Some of them make economics easier than a natural science, some of them make economics harder than a natural science, and some of them just make it different.

First, because economics is a social science, debates within economics last a lot longer and are *much* less likely to end in a clear consensus than in the natural sciences. The major reason is that different people have different views of what makes a free, a good, a just, or a well-ordered society. They look for an economy that harmonizes with their

vision of what a society should be. They ignore or explain away facts that turn out to be inconvenient for their particular political views. People are, after all, only human.

Economists *try* to approach the objectivity that characterizes most work in the natural sciences. After all, what is, is; and what is not, is not. Even if wishful thinking or predispositions contaminate the results of a single study, later studies can correct the error. But economists never approach the unanimity with which physicists embraced the theory of relativity, chemists embraced the oxygen theory of combustion, and biologists rejected the Lamarckian inheritance of acquired characteristics. Biology departments do not have Lamarckians. Chemistry departments do not have phlogistonists. But economics departments do have a wide variety of points of view and schools of thought.

Second, the fact that economics is about people means that economists cannot ethically undertake large-scale experiments. Economists cannot set up special situations in which potential sources of disturbance are reduced to a minimum, then observe what happens, and generalize from the results of the experiment (where sources of disturbance are absent) to what happens in the world (where sources of disturbance are common). Thus the experimental method, the driver of rapid progress in many of the natural sciences, is lacking in economics. This flaw makes economics harder to do, and it makes economists' conclusions much more tentative and subject to dispute.

Third, the subjects economists study--people--have minds of their own. They observe what is going on around them, plan for the future, and take steps to avoid future consequences that they foresee and fear will be unpleasant. At times they simply do what they want, just because they feel like doing it. Thus in economists' analyses the present often depends not just on the past but on the future as well--or rather on what people expect the future to be. Box 3.1 presents one example of this: it describes how people's expectations of the future and particularly their fear that there might be a depression contributed to the coming of the Great Depression of the 1930s.

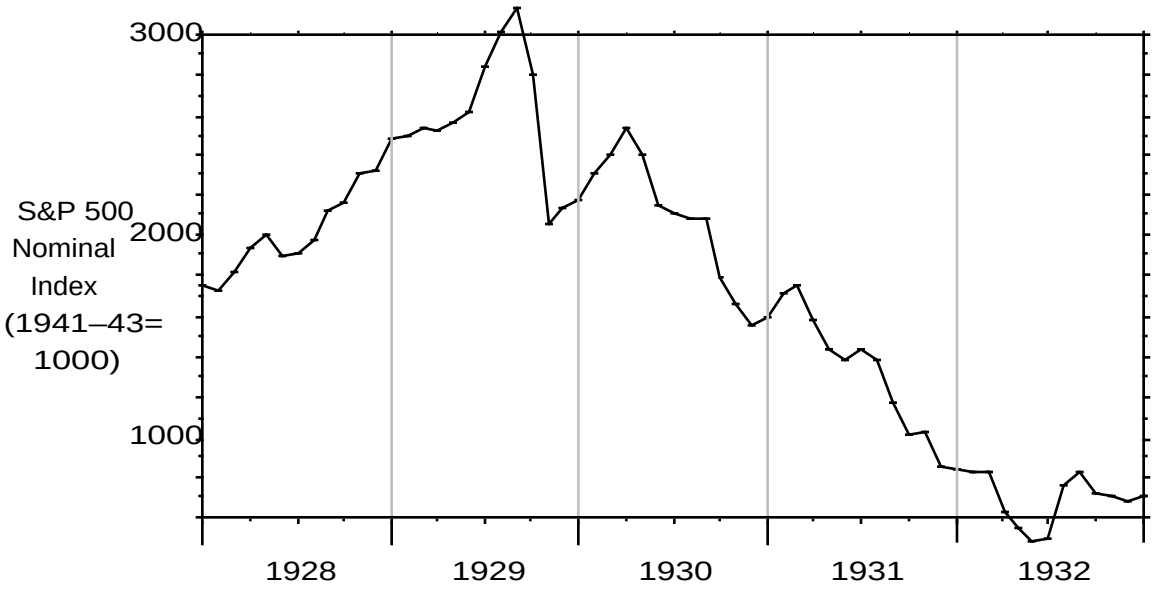
This third wrinkle makes economics in some sense very hard. Natural scientists can always assume the arrow of causality points from the past to the future. In economics people's expectations of the future means that the arrow of causality often points the other way, from the (anticipated) future back to the present.

Expectations and the Coming of the Great Depression

An important example of how people's expectations can change the course of economic events comes from the stock market crash of 1929. The crash changed what Americans expected about the future of the economy, and the shifts in spending caused by these changes in expectations played a key role in causing the greatest economic depression in American history, the Great Depression.

On October 29, 1929,the price of shares traded on the New York Stock Exchange suffered their largest one-day percentage drop in history. Stock values bounced back a bit initially, but by the end of the week they were down by more than a quarter (see Figure 3.1). Gloom fell over Wall Street. Many people had lost a lot of money.

The Stock Market , 1928-1932



At that time stock ownership was confined to the rich. Middle-class Americans owned little stock. Nonetheless, the crash affected their perceptions of the economy: bad times were coming. Because people expected the economic future to be dimmer, many cut back on spending, especially on big-ticket consumer durables. The 1920s had been the first decade in which consumer credit had been widely available to finance purchases of cars, refrigerators, stoves, and washing machines. With the economic future uncertain, spending on consumer durables collapsed. It made sense to borrow to buy a consumer durable only if you were confident that you could make the payments and pay off the loan. If you thought the economic future might be bad, you had a powerful incentive to avoid debt. And in the short run the easiest way to avoid debt is to not to purchase large consumer durables on credit.

You can probably guess what happened in the months after the crash. Most people simply stopped buying big-ticket items like cars and furniture. This massive drop in demand reduced new orders for goods. The drop in output generated lay-offs in many industries. Even though most people's incomes had not yet changed, their expectations of their future income had.

The drop in demand produced by this shift in expectations helped bring on what people feared, and put America on the path to The Great Depression. The Great Depression happened in large part because people expected something bad to happen. Without that pessimistic shift in expectations triggered by the crash of 1929, there would have been Great Depression.

In spite of the political complications, the non-experimental nature, and the peculiar problems of cause and effect in economics, the discipline remains a *quantitative* science. Most of the relationships that economists study come quantified. Thus economics makes heavy use of arithmetic and algebra, while political science, sociology, and most of history do not. Economics makes heavy use of arithmetic to measure economic variables of interest. Moreover, economists use mathematical *models* to relate these variables.

The American economy is complex: 130 million workers, 10 million firms, and 90 million households buying and selling $24 trillion worth of goods and services a year. Economists must simplify it. To understand this complex phenomenon, they restrict their attention to a very few behavioral relationships--cause-and-effect links between economic quantities--and a handful of equilibrium conditions--that is, conditions that must be satisfied for economic activity to be stable and for supply and demand to be in balance. They attempt to cappture these behavioral relationships and equilibrium conditions in simple algebraic equations and geometric diagrams. Then they try to apply their equations and graphs to the real world, while hoping that their simplifications have not made the model a distorted and faulty guide to how the real world economy works.

Economists call this process of reducing the complexity and variation of the real-world economy into a handful of equations “building a model.” Using these to understand what is going on in the complex real-world economy has been a fruitful intellectual strategy. But model-bulding tends to focus on those variables and relationships that fit easily into the algebraic model. It overlooks other factors.

The Circular Flow of Economic Activity

When economists speak of the "circular flow" of economic activity, they have a definite picture in mind. They see paterns of spending, income, and production as liquid flowing through various sets of pipes. In this extended metaphor, categories of agents in the economy-- all businesses, or the government, or all households--are the pools into and out of which the fluid of purchasing power (i.e., money) flows.

Thus economists think of economic activity--the pattern of production and spending in the economy--as a circular flow of purchasing power through the economy. This circular flow metaphor allows them confidently to predict that changes in one part of the

economy will affect the whole, and in what ways. It allows them to simplify economic behavior, to understand the entire set of decisions taken by different agents in different parts of the economy by thinking of a few typical decisions taken by abstract representative agents.

Income, production, and expenditure can be measured at three different points in the circular flow. Economists measure GDP at the point where consumers, exporters, the government, and firms that are making investments purchases goods and services from businesses. This measurement is real GDP, or total output. It is the total economy-wide production of goods and services. It is the "expenditure side" measure of the circular flow.

Economists also measure the level of economic activity at the point in the circular flow where businesses pay households for the factors of production. Businesses need labor, capital, and natural resources, all factors of production owned directly or indirectly by households. When businesses buy them, they provide households with incomes. This measurement is called total income or national income. It is the "income side" measure of the circular flow.

Third, economists measure the level of economic activity at the point where households decide how to use their income. How much do they save? How much do they pay in taxes? How much do they spend on consumption goods? This measure of the circular flow of economic activity is the "uses of income" measure.

The measure used most often is the expenditure-side measure: the Gross Domestic Product produced by firms and demanded by purchasers. It is estimated by counting up the four components of spending (and sales): consumption, government purchases, investment, and net exports. If we compare the expenditure-side measure of GDP with the income-side or uses-of-income-side measure, we will find that aside from differences created by different accounting conventions they are equal (see Box 3.2). They are equal because the circular flow principle is designed into the National Income and Product Accounts (NIPA). Every expenditure on a final good or service is accounted for as a payment to a business. Every dollar payment that flows into a business is then accounted for as paid out to somebody. It can be paid out as income--wages, fringe benefits, profits,

interest, or rent, or as an expenditure on goods or services of another business that then in its turn purchases factors of production.

What if you want to withdraw your income from the circular flow? Suppose, for instance, you simply take the dollar bills you receive and use them to buy something old and precious from another household--a bar of gold, say. And suppose you keep the bar of gold in your basement. Doesn't that break the circular flow? The answer is that it does not. You no longer have your income, but the household that you bought the gold bar from does. That household will then either spend it on consumption goods, save it, or have it taxed away.

What if you decided to hide the dollar bills themselves in your basement? Doesn't that break the circular flow? The answer is that it does not. The Bureau of Engraving and Printing will notice that the total number of dollar bills circulating in the economy has dropped. It will print up more dollar bills, and hand them to the Treasury. The government will spend these extra dollar bills, and so replace the ones you have hidden. The net effect would be the same as if you had saved that portion of your income by loaning it out to the government and had bought a Treasury bond. There are only two differences between buying a Treasury bond and your basement storage scheme. The first is that you have a stack of dollar bills in your basement rather than a piece of paper with the words "Treasury bond" written on it. The second is that the government does not pay interest on the dollar bills stacked in your basement, but it does pay interest on its bonds. In the circular flow diagram, you have saved this portion of your income, and you have saved it in a relatively pointless way by making the government an interest-free loan.

Markets

Economists often speak as if all economic activity took place in the great open-air marketplaces of medieval merchant cities. Contracts between workers and bosses are made in the “labor market.” All the borrowing of money from and the depositing of money into banks take place in the “money market.” Supply and demand balance in the “goods market.” Indeed, in the market squares of pre-industrial trading cities you could survey the buyers and sellers, and form a good idea of what was being sold for how much.

In using the open-air markets of centuries past as a metaphor for the complex processes of matching and exchange that take place in today's modern industrial economy, economists are assuming that information travels fast enough and that buyers and sellers

are well informed enough that prevailing prices and quantities are *as if* we actually could walk around the perimeter of the marketplace and examine all buyers and sellers in an hour. In most cases this will be a good intellectual bet to make. But some times (for example, in situations of so-called *structural unemployment*) it may not be.

Equilibrium

Economists spend most of their time searching for the state of *equilibrium*--a point or points of balance at which some economic quantity is neither rising nor falling. The dominant metaphor is of an old-fashioned scale whose two pans are in balance. This search for equilibrium is an attempt to simplify the problem. Economis questions are much easier to analyze if we can identify "points of rest" where pressures for economic quantities to rise and fall are evenly balanced. Once the potential points of rest have been identified, economists can figure out how fast economic forces will push the economy to those points of equilibrium. This search for points of equilibrium, followed by an analysis of the speed of adjustment to equilibrium, is the most common way of proceeding in any economic analysis.

Do not, however, forget that this pattern of thought is merely an aid to understanding economic theories and principles. They are not the theories and principles themselves. the theories and principles, in turn, are just aids to understanding the reality; they are not themselves the reality.

Graphs and Equations

In the seventeenth century, the French philosopher and mathematician Rene Descartes spent much of his life demonstrating that graphs and equations are two different representations of the same reality. Specifically, an algebraic equation relating two variables can also be represented as a curve drawn on a graph. Each of the variables in the equation can be thought of as one of the axes of the graph. The set of points whose x-axis value is the first variable and whose y-axis value is the second—that is, the set of points for which the equation holds—makes up the line or a curve on the graph. That line or curve *is* the equation (see Figure 3.5). Thus the solution to a set of two equations is that point on the graph where the two curves that represent the equations intersect. Moreover, you can just as easily move back in the other direction, by thinking of a curve in terms of the equation that generates it. Today economists make very extensive use of these ideas from Rene Descartes's *analytic geometry*.

Just after the end of World War II Professor Paul Samuelson of M.I.T. discovered that many of his students were much more comfortable manipulating diagrams than solving algebraic equations. With diagrams, they could *see* what is going on in a hypothetical economy. Thinking of how a particular curve would shift was often easier than thinking of the consequences of changing the value of the constant term in an equation.

If you find analytic geometry easy and intuitive, then Samuelson's intellectual innovation will make macroeconomics more accessible to you. Behavioral relationships become curves that shift about on a graph. Conditions of economic equilibrium become dots where curves describing two behavioral relationships cross (and thus both behavioral relationships are satisfied). Changes in the state of the economy become movements of a dot. Understanding economic theories and arguments becomes as simple as moving lines and curves around on a graph and looking for the place where the correct two curves intersect. And solving systems of equations becomes easy, as does changing the presuppositions of the problem and noting the results.

If you are not comfortable with analytic geometry, then you need to find other tools to help you think like an economist. Remember that the graphs are merely *tools* to *aid* your understanding. If they don't, then you need to concentrate on understanding and manipulating the algebra, or at understanding and using the verbal descriptions of a problem. Use whatever method feels most comfortable: grab hold of what makes most sense, and recognize that all three are ways of reaching the same conclusions.

Building Models

The American economy is complex: 130 million workers, 10 million firms, and 90 million households all producing $8.5 trillion worth of goods and services a year. Economists have placed the intellectual bet that the best way to understand this complexity is to simplify. Restrict the problem to a very few behavioral relationships--cause-and-effect links between two sets of economic quantities. Look at only a handful of equilibrium conditions--conditions that must be satisfied for economic activity to remain stable. Capture these few behavioral relationships and equilibrium conditions in simple algebraic equations (and use diagrams to represent those equations). See how the mathematical system made up of those equations behaves. Then apply them back to the real world, and hope that the quantifiying and simplifying have not made the model a bad approximation to reality. Economists call this process of focus and analysis "building a model."

Simplification is the essence of model-building. Economists use simple models for two reasons. First, no one really understands excessively complicated models, and model is of little use if economists cannot understand the logic behind a model's prediction. Second, the predictions generated by simple models are nearly as good as the ones generated by more complex models. While the economic models used by the Federal Reserve or the Congressional Budget Office are more complicated than the models presented in this textbook, at the bottom they are clearly cousins of the models used here.

You may have heard that economics is more of an art than a science. This means that the rules for effective and useful model-building--for omitting unnecessary detail and

complexity while retaining the necessary and important relationships--are nowhere written down. In this important respect, economists tend to learn by doing or by example. But there are fundamental steps that almost every successful construction of a macroeconomic model follows. They include the use of representative agents, a focus on opportunity costs in understanding agents' decisions, and careful attention to the effect of people's expectations on events.