Principles of Macroeconomics: April 4, 2012

Notes for the Spring 2012 Instantiation of Economics 1 at U.C. Berkeley

Lecturer: J. Bradford DeLong

MW 11-2, + 2 hours section/week

Version 2.03

Lecture 1

1. Overview of Macroeconomics

A Roadmap for This Half of the Course

What You Will Learn

On the first Friday of May 2007, the U.S. Department of Labor's Bureau of Labor Statistics announced that it estimated that 6,845,000 American adults were (a) actively looking for work and yet (b) without jobs. Three years later, on the first Friday of May 2010, the BLS announced that15,260,000 American adults were looking for work and without jobs. Why did the number of Americans looking for jobs and yet not finding them more than double over that three year period?

On June 30, 2010, the U.S. Congress's Congressional Budget Office announced that if laws remain as they are (except for a few specific changes that Congress is widely regarded as highly likely to pass), then over the next twenty-five years the most likely outcome would be that federal taxes averaged 20.7% of Gross Domestic Product while federal spending averaged 25.5% of GDP, leaving a 4.8% of GDP "fiscal gap" that must be covered somehow, someday. How did qw in the United States—Presidents, Congresses, and voters—get themselves into a situation in which the spending promises for the long run that the government has made so far outstrip the taxes that the government currently raises?

Almost every single Principles of Economics course and textbook has a sharp division about halfway through it: on one side are discussions of choice, supply and demand, and market equilibrium; on the other side are discussions of inflation, unemployment, and total production. Remarkably little is carried over from one side to another. Why is modern American economics—in both courses and textbooks—divided into a "microeconomic" and a "macroeconomic" half?

These are all things that we hope you will learn, questions that you hope, when you finish this lecture and more so when you finish these notes, you should be able to answer. We on the Econ 1 teaching staff all hope that you will be able to:

1. Explain how large fluctuations in the unemployment rate are the result of large changes in the flow of total economy-wide spending—what economists call aggregate demand—relative to the productive capacity of the economy—what economists call potential output.
2. Evaluate whether an economic issue is a "microeconomic" or a "macroeconomic" one.
3. Classify macroeconomic issues by which of the four branches of macroeconomics—depression economics, inflation economics, government budget economics, or growth economics—they fall into.
4. Assess which of the four branches of macroeconomics is most important for understanding and dealing with the country's current economic problems.

as well as answer many other questions.

WHAT IS MACROECONOMICS?

Half of the first-year economics college curriculum is microeconomics: the study of individual workers, investors, firms, markets, and industries in our economy. Half of the first-year economics curriculum is macroeconomics: the study of issues that cannot be analyzed properly without considering the economy as a whole. This chapter starts the macro half. This half should, given the big recession outside and the high level of unemployment in this country and the world starting in 2009, grab and keep your attention.

While studying macroeconomics, watch out for one thing. Some principles, lessons, and techniques from studying microeconomics carry over to macro. But some do not. And the underpinnings of macro are sketchier. There is, with macroeconomics, a certain amount of the construction of an intellectual edifice in midair on shaky foundations. (Economists work diligently to shore up these "microfoundations." But so far there work has not been terribly successful.)

How is macro most different from micro? Microeconomics, most of the time, presumes that the market system as a whole is functioning reasonably well. In its background it presumes that almost all sellers find willing buyers and almost all buyers find willing sellers at prices more-or-less like those they expect. It presumes that, as a rule, contracts made will be fulfilled. It presumes that, as a rule, promises—whether made by governments, financiers, employers, workers, buyers, or sellers—will be kept.

But what if this overriding assumption is wrong? What if the web of connected markets does not work smoothly? And when does the web of connected markets not work smoothly? And why might the web of connected markets not work smoothly?

That is what macroeconomics is for.

The Parts of Macroeconomics

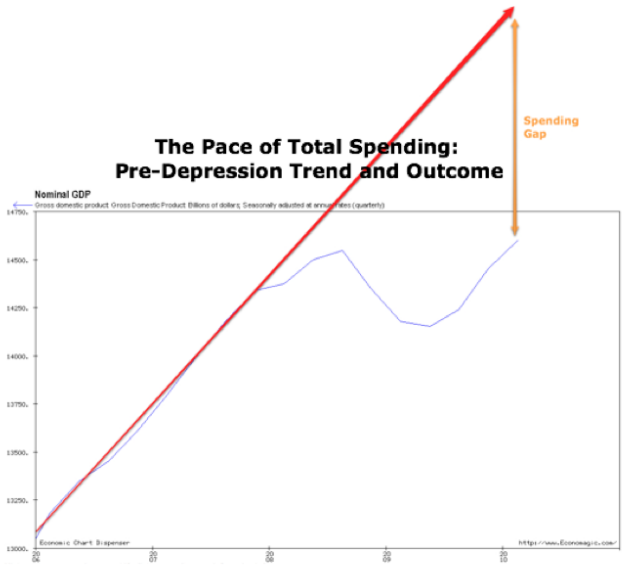
The domain of macroeconomics itself has four topics. Each of them deals with one of four major ways in which the web of markets can fail.

Depression Economics: The first is depression economics. It examines what happens when sellers cannot, generally and on average, find willing buyers at more-or-less the normal prices. The answer is not pretty. It is called recession or depression. This topic should grab you. We entered the deepest economic recession since the Great Depression back in 2007.

In December 2006 63.4% of American adults of working age had jobs. By December 2009 only 58.2% had jobs. Over those three years the unemployment rate jumped from 4.4% to 10.0%. Total production in the economy had stood at a level of $13.06 trillion per year at the end of 2006 (measured in the prices as they stood in 2005). It had then been growing at an average rate of a hair above 3% per year. Thus total production should have stood at $14.3 trillion per year at the end of 2009. It did not: it was $13.1 trillion per year instead—fully 8.5% lower than what three years before we had all expected the level of production to be.

More than 8% of the useful goods and services that we ought to have been making at the end of 2009 were simply not there. They had vanished completely.

This is what happens when the expectation of sellers that they can, generally and on average, find willing buyers at more-or-less the prices that they had expected, goes wrong. It is what happens when, in general and economy-wide, there is excess supply. And it is what happens when—as invariably happens in conditions of macroeconomic excess supply— the assumption that private financiers and entrepreneurs will generally fulfill their contracts and keep their promises goes wrong as well.



The shortfall in economy-wide total spending relative to trend in the United States that is the Great Recession of 2007-2009

Inflation economics: The second part is inflation economics: what happens when buyers cannot find willing sellers at the prices they expected. The answer is that you get situations of moderate inflation. The economy sees full or near-full employment as firms find that they can sell as much as they can produce at prices higher than they expect. But it also sees unsettling and disturbing upward wage-price spirals as workers and managers and consumers change their expectations in order to expect faster general price rises—more inflation—than they had expected before. And then they find that prices are rising even faster than their new expectations had led them to believe.

If the only consequence of a situation of inflation economics were that, year after year, purchasers going to market found that prices were two, three, four, or five percent or so higher than they had been last year, few would complain. An economy in which it is easy for workers to find or change jobs and it is easy for managers to sell what their factories have produced is a comfortable place to be.

The problem arises when managers, workers, and consumers begin to reflect on the process of moderate inflation. If prices have been rising at five percent per year for several years, shouldn't you expect that to continue, and build that into your expectations? And so buyers pay even more, and prices rise by more than they had been expecting them to. And the entire mechanism breaks down, as prices rise more than people had been expecting even though people had been expecting them to rise. The situation can end in a reversal of course as the situation is brought to a close via a dose of depression economics. Or the situation can end in a breakdown of trust in the government and the monetary system.

Government budget economics: The consequences of such breakdowns are the third part of the domain of macroeconomics, which deals with the case in which the macroeconomic market

failure is one of promise-keeping on the part of the government. As the late Milton Friedman put it, for the government to spend is for the government to tax. Whenever the government spends, it is also promising explicitly or implicitly to tax somebody, either in the present or the future, either directly or indirectly, to pay for that purchase. The government can tax now to pay for spending later—and so run a budget surplus. The government can spend now and promise to tax later—and so run a budget deficit and increase the national debt.

But what happens when the government runs up too great a debt and the political system tries to get the government to break its promise to tax? How to guard against such attempted promise-breaking by the government, and what happens when the government attempts such promise-breaking occurs is deficit economics. And once again it is not pretty: capital flight, disinvestment, stagflation, currency collapse, and hyperinflation.

Growth economics: The fourth part does not fit quite as easily as the other three. It is growth economics, the study of how economies grow—or don't grow—in the longer run: how material living standards and labor productivity levels advance, or fail to do so.

Growth economics fits uneasily with the other components of macroeconomics for three reasons.

1. Growth economics is concerned with long-run trends across decades or generations while they are short run, concerned with whether the government is paying its debts or (implicitly or explicitly) defaulting on them, whether workers expecting to find jobs can do so or are disappointed, whether purchasers expecting to buy goods at yesterday's prices can do so or are disappointed, and whether any or all of these are happening right now.

2. Growth economics is concerned with situations in which expectations are generally satisfied while the others are concerned with situations in which expectations are disappointed.

3. Growth economics is concerned with situations in which the economy has recently (where "recently" means something like "the past 200 years") done relatively well, while the other three are concerned with situations in which things are or are near the point of going badly.

Nevertheless, growth economics is similar to the other three. It, too, looks not at an individual market or firm or household or industry but rather at the economy as a whole. It, too, looks at a situation in which market failures are everywhere and of great importance. For this reason Greg Mankiw added it to the "macroeconomics" half of the syllabus in the late 1980s, and it has stuck here ever since.

Thus we have the solution to the puzzle: Why is modern American economics—in both courses and textbooks—divided into a "microeconomic" and a "macroeconomic" half? The solution is that there is a huge divide between those issues in which it is a useful background assumption that the market system as a whole is functioning acceptably, and those issues in which such a background assumption confuses and misleads. Microeconomics deals with issues of the first type. Macroeconomics deals with issues of the second type. To try to mix them up—to fail to set macro apart from micro—could lead to nothing but utter confusion.

Shifting the Focus to the Economy as a Whole

Microeconomics analyzes what goes right and wrong at the level of the individual firm, the individual household, the individual industry, or the individual market. Macroeconomics shifts the focus to the economy as a whole and analyzes what goes right and wrong in the aggregate. It looks at things from a macro perspective, one might say. Hence its name.

The shift in perspective from micro to macro has four sets of consequences that you should note. First, it has consequences for what things are held constant in the analysis. Second, it has consequences for how shifts in the economy can feedback upon and amplify each other. Third, it is far, far easier in macro to wind up in situations in which there are a number of possible ways in which supply could equal demand—and in which the principle that the economy comes to rest where supply equals demand is not of much help. Fourth and last, the expectations of the people living in the economy are much more important pieces of analysis in macro than in micro.

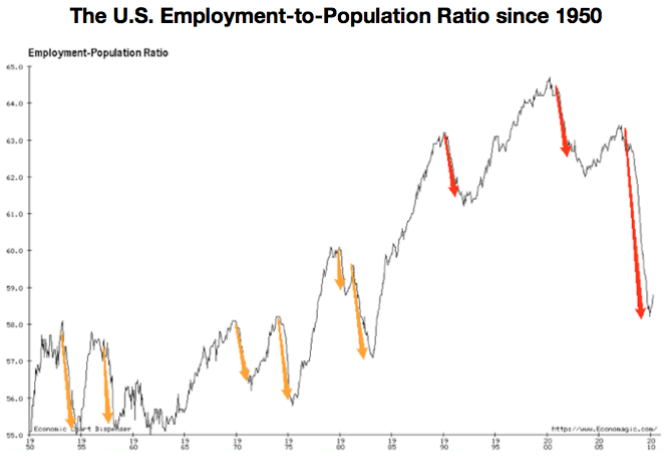
The Importance of Expectations in Macroeconomics

The last of these is worth a little more explanation here. In the microeconomic portions of this book each little market equilibrium was self-contained: there were suppliers and demanders, they had goods to sell and needs to buy, and so all the relevant information for what would happen in the market was right there in front of us. In macroeconomics people are making decisions and plans which depend on what the future is going to be like—and what the future will be like depends on what decisions and plans are made today, and what their consequences are. Thus the questions of how people form their expectations of the future, and how changes in what happens today affect expectations of the future, are absolutely crucial: different ways of forming expectations lead to very different market outcomes, as we will see.

THE FOUR PARTS OF MACROECONOMICS

Depression Economics

In December 2006 63.4% of American adults of working age had jobs. By December 2009 only 58.2% had jobs. Over those same three years the unemployment rate—which looks at a narrower group, not all American adults but only those who say that they are actively looking for work and would take a job if offered one—jumped from 4.4% to 10.0%. Total production in the economy which had stood at a level of $13.06 trillion for each year at the end of 2006 (measured in the prices as they stood in 2005) and which had been growing at an average rate of a hair above 3% per year stood not at $14.3 trillion per year but at $13.1 trillion per



The share of American adults with jobs. From the Department of Labor Bureau of Labor Statistics's Current Population Survey.

year as of the end of 2009—fully 8.5% lower than what three years before we had all expected the level of production to be. More than 8% of the flow of production of useful goods and services that we ought to have been producing and could have been producing at the end of 2009 was gone: vanished completely into thin air.

That fall in the flow of production was the cause of the collapse in the share of American adults who had jobs from 63.4% to 58.2%, and the rise in the unemployment rate—the ratio of those searching for jobs who had not yet found one they should take to the sum of (a) those who had jobs and (b) those who did not have jobs but were searching—to 10%. This "Great Recession" was only the latest, although by far the biggest, of eight similar collapses in employment in America since 1950.

Why this shift, this "Great Recession" in the pace of the flow of production and demand and and the level of employment?

It is not because of any large negative shock to our knowledge about technologies and organizations—not because we have forgotten how to make things or organize ourselves. It is not because of any sudden shortage or exhaustion of natural resources. It is not because of any sudden destruction of national capital stock—of the assembly of produced means of production, of machines and structures that assist and amplify our powers to make and do things. It is not because American workers have lost their taste for labor and prefer to take a great vacation right now: those who have lost their jobs and have not found new ones in this "Great Recession" are for the most part not happy people right now. And it is not because a sudden wave of government regulation or sudden increases in tax rates have disrupted the market economy's productive division of labor—although you can find people who will claim each of these things with straight faces. All of these factors that might under some conditions explain some of a fall in the pace of production and sales, in the level of employment, and in the fraction of the productive capacity of factories that is being used. But not this time.

Instead, the "Great Recession" of the late 2000s was yet another occurrence of a disease that has periodically but irregularly struck industrial market economies since at least 1825: the demand-driven industrial business cycle. Extraordinarily large numbers of people are unemployed in 2009-2010 because aggregate demand is low: there is no demand for the things they might or that they used to make and do. The expectation of sellers that they can, generally and on average, find willing buyers at more-or-less the prices that they had expected, has gone wrong. And, in general and economy-wide, there is excess supply. And because there is macroeconomic excess supply the assumption that private financiers and entrepreneurs will generally fulfill their contracts and keep their promises has gone wrong as well.

In a recession—we generally do not use the word "depression" for anything after World War II, largely because the word sounds too scary—sellers all across the economy find that buyers do not show up in the numbers they had been expecting and so inventories of unsold goods pile up on the shelves. This wave of extra unexpected inventories works its way back through the production chain and producers respond as they usually do to deficient demand: they lay off workers, cut back production, and cut prices. Normally when there is deficient demand for some commodity and hence a glut of it on the market there is excess demand for and hence a shortage of another

one—thus one firm or industry will be hiring workers, increasing production, and raising prices when another is firing, cutting, and lowering. A recession is a general glut: a shortage of aggregate demand and not of demand for only one or only a few commodities. And in a recession the things that producers do to handle a single-commodity glut—firing, cutting back, and lowering—do not help repair the situation but instead work to make matters worse.

One (partial) reason there is low aggregate demand is that so many people are unemployed—and so have reduced incomes, and so can spend less. The feedback loop from lessened aggregate demand to reduced employment to reduced incomes to even further reduced aggregate demand is a vicious circle that makes recessions and depressions worse than they would otherwise be.

But where does the initial deficiency of aggregate demand—the one that caused the first piling-up of inventories unsold on store shelves—come from? You cannot have a downward vicious spiral without an initial push. The answer is that the initial push can come from a number of places, and take a number of forms, but that once the recession begins the process by which deficient aggregate demand is generated and propagates itself is very similar. Investigating that process or propagation and classifying the shocks that produce economic downturns is the subject matter of depression economics.

Thus we have the answer to the puzzle: Why did the number of Americans looking for jobs and yet not finding them more than double over that three year period from 2007-2010? The answer is that the rise in unemployment was the consequence of a collapse in economy-wide aggregate demand: a fall in the pace at which Americans spent their money to buy currently-produced goods and services.

Inflation Economics

Inflation economics deals with times when the economy suffers from the reverse of the problems of depression economics: when there is not a shortage but instead a surplus of overall aggregate demand.

The second part, the subject of the two chapters following those on depression economics, is inflation economics: what happens when it is not true that buyers generally find willing sellers at the prices that they expected. The answer is that you get situations of moderate inflation. Such are characterized by full or near-full employment as firms find that they can sell as much as they can produce at prices higher than they expect. And they are times of climbing wage-price spirals as workers and managers and consumers change their expectations in order to expect faster general price rises—more inflation—than they had expected before. And then they find that prices are rising even faster than their new expectations had led them to believe.

If the only consequence of a small excess of aggregate demand over aggregate supply were that, year after year, purchasers going to market found that prices were two, three, four, or five percent or so higher than they had been last year, few would complain. An economy in which it is easy for workers to find or change jobs and it is easy for managers to sell what their factories have produced is a very comfortable place to be.

The problem arises when managers, workers, and consumers begin to reflect on the process of moderate inflation—of ever rising prices. If prices have been rising at five percent per year for several years, shouldn't you expect that to continue, and build that into your expectations? And then, when people go to market, they find that as long as their is excess aggregate demand their aren't enough goods on the shelves to satisfy demand at expected prices, which are (say) five percent or whatever above what they were last year. And so buyers pay more, and prices rise by more than they had been expecting them to. And then the entire mechanism breaks down, as prices rise more than people had been expecting even though people had been expecting them to rise.

The situation can end in a reversal of course as excess supply is replaced by excess demand and recession, with a larger previous excess of aggregate demand producing a larger subsequent recession. Or the situation can end in a breakdown of trust in the government and the monetary system.

Government Budget Economics

The consequences of such breakdowns in trust are the third part of the domain of macroeconomics. It deals with the case in which the macroeconomic market failure is one of promise-keeping on the part of the government.

As the late economist Milton Friedman put it, for the government to spend is for the government to tax. Whenever the government spends money to purchase something, it is also promising explicitly or implicitly to tax somebody, either in the present or the future, either directly or indirectly, to pay for that purchase. The government can tax now to pay for spending later—and so run a budget surplus. The government can spend now and promise to tax later—and so run a budget deficit and increase the national debt.

But what happens when the government runs up too great a debt and the political system tries to get the government to break its promise to tax, or even when investors and savers and managers and workers and spenders fear that the government will explicitly or implicitly try to break its promises? How to guard against such attempted promise-breaking by the government and what happens when attempted promise-breaking occurs is deficit economics. And once again it is not pretty: capital flight, disinvestment, stagflation, currency collapse, and hyperinflation.

Thus we have the answer to the puzzle: How did United States—Presidents, Congresses, and voters—get themselves into a situation in which the spending promises for the long run that the government has made so far outstrip the taxes that the government currently raises?

The answer is, at bottom, simple from the perspective of an economist who believes that voters are self-interested. Whenever politicians promise to spend now or to cut taxes now and finance the change by raising taxes two generations into the future, there is a good chance that those who financially benefit today from the change in policy will be pleased, and more likely to vote to elect or reelect the politicians. By contrast, there is absolutely no chance that those alive two generations from now who suffer financially from the change in policy will travel back in time to today, illegally register to vote, and vote against the politicians. That governments find themselves with

large long-run projected deficits is not a surprise if you assume at the start that voters and politicians are self-interested: care about becoming richer and getting elected and reelected.

The puzzle, rather, is that episodes in which governments have unstable long-term finances are not much more common. That is what should puzzle economists who believe that voters and politicians are purely self-interested—for if their approach were correct, we would never see a government with a long-term projected budget in balance.

Growth Economics

The fourth part of the domain does not quite fit easily with the other three. It is growth economics, the study of how economies grow—or don't grow—in the longer run. How is it that material living standards and labor productivity levels advance, or fail to do so?

Growth economics fits uneasily with the other components of macroeconomics for three reasons:

1. It is concerned with long-run trends across decades or generations while the other branches are short run, concerned with whether the government is paying its debts or (implicitly or explicitly) defaulting on them, whether workers expecting to find jobs can do so or are disappointed, whether purchasers expecting to buy goods at yesterday's prices can do so or are disappointed, and whether any or all of these are happening right now.

2. It is concerned with situations in which expectations are generally satisfied while the others are concerned with situations in which expectations are disappointed.

3. It is concerned with situations in which the economy has recently (where "recently" means something like "the past 200 years") done relatively well, while the other three are concerned with situations in which things are or are near the point of going badly.

Nevertheless, growth economics is similar to the other three in that it looks not at an individual market or firm or household or industry but rather at the economy as a whole. For this reason Greg Mankiw added it to the "macroeconomics" half of the syllabus in the late 1980s, and it has stuck here ever since.

THE RELATIVE IMPORTANCE OF THESE FOUR PARTS

At the moment of this writing the U.S. unemployment rate at 9.6%. Everybody's focus is on depression economics. The other three parts of macroeconomics—inflation economics, government-debt economics, and long-term growth economics—are definitely in the back of people's minds.

But this will not always be the case.

By the time you are reading this, things may be different. It may well be the case that one of the other three parts has come to the forefront of the news and of the policy debate. So, at least, the pattern has been for the entire past century.

The World War I era focused on inflation, the 1920s focused on growth, and the Great Depression of the 1930s saw the true birth of depression economics. But by the 1940s the pressures of World War II brought inflation to the forefront, followed by a concern about growth in the 1950s and 1960s, about inflation in the 1970s, and about depression economics again in the early 1980s. The late 1980s and early 1990s saw focus on government debt. They were followed by a late 1990s and early 2000s focused, again, more on economic growth than on any of the other three aspects. And then the financial crisis starting in 2007 has brought about the latest turn of the wheel.

So take from this section of the book what is most useful to you. Some of it will be immediately useful and enormously relevant. Some of it will appear to be fusty and outdated. Some of it will appear to come from the outfield. But if history teaches us anything, it is that the only unchaing thing is that things do change.

The odds are that at some point in your life you will find each of the four components of macroeconomics very important for the economy in which you will then be living.

SUMMARY

Macroeconomics is that half of the first-year economics college curriculum that deals with issues that require that the shape of the economy as a whole (rather than an individual industry, commodity, firm, producer, or consumer) be kept in the forefront. Some of the principles, lessons, and techniques from studying microeconomics carry over. Many do not. And the underpinnings, the "microfoundations," of macroeconomics are sketchier and less well-developed than in the rest of economics. The most important feature of macroeconomics is that in it the background assumption that the market system as a whole is functioning relatively smoothly—with buyers finding sellers and sellers finding buyers and contracts being fulfilled, promises kept, and expectations satisfied—does not hold.

The domain of macroeconomics itself has four parts. Depression economics examines what happens when sellers cannot, generally and on average, find willing buyers at more-or-less the normal prices. It is the economics of downturns and high unemployment. Inflation economics examines what happens when buyers cannot find willing sellers at the prices they expected. It is the economics of unsettling and disturbing upward wage-price spirals that disrupt the normal functioning of the market price system. Budget economics deals with the spending and tax promises made by governments, and with what happens when they cannot or do not or it is feared that they will not keep their promises. Growth economics studies how we collectively invest in various ways to make the future richer than the present—and how the market system does not do a good job of appropriately rewarding those whose actions provide for our and our descendants' common future.

At the moment of this writing, with the U.S. unemployment rate at 9.6%, everybody's focus is on depression economics. The other three parts seem much less important. But this will not always be the case. But by the time you are reading this, things may well be different, and one of the other three parts may have come to the forefront of the news and of the policy debate. Explain how large fluctuations in the unemployment rate are the result of large changes in the flow of total economy-wide spending—what economists call aggregate demand—relative to the productive capacity of the economy—what economists call potential output.

By now it should be clear to you whether an economic issue is a "microeconomic" or a "macroeconomic" one. Does it require that you keep your eye on the economy as a whole? Is the presumption that the market system as a whole is working reasonably well satisfied? If your answer to the first question is "yes" and to the second question "no," it is a macroeconomic issue. And it should also be clear which part of macroeconomics is applicable. Is it a problem of the causes of high unemployment? Then it is depression economics. Is the problem one of instability in wage and price levels on the upward side? Then it is inflation economics. Is the government making promises about spending and taxes that people doubt it will be able to or with to keep? That is government budget economics? Does the problem concern whether people have adequate incentives to induce them to provide properly for our and our descendants' common future? That is growth economics.

Look around you. Which of these sets of problems seems most pressing—unemployment, inflation, the government's deficit and the financing of its debt, or economic growth? That tells you which part of macroeconomics you yourself should pay the most attention to.

TEST YOUR KNOWLEDGE

1. What are the big differences between macroeconomics and microeconomics?
2. What are the four component parts of macroeconomics?
3. Why did the employment-to-population ratio fall by nearly five percentage points between 2007 and 2010?
4. Which is the most important part of macroeconomics now?
5. Which will be the most important part of macroeconomics in the future?

Lecture 2

2. Measuring the Macroeconomy *The National Income and Product Accounts*

What You Will Learn

After finishing this lecture you should be able to:

1. Explain what the National Income and Product Accounts—NIPA—are and how economists use them to assess the pace of economic activity.
2. Explain why Gross Domestic Product—GDP—is the most commonly-used measure of the flow of economic activity.
3. Understand what price indexes are for, and distinguish between real and nominal economic quantities.
4. Classify different forms of expenditure, income, and production into their proper places in the NIPA framework.
5. Critique the NIPA as a flawed framework for assessing the pace of economic activity.
6. Use the circular flow principle to understand why, most of the time and in most places, the overall flow of economic activity is reasonably smooth: most buyers find willing sellers, and most sellers find willing buyers.

The Flow of Production and Sales

Production

The U.S. Department of Commerce's Bureau of Economic Analysis has estimated that in the third quarter of 2007—that is, adding up the months of July, August, and September—the United States economy produced goods and services at a rate of $14,179.9 billion worth a year.

That doesn't mean that in July, August, and September we produced $14 trillion plus worth of stuff: we only produced a quarter of that: $3,545.0 billion. What the Bureau of Economic Analysis said was that, if we were to maintain that quarter of the year's pace of production for an entire year, then in that year we would have made $14 trillion plus.

Confused? Don't blame yourself. It is confusing.

The BEA's estimates of the current-dollar value of production—its estimates of nominal Gross Domestic Product—are a flow, not a stock. They are measured in terms of how many dollars worth of stuff are made in a given unit of time.

It is like an automobile's speed: if you drive 60 miles an hour for fifteen minutes—a quarter of an hour—you don't go 60 miles but instead 15. If you produce $3,545.0 billion worth of stuff in three months you are making things and providing services at a rate of $14,179.9 billion per year.

Sales

Not all but almost all of the value of the stuff made in the fourth quarter of 2007 was sold. Nominal gross final sales of domestic product in that quarter proceeded at a rate of $14,148.8 billion per year. The difference between $14,179.9 and $14,148.8—$31.0 billion—is inventory accumulation: the difference between production and sales piles up as "inventories" of goods that firms own but that they want to sell. The inventories of goods that had been produced but had not been sold were greater at the end of September than they had been at the start of July.

How much greater?

If you say $31.0 billion, you are wrong: inventories were growing—inventory investment was proceeding—in the third quarter at a rate of +$31.0 billion *per year*. It proceeded at this pace for three months: a quarter of a year. Increasing business inventories at a pace of +31.0 billion per year for a quarter of a year means that at the end of September the Bureau of Economic Analysis's estimate was that inventories were $31.0 billion per year x 1/4 year = $7.8 billion higher than they had been at the start of July.

How to Keep Track

Be careful. The smartest people in the world at this get confused—one example is Princeton Professor and former Federal Reserve Vice Chair Alan Blinder in the White House, back when he was a member of President Clinton's Council of Economic Advisers: he divided rather than multiplying by four in his head and thus got an answer that was off by a factor of 16, and none of the young hotshots sitting in the room felt sure enough to try to correct him on the spot.

Thus there are three pieces of advice to keep in mind:

1. Don't try to do this stuff in your head—it is just too hard.
2. Remember what your high-school physics teacher said: no naked numbers. Every number that you write down has to come with its units attached to it. If you keep units attached to numbers then it is harder to divide when you should multiply.
3. Do every problem twice, at least.

Remember: just as rate x time = distance, and just as distance/rate = time and distance/time = rate, so flow x time = change in stock and change in stock/time = flow.

Imports and Exports

One more wrinkle. Does the $14,148.8 billion per year of nominal gross final sales of domestic product in the third quarter of 2007 mean that Americans and others resident in the United States were then buying stuff at a rate of $14,148.8 billion a year? No.

Total nominal gross final sales to American residents were at a pace of $14,847.2 billion per year in that quarter.

Where does this difference come from? The difference is net imports: we bought more currently-produced goods and services from foreigners than we sold to them. That is our *trade deficit.* In the fourth quarter of 2007 American businesses sold good and services abroad at a pace of $1,685.2 billion per year, while American residents bought goods and services made outside the United States at a pace of $2,383.6 billion per year. Thus our *trade deficit* in that quarter was at a pace of $698.4 billion per year, our net exports were -$698.4 billion per year. How did we pay for this deficiency of exports relative to imports? Well, in net we sold some of our property and assets to foreigners, and we also borrowed from foreigners.

How much in assets did we sell or borrow?

$698.4 billion?

Again, no.

Our net exports in the third quarter of 2007 were -$698.4 billion *per year*, which means that net foreign investment in the United States was then growing at a pace of $698.4 billion *per year*, which means that over three months net foreign investment in the United States grew by $698.4 billion per year x 1/4 year = $174.6 billion.

NIPA Summary

To the left is a summary table of all the numbers we have talked about for the third quarter, July-September, of 2007.

Production in the Third Quarter of 2007 (Billions of Dollars at Annual Rates)

Gross Domestic Product:	$14,179.9
- change in inventories	$31.0
= final sales of domestic product	$14,148.8
- net exports	- -$698.4
= final sales to domestic purchasers	$14,847.2

Gross exports	$1,685.2
- gross imports	$2,383.6
= net exports	-$698.4

From the Department of Commerce Bureau of Economic Analysis's National Income and Product Accounts.

The measure of the size of the American economy that nearly everybody focuses on and that is referred to the most is the Gross Domestic Product—GDP. The word "product" in this measure is important. It is a measure of how much America's businesses make, not how much they sell—that would be Final Sales of Domestic Product. The difference between the two is, as noted above, the change in inventories: Did businesses as a whole add to or subtract from their stock of goods being made and finished products in transit and waiting on store shelves? Did businesses "invest" in inventories by adding to their stock, or disinvest by reduc-

ing it? If this "inventory investment" item is positive then GDP will be greater than final sales; if this item is negative then GDP will be less.

And GDP is not what Americans buy for their households to use, for their businesses to build up capacity, and for their government to use in its functioning. That would be final sales to domestic purchasers.

Why does everybody focus on GDP rather than on either of the two final sales measures? Mostly for historical reasons: the National Income and Product accounting system was set up before World War II to focus on the "product" measures, and nobody has felt it important to make that change.

Real and Nominal Magnitudes

The $14,179.9 billion per year number that we have been talking about is what economists call a nominal GDP number: a measure of the value in dollars of the production of marketed goods and services. That number was higher in the third quarter of 2007 was higher than it had been a year or two earlier.

In the third quarter of 2006 the pace of nominal GDP had been $13,452.9 billion per year. In the third quarter of 2005 the pace of GDP had been $12,741.6 billion per year. Nominal GDP was thus 11.3% higher in the third quarter of 2007 than it had been two years earlier—a rate of growth in the pace at which America was producing marketed goods and services of 5.6% per year: an average over those two years waiting a year meant that the pace at which the American economy would have been producing sellable stuff—measured in dollars—would be 5.6% higher.

Why this "measured in dollars"? Because the BEA's nominal GDP estimates do not just grow when we produce stuff at a faster rate. They also grow when prices on average go up. Prices are going up and down all the time: some prices rising, some prices falling. But on average, in normal years, more dollar prices are rising than falling. So the BEA's estimates of nominal GDP would grow in an average year even if Americans were not producing any more goods and services.

That means that the answer to the question "is nominal GDP growing?" is not the same as the answer to the question "is America making more valuable goods and services?" We would like the answer to the second question, but the estimates of nominal GDP answer only the first.

And so the BEA has another measure: not nominal GDP measured in dollars but real GDP measured in "constant dollars": real GDP is nominal GDP adjusted for changes over time in the average dollar price of goods and services produced and marketed in the United States.

Ask the BEA what the pace of growth in the rate at which America was producing real marketed goods and services was, and it will tell you that real GDP between the third quarter of 2005 and the third quarter of 2007 grew at a pace of 2.5% per year. The difference between the 2.5% per year rate of growth of real GDP and the 5.6% rate of growth of nominal GDP over the period

2005:III to 2007:III is inflation: the fact that on average the dollar prices that goods and services sold for grew over that interval at a rate of 3.1% per year.

The BEA thus tells us that while nominal GDP was being produced at a pace of $12,741.6 billion per year in the third quarter of 2005, the value of that production at the average prices of 2005 was instead $12,683.6 billion per year—by July-September 2005 prices were a little bit higher than the average price in 2005. And by the third quarter of 2007 the BEA will tell you that while its estimate of nominal GDP is that $14,179.9 billion per year of marketed goods and services were being produced, its estimate of real GDP is that only $13,321.1 billion per year in chained 2005 dollars of marketed goods and services were being produced.

What is this "chained 2005 dollars"?

It is a way of telling us that the BEA is calculating the change in the average of all the prices in the economy in a particular and sophisticated way. It is attempting to separate out those changes in the flow of nominal GDP that are due to increases or decreased in the pace at which valuable goods and services are being produced and hitting the loading dock from those changes in the flow of nominal GDP that are due to increases or decreases in the average level of prices. This is not a straightforward task. If this was a full-year course, at this point it would be time digress into the index-number problem—into why this is not a straightforward task. But this is not a full year course.

The Circular Flow of Economic Activity

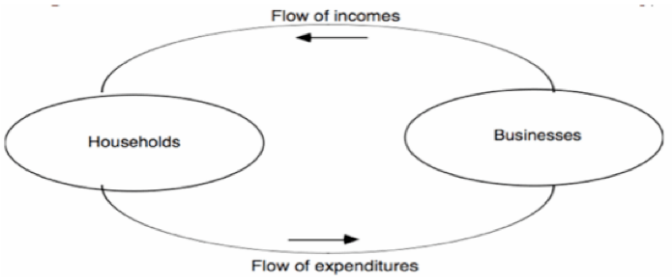
Back at the start of the nineteenth century. a market economy where almost everybody specialized in one particular kind of job was a new thing. For most of human history most people had spent most of their time working to provide for their own households: growing their own food, weaving and sewing their own clothes, building their own houses, with purchases and sales in the market restricted to a relatively small part of total economic activity. But starting in the eighteenth century economic growth brought us to a place where, in northwestern Europe at least, for the first time most of what was produced was not consumed by the household that had made it, but was then sold in the marketplace and the money earned used to buy things that others had made.

This market economy disturbed a great many people. "What if it all went wrong?" they asked. "Could we wind up with a situation in which the yoga instructors were offering too many lessons on achieving inner peace that the weavers couldn't buy, and the weavers had woven too much cloth that the farmers couldn't buy, and that the farmers had grown too much food that the yoga instructors could not buy—so everyone was unable to satisfy their needs because they could not sell what they had produced, and because they could not sell what they had made they could not afford to buy what others had made?"

Say's Law and the Circular Flow

It was French economist Jean-Baptiste Say who first proposed an answer back in 1803. He claimed that such a "general glut" was almost inconceivable, for every seller was also a purchaser. In a market economy, Say argued, every transaction has two sides, and nobody sells without intending to buy, and so purchasing power flows throughout the economy in a circle. Businesses produce and sell because they then intend to spend the money they earn hiring workers and rent capital: what they pay workers and capitalists in wages, salaries, rent, income, and dividends becomes their household incomes. But workers and capitalists only sell and rent their hours and their resources to businesses because they then intend to spend the money they earn buying goods and services. And those goods and services that they buy—well, those are the goods and services that the businesses make. So businesses sell final products to households and buy factor services from households, and households buy final products from and sell factor services to businesses.

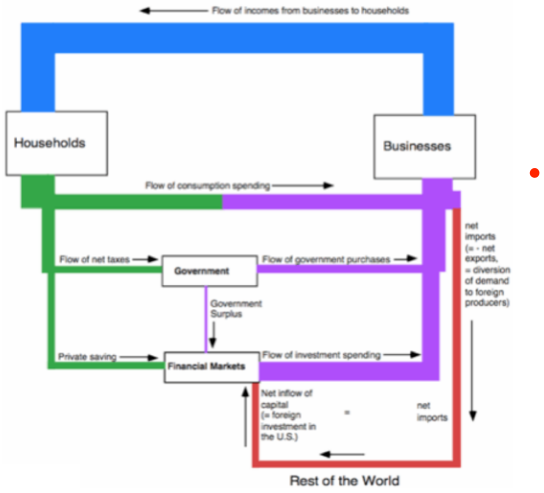
The Circular Flow of Economic Activity



A version of the circular flow diagram. Households spend money buying the products made by businesses, and businesses turn around and spend the same money buying the factors of production that households own—workers' time and attention, finance, the use of land and other natural resources.

We are going to want to keep finer track of the flow of purchasing power through the economy than just to say that households buy things (goods and services) from businesses and businesses buy things (labor-time and capital services) from households. We are going to want to keep track of what happens with the government, with financial market intermediaries, and with the rest of the world as well.

The Circular Flow of Economic Activity II



Another, finer version of the circular flow diagram. Households spend some of their money buying consumption goods, pay money to governments in taxes, and save the rest. Governments take the net taxes they collect and borrow and use the proceeds for government purchases Savings less government borrowing plus the inflow of finance from abroad are spent on investment goods to boost productive capacity. The balancing item is net imports—final demand not satisfied by U.S. but instead by external production, the flip side of external finance to fund investment.

The Components of GDP

So let us start with household spending. Households take their incomes and divide them up into three parts: some they spend buying goods and services from businesses, some they u to pay taxes, and some they save and deposit in financial intermediaries—banks, mutual funds, 401(k) account holders, brokerages, et cetera. In the third quarter of 2007, households spent at a rate of $9,865.6 billion/year on consumption goods and services. Households also paid to governments at a rate of $2,467.8 billion/year in net taxes—the difference between tax checks written to governments and income support checks (like Social Security) written from governments to households. And total private savings were $1,851.9 billion/year: the sum of direct savings by households, and indirect savings on behalf of the households that owned them by businesses that took

some of their profits and decided not to pay them out as dividends but to save them. That was how households disposed of the $14,185.3 billion/year in net incomes they received in the third quarter of 2007

The federal, state, and local governments, in that quarter, took their $2,467.8 billion/year in net taxes, added to it $238.4 billion/year in net government borrowing, and spent $2,700.9 billion/year buying goods and services for the government. "Wait a minute," you say: "2467.8 + 238.4 = 2706.2, not 2700.9." Yep. The difference between 2706.2 and 2700.9 is the "statistical discrepancy." The Commerce Department's Bureau of Economic Analysis does not track ever single purchase and sale in the economy. Rather, it makes estimates. And these estimates are not quite consistent with each other. As long as the statistical discrepancy is small, we are not unhappy.

In the third quarter of 2007, financial intermediaries and businesses received $1,851.9 billion in private savings plus the $698.4 billion/year in net investment in the United States by foreigners. Of this $2,550.2 billion/year total, $238.4 billion/year was loaned to the government, and $2,311.9 billion/year was spent by businesses in gross private investment.

Add up the $9,865.6 billion/year in consumption spending, the $2,700.9 billion/year in government purchases, and the $2,311.9 billion/year in business investment spending, and then subtract off the -$698.4 billion/year in net exports, and we are back to our total of $14,179.8 billion/year for GDP in the third quarter of 2007.

What did the foreigners do with the extra $698.4 billion/year more that they sold us in imports than they bought in exports? Dollar bills are not of much use outside the United States, after all. The answer is that they took them and invested them in the United States: that's the $698.4 billion/year in loans from abroad and purchases of property and assets in the United States that we saw flowing into financial intermediaries above.

Thus we see the kernel of truth in Jean-Baptiste Say's idea: every transaction does have two sides, for every buyer there is a seller, and purchasing power does proceed throughout the economy, greasing a flow of production, sales, income, and purchases that in the U.S. economy now amounts to more than $14 trillion worth of commodities every year. In 1803 Jean-Baptiste Say was confident that nothing would interrupt or disturb this flow. By 1829—after watching the depression of 1825-6 in England—he had a different view. But that is for the next chapter: our first chapter on depression economics proper.

SUMMARY

The National Income and Product Accounts—NIPA—is the accounting system set up in the lat 1930s that economists use to assess the pace of economic activity. It tracks the flow of the production of goods and services. It tracks expenditure by households, businesses, the government, and foreigners on what are called "final" goods and services—that is, products that are not themselves used immediately in further production. And it tracks incomes throughout the economy.

The most-often used piece of the NIPA is the measure of Gross Domestic Product—GDP—which is the most easily-calculated and the most commonly-used measure of the total overall flow of economic activity. It attempts, in an admittedly flawed way, to give a picture of the size of economic activity.

One important additional component of the NIPA is its distinction between "real" and "nominal" economic magnitudes. Nominal magnitudes are spending, production, and income flows as measured in dollars. Real magnitudes are what the same flows of spending, production, and income would be if the average level of prices had not changed between some reference "base year" and today.

The NIPA makes clear that there is a circular flow of economic activity. The sales of one entity are the purchases of another. The expenditures of one entity are the incomes of another. Nobody produces unless they intend to use or to sell, and nobody sells unless they intend to buy. Thus for the most part, most of the time, in most places the flow of production, income, and spending is a balanced and reasonably smooth circular flow: most buyers find willing sellers, and most sellers find willing buyers.

TEST YOUR KNOWLEDGE

1. What is the NIPA?
2. What is GDP?
3. What is the difference between real and nominal GDP?
4. What is the difference between GDP in the fourth quarter of 2007 and the flow of GDP in the fourth quarter of 2007 at an annual rate?
5. What are the components of GDP?
6. What is the circular flow of economic activity?
7. Why should income, spending, and production side measures of GDP all be equal?
8. What is Say's Law?

Lecture 3

3. The Circular Flow and Depression Economics
The Necessity for a Theory of Downturns

What You Will Learn
When you finish this lecture, you will be able to:

1. Explain the relevance of the circular flow principle for the big issues in depression economics.
2. Explain why we need a theory of depression economics.
3. Explain "Say's Law" of the circular flow of economic activity.
4. Explain how the interaction of financial markets with the rest of the economy can lead to the breaking of Say's Law—and thus to economic downturns, recessions, depressions, and episodes of very high cyclical involuntary unemployment.
5. Use the income-expenditure framework to assess how large economic downturns are likely to be.
6. Explain the place of downward price stickiness in helping to generate economic downturns and high unemployment.
7. Evaluate critiques of the framework presented here—i.e., claims that there is really no such thing as involuntary unemployment at all.

The Circular Flow Principle
If I had had more time last time, I would have talked about the circular flow of economic activity. I would have said that back at the start of the nineteenth century a market economy where almost everybody specialized in one particular kind of job was a new thing. For most of human history most people had spent most of their time working to provide for their own households: growing their own food, weaving and sewing their own clothes, building their own houses, with purchases and sales in the market restricted to a relatively small part of total economic activity. But starting in the eighteenth century economic growth brought us to a place where, in northwestern Europe at least, for the first time most of what was produced was not consumed by the household that had made it, but was then sold in the marketplace and the money earned used to buy things that others had made.

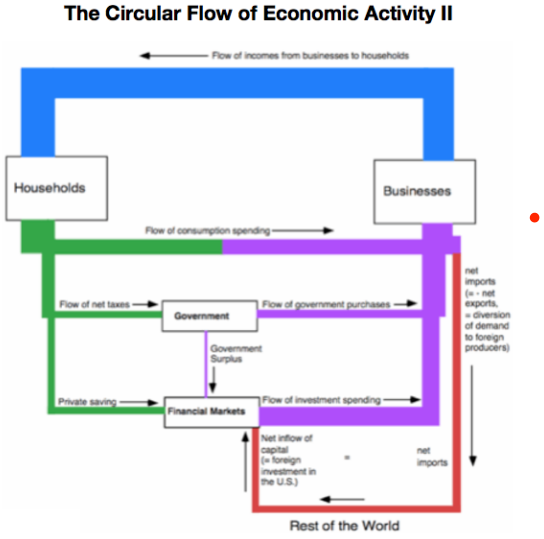
This market economy disturbed a great many people. "What if it all went wrong?" they asked. "Could we wind up with a situation in which the yoga instructors were offering too many lessons

on achieving inner peace that the weavers couldn't buy, and the weavers had woven too much cloth that the farmers couldn't buy, and that the farmers had grown too much food that the yoga instructors could not buy—so everyone was unable to satisfy their needs because they could not sell what they had produced, and because they could not sell what they had made they could not afford to buy what others had made.

Say's Law and the Circular Flow

It was French economist Jean-Baptiste Say who first proposed an answer back in 1803. He claimed that such a "general glut" was almost inconceivable, for every seller was also a purchaser.

In a market economy, Say argued, every transaction has two sides, and nobody sells without intending to buy, and so purchasing power flows throughout the economy in a circle. Businesses produce and sell because they then intend to spend the money they earn hiring workers and rent capital: what they pay workers and capitalists in wages, salaries, rent, income, and dividends becomes their household incomes. But workers and capitalists only sell and rent their hours and their resources to businesses because they then intend to spend the money they earn buying goods and services. And those goods and services that they buy—well, those are the goods and services that the businesses make. So businesses sell final products to households and buy factor services from households, and households buy final products from and sell factor services to businesses.



Another, finer version of the circular flow diagram. Households spend some of their money buying consumption goods, pay money to governments in taxes, and save the rest. Governments take the net taxes they collect and borrow and use the proceeds for government purchases Savings less government borrowing plus the inflow of finance from abroad are spent on investment goods to boost productive capacity. The balancing item is net imports—final demand not satisfied by U.S. but instead by external production, the flip side of external finance to fund investment.

Households take their incomes and divide them up into three parts: some they spend buying goods and services from businesses, some they use to pay taxes, and some they save and deposit in financial intermediaries—banks, mutual funds, 401(k) account holders, brokerages, et cetera. The federal, state, and local governments take their taxes, return some to households as transfer payments, add to net taxes their government borrowing, and spend buying goods and services. Financial interme-

diaries received the private savings from households and the net investment by foreigners, and use that to fund investment to expand capacity by businesses.

Where do foreigners get the dollars that they use to invest in America? They get them by selling us more in imports than they buy in exports. Dollar bills are not of much use outside the United States—so they take them and invest them in the United States.

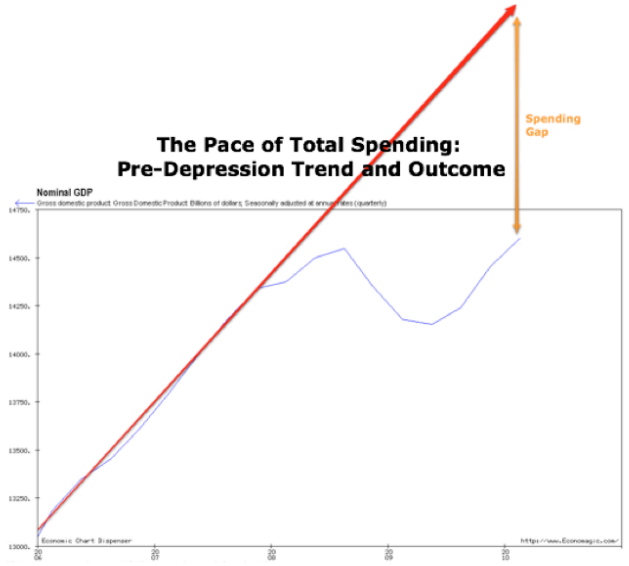
Thus Jean-Baptiste Say in 1803 was right. Every transaction does have two sides. For every buyer there is a seller. Everyone's cost is somebody else's income. And purchasing power does proceed throughout the economy, greasing a flow of production, sales, income, and purchases that in the U.S. economy now amounts to $14 trillion worth of commodities every year.

In 1803 Jean-Baptiste Say was confident that nothing would interrupt or disturb this flow. By 1829—after watching the depression of 1825-6 in England—he had a very different view.

DISRUPTING THE CIRCULAR FLOW

The Coming of the Great Recession

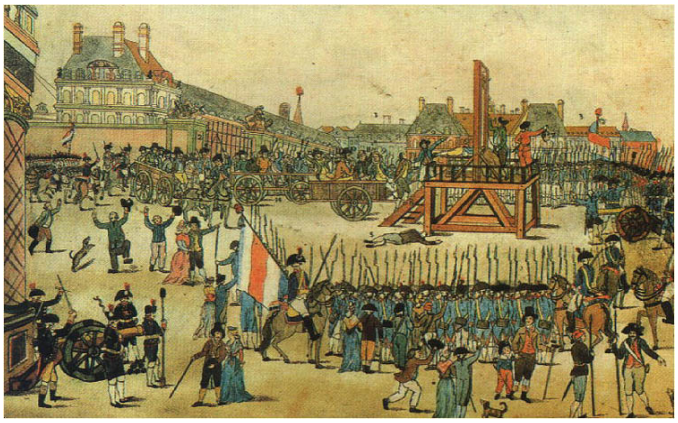
Total production in the economy had stood at a level of $13.06 trillion per each year at the end of 2006 (measured in the prices as they stood in 2005). It had then been growing at an average rate of a hair above 3% per year. People expected it to stand at $14.3 trillion per year as of the end of 2009. But it did not. The flow of production at the end of 2009 was a mere $13.1 trillion per year—fully 8.5% lower than what three years before we had all expected it to reach. More than 8% of the flow of production of useful goods and services that we ought to have been producing and could have been producing at the end of 2009 was not there. It had vanished completely—into thin air.



The shortfall in economy-wide total spending relative to trend in the United States that is the Great Recession of 2007-2009

Economists and the Possibility of a "General Glut"

Normally, whenever there is deficient demand for some commodity—and hence a glut of it on the market—there is excess demand for and hence a shortage of another one. That was what Jean-Baptiste Say was the first to point out.



Say had been special assistant to Tom Paine's friend and France's Girondist Party Secretary of the Treasury Etienne Claviere. Secretary of the Treasury Claviere was then purged, arrested, and imprisoned by Maximilien Robespierre's Mountain Party. He committed suicide in prison the night before his scheduled execution.

Somehow Say escaped the purge of the Girondists with his liberty and, more important, his life.

Say decided, perhaps wisely, to retire from politics and government. He become a theoretical economist. Ten years later he published his first economics book, his Treatise on Political Economy. And thereafter he churned out more and more volumes.

In his 1803 Treatise Say dealt with the possibility of a "general glut," of deficient aggregate demand. He concluded that there could be no such thing. Aggregate demand had to match supply, he wrote, because the only thing that could generate demand was supply:

> it is production which opens a demand for products.... Yonder farmer... can buy none at all [of your woollens] if his crops fail] altogether. Neither can you buy his wool nor his [wheat] yourself, unless you contrive to [first sell] woollens or some other article.... The silver coin you will have received for the sale of your own products and then use to buy those of other people will in the next moment do the same thing for other contracting parties, and so from one to another to infinity.... You will have bought, and everybody will have bought, what you want or desire, each doing so with the value of his own respective products sold and transformed into money for that instant only. Otherwise, how could it be possible that there should now be bought and sold in France five or six times as many commodities as in the miserable reign of King Charles VI? Is it not obvious that five or six times as many commodities must be produced now [as then]. And that they must have served to purchase each other?

This is the circular flow principle of the previous lecture. Households earn money—and they then spend it: it doesn't do them any good if they don't spend it on anything, and "spending" includes buying a bond or putting it into a bank. Businesses receive what households spend, and they then use that money to (a) hire workers, (b) buy things, or (c) distribute to their shareholders as profits: it doesn't do them any good if they in turn do not spend or distribute it. But the spending of businesses hiring workers and the distribution of profits are the incomes of households.

Thus Say argued in 1803 that we didn't have to worry about a lack of aggregate demand. Consider a simple toy model of a three-sector economy—agriculture, industry, and service sectors, and since this is Berkeley let's talk about baristas, potters, and yoga instructors. We thus have baristas who make lattes, potters who make ceramics, and yoga instructors who teach lessons. Can there be a situation in which baristas have brewed more cups of coffee than potters wish to buy

who have made more ceramics than yoga instructors want to buy who are offering more yoga lessons than baristas want to take? Say in 1803 said no. And others have picked up the argument ever since.

Does Excess Supply Here Mean Excess Demand There?

And Say's argument does have at its core the truth that is the circular flow of economic activity. Everybody's expenditure is somebody else's income, and everybody's income is somebody else's expenditure. You cannot earn the money that you will yourself then spend unless you can sell what you are making. And they cannot buy what you have to sell unless you have bought what they are selling. That circular flow seems at first glance to rule out any possibility of a "general glut"—of a general economy-wide excess of supply. Say in 1803 certainly thought that it did so.

But by the end of his career, in his last book, his 1829 *Cours Complet d'Economie Politique Pratique*, Say was singing a very different tune. Describing the British economy's crash and depression of 1825-6 he admitted not only the possibility but the reality of such a "general glut":

> As [the price of] every type of merchandise had sunk below its costs of production, a multitude of workers were without work. Many bankruptcies were declared among merchants and among bankers, who having placed more bills in circulation than their personal wealth could cover, could no longer find guarantees to cover their issues beyond the undertakings of individuals, many of whom had themselves become bankrupt...

And Say's 1829 analysis of how the British economy had then gotten itself so wedged sounds remarkably modern:

> The Bank [of England]... obliged to buy gold back... [t]o limit its losses... forced the return of its banknotes... ceased to put new notes into circulation... was then obliged to cease to discount commercial bills. Provincial banks were in consequence obliged to follow the same course, and commerce found itself deprived at a stroke of the advances... to create new businesses, or to give a lease of life to the old.... [B]usinessmen... obliged to meet [the bills they had issued]... each was forced to use up all the resources at his disposal. They sold goods for half what they had cost. Business assets could not be sold at any price...

But how can it be that the price of everything "had sunk below its cost of production" if everyone's expenditure is somebody else's income, and thus everybody's cost is somebody else's purchasing power? The circular flow principle seems to rule it out.

Disrupting the Circular Flow

It was an economist a generation younger than Jean-Baptiste Say who put his finger on the reason: moral philosopher, libertarian, colonial bureaucrat, feminist, public intellectual, and economist John Stuart Mill put his finger on the answer in a piece he wrote in 1829:

> [T]hose who have... affirmed that there was an excess of all commodities, never pretended... money was one of these.... [P]ersons... at that particular time... [fearing] being called upon to meet sudden demands [for payment], liked better to possess money than any other commodity. Money, consequently, was in request, and all other commodities

> were in comparative disrepute... the result is, that all [other] commodities fall in price, or become unsaleable...

We don't just buy those goods and services that are then currently being produced. We don't at just sell the current flow of services from the labor, the machines and buildings, and the natural resources we own. We add to the current flow of our incomes by selling our assets. We spend our purchasing power not just on the goods and services currently being produced but on financial assets as well.

Thus it is perfectly possible for there to be an excess supply of goods and services—for the current flow of aggregate demand for goods and services to be less than the cost of the goods and services currently being produced—if there is an excess demand for assets. Depressions come, and we need depression economics to analyze, when there is an excess demand for one or more of three particular kinds of financial assets:

1. "Liquid" assets, assets that can be readily and easily used to pay for things, which assets we usually call "money".
2. High-quality assets, assets that are generally regarded as safe ways to store up purchasing power so that it will still be there intact to be used later on—like U.S. Treasury bonds.
3. Long-duration assets, assets that allow us to take some of the money we are earning now and move it back in time away from us into the future.

Whenever there is full employment and yet the population as a whole wants to hold more of any of these types of assets than exist, people try to switch their spending away from spending on currently-produced goods and services and towards accumulating these assets. And that puts downward pressure on employment and production.

That is the important insight. let us see if we can make it—the mechanism of how the economy falls into a depression—clearer:

Consider, first, a normal shift in demand: Berkeleyites decide that they want to spend somewhat less on lattes that make them jumpy, irritable, and stressed. Berkeleyites decide they want to spend somewhat more on yoga lessons in order to seek inner peace. Baristas find that they have brewed more lattes than they can sell. Some cut their prices and see their incomes fall, some cut back on hours, some find themselves unable to buy the shade-grown beans for their next round of production and are unemployed.

Yoga instructors find demand booming.

They schedule extra classes.

They work late into the night chanting "om mani padme hum" to satisfy demand.

They raise their prices.

They take on extra apprentices to help them carry the load.

Prices fall in the coffee industry. Prices rise in the fitness industry. Excess supply of coffee and baristas comes with excess demand for yoga lessons and yoga instructors.

In a short time the economy adjusts.

Labor exits the coffee industry and enters the yoga industry. And in a short while the economy has rebalanced with fewer baristas and more yoga instructors, the structure of production has shifted to accommodate the shift in demand, and there is no more excess unemployment.

But now consider, instead, what Jean-Baptiste Say and John Stuart Mill were talking about in 1829.

Consumers decide that they want to spend somewhat less on lattes purchased from baristas and to hold more cash in their wallets instead. Instead of spending normally, everybody decides to keep at least one $20 in reserve at all times. Those with less than $20 simply stop spending on clothes—until somebody buys some of what they have made and they have more than $20 in their pockets.

What happens?

Well, what happens in the coffee industry is the same thing that happened when there was a shift in demand from caffeine to inner peace. Baristas find that they have brewed more lattes than they can sell. Some cut their prices and see their incomes fall, some cut back on hours, some find themselves unable to buy the beans for their next round of production and are unemployed. Inventories of unsold beans and cold coffee pile up. Entrepreneurs looking at their growing piles of unsold inventory cut back on hours and production even more.

But there is no countervailing increase in spending, employment, and hours for yoga instructors. Things then snowball. The unemployed baristas now have no incomes. They cannot afford to buy as many pots or as many yoga lessons or, indeed, as much of the coffee made by other baristas. Inventories of unsold goods keep rising, and so employers cut back production and employment even more. Thus there is a second-round fall in demand which renders even more people unemployed—and not just weavers this time. And then there is a third round. And so on...

Moreover, everybody sees rising unemployment and falling incomes around them. Can you imagine a better signal to make you decide to try to hold onto more cash? Instead of cutting back on spending on coffee when you have less than $20 in your pocket, people start cutting back on all spending when they have less than $40 in their pocket. And the more the prices at which you can

sell your goods falls and the higher unemployment climbs, the more desperate people are to pile up more cash in their wallets.

In a normal market adjustment—a fall in the demand for lattes and a rise in the demand for inner peace—the workers fired from the coffee industry would rapidly be hired into the yoga instructor industry. But this is not a normal market adjustment: this is depression economics.

How far down does production and employment decline when the economy gets itself into a depression economics state? How high does unemployment rise? Well, employers keep cutting back employment—and thus keep cutting back their workers' incomes—until they are no longer producing more than they can sell and inventories are stable rather than rising. And households keep trying to build up their cash balances until their incomes have fallen so low that they do not think that they dare economize any further to try to boost their cash.

How far is that? To determine how far that is, we need to build another, different economic model—a macroeconomic model.

A Caveat: Not a Consensus Framework

Before we build up our approach, however a digression and a warning: our framework is not a consensus framework. The total-spending-shortfall approach that is law within this course, and that has been the dominant thread in economists' understanding of economic downturns since at least 1829, does not command the attention of all economists. I count at least three four other theories, all of which have at least some adherents to day. And the economists who hold to the total-spending-shortfall approach are themselves divided into what I think of as three sects, but each of those sects has sub-sects, some of whom think their small differences with their neighbors are of vital importance, and so on.

Why is this the case? Why aren't economists able to reach even a rough consensus about their discipline. This is especially true in macroeconomics much more than in microeconomics. This has always been the case. As an economist we have seen before, John Stuart Mill, wrote early in the nineteenth century:

> What was affirmed by Cicero of all things with which philosophy is conversant, may be asserted without scruple of the subject of currency—that there is no opinion so absurd as not to have been maintained by some person of reputation. There even appears to be on this subject a peculiar tenacity of error—a perpetual principle of resuscitation in slain absurdity.

The sects into which the overwhelming bulk of economists who believe in the total-spending-shortfall approach are three. One, monetarists, focus on excess demand for liquid cash money as the principal cause of downturns. A second, Keynesians—although the Swedes say they should be called Wicksellians—focus on excess demand for bonds, excess savings, as the principal cause of downturns. The third who don't have a generally-accepted shorthand name because until recently there were too few of them—we will call them Minskyites—focus on excess demand for safe assets as the principal cause of downturns. But let's postpone that discussion until next time.

The sects that deny that total-spending-shortfalls are at the root of economic downturns are, by my count at least, five. Call them economists who believe that the root of downturn lies in a "great forgetting," a "great vacation,"a "great rusting," a "great confusion," and a "great immobilization," respectively.

"Great forgetting": It is claimed sources of downturns lie in a reduction in productivity—businesses forget how to organize themselves productively, and workers forget how to use technology. Because workers and machines are less productive, it becomes impossible for entrepreneurs to higher them at prevailing wage and rental rates and make a profit. And when entrepreneurs offer lower wage rates, workers decline to work because they would rather have the time off. This theory runs aground on the lived experience of workers and entrepreneurs. Entrepreneurs in downturns do not say that they are cutting back on production because their operations are less efficient: they say that they are cutting back because there is less demand for what they make. Workers do not say that they are happy being unemployed because there is no job at which their skills would add enough value to make it worth their while to work: unemployed workers say that they are sure they could be more than useful to earn their keep at wages they would be more than happy to work at—if only they could find a job.

"Great vacation": It is claimed that workers decide they no longer want to work as long, and wish instead to indulge in much more leisure. (A subcomponent of this is the belief that downturns are the result of unions or minimum wages: but unions today in America are less powerful than they have been in 70 years, and the minimum wage lower as a share of average labor productivity than it has been in half a century.) Again, this theory runs aground on lived experience: the workers without jobs today are overwhelmingly not people who welcome an extra vacation or an early start on retirement.

In a **"great rusting"** a large chunk of the economy's capital stock suddenly becomes obsolete. A possible cause would be, say, a tripling of global energy prices. But nothing like that has happened.

In a **"great confusion"** workers think that the overall level of prices is higher than it is and so they think that businesses aren't offering them high enough wages to induce them to work—but this is perhaps the least plausible explanation of all, because you know what prices you are paying for what you buy. The big advocate of this is the University of Chicago's Robert Lucas, who has spent his career arguing that if only changes in the price level were *anticipated* there would be no downturns because there would be no downward surprises in wages, and changes in wages would be *anticipated* if the changes in the money stock that produce them are *anticipated*. The problem with this is that I have never met anybody who is confused about the relationship between the wages they receive and the prices they pay, and who has quit their job because they wrongly think that their wages are lower relative to the prices that they pay than they are.

Last, in a **"great immobilization"** somehow all the unemployed cannot figure out that they ought to be trying to find jobs in the expanding sectors until they have been unemployed for a very long time first. This comes in "Austrian" and "structural" flavors. It certainly can be true. But when it is you see evidence that labor finds it difficult to move from contracting to expanding

sectors: you see employers in expanding sectors desperate to higher more workers, willing to pay through the nose to do so, and frantically raising wages in expanding sectors in order to attract more qualified applicants. We may see that in three years. We do not see that now.

So I believe that right now Americans' knowledge of technology and organization is as great as it ever was—that there has been no "great forgetting"—that American workers are as eager to work as they ever were—that the unemployed are not taking a "great vacation"—that our capital stock is as useful as it ever was—that there is no "great rusting"—that people know full well what the prices are of the things they buy—and that there is no "great confusion."

I also believe that claims that there is a "great immobilization"—the unemployed workers don't have the skills to take the jobs available, and won't acquire those skills unless forced to by the scourge of poverty and long-term unemployment—are vastly overblown. If there were jobs available that there were no qualified workers to take firms would be trying to fill those jobs. They would be offering to pay qualified workers more. We would see wage and price inflation in the expanding sectors. And we do not.

So now let us turn to a productive model of how economic downturns produced by a generalized shortage of aggregate demand come from: call it the NIPA-based income-expenditure framework.

SUMMARY

Ever since at least 1825 we have had macroeconomic downturns: relatively sudden and substantial falls in production and employment, the effects of which persist for years before production returns to trend and employment returns to normal levels. These downturns are not the result of any collective "forgetting" of technological or organizational knowledge. They are not the result of some sudden change in preferences to work less and enjoy leisure more. They are not the result of some sudden obsolescence of any significant part of the economy's capital stock. They are not the result of the sudden emergence of a mismatch between the skills of the labor force and the requirements of producing the goods and services households and businesses demand—although they can themselves generate such long-run "structural" employment mismatches. And they are not—for the most part—the result of confusion between the value of wages workers can earn and what they think the value of their wages is.

Instead, such downturns are the result of a generalized deficiency of demand for goods and services. People collectively want to buy less of the goods and services currently being produced than they want to make.

This generalized deficiency, this "general glut" requires some explanation: As Jean-Baptiste Say put it back in 1803, nobody makes unless they intend to use or sell, and nobody sells unless they intend to buy. It is perfectly understandable how there can be excess supply of any particular good—how people can plan to buy more houses or washing machines or grapefruits than are currently being made. But excess supply of one good must be balanced by excess demand for another, right? And so labor and machines and buildings and organizations and finance will rela-

tively quickly flow out of those industries where too much is being made and into those industries where too little is being made, right? This would seem to be guaranteed by the circular flow principle: the idea that everybody's sales are somebody else's purchases, that every dollar earned by businesses in sales is passed on to somebody as income, and that every dollar of income winds up as somebody's purchases.

What Say's 1803 argument missed was that people seek not just to buy currently-produced goods or services but also to build up or draw down their stocks of assets—in particular, their stocks of liquid money assets, their stocks of long-duration bond-like assets, and their stocks of safe high-quality assets. Whenever there is planned excess demand for money, for savings vehicles, or for safe assets, there will be a generalized excess supply of currently-produced goods and services—and a downturn in production and employment will follow, as businesses respond to the piling-up of unsold goods and services by firing workers and cutting back production.

TEST YOUR KNOWLEDGE

1. Which early nineteenth-century classical economist—Malthus, Mill, or Say—changed his position on the possibility of "general gluts" over his life, and how did he change it?
2. Why did that classical economist change his mind?
3. What does break Say's Law—why isn't it the case that excess supply of some currently-produced goods and services always is offset by excess demand for some others?
4. What kinds of financial excess demand produce "general gluts"—produce economic downturns and high unemployment rates?