# Principles of Macroeconomics

*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: 70,283 words; 168 pages.*

*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*

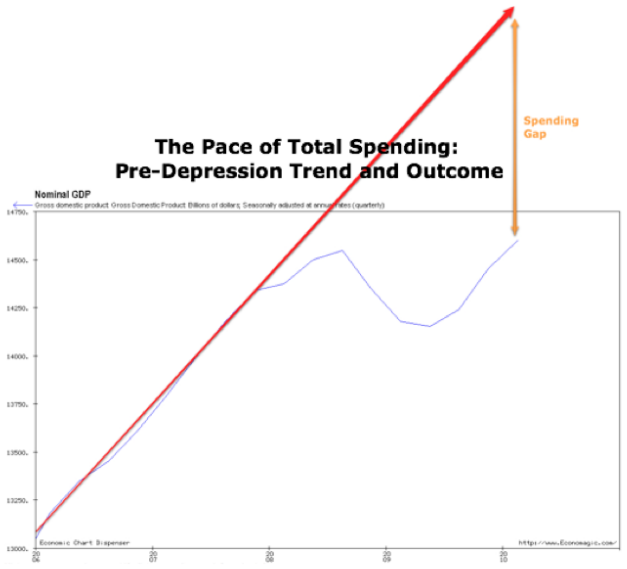
The domain of macroeconomics itself has four topics. Each of them deals with one of four major ways in which the web of markets can fail.

**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.

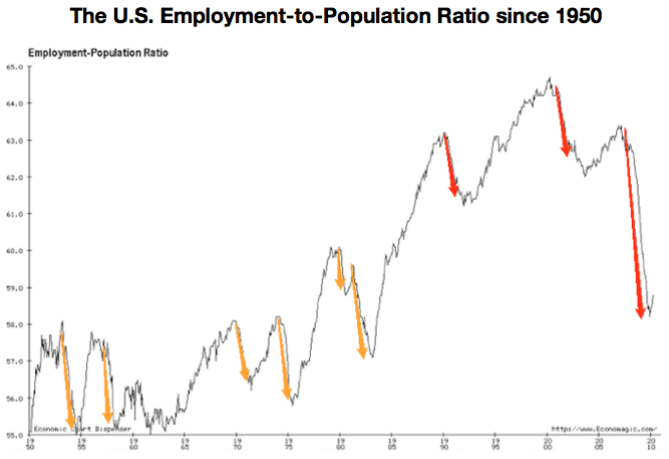
### *The Importance of Expectations in Macroeconomics*

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

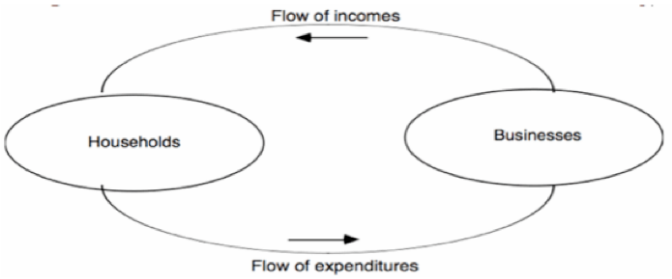
Back at the start of the nineteenth century. a market economy where almost everybody specialized in one particular kind of job was a new thing. For most of human history most people had spent most of their time working to provide for their own households: growing their own food, weaving and sewing their 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.

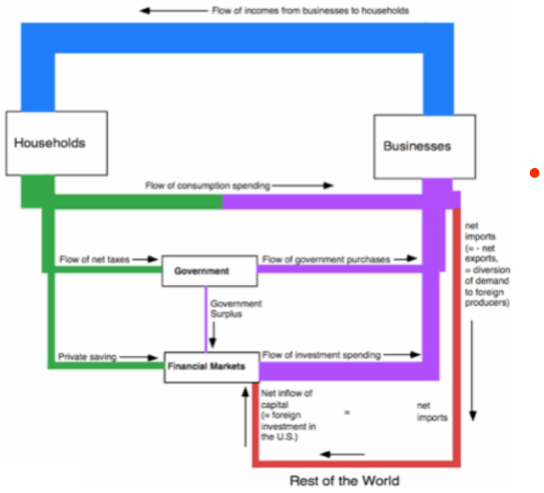
**The Circular Flow of Economic Activity**




*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.

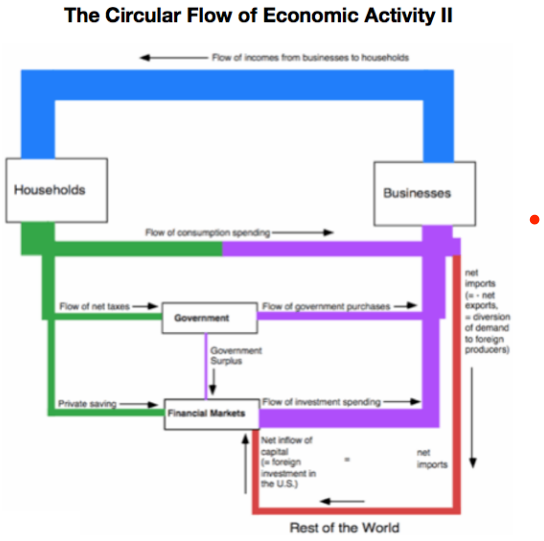
This market economy disturbed a great many people. "What if it all went wrong?" they asked. "Could we wind up with a situation in which the yoga instructors were offering too many lessons

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.

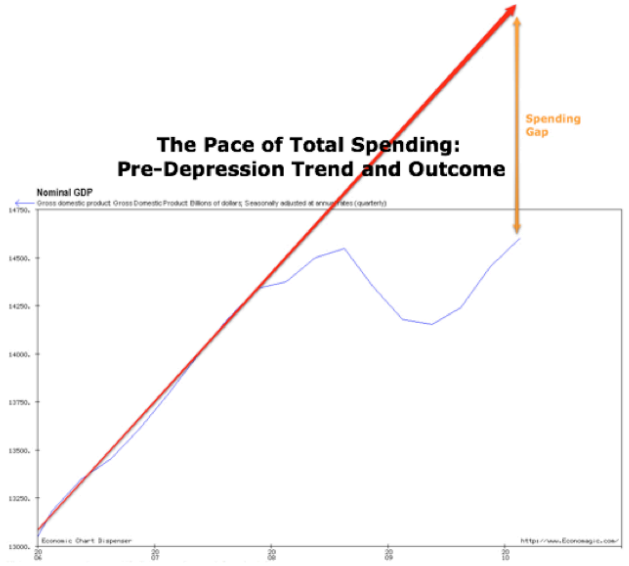
Thus Jean-Baptiste Say in 1803 was right. Every transaction does have two sides. For every buyer there is a seller. Everyone's cost is somebody else's income. And purchasing power does proceed throughout the economy, greasing a flow of production, sales, income, and purchases that in the U.S. economy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

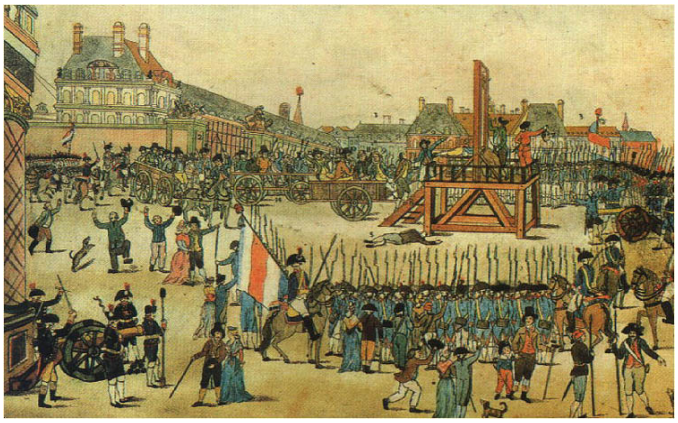
Total production in the economy had stood at a level of $13.06 trillion per each year at the end of 2006 (measured in the prices as they stood in 2005). It had then been growing at an average rate of a hair above 3% per year. People expected it to stand at $14.3 trillion per year as of the end of 2009. 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?

*Lecture 4*

# 4. The Income-Expenditure Framework

## What You Will Learn

By the time you finish this lecture, you should be able to:

1. Explain the role of downward-sticky wages in turning declines in spending into declines in production and employment.
2. Explain the psychological and institutional sources of downward-sticky wages.
3. Divide total spending up into components due to households, businesses, government, and the international sector
4. Calculate how household consumption spending depends on income.
5. Calculate how large a decline in production and income will be induced by a decline in one of the components of "other" spending.
6. Explain the connection between the income-expenditure framework and the braking of Say's Law

## Understanding Downturns

### *Downward-Sticky Wages*

To understand depressions, we need to build an economic model in which the market system does not work well. If the market economy was working well, we would not have a depression and mass unemployment. And so a model that premises that the market system works well cannot help us.

So let us start, instead, with the assumption that prices and wages are, at the level of the economy as a whole, "sticky" downwards. When total spending falls—as it did from 2007-2009—average wages and prices will not. Businesses respond to falls in demand first by firing workers and shutting down their production lines, and not by cutting wages. And if businesses do not cut wages on a large scale, they cannot afford to cut prices. Losing money on each item sold and trying to make it up on volume is not a profitable business strategy.

Why are wages sticky? Here are four possible reasons:

1. Managers and workers find that renegotiating wage levels downward is a costly and disruptive exercise as people make all kinds of threats about how they will behave if the other party doesn't knuckle under that they do not mean but then feel forced to carry out. Hence cutting wage levels best delayed as long as it possibly can be, and then it is best delayed a little longer than that.
2. Managers and workers lack information and so confuse changes in total economy-wide spending with changes in demand for their specific products: if it is demand for your particular product that has fallen, you won't be able to cut wages and still keep your same-quality workforce—better to get ahead of the game by shrinking your operations.

3. The level of wages is as much a sociological as well as an economic variable—determined as much by what values people think is "fair" as by the balance of supply and demand. Workers take a cut in their wages as an indication that their employer does not value them—hence managers avoid wage cuts because they fear the consequences for worker morale and worker effort.
4. Managers and workers suffer from simple "money illusion"; they overlook the effect of price-level changes when assessing the impact of changes in wages or prices on their real incomes or sales, and so don't notice that other prices and wages are falling all around them when they consider whether to cut wages.

All of these reasons are operating.

People do wish to stabilize commercial relationships by long-term contracts. Customers do find frequent price changes annoying. When other firms are not changing their prices and wages, you attract attention you may not want when you change yours. Hence managers and workers do prefer to keep their prices and wages stable as long as the shocks that affect the economy are relatively small—or as long as they think that they will quickly pass. People do lack full information, and so they are unsure whether a change in the flow of spending on their products reflects a change in overall demand or a change in demand for their product in particular. Managers who are uncertain which the change is will split the difference. Workers and managers are really not the flinty-eyed rational maximizers of economc theories. Work effort depends mightily on whether workers believe they are being treated fairly, and cutting your wages is almost universally perceived as unfair.

Which of these is the most important factor?

The best thing to say is that economists do not really know. But we do know that total spending in the American economy in mid-2010 was 10% below what the pre-2008 trend had led everybody to expect it to be, and that this fall in spending was unaccompanied by any noticeable decline relative to trend in either wages or prices. All of the decline in spending was, instead, a decline in production and employment.

## *Consequences of Downward-Sticky Wages*

Thus any economist who wants to describe the real world will note that price and wage levels—not individual prices and wages, but economy-wide average levels—are sticky downward. Prices and wages remain fixed at predetermined levels as businesses expand or contract production and employment in response to changes in demand and costs.

If wages and prices are sticky downward, then the consequences of a sudden rise in household or business desire to hold cash are clear: as businesses see spending on their products begin to fall and inventories, they will cut production and employment. They want to avoid accumulating unsold and unsellable inventory, so they will cut production and employment until their level of production is no greater than total economy-wide spending, and so inventories are no longer growing. And by the circular flow principle, as they cut production total economy-wide incomes

will fall as well, for the flow of production is nothing other than the flow of incomes. Thus to determine how much they will cut production, we need to figure out what total economy-wide expenditure will be.

### *Suppose Wages Were Not Sticky?*

How would it change things if wages were not sticky downward? Would we avoid downturns in production and employment largely if not completely? Spending would drop, but wages and prices would drop too, so the lower flow of nominal spending would still be enough to buy the same stuff and employ the same people.

Perhaps it would work out that way.

Perhaps it would not.

Prices and wages would drop along with spending, but how about debts? And how about interest payments on debts? Businesses that had borrowed money to establish themselves or to expand would find that their nominal cash flow had fallen while their fixed debt repayments had not. They would be forced to declare bankruptcy. The debts that they owed would no longer be safe or liquid assets to hold or suitable vehicles for transporting purchasing power into the future via saving. The bankruptcies would generate an excess demand in financial assets and deficient demand for currently-produced goods and services.

Milton Friedman's teachers Irving Fisher and Jacob Viner back in the 1930s thought that the downward flexibility of wages and prices made downturns worse, not better.

If the falls in wages and prices are accompanied by equal relative falls in debt, then downward wage and price flexibility probably is an effective way of keeping downturns in spending from causing large depressions. You can view a country's decision to depreciate or devalue its currency in that light—and, in a small country that trades a lot with the outside world, depreciation and devaluation are among the most effective depression-fighting policies that exist. But in the 1990s we saw that that was not true when a country's businesses owe a lot of money to foreigners that is denominated not in the home but in foreign currency. Then depreciation writes down the value of wages and prices in the foreign currency while leaving the values of debts unchanged—and in both Mexico in 1994-5 and East Asia in 1997-8 currency depreciations triggered very large economic downturns indeed.

## Analyzing The Components of National Income and Product

### *Components of Spending*

Above we saw that total spending was divided into four components:

1. Consumption spending (C),

2. Investment spending (I), and
3. Government purchases (G).

Add up these four components and call their sum E, for total expenditure.

$$C + I + G = E$$

## *Consumption Spending*

Now look at consumption spending. It will be higher the higher are households' incomes. And it will depend on the confidence that households have in the economy—which itself depends on how much of their incomes they expect to be taxed away by the government (with higher expected taxes leading them to curb spending), on whether they think that they need to boost their cash balances or not due to uncertainty about the future, on whether they have confidence that they will be able to borrow money if they need to or can afford to pay off the debts they currently owe, and other factors. So to start thinking about this, let us write down a very simple arithmetic rule for consumption spending:

$$C = c_0 + c_y \times Y$$

Consumption spending is going to be some number $c_0$ times some other number $c_y$ times the level of total economy-wide incomes Y. The "$c_y \times Y$" captures the dependence of consumption spending on current incomes, and the "$c_0$" captures all the confidence, tax, desire to boost cash-on-hand, and other factors. In the United States in 2010, the proper value to pick for $c_y$ is roughly 0.5: as a rule, if total economy-wide incomes fall by one dollar, consumption spending is likely to fall by fifty cents; and in the United States in 2010, the proper value to pick for $c_0$ is roughly $3.5 trillion/year. Were economy-wide incomes to be $15.5 trillion/year, consumption spending would be $11.25 trillion/year.

So if we take our equation:

$$C = c_0 + c_y \times Y$$

Substitute in $3.5 trillion/year and 0.5 for $c_0$ and $c_y \times Y$:

$$C = \$3.5T/y + 0.5 \times Y$$

And then substitute in $15 trillion/year for Y, we see that we get:

$$\$3.5T/y + 0.5 \times \$15T/y = \$3.5T/y + \$7.75T/y = \$11.25T/y = C$$

So why do we write these symbols "$c_0$ and $c_y$"? Why not simply write "$3.5T/y" and "0.5"? Because as the economy changes over time those values will change. And those values do not apply to other countries. And those values can shift—especially $c_0$, when consumer confidence collapses or recovers.

Notice that in writing this particular equation—this particular consumption function—we have once again followed economists' principle (or vice) of ruthless simplification.

In this complicated world, consumption spending does not depend on disposable income and confidence alone. It depends on a host of other factors—including the interest rates at which households can borrow, the values of people's houses, the values of their 401(k) retirement accounts, the distribution of income across the economy, expected future income growth, risk tolerance, and a host of other factors. We hope that confidence and income are the most important one—but if we come across a situation in which other factors are the most important, there is no reason not to ditch this equation for another one that more accurately models reality.

# CALCULATING THE SIZE OF DOWNTURNS

## *Expenditure, Output, and Income*

Recall our equation for total spending E (E for Expenditure):

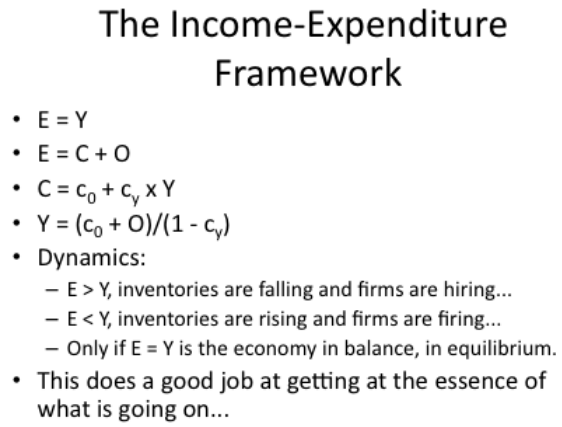
$$E = O + C$$

We can replace the "C" with our consumption function:

$$C = c_0 + c_y \times Y$$

To get:

$$E = O + c_0 + c_y \times Y$$




What happens in this model of the economy if expenditure E is greater than income Y? Well, by the circular flow principle income is the same as production, so if E is greater than Y then spending is greater than production—and inventories are falling. If inventories are falling, then businesses are hiring workers and expanding production, so Y is rising. What happens if expenditure E is less than income Y? Well, if E is less than Y then spending is less than production—and inventories are rising. If inventories are rising then businesses are firing workers and cutting back on production, so Y is falling. The only situation in which things are in balance and Y is not quickly changing is if:

$$E = Y$$

Then inventories will be balanced, and firms will be neither hiring and expanding nor firing and contracting. Thus the economy will very quickly spiral down in production and employment until it reaches a state where E=Y.

## *Where the Economy Settles: Equilibrium*

Where will that be? We can see where the economy will settle, where its stable level of production and income will be, by doing some algebra. If we substitute Y in for E:

$$E = O + c_0 + c_y \times Y$$

Since we would like to figure out what Y is, we should subtract Cy x Y from both sides to get it all by itself on the left:

$$Y - c_y \times Y = O + c_0 + c_y \times Y - c_y \times Y$$

We can cancel terms on the right:

$$Y - c_y \times Y = O + c_0 + \cancel{c_y \times Y - c_y \times Y}$$

We can gather terms on the left:

$$Y \times (1 - c_y) = O + c_0$$

We can then divide both sides by $(1 - c_y)$:

$$Y \times (1 - c_y)/(1 - c_y) = (O + c_0)/(1 - c_y)$$

We can cancel terms on the left:

$$Y \times \cancel{(1 - c_y)/(1 - c_y)} = (O + c_0)/(1 - c_y)$$

## The Solution to Our Model

- $Y = (O + c_0)/(1 - c_y)$
  - Take the flow of "other spending": net exports NX plus business investment I plus government purchases G
  - Add to that the amount of consumption spending that depends on "confidence" and like factors $c_0$
  - Divide by $1 - c_y$
  - You are done. That's the level of spending—and incomes, and production—at which the economy is going to settle.

And so arrive at our destination: our formula for what the economywide level of production and spending will be:

$$Y = (O + c_0)/(1 - c_y)$$

Thus to determine the level of economy-wide production (and income, and economy-wide spending) under conditions of depression economics, you follow a three-step plan:
Add up "other" spending O—the sum of net exports, investment spending, and government purchases—and the "confidence" component C0 of consumer spending.

Divide that sum by one minus the marginal propensity to consume—the number Cy that tells you how much consumption spending typically changes when economy-wide incomes change.

You are done: PROFIT!!

This is probably a good place to make a point about what we have been doing here. We were talking about people who were buying and selling and spending and saving, and then all of a sudden we were doing... algebra. It was simple algebra, but still: why algebra? Where does this math come from?

The math is an attempt to summarize and aggregate what people are doing in a very compact format. The equations we had all fell into one of three types:

1. Accounting identities—like C + O = E: in this case, consumption spending C plus other final demand spending O equals total spending E.
2. Behavioral relationships—like $C = c_0 + c_y \times Y$: in this case, consumption spending C equals some amount $c_0$ that depends on household confidence and expectations plus a fraction $c_y$ of households' current incomes Y.
3. Equilibrium conditions—like Y = E: in this case, production (and thus total income) Y equals total spending, aggregate demand for currently-produced goods and services E.

Accounting identities are simply that: part of how we set up the framework for analysis in a consistent way. Behavioral relationships are shorthand descriptions of what people do: what economic decisions people make in response to their existing and to changes in the economic environment. They are another, alternative representation of what we were talking about before: people who are buying and selling and spending and saving.

Equilibrium conditions are a bit more complex. An equilibrium condition is something that must be true if the economy is to be in balance. If an equilibrium condition is not satisfied, then the state of the economy will be changing rapidly. It will be moving toward a state of affairs in which the equilibrium condition does hold.

Here the equilibrium condition is that production Y must equal aggregate demand E. If it doesn't, things are changing. If production is greater than aggregate demand, inventories are piling up and the rate of production and income Y is falling businesses are cutting back on hours, firing workers, and cutting prices. If production is less than aggregate demand, inventories are being exhausted—and the rate of production and income is rising as businesses are adding hours, hiring workers, and raising prices.

The state of affairs in which all three of these equations are satisfied is one in which (a) things add up, (b) people are behaving according to the patterns we set out, and (c) the economy is at a point of rest at which production, incomes, and aggregate demand and expenditure are stable. That is why we do the algebra: it is a shorthand, compressed, and more rapid way of doing the whole argument. But it is only worth doing if it is not a strange series of rote incantations but a shorthand that you can expand into the longer argument should you need to.

Every new subject requires new patterns of thought; every intellectual discipline calls for new ways of thinking about the world. After all, that is what makes it a discipline that allows people to think about some subject in some particular way. Economics is no exception.

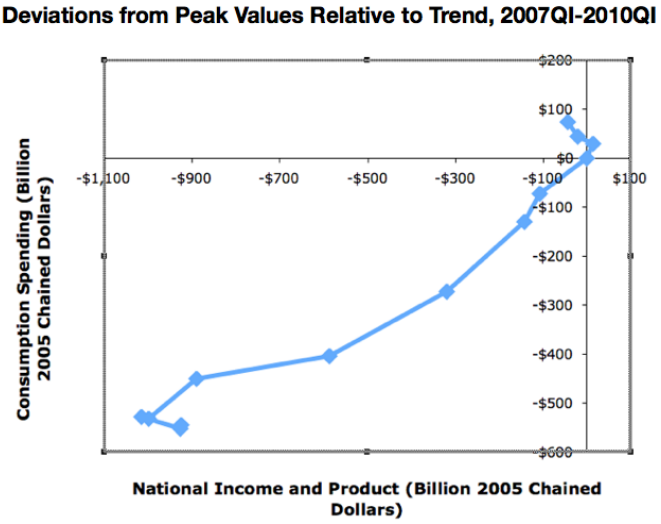
In a way, learning an intellectual discipline like economics is similar to learning a new language or being initiated into a club. Economists' way of thinking allows us to see the economy more sharply and clearly than before. (Of course, it can also cause us to miss certain relationships that are hard 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.)

## *How Well Does This Work?*

How well does this work?

Quite well, actually—impressively well for such a simple and crude model. At the depeest part of the recession—the third quarter of 2009—total other spending I + G—was $487 billion/year less than its pre-2008 trend pace, and total spending E was $1,015 billion/year less than its pre-2008 trend pace.




*The decline in national income and the decline in consumption spending during the "Great Recession"*

Let us adopt another notation convention: let us use the symbol "Δ"—capital Greek delta—for "difference."

Take our equation:

$$Y = (O + c_0)/(1 - c_y)$$

Then if we set:

$c_y = 0.5$, and

$\Delta O$ = -$500 billion/year — the change in O is -$500billion/year

We get:

$$\Delta Y = (\Delta O + \Delta c_0)/(1 - c_y)$$

$$\Delta Y = (\text{-\$500 billion/year})/(1 - 0.5)$$

$$\Delta Y = \text{-\$1,000 billion/year}$$

This predicted difference in national income Y relative to its pre-recession trend is remarkably close to the reality of what happened in the recession. The fall in consumption spending C set in train by the fact that households with unemployed workers and lowered incomes spend less doubled the magnitude of the spending shortfall. This multiplier process had doubled the size of the recession over what it might have been otherwise.

There are trained professionals who do this for a living. Some of them have high-paying jobs doing exactly this at a much more complex and sophisticated level. But the skeleton of the argument is the same as laid out here: something happens to reduce the other components of spending, people lose their jobs, households lose their incomes, and that loss induces a cutback in consumption spending that amplifies the size of the economic downturn.

What induces the reduction in other components of spending? That topic has to wait for next time.

## SUMMARY

We can use the accounting framework of the NIPA to analyze how large a downturn will be generated by a planned excess demand for money, for savings vehicles, or for safe assets. The total flow of production and incomes Y can be divided into five parts: investment spending I, government purchases G, that part of household consumption spending that depends on income $c_y$•Y, and that part of household consumption spending that depends on household confidence and other factors $c_0$. Track the fall in the components of production and income Y, and you track the size of the economic downturn.

## TEST YOUR KNOWLEDGE

1. Why is it allowable for us to conclude that E, total expenditure, total economy-wide spending, is equal to Y, income and output?
2. What is our equation for figuring out how much production and incomes Y will fall if there is a fall in either I, G, or the "confidence" component of consumption spending $c_0$?

*Lecture 5*

# 5. Economic Downturns
## *Keynesians, Monetarists, and Minskyites*

## What You Will Learn

This is the chapter on the relationship between economic downturns and financial markets. The problem in economic downturns is that a lot of people who could work productively at wages that would make them and their employers happy are not. Yet when you talk to economists about how to cure such downturns they almost always come up with some theory or policy affecting finance. Why?

The reason is, once again, the circular flow principle: Say's original insight of 1803 that everybody's purchases are somebody else's income, so there cannot be any shortage of income as a whole in the economy to buy the goods and services that are currently being produced. What can happen is that the circular flow can be broken—as Thomas Robert Malthus feared, and as Say came to recognize, and as John Stuart Mill put his finger on it, if people as a whole want to build up their holdings of financial assets there can be too little demand for goods and services even though there was plenty of income.

This provides a way of avoiding downturns. The government does not have to hire the unemployed, or draft the unemployed, or decree that businesses have to hire the unemployed: the government can conduct strategic interventions in financial markets that satisfy what was the excess demand for financial assets, and that will automatically relieve the deficient demand for goods and services as a whole.

In this lecture we are going to consider the doctrines of two sects of economists: "Keynesians," who believe that downturns are principally caused by an excess demand to hold bonds, savings vehicles to transport your purchasing power from today into the future; and "monetarists," who believe that downturns are principally caused by an excess demand for liquid cash money that you use to grease your economic transactions. And we are going to point to the existence of a third sect, "Minskyites," who believe that big downturns are the result of an excess demand for safe AAA high-quality assets—but we are going to defer most of the discussion of this third position to next time because it is the sect most relevant to our current problems and thus deserves a lecture on its own.

Which view is more correct and more helpful in any particular case is, of course, an empirical issue. But few of them see it that way: for them, it is overwhelmingly an issue of ideological allegiance that reaches a religious intensity.

By the end of this lecture you will have learned the theories and approaches of Keynesians and monetarists, and be smarter than either group because you will understand the relevance and limits of application of their theories.

# RECAPITULATION

## *Our Framework for Depression Economics*

Last time we saw how recessions and depressions could come to be—how you can have collapses in the circular flow of economic activity and of total economy-wide spending like this one we are in now.

We started with a puzzle. Jean-Baptiste Say set forth the circular flow principle in 1803—the idea that because everybody's spending is somebody else's income there can be no depressions, no recessions, no "general gluts" but only sectoral shifts and readjustments. Nobody makes except to use themselves or to sell. Nobody sells unless to buy. Therefore supply creates its own demand: why have to worry about sectoral maladjustment in which their to too much demand for one commodity and too little for another, but we don't have to worry about excess supply, deficient aggregate demand in general. That's what Say said in 1803. Malthus pointed out that that sounded good in theory but did not seem to work in practice. And by 1829 Say and John Stuart Mill agreed with Malthus.

We started with this circular flow principles, with "Say's Law," and we broke it. We broke it by pointing out that the normal process of adjustment, by which workers smoothly move from industries and occupations where there is excess supply to industries and occupations where there is excess demand, simply does not work when the excess supply is of goods and services and the excess demand is for money—or some other kind of financial asset. Then people working in industries where there is excess supply lose their jobs. But there is no countervailing source of extra hiring in the economy to give them someplace to go.

And last time we saw how these recessions and depressions could come to be big. Workers who lose their jobs are in households that thus lose their incomes, and they cut back on their spending. This second round of falling spending on currently-produced goods and services amplifies the shortage of aggregate demand for goods and services, and multiplies the effect of whatever the initial problem was. Then there is a third round, a fourth, and a fifth, until the economy settles down in some high-unemployment depressed state.

What is the level of production at that depressed state? We presented a way to calculate it: our multiplier equation. We argued that the economy will tend to rapidly head for and then remain at a state in which total production and incomes Y are equal to aggregate demand, total spending on goods and services, or total expenditure E:

$$E = Y$$

that total expenditure E will be the sum of spending on consumption goods C and on other components of final demand, investment spending I and government purchases G:

$$E = C + I + G$$

And that consumption spending will have a component $C_0$ that depends on confidence and other factors and a component $c_y \times Y$ that depends on households incomes:

$$C = c_0 + c_y \times Y$$

Those three relationships will all be in balance if and only if:

$$Y = (c_0 + I + G)/(1 - c_y)$$

If aggregate demand, expenditure E is greater than production and incomes Y, then inventories are falling and firms are busily hiring workers and expanding production. If E is less than production and incomes Y, then inventories are rising and firms are firing workers, cutting back on production, failing and closing down. Only if aggregate demand and expenditure on the one hand are equal to production and incomes Y is the economy in balance, in equilibrium.

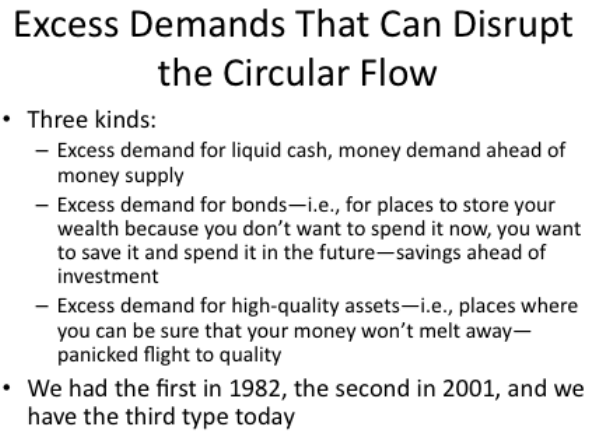
We presented this aggregate expenditure framework, and we argued that it did a good job at getting at the essence of what is going on in recessions and depressions.

But we left one big question unanswered: What are the sources of the declines in $c_0$ and O that set in motion the decline in aggregate demand, in total expenditure on goods and services? What financial assets are businesses and households trying to buy that produces the excess demand in finance and the deficiency of demand for goods and services?

## MACROECONOMICS AND FINANCIAL MARKETS

Economists have argued for more than a century about just what is the financial market excess demand that produces the shortfall in aggregate demand for goods and services. As best as we can see, all these debates have been fruitless and counterproductive. It is like the parable fo the blind philosophers and the elephant: each is touching a different piece of the elephant, and each is correctly reporting what he or she feels, but all are wrong in being vociferously sure that the piece of the animal that they have hold of is the entire beast.

Briefly, economists looking for the origins of recessions and depressions who admit that the circular flow principle is not perfect, that Say's Law can break, have broken up into three schools or sects, one for each type of excess demand for financial assets in downturns that we know of. One sect, call them "Keynesians," after the late English economist John Maynard Keynes of Cambridge University, sees the financial excess demand as an excess demand for bonds. A second sect, named "monetarists" by their intellectual leaders the late Irving Fisher of Yale and the late Milton Friedman of Chicago and Stanford, sees the financial excess demand as an excess demand for cash. And there is a third small sect which does not have a common agreed-upon



name—call them Minskyites after the late Hyman Minsky, an economist at Washington University at St. Louis—sees the financial excess demand as an excess demand for safety, for high-quality places where you can put your wealth and be confident that it will not melt away and disappear.

## *Keynesians*

One of the oldest sects, tracing its ancestry back to Swedish economist Knut Wicksell in the late nineteenth century, a sect now called "Keynesians" (to the great annoyance of Swedish economists) sees the financial excess demand as an excess demand for bonds. Bonds—and stocks, and loans, and other such assets—pay interest, dividends, return to you their principal or par value in the future, perhaps pay capital gains. They are all vehicles which you can use to move purchasing power from the present to the future: vehicles that people use to save. Bonds are created when businesses borrow and issue them to finance their investment spending and when the government borrows in order to finance its deficit spending.

To Keynesians—or perhaps more properly Wicksellians—downturns begin when households want to buy more bonds (and stocks, and pieces of real estate) to add to their financial wealth than businesses and the government together want to issue: when savings is greater than investment (plus the government deficit). The attempt by households to redirect their wealth from buying currently-made goods and services to buying bonds—to saving—is what produces the initial deficiency in aggregate demand that sets the downturn in motion.

Thus we reach the recommended economic policy of the Keynesians. If a downturn is the result of an excess of savings over investment plus the government deficit, take policy steps to:

3. increase household confidence so that they are willing to spend more and save less.
4. by reducing interest rates or otherwise improving the investment climate, induce businesses to spend more money investing to add to their capacity and so issue more bonds.
5. expand the government deficit so that the government will issue more bonds that households can then hold.

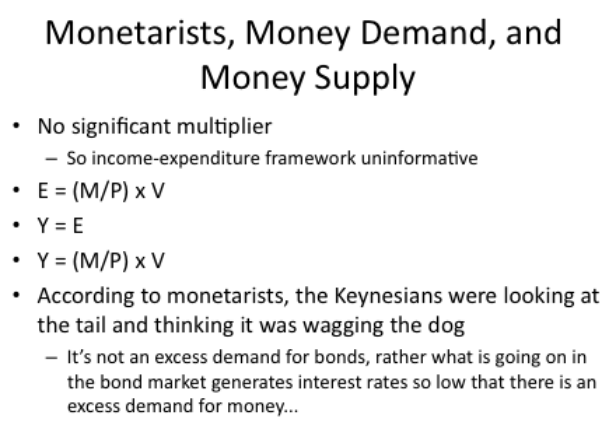
All three sets of policies eliminate the excess demand for bonds, and so also remove the deficient aggregate demand for currently-produced goods and services that sets the downturn in motion.

## *Monetarists*

The second sect, Irving Fisher's and Milton Friedman's monetarists, starts with the observation that cash is a very special asset in any market economy. It is what you use to buy things—you show up at the store with cash (or with your credit card which is a promise that VISA will pay them in cash, or with your checkbook with a live and valid balance which is a promise that your bank will pay them in cash), and the storekeeper will accept your cash as payment and let you buy your stuff. Economists call this asset "money." (Note that in so doing they deviate from normal English usage, in which "money" can mean "wealth" as well as "cash": when we say that somebody "has a lot of money" we don't mean that they have $10,000 in their pocket.) The

monetarists claim that downturns in production and employment are always due to an excess demand for cash money. When something has disturbed the supply or demand for liquid cash money so that households and businesses have less of it than they wish, they slow down their spending in an attempt to build their cash balances up, and it is this slowdown in spending that launches the downturn.

A number of things can trigger such an excess demand for liquid cash money:




1. Under a gold standard, the shipment of gold bars abroad to pay for imports reduces the money supply, and so creates an excess demand for money—and thus to deficient demand for goods and services.
2. Open-market sales of government bonds by a central bank like the Federal Reserve by which the central bank trades government bonds for cash diminishes the supply of and so creates an excess demand for money—and thus to deficient demand for goods and services.
3. A loss of confidence by households in the banking system or in finance leads them to trade interest-earning assets for cash and then to stuff that cash under their mattresses increases their demand for cash money, and so leads to an excess demand for money—and thus to deficient demand for goods and services.
4. A failure of or runs on important banks that eliminate or freeze the checking-account deposits of households leads them to try to get more cash in their pockets and leads to an excess demand for money—and thus to deficient demand for goods and services.
5. A loss of confidence and a failure of nerve on the part of businesses that leads them to think that they need to have larger cash balances to deal with economic uncertainty creates an excess demand for money—and thus to deficient demand for goods and services.

Everybody needs cash—and/or a checking account at a reliable bank with cash, and/or an unspent balance on a credit card—in order to carry out their normal day-to-day transactions. What happens when people find that they have less cash than they wish? They cut back on their spending and divert some of their income to trying to build up their cash balances. That cut back on their spending is, monetarists say, the thing that produces the initial fall in aggregate demand that sets the downturn in motion.

Thus we reach the recommended economic policy of the Monetarists: have a central bank that uses open-market operations to keep the supply of cash money in balance with demand, they say.

Without any excess demand for cash, there will be no deficient aggregate demand for goods and services. And so there will be no downturns: no depressions, no recessions, no "general gluts."

### *Minskyites*

There is a third sect, until recently too small and too disorganized to have a name. We call them Minskyites. This sect says that, for big downturns at least, the key is not that the economy has too little cash money or too few bonds, but instead that it has too few high-quality safe assets. It is not that people are cutting back on spending on currently-produced goods and services because they want to have more cash in their pockets or more bonds in their portfolio than exist. Instead, people are fearful that their wealth is unsafe: that they need to sell their risky assets and buy safe ones or else their wealth might simply melt away overnight as whatever partnerships, companies, banks, or governments they have invested in shut their doors, fail, and default on their debts. Thus the policy recommendation of the Minskyites: bailout. The problem is that the economy does not have enough safe high-quality assets, and the private sector cannot create more because nobody trusts any partnership, company, or bank to be good for its current debts let alone for any new ones it might create. The solution is for the government to step in: to support shaky banks so that they can meet their obligations, to take over shaky companies and recapitalize them, to issue its own safe high-quality bonds and use the proceeds to buy up risky private assets, to generally calm the panic.

There are many problems with bailout as a policy. It is unfair, and it sets the stage for more trouble down the road. It is unfair in that it enriches those very financiers and investors whose reckless, speculative, and heedless portfolio strategies that triggered the panic and the general rush by everybody to move a greater proportion of their portfolio into safe, secure, high-quality assets. Those whose actions set the stage for the downturn should not profit. It sets the stage for more trouble down the road because every time Minskyite policies of bailout are adopted risk-loving financiers become more confident that the government will bail them out the next time as well, and so see even more of an incentive to engage in reckless, speculative, and heedless portfolio strategies.

As the late MIT economist Charles Kindleberger put it, writing of the need for a "lender of last resort" to perform the bailouts, but:

> if the market is sure that a lender of last resort exists, its self-reliance is weakened.... The lender of last resort... should exist... but his presence should be doubted.... This is a neat trick: always come to the rescue in order to prevent needless deflation, but always leave it uncertain whether rescue will arrive in time or at all, so as to instill caution in other speculators, banks, cities, or countries.... some sleight of hand, some trick with mirrors... [because] fundamentalism has such unhappy consequences for the economic system...

Or as former Federal Reserve Vice Chair Don Kohn put it, the lender of last resort should act because teaching a few thousand investment bankers a lesson that they deserve is not worth doing if the cost is the jobs of millions.

Back in the nineteenth century, London Economist editor Walter Bagehot had a plan for how to deal with such panics and crises. The central bank and the government should, he argued, sup-

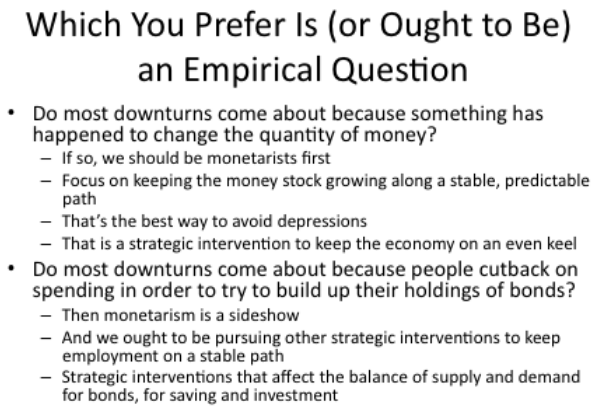
port the market by buying up risky assets and issuing safe ones and so satisfying the market demand for extra safe-high quality assets. But it made sure that those whose excessive speculation had caused the problem did not profit. "Lend freely" to banks and other financial institutions that needed safe assets in order to avoid banruptcy themselves, "but at a penalty rate"—at a high rate of interest which would make them poor in the long run as they were forced to hand over their cash or ownership stakes in their firms to the government, and would make them wish that they had not been so reckless in the first place.

In the late financial crisis central banks and governments have followed the first half of Walter Bagehot's plan. They have indeed "lent freely" in order to increase the supply of safe, high-quality financial assets. But they have been unable or unwilling to implement their policies in such a way that their support for financiers is "at a penalty rate," and leaves financiers poor and wishing they had been more prudent before the crisis.

## *Who Is Right?*

Which of these three sects is right?

All of them—sometimes. Each has been right at at least one moment in the past generations.




We can see when there is an excess demand for liquid cash money that you can use to purchase things in the economy. When there is an excess demand for liquid cash money, savers and investors are trying to sell all their other financial assets at whatever prices they can in order to get their hands on cash. Thus the prices of stocks, real estate, and bonds are low—which means that the interest rates on all kinds of bonds are very high, for when the price of a bond is low the interest coupon it pays every six months is a large proportion of its value. In 1982 there was such a liquidity squeeze in the U.S. economy: pretty much everybody was attempting to build up their cash balances and trying to sell other financial assets to do so, and interest rates reached their highest levels of the post-World War II period.

Where did this liquidity squeeze—this excess demand for liquid cash money—come from in 1982? It had been deliberately created by the Federal Reserve, which believed that it had to break the cycle by which Americans had come to expect that each year would see 10% inflation. The only way to do that, then Federal Reserve Chair Paul Volcker and his colleagues concluded, was to create a situation of high unemployment, slack capacity, low production, and depression economics so that neither firms nor workers would dare to ask for the price and wage increases that they had planned. It worked: the 1970s had been a decade of accelerating and the 1980s were a

decade of low inflation. It came at a high cost: the unemployment rate peaked at 10.8% at the end of 1982.

We can see when there is an excess demand for bonds—for vehicles to carry purchasing power forward from the present into the future, when there is a savings glut. When there is an excess demand for bonds, savers are willing to pay almost any price for bonds and as a result the interest rates on pretty much all kinds of bonds are very low, for when the price of a bond is high the interest coupon it pays every six months is a low proportion of its value. In 2003 there was such a savings glut in the U.S. economy and indeed worldwide: pretty much everybody was attempting to buy up bonds to hold so that they could shift spending on goods and services from the present into the future, and interest rates as a group reached their lowest levels of the post-World War II period.

And over the past three years we have seen an excess demand for safe, high-quality assets. That has been the excess demand that has triggered pretty much everybody to cut back on spending on current goods and services as they try to build up more wealth in vehicles in which they can be confident it will not melt away. When there is an excess demand for high-quality assets, then the prices of risky assets— stocks, real estate, and corporate and other bonds seen as possible candidates for default—will be low, which means that the interest rates on risky bonds will be high, for when the price of a bond is low the interest coupon it pays every six months is a large proportion of its value. By contrast when there is n excess demand for high-quality assets, then the prices of safe assets—bonds issued by governments regarded as credit worthy, and private loans guaranteed or backed in some way by governments or by ample collateral—will be high because savers are willing to pay almost any price for high-quality bonds, and as a result the interest rates on high-quality bonds will be low, for when the price of a bond is high the interest coupon it pays every six months is a low proportion of its value. Credit spreads—the difference between the interest rates on high-quality bonds and risky bonds—will be extraordinarily high. And whenever a set of bonds shifts in investors' expectations from being high-quality to low-quality—as the bonds of the government of Greece did—the interest rate on those bonds will jump massively. That is what we have seen over the past three years.

You should recognize that these three classifications are ideal types and not pure types. People can try to switch their spending between all four categories. Think of it this way: when the economy is in balance, people as a whole (a) plan to spend enough but no more on currently-produced goods and services to buy the full-employment rate of production, (b) plan to hold the existing but no more than the existing stock of liquid cash money, (c) plan to add enough but not too much to their holdings of savings vehicles—bonds—to buy up all the newly-issued bonds that businesses are printing to finance their expansions and the government is printing to finance its deficit, and (d) plan to hold the existing but no more than the existing supply of safe AAA high-quality assets. It is extremely unlikely that two of these plans for categories will be precisely in balance and two will be out of balance—you are much more likely to find something like deficient demand for currently-produced goods and services accompanied by a small excess demand for liquid cash money, a small excess supply of savings vehicles, and a large excess demand for safe high-quality assets.

# CALCULATING OUTPUT GAPS

## *Savings-Investment Gaps*

The Keynesian framework focuses on excess quantity demanded for bonds as a source of pressure making for economic downturns. The quantity demanded of bonds is equal to whatever the current stock of bonds held by households is, plus the flow of savings into financial markets. What is the flow of savings? Planned domestic savings $S^d$ is the difference between households' incomes Y and the sum of what they plan to spend on consumption goods C and what they pay in taxes T to the government:

$$Y - C - T = S^d$$

Since the current stock of bonds held by households is equal to the current stock issued by businesses and the government, the flow-of-funds in financial markets will be in balance if the rate at which funds are flowing into financial markets from households and foreigners is equal to the rate at which funds are flowing out to businesses and the government, if:

$$S^d = I + (G-T)$$

If the quantity that people plan to buy of bonds is greater than the quantity that businesses plan to supply, if:

$$S^d > I + (G-T)$$

then households and firms will be to cutting back on their spending, and there will be downward pressure on output and incomes Y—and downward pressure on employment.

How far will output and incomes fall if there is a Keynesian gap, an excess of planned savings over planned investment? We can draw a graph with planned savings and planned investment plotted on the vertical axis and with the level of incomes Y on the horizontal axis.
We see that if incomes are lower, planned savings are lower as well—and eventually if incomes fall low enough planned savings fall low enough to be equal to investment. At that point there is no longer downward pressure on spending, output, and incomes, and the economy is in equiibrium balance.

How to calculate where that point is? The requirement that savings equals investment (plus the government deficit) is our equiibrium condition:

$$S^d = I + (G-T)$$

Substitute our expression for the level of domestic savings into this equation:

$$Y - C - T = I + (G-T)$$

Note that a -T appears on both sides, so we can cancel it:

$$Y - C = I + G$$

Recall our consumption function:

$$C = c_0 - c_y \times Y$$

And substitute it into our equation, thus breaking consumption spending down into its components $c_0 + c_y \times Y$:

$$Y - (c_0 + c_y \times Y) = I + G$$

We want to determine the value of total output and incomes Y at which this equilibrium condition is satisfied, so collect the terms in Y on the left hand side

$$Y \times (1 - c_y) - c_0 = I + G$$

Move the other terms on the left over to the right:

$$Y \times (1 - c_y) = c_0 + I + G$$

and then solve for Y:

$$Y = (c_0 + I + G)/(1 - c_y)$$

That tells us the level of output and incomes Y at which the excess demand for bonds, the excess of planned savings over planned investment, is eliminated. That tells us what the equilibrium level of Y will be in this Keynesian framework.

If you cast your minds back to an earlier section, you remember an alternative expression for the equilibrium level of Y, calculated from the consumption function and the equilibrium condition that expenditure equalled output (and incomes):

$$Y = (c_0 + I + G)/(1 - c_y)$$

you see that these two lines of argument are the same thing.

At this point you should ask how this can be. One of these lines of argument is a result of the equilibrium condition that firms be happy with their level of production—that expenditure equalled production so that inventories were neither rising nor falling. The other line of argument is a result of household savers being happy with their holdings of bonds—that plans between savers and investing businesses be consistent so that there be no excess demand for bonds, and thus that the flow-of-funds through financial markets be in balance.

How is it that these two lines of argument lead to exactly the same conclusions?

The answer is: it is because of the circular flow principle. Whenever expenditure = output = incomes, then the flow-of-funds through financial markets will be in balance and savings will be equal to investment (plus the government's budget deficit). Whenever the flow-of-funds through financial markets will be in balance and savings will be equal to investment (plus the government's budget deficit). then expenditure = output = incomes. That one is the same as the other is a requirement of the accounting identities we used to set up this system of national income, a requirement of, as John Stuart Mill put it, "the metaphysical necessity of the case."

Our depression-economics formula for the level of output Y when the source of the downturn is a Keynesian excess demand for bonds:

$$Y = (c_0 + I + G)/(1 - c_y)$$

suggests policies to get us out of recession or depression:

1. Have the central bank lower the interest rates at which businesses can borrow, and thus make businesses increase their investment spending I—when you can borrow money to expand capacity more cheaply you borrow more of it because the cost of expanding capacity is lower.
2. Provide businesses with other incentives, like special tax credits, to increase investment spending I
3. Increase government purchases G—expansionary fiscal policy.
4. Claim that prosperity is just around the corner, and thus make businesses more confident about the future and hence raising investment spending I.
5. Claim that prosperity is just around the corner, and thus make households more confident about the future, hence raising the baseline consumption-spending confidence term c0, and so cut saving.
6. Cut taxes, thus giving households more money in their pockets and hence raising the baseline consumption-spending confidence term c0—but be careful, for if the tax cut convinces households that the government has no plan for financing itself in the long run, a tax cut will not improve but diminish confidence and will not raise but lower c0: under those conditions it is actually a tax increase that is expansionary.

In normal times, when central banks have the freedom of action to raise and lower interest rates, most Keynesian economists would say that the best tool to try to use to fight recession and depression is option number (1). The first line of defense against downturns—and usually the only one that is needed—is for the central bank to respond by lowering interest rates and thus providing businesses with incentives to boost their investment spending. Such expansionary monetary policies are the easiest to put into action, likely to be among the most rapidly working, least likely to become footballs for destructive political games, and tend to have fewer adverse side effects than the other policies.

But when—as has been the case since 2008—the central bank has lowered the interest rates it controls as far as it possibly can, governments must either wash their hands of the situation or resort to one or more of the other policies for fighting a Keynesian downturn.

## *Money Demand-Money Supply Gaps*

The monetarist framework focuses on excess quantity demanded for liquid cash money as a source of pressure making for economic downturns. Take the total liquid cash money supply in the economy—cash, reserve deposits at the twelve regional Federal Reserve banks, deposits in checking accounts, unspent VISA authorizations—and call it M, for money. Divide it by the average price level, which we will call P, in the economy. The quotient M/P we call the real money stock.

The monetarist version of depression economics says that when M/P goes up households and businesses try to get rid of their excess cash by spending more faster, and they do until the higher rate of their spending makes them think that they need all the liquid cash money they are holding. Conversely, when M/P goes down households and businesses try to build up their cash balances by spending less slower and they do until the lower rate of their spending makes them think that they have enough liquid cash money and do not need to be holding any more. Monetarist founder Irving Fisher hypothesized that the relationship between total expenditure E and the real money stock M/P would be more-or-less a proportional one:

$$E = (M/P) \times V$$

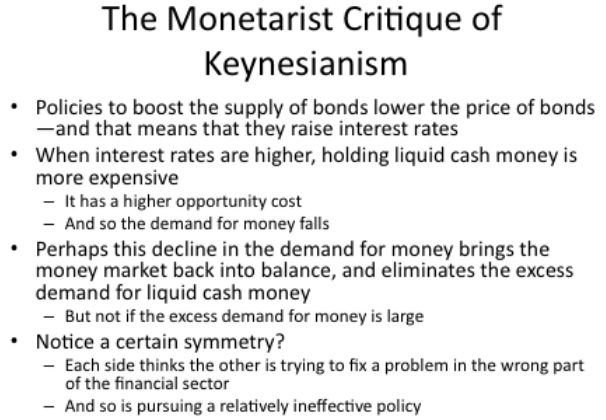
and he named the factor of proportionality V, calling it the "velocity" of money through the economy. Combine this behavioral relationship with our businesses-neither-expanding-nor-contracting-production equilibrium condition:

$$Y = E$$

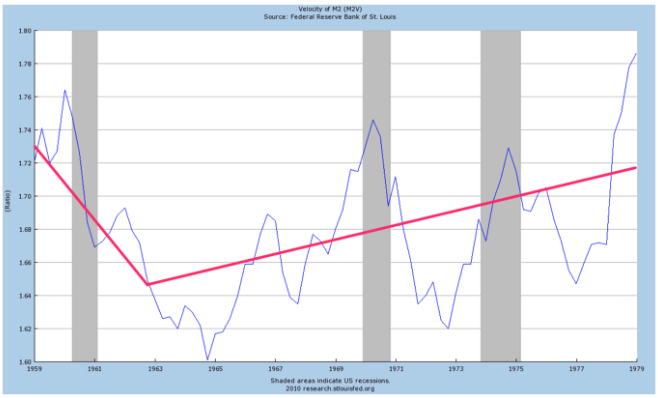
and you have the monetarist theory of downturns: the economy is in recession or depression because the real money stock M/P or V or both are too low.

Thus the monetarist way to cure a downturn is for the central bank to buy bonds for cash, thus raising the real money stock until spending, output, and incomes—and employment—are once again back at normal levels.

According to the monetarists the Keynesians were looking at the tail and thinking it was wagging the dog. The Keynesians talked about how Federal Reserve open-market purchases of bonds for cash in a downturn decreased the supply of bonds and so restored equilibrium to financial markets. They, the monetarists said, ought to have talked about how Federal Reserve open-market purchases of bonds for cash in downturns increased the supply of money and so restored equilibrium to financial markets. And, of course, the Keynesians said that any excess demand for money there was was simply a reflection of the fact that there weren't enough bonds available for people to hold.



**The Velocity of Money, 1959-1979**

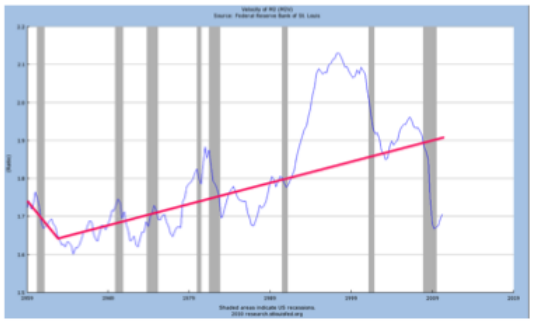


*The velocity of money was stable after World War II up until the start of the 1980s*

When I started in this business in 1978-1979, the monetarists had a good case. In the post-WWII United States, at least, the velocity of money looked amazingly stable: it looked like when the real money stock fell production fell, and when the real money stock rose production rose, and that little else had much if any effect on spending, production, incomes, and employment. As a result, at the end of the 1970s Federal Reserve Chair Paul Volcker announced that the Federal Reserve was going to pay more attention to the monetarists—with their focus on the supply of money and on the money market—than it had on the past.

This may have been his biggest mistake. The close correlation between the real money stock on the one hand and production and income on the others almost immediately broke down. Before 1979 there were very few times when velocity was more than 4% away from its trend. After 1979 it has been that far away from trend more often than not. Thus it is difficult now to trust monetarist analyses of depression economics—and their claim that if only the Federal Reserve would engage in more open-market purchases of bonds for cash things would rapidly return to normal.

Unstable Velocity of Money, 1978-



Since 1979 the velocity of M2 in the United States has usually been more than 5% away from its long-run trend. Thus the usefulness of the monetarist doctrine—that all you have to do is avoid an excess demand for money and the demand for money is stable enough that that is easy to do by keeping the growth rate of the money stock on a simple predictable path—has dropped enormously

## *Panic and Flight to High-Quality Assets*

If you are a monetarist or a Keynesian stating why the economy is in a downturn and recommending what should be done to fight depression is very easy and straightforward. In each case all you have to do is to remember and apply one equation. In the monetarist case you have to remember and apply:

$$Y = (M/P) \times V$$

In the Keynesian case you have to remember and apply:

$$Y = (c_0 + I + G)/(1 - c_y)$$

But what do you do if you are a Minskyite, if you think that downturns—big downturns at least—are the result not of an excess demand for cash (which would produce high interest rates across the board) or of an excess demand for bonds (which would produce very low interest rates across the board) but of an excess demand for safe, high-quality assets which produces very low interest rates on low-risk securities like the debt of fiscally-sound governments and very high interest rates elsewhere in the economy?

Unfortunately for you, there is no single-equation Minskyite counterpart to the single-equation income-expenditure formulation of the Keynesian model or the single-equation quantity-theory-of-money formulation of the monetarist model. The Minskyites have been a small sect rather than a large school, and so have not had the intellectual firepower to determine how to strip their theory down to its essentials so that it can be taught via a single equation to Econ 1 students.

Unfortunately for me, the past three years have been overwhelmingly a "Minskyite" downturn. There has been no general shortage of liquid cash money—interest rates on safe alternative assets like short-term U.S. Treasury bonds have remained low. If we were in a primarily "monetarist" downturn with a cash shortage those interest rates would have skyrocketed, as they did in the early 1980s. There has been no general shortage of bonds either—prices of corporate bonds have in fact fallen and interest rates risen. If we were in a primarily "Keynesian" downturn with a savings glut those interest rates would have plunged, as they did in the early 2000s. We are in a more complicated and confused situation, one that is hard to teach to Econ 1 students.

## SUMMARY

In economic downturns, a lot of people, people who could work productively at wages that would make them and their employers happy, are not working. In order to improve this situation, the government can conduct strategic interventions in financial markets that satisfy what was the excess demand for financial assets, and that will automatically relieve the deficient demand for goods and services as a whole.

"Keynesians" believe that downturns are principally caused by an excess demand to hold bonds, savings vehicles to transport your purchasing power from today into the future. "Monetarists" believe that downturns are principally caused by an excess demand for liquid cash money that you use to grease your economic transactions. "Minskyites" believe that big downturns are the result of an excess demand for safe AAA high-quality assets—but we are going to defer most of the discussion of this third position to next time because it is the sect most relevant to our current problems and thus deserves a lecture on its own.

Which view is more correct and more helpful in any particular case is, of course, an empirical issue.

If the economy is caught in a Keynesian downturn, the best way to analyze it is to use the NIPA GDP equation: to look at the four component flows of final demand, consumption spending, in-

vestment spending, and government purchases, and track how excess demand for savings vehicles is pushing them down and causing a fall in production. If the economy is caught in a monetarist downturn, the best way to analyze it is to use the quantity theory of money equation to carry out a similar exercise.

## TEST YOUR KNOWLEDGE

1. Why, empirically, did Jean-Baptiste Say come to the conclusion by 1829 that he was wrong in 1803 to claim that we did not have to worry about episodes like the one that we are in—episodes in which supply does not create its own demand, and there is economy-wide excess supply of currently-produced goods and services?
2. Why, theoretically, did John Stuart Mill claim back in 1829 that Jean-Baptiste Say should have realized that there was a hole in his argument?
3. Why is it allowable for us to assume that E, total expenditure, total economy-wide spending, is or soon will be equal to Y, income and output?
4. What kinds of financial excess demand produce "general gluts"—produce economic downturns and high unemployment rates?
5. What is our equation, if we are Keynesians, for figuring out how much production and incomes Y will fall if there is a fall in either I, G, or the "confidence" component of consumption spending c0?
6. What is our equation, if we are monetarists, for figuring out what the level of production and incomes Y will be?
7. Why are neither Keynesian nor monetarist approaches terribly good fits to our current situation?

*Lecture 6*

# 6. Dealing with the Great Recession *Government Policy and Excess Demand for Safe, High-Quality Assets and the Downturn*

## What You Will Learn

1. The two parts of the cure for a Minskyite downturn—"lend freely" and "at a penalty rate."
2. How the government has dealt with the downturn: it has been about ⅔ successful in carrying out the "lend freely" part of providing support to markets to rebalance demand and supply for high-quality assets.
3. How the government has not successfully carried out the "at a penalty rate" part of providing incentives to financiers to avoid irrational exuberance during the next financial boom.

## Recapitulation

Last chapter we ran through the "monetarist" and "Keynesian" explanations of downturns.

The monetarist explanation—that downturns are the result of an excess demand for cash, of too little money chasing goods—is a good explanation for why the downturn of 1982 came about. The Keynesian explanation—that downturns are the result of an excess of (planned) saving over investment, an excess demand for bonds—is a good explanation for why the downturn of 2002 came about.

### *Keynesians*

Last time we ran through two types of recessions, "Keynesian" type and "monetarist" type—the one we saw in 2002 and the otjer we saw in 1982.

In a "Keynesian" downturn the fundamental financial excess demand in the economy is an excess demand for bonds: an excess of (planned) savings over business investment. Households try to shift their spending from purchasing current goods and services to purchasing bonds and other investment vehicles to carry purchasing power forward into the future. The shift in spending away from currently-produced consumption goods and services puts downward pressure on employment and production in those industries. But where is the excess demand for labor to pull the newly-unemployed into new occupations?

Perhaps as bond prices rise and interest rates fall businesses become exuberant about expanding their productive capacity, boost business investment spending, and excess supply in consumption-goods industries is offset by excess demand in investment-goods industries and the economy

smoothly rebalances. But perhaps not—perhaps businesses don't become exuberant, or perhaps (as happened in 2002) interest rates fall to their floor near zero, and there still is not enough incentive for businesses to invest enough to make them want to borrow enough to soak up the savings glut. Then the downward spiral of the multiplier kicks in: falling production and employment means falling incomes means further reductions in spending and further reductions in production, employment, and incomes.

The cures for a Keynesian downturn are for something to happen that brings the supply and demand for bonds back into balance. Interest rate reductions by the central bank might induce exuberant businesses to undertake investment spending to expand capacity. Thus they would print up more bonds too sell to finance their expansion. This would expand the supply of bonds, and so reduce the excess demand for bonds. Perhaps interest rate reductions would reduce the value of the dollar and so boost exports as U.S.-made goods look cheaper to foreigners. They would then pay for these greater purchases of our exports by selling their own dollar-denominated bondholdings into the market. This would reduce the demand for bonds, and so reduce the excess demand for bonds. Or the government could pull its spending forward into the present and push its taxes back into the past. In order to finance this shift, the government would sell more bonds. That would expand the supply of bonds. And that, too, would reduce the excess demand for bonds.

Standard monetarist cures—for the Federal Reserve to buy short-term government bonds for cash—are ineffective because an excess demand for liquid cash money is not the problem, except insofar as the Federal Reserve's open-market purchases trigger enough of a reduction in interest rates to sufficiently boost either business investment spending (and bond issues) or net exports (and foreigners' bond sales).

### *Monetarists*

In a "monetarist" downturn the fundamental financial excess demand in the economy is an excess demand for liquid cash money: an excess of (desired) cash holdings over the economy's money stock. Households try to shift their spending from purchasing current goods and services to building up their cash balances to achieve their desired liquidity. The shift in spending away from currently-produced consumption goods and services puts downward pressure on employment and production in those industries. But where is the excess demand for labor to pull the newly-unemployed into new occupations?

Perhaps as households dump bonds on the market to try to build up their cash holdings bond prices fall and interest rate rise enough that households notice the high opportunity cost of holding cash and reconfigure in order to be satisfied with much lower liquid cash money holdings. But perhaps not. Perhaps (as happened in 1982) interest rates rise but households and businesses still want to build up their cash holdings. And then the downward spiral of the multiplier kicks in: falling production and employment means falling incomes means further reductions in spending and further reductions in production, employment, and incomes.

The cures for a monetarist downturn are for something to happen that brings the supply and demand for liquid cash money back into balance. Interest rate increases could induce households

and businesses to reconfigure their operations, in order to get along with much smaller liquid cash money holdings. A general fall in the price level could reduce the flow of nominal spending needed to maintain the economy at full employment and normal capacity. The central bank could simply expand the money stock by buying bonds for cash. The banking system could reconfigure itself to accept more deposits for each dollar of its own reserves and thus run itself a little closer to the edge of vulnerability to a panic or a run.

Keynesian cures—for the government, say, to print up a bunch of bonds and engage in deficit spending—are ineffective because an excess demand for bonds is not the problem, except insofar as the government's bond issues trigger enough of a rise in interest rates to induce a sufficient reconfiguration so that households and businesses can carry out their normal spending plans with less liquid cash money in their reserves.

## *But This Time Is Different*

However, the current downturn that started in 2007 and is still going on is different. It requires a different explanation. There is, currently, no shortage of cash in the economy: the Federal Reserve has bought short-term government bonds with cash until the economy is positively awash with liquid cash money. But the result has not been a renewal of spending. Instead, the velocity of money—the expression V in the quantity theory of money equation:

$$Y = (M/P) \bullet V$$

has fallen to previously unimaginable levels.

There is, currently, no obvious excess demand for bonds, for vehicles for saving to transfer purchasing power from the present to the future. You can get corporate bonds issued by corporations with good fundamental long-term economic prospects at extraordinarily low prices—and thus paying extraordinarily high yields—relative to normal times.

If the fundamental problem that was breaking Say's Law was an excess demand for money, then interest rates would be high. If the fundamental problem that was breaking Say's Law was an excess demand for bonds, an excess of (planned) expenditure over income, then bond prices would be high and interest rates generally low.

Instead, it is only interest rates on government bonds and other assets regarded as safe and of high quality (i.e., mortgages conforming to Fannie Mae guidelines) that are low—only the prices of those assets that are high.

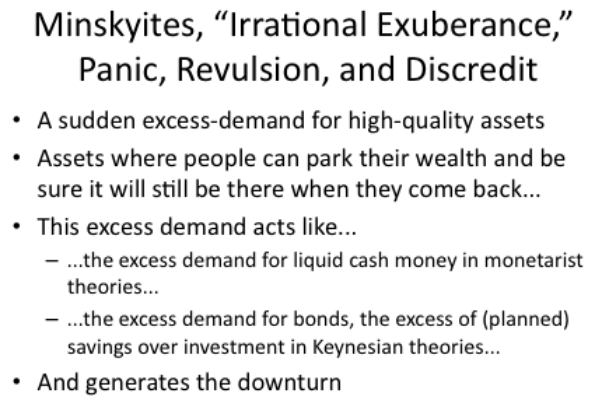
Thus today we have a different type of economic downturn: it is neither a Keynesian downturn triggered by an excess of (planned) saving over investment, nor a monetarist downturn triggered by an excess of desired liquid cash money holdings over the available money stock.

# THE THIRD TYPE OF DOWNTURN: MINSKYITE

## *An Excess Demand for Safe Financial Assets*

This current downturn is thus the result of an excess demand for safety, for high-quality assets, for vehicles in which one can place one's wealth and be confident that it will not melt away.

This downturn is a Minskyite downturn.




Instead, it is a Minskyite downturn triggered by an excess demand for safe high-quality assets. On the one hand, a great deal of the asset pool that people had regarded as safe and high quality—as nearly as good as Treasuries—is gone, or at least definitely no longer regarded as a safe place to park your wealth so that it will still be there when you come back. On the other hand, the fact of panic and the lack of trust in governments' abilities to stabilize the economy has greatly increased the share of portfolios that investors wish to hold in high-quality even if low-yielding vehicles.

If you are a monetarist or a Keynesian stating why the economy is in a downturn and recommending what should be done to fight depression is very easy and straightforward. In each case all you have to do is to remember and apply one equation. In the monetarist case you have to remember and apply:

$$Y = (M/P) \times V$$

In the Keynesian case you have to remember and apply:

$$Y = (c_0 + I + G)/(1 - c_y)$$

But what do you do if you are a Minskyite, if you think that downturns—big downturns at least—are the result not of an excess demand for cash (which would produce high interest rates across the board) or of an excess demand for bonds (which would produce very low interest rates across the board) but of an excess demand for safe, high-quality assets which produces very low interest rates on low-risk securities like the debt of fiscally-sound governments and very high interest rates elsewhere in the economy?

There have been lots of Keynesians and monetarists developing their approaches and fighting it out since, well, since the days of Irving Fisher and Knut Wicksell more than a century ago. That is the reason why their arguments go so smoothly. But there have been fewer Minskyites. And I am not smart enough to make the argument as polished. So this lecture will be considerably rougher.

Thus unfortunately for you, there is no single-equation Minskyite counterpart to the single-equation income-expenditure formulation of the Keynesian model or the single-equation quantity-theory-of-money formulation of the monetarist model. The Minskyites have been a small sect rather than a large school, and so have not had the intellectual firepower to determine how to strip their theory down to its essentials so that it can be taught via a single equation to Econ 1 students.

And unfortunately for me, the past three years have been overwhelmingly a "Minskyite" downturn. There has been no general shortage of liquid cash money—interest rates on safe alternative assets like short-term U.S. Treasury bonds have remained low. If we were in a primarily "monetarist" downturn with a cash shortage those interest rates would have skyrocketed, as they did in the early 1980s. There has been no general shortage of bonds either—prices of corporate bonds have in fact fallen and interest rates risen. If we were in a primarily "Keynesian" downturn with a savings glut those interest rates would have plunged, as they did in the early 2000s. We are in a more complicated and confused situation, one that is hard to teach to Econ 1 students.

### *Panic and Flight to High-Quality Assets*

The Minskyite story of a downturn follows, for a while, the same pattern as the monetarist and the Keynesian stories did. We break Say's Law by noting that general excess supply in all the markets for currently-produced goods and services can be generated by excess demand for financial assets, and that general excess supply produces downward pressure on production and employment—with no countervailing upward pressure in any other market for any other currently-produced goods or services.

The logic is that people today are not spending at their normal pace because they want to divert their purchasing power to building up their holdings of high-quality safe assets: there is an excess demand for such "AAA" assets. Thus households and businesses have been trying to switch their spending from purchasing currently-produced goods and services to purchasing and building up their safe asset holdings.

Thus employment and production in currently-produced goods and services industries has fallen—with nothing (so far) to pick up the slack.

This is in some respects an old and well-known story. Many economists (if not as many as there are Keynesians and monetarists) have set forward versions of it. Representative members of this "Minskyite" school include: Walter Bagehot, John Maynard Keynes (in some of his moods), Hyman Minsky, Charles Kindleberger, Ben Bernanke, and Ricardo Caballero. And it does have a cure, outlined nearly one hundred and fifty years ago by economist Walter Bagehot in his book *Lombard Street: A Study of the Money Market.* Bagehot compressed his cure for dealing with such a downturn into six words: the government should "lend freely" at a "penalty rate."

## THE MINSKYITE CURE

### *A Shortage of Safe High-Quality Assets*

In a monetarist downturn the problem is an excess demand for liquid cash money, a money supply that is too small. The solution is for the central bank to boost the supply of money via open-market operations that buy short-term government bonds for cash. In a Keynesian downturn the problem is an excess demand for bonds—an excess of (planned) savings over investment. The solution is to bring savings and investment back into balance either via inducing the public to save less, the government to spend more and issue more bonds, or private companies to invest more and issue more bonds.

In the Minskyite downturn the problem is an excess demand for safe, high-quality, "AAA" financial assets. The economy is short of places where investors can park their wealth where they regard it as safe—where they think that it will still be there when next they look. Such an excess demand is the result of justified fear:

- The economy is in a downturn
- A lot of investors have lost their money
- Many financial institutions are teetering on the edge of bankruptcy

Thus it is reasonable for the demand for safe assets to rise.

But such an excess downturn is also the result of previous misjudgment and surprise:

- During the boom preceding the crash financiers had created a lot of brand-new financial assets
- Many of those assets had been widely and generally regarded as safe
- Many people and institutions had accepted the general regard and had treated them as safe places to park their wealth
- They turned out to be wrong
- The newly-created assets turned out to be risky indeed
- And so all those who held the no-longer-AAA assets are eager to move their wealth out of them and into properly, truly safe assets

Thus the excess demand for safe assets has both a supply and a demand side to its creation.

## *The Process of Recognition*

We can see the process of recognition that assets regarded by safe are not safe at all in the internal discussions and judgments at the then-largest bank in the world—Citigroup—as it tried to understand its holdings of Mortgage-Backed Securities in 2007. The SEC vs. Citigroup civil court case settled in 2010 gives us a window into this process of recognition: that assets widely regarded as safe were in fact not so.

Tracking the documents, it seems clear that in January 2007 the top management of Citi thought that it owned $26 billion of safe MBS. By April 2007, the top managers thought that Citi had reduced its asset holdings to about $20 billion of relatively-safe MBS, and recognized that there was an additional $38 billion on its books—but was confident that that $38 billion were absolutely and totally safe so that there was next to no possibility of any loss. And by July 2007 Citi's

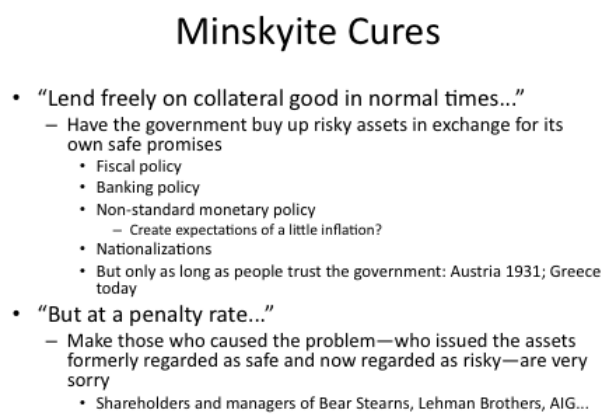
top managers thought that they had reduced their relatively-safe holdings to $13 billion and their absolutely safe exposure to an additional $33 billion.

Then in the late summer and fall they change their mind. In September 2007, Citi concludes that it has probably lost $100 million on its $13 billion of relatively-safe MBS. By October, Citi believes that it has lost $1.6 billion on its $13 billion of relatively-safe MBS—but that it has no losses on what is now seen as an additional $43 billion of exposure.

And then in November 2007 Citi concludes that it has lost $10 billion on its $55 billion of MBS—that they were not safe assets at all. Citi ultimately lost about ¾ of the $55 billion that at the start of 2007 it had thought were safe places to park its wealth.

## *The Cure to the Downturn: "Lend Freely…"*

The cure to a Minskyite downturn is analogous to the cures for monetarist and Keynesian downturns. In a Minskyite downturn the central problem is an excess demand for safety, a shortage of safe high-quality assets. The cures are two.




First, reduce the demand for high-quality assets by easing the panic—restoring the confidence and the risk-bearing capacity of the market.

Second, increase the supply of safe assets by having the government guarantee risky assets, thus transforming them into safe ones, or simply issue more debt itself and use the proceeds to buy up risky assets. This will also help eliminate the excess demand for safe assets—as long as people trust the government's promises, and don't take the expansion of its debts as a sign that its liabilities, too, are risky ones to be shunned.

When the government undertakes a Minskyite cure to a downturn—undertakes to reassure markets and to transform risky assets that no investors want to hold at anywhere near their fundamental prices into safe assets—it must. Bagehot said, act aggressively. Investors must see that the government is acting to make the otherwise-risky securities close to riskless. Investors must be confident that the government will continue to do so. Otherwise, they will worry about the risk that the government will abandon its market-stabilization policies, and that will make perceived risk even higher.

The government must, as nineteenth-century economist Walter Bagehot put it, "lend freely." Anybody and everybody who wants to swap the assets they currently hold for safe government-issued ones must be able to do so. That ability is the only thing that can make all the rest of investors confident that the assets they are holding are not risky at all.

In our current situation, this injunction for the government to do everything needed to expand the supply of assets the market considers safe is a call for a number of different kinds of expansionary policy.

It is a call for expansionary fiscal policy, for deficit spending—in which the government spends and then borrows by issuing its own bonds to finance its deficit spending, and those bonds then become safe assets that investors can hold.

It is a call for banking policy: government long-term loans to banks that are on the edge of failure, government guarantees of privately-issued assets, government purchase of risky assets financed by the issue of its own safe debt.

It is a call for non-standard monetary policy: open-market operations not just in short-term government bonds but in long-term and private securities that perform the same function of taking risk onto the government's balance sheet and providing the private sector with safe high-quality assets in their place.

And it is a call for raising the expected future rate of inflation a bit: if high-quality assets are now expected to have some of their value gradually eroded by slow inflation, demand for them will fall and so spending on currently-produced goods and services will rise.

## *Risks of Aggressive Policy Activism*

If investors are still not confident that the government will preserve the financial system from collapse, then temporary bank nationalizations may be called for: if investors are not confident that the government will continue to support private-sector banks in trouble, they may need to be reassured by making the liabilities of shaky private banks liabilities of the government as well.

But all of these policies work only as long as and insofar as they do not shake investors' confidence in the government's own finances. For if investors begin to think of the government's liabilities as also not safe and subject to risk, all of these government policies will turn out not to raise the supply of safe high-quality assets but to diminish it. Then the gap between demand and supply for high-quality, safe assets will be bigger than ever, and the downward pressure on the flow of spending on currently-produced goods and services larger than ever. We saw this collapse of confidence in government credit in Austria in 1931, in Greece in 2010, and innumerable other times in other countries.

## *The Minskyite Cure: "At a Penalty Rate…"*

"Lending freely" is, however, only half of the Minskyite cure to a downturn. The government must also lend at, as Walter Bagehot put it, "a penalty rate." For the government to lend to financial institutions that have portfolios so risky that the market has concluded that they are bankrupt and need to be shut down is to reward excessive risk taking. If investors and financiers come to believe that the government will be there to shore up the debts of aggressive financial institutions in a panic and make them safe to hold, investors and financiers will then have no incentive to

curb their own appetite for risk—there will be no risk to them, they expect, for the government will bail them out. Thus a Minskyite cure to the current downturn tends to guarantee that the next downturn will be even worse, for nobody will then have any incentive to limit the risks that they are their creditors take.

As my old teacher from MIT, Charlie Kindleberger, liked to say:

> The presence of a lender of last resort weakens the self-reliance of the banking system and increases its likelihood of falling into excesses of overtrading, revulsion, and discredit...

Although he did note that

> [this argument] has overtones... that there is no use providing the poor with housing since they will only keep coal in the bathtub...

Kindleberger thus saw a dilemma. To cure the crisis and avoid or cut short the period of mass unemployment, the government must do something to increase the supply and decrease the demand for safe, high-quality assets. It must act as what he called a "lender of last resort" for the financial system. But, as he expressly, noted, this makes economic policy under such circumstances not a science but "an art." The rescuer of the system:

> should exist... but his presence should be doubted [beforehand].... This is a neat trick: always come to the rescue in order to prevent needless deflation, but always leave it uncertain whether rescue will arrive in time or at all, so as to instill caution in other speculators, banks, cities, or countries.... some sleight of hand, some trick with mirrors... because... [nonappearance] has such unhappy consequences for the economic system...

Bagehot, a century earlier, had thought he had a solution to this dilemma. Although the government should provide support and so transform what the market now regards as risky assets into safe ones, it must do so in a way that makes the original holders of those assets unhappy. It must make sure that those who would have lost wealth had the government not intervened do lose wealth. That is what he meant by saying that the government should only lend at a "penalty rate"—an interest rate that makes the original financiers unhappy, and poor. Whether the government does this by charging banks high interest rates on the money it lends them, on forcing the sale of assets to itself at distressed prices, by taking large ownership stakes in private financial institutions and so taking the lion's share of any future profits, or by direct nationalization at fire-sale prices is a matter of judgment.

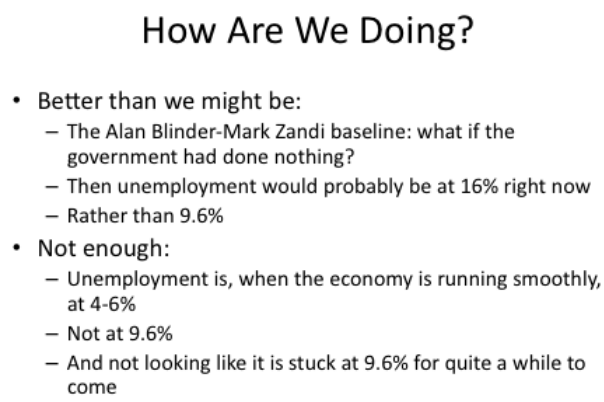
It may even be impossible to carry out the "penalty rate" portion of Bagehot's injunction. As former Federal Reserve Vice Chair Donald Kohn observed in 2009, when the choice is between teaching a few thousand feckless financiers not to over-speculate on the one hand or avoiding the loss of the jobs of tens of millions on the other, there is really no choice at all.

# How Has This Advice Been Implemented?

How are we doing? How has the U.S. government, and other governments, done at carrying out the proper policies for dealing with a Minskyite downturn?

## *What If the Government Had Let the Economy Alone?*

One answer is that the government has done reasonably well: that the glass is two-thirds full on the "lend freely" component. Two economists, Alan Blinder and Mark Zandi, have made that argument most powerfully. Alan Blinder is a Princeton professor, a former Vice-Chair of the Federal Reserve, was an advisor to Barack Obama in the 2008 presidential campaign, and is a perennial on the short lists for senior economic policy positions under Democratic administrations. Mark Zandi is Chief Economist for Moody's economics.com website, was an advisor to John McCain in the 2008 presidential campaign, and will be a perennial on the short lists for senior economic policy positions under future Republican administrations.




They ask the baseline question: What would the economy look like today if the government had followed the policies recommended by the currently-dominant faction of the Republican Party and had done nothing starting in the summer of 2008? What if they had refused to rescue and support the banks, refused to spend government money on a recovery program, and focused instead on reducing the long-run deficit?

Then, they conclude, the unemployment rate today would probably be at 16%.

Instead, as of this lecture the unemployment rate is 9.6%.

The unemployment rate, in normal times, is between 4% and 6%—say 6%.

Blinder and Zandi thus conclude that the TARP and the TALF and the HAMP and Federal Reserve "quantitative easing" policies and extra deficit spending via the ARRA and all the other government interventions have accomplished 6.4% of a 10%-reduction-in-unemployment-relative-to-where-it-would-otherwise-have-been job. That is almost ⅔ of the job. The glass is about ⅔ full.

On the other hand, the glass is a little more than ⅓ empty as far as "lend freely" is concerned. In retrospect it is clear that the government should have been even more aggressive in promoting recovery, boosting spending, and supporting financial markets.

This conclusion—the ⅓ empty glass part—is reinforced by noting that current economic forecasts see little if any reduction in the unemployment rate over the next two years, and in fact a likely small increase in the rate of unemployment for a while.

### *The Failure to Lend at a Penalty Rate*

If the glass of economic policy is ⅔ full as far as the "lend freely" part of proper economic policy is concerned, the glass is totally empty as far as the "at a penalty rate" part of proper economic policy is concerned. In fact, it is doubtful that there is a glass at all.

## SUMMARY

A Keynesian downturn is the result of planned savings in excess of planned investment: people as a whole planning to buy more bonds than exist to use as savings vehicles to carry their purchasing power forward into the future. It is cured by either expanding the supply or decreasing the demand for bonds. A monetarist downturn is the result of desired holdings of liquid cash money in excess of the economy's money stock. It is cured by expanding the money supply.

Our current downturn is, overwhelmingly, neither of these. It is a "Minskyite" downturn—the result of an excess demand by people to hold safe, high-quality assets in their portfolios. The cure for a Minskyite downturn has two parts. (1) "Lend freely"—the government needs to create more high-quality financial assets for people to hold, either by issuing more of its own high-quality liabilities or by guaranteeing, formally or informally, banks and finance companies. (2) "At a penalty rate"—the government needs to try to make sure that those whose initial promises that certain investments would be safe and high-quality do not profit from the bailout necessary to minimize the size of the downturn.

In this crisis, the U.S. government has done reasonably well on the "lend freely" part—the glass is about two-thirds full. It has done much worse on the "penalty rate" part of the Minskyite policy prescription.

## TEST YOUR KNOWLEDGE

1. What does it mean for the government to "lend freely"?
2. What does it mean for the government to "lend... at a penalty rate"?
3. Why is it appropriate for the government to "lend freely" in a Minskyite downturn?
4. Why is it appropriate for the government to "lend... at a penalty rate" in a Minskyite downturn?

*Lecture 7*

# 7. Origins of the Great Recession
# *The Global Savings Glut, the Housing Bubble, Overleverage, Crash, and Downturn*

## What You Will Learn

By the time that you finish this lecture, you should be able to:

1. Explain the origins of the "global savings glut" that led to such low interest rates and such eagerness to experiment with "financial engineering" in the 2000s.
2. Explain the financial engineering devices that so greatly enlarged the pool of those who could buy houses in the 2000s
3. Explain how an increase in housing finance availability and in the number of people who thought they could afford to buy houses generated a large housing bubble.
4. Explain how the housing bubble was bound to crash.
5. Explain why an earlier bubble crash—that of the dot-com bubble in 2000-2002—did not generate any large economic downturn.
6. Explain why the crash of the housing bubble did generate a large economic downturn

## Origins of the Downturn

### *The Global Savings Glut*

Begin with the global savings glut of the early 2000s. The end of the high-technology computers-and-communications boom and dot-com bubble in 2000 greatly reduced the flow of productive places in which people could put their savings worldwide.

At the same time the rise of Asia—and the increasingly-large international trade surpluses being run by Asian economies following manufacturing export-oriented development strategies, and the necessity of placing the earnings from those exports as savings in the purchasing countries rather than using them to buy imports—greatly increased the supply of savings worldwide. Traditionally, industrializing countries have run trade deficits with the world economy's rich, developed, North Atlantic core as those industrializing and growing fast buy machinery and other capital goods they cannot (yet) make at home. But by 2000 rapidly-industrializing economies in Asia and oil-exporting economies in the Middle East ran large trade surpluses with the North Atlantic. They took the extra money they had earned with their trade surpluses and saved it, looking to buy assets (primarily bonds) in North Atlantic economies (primarily the U.S.). For China, especially, this became a development strategy: maintain full employment in Shanghai by (indirectly) lending America's consumers the renminbi they need to keep their purchases up.

The result was what Federal Reserve Chair Ben Bernanke calls a "global savings glut": a (planned) excess demand for savings vehicles worldwide. This glut threatened to turn the small global economic downturn of 2000-2002 into a big downturn, unless some way was found to boost the amount of bonds being newly issued by businesses seeking to expand and so satisfy the excess worldwide demand for savings vehicles.

Globally, central banks responded to the global savings glut by flooding the world with liquidity—buying bonds for liquid cash and promising to continue such easy-money policies in the future, with an eye toward lowering interest rates and thus the cost of capital to firms, and thus getting firms to respond by increasing their plans to build capacity through corporate investment and increasing their bond issues. This would, they hoped, alleviate the danger of the excess demand for savings vehicles producing a large shortfall in the demand for currently-produced gods and services. Interest rates—not just the short-term rates set by central bank policy, but the longer-term interest rates that matter the most for housing prices—fell, and stayed low even when the Federal Reserve began in 2004 to raise the interest rates it directly controlled.

To some degree this worked as intended: corporate investment did rise. But to some degree this had unintended consequences: Lower interest rates generated a mortgage and a financial engineering boom, which generated a housing boom, and then a housing bubble, and then a housing crash, and that generated our current deep economic downturn.

Home prices, however, rose much more than they should have given low mortgage rates. Suppose that you believe that the inflow of savings from China and elsewhere was going to continue for a decade, and was going to depress the cost of capital to mortgage lenders by 2% per year. Even if all of that reduction was passed on to borrowers, it would only have allowed them to pay an extra 20% for houses. Yet the price of houses in America roughly doubled between 1996 and 2006.

So the next stage in our study of the origins of the downturn is to look at mortgage finance and financial engineering in the 2000s.

## *Mortgage Finance and Financial Engineering*

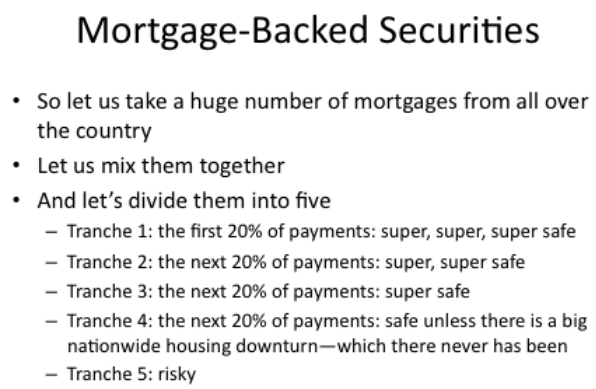
The

Banks that make mortgages in their areas
But what if something bad happens to the local real estate market?
The U.S. government—Fannie Mae—will buy up "conforming" mortgages (20% down, stable income, low principal, appraised value) and take on the risk
But what about the others?
Making "subprime" loans too risky to be a big business
The

So let us take a huge number of mortgages from all over the country
Let us mix them together
And let's divide them into five
Tranche 1: the first 20% of payments: super, super, super safe

Tranche 2: the next 20% of payments: super, super safe
Tranche 3: the next 20% of payments: super safe
Tranche 4: the next 20% of payments: safe unless there is a big nationwide housing downturn—which there never has been
Tranche 5: risky

You have taken a whole bunch of non-conforming mortgages that are too risky for banks or insurance companies, etc., to hold...
And you have turned them into five piles—one of which (T5) is risky, one of which (T4) is safe unless there is a big nationwide housing downturn, and three of which are safe no matter what...
Or so your calculations show...




## *Securitization and the Concealment of Risk*

By now the litany is familiar: the old model of banking, in which banks held on to the loans they made, was replaced by the new practice of originate-and-distribute. Mortgage originators—which in many cases had no traditional banking business—made loans to buy houses, then quickly sold those loans off to other firms. These firms then repackaged those loans by pooling them, then selling shares of these pools of securities; and rating agencies were willing to label the resulting product chicken—that is, to bestow their seal of approval, the AAA rating, on the more senior of these securities, those that had first claim on interest and principal repayment.

Everyone ignored both the risks posed by a general housing bust and the degradation of underwriting standards as the bubble inflated (that ignorance was no doubt assisted by the huge amounts of money being made). When the bust came, much of that AAA paper turned out to be worth just pennies on the dollar.

It's a disgraceful story. It's important, however, to step back and ask how important these dodgy financial practices were in setting the stage for crisis.

Three points seem relevant. First, the usual version of the story conveys the impression that Wall Street had no incentive to worry about the risks of subprime lending, because it was able to unload the toxic waste on unsuspecting investors throughout the world. But this claim appears to be mostly although not entirely wrong: while there were plenty of naive investors buying complex securities without understanding the risks, the Wall Street firms issuing these securities kept the riskiest assets on their own books. In addition, many of the somewhat less risky assets were bought by other financial institutions, normally considered sophisticated investors, not the gen-

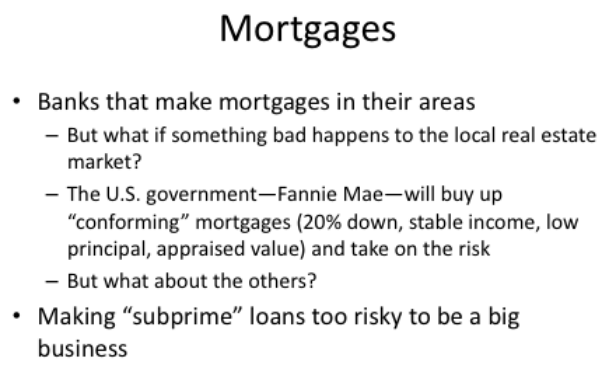
eral public. The overall effect was to concentrate risks in the banking system, not pawn them off on others.

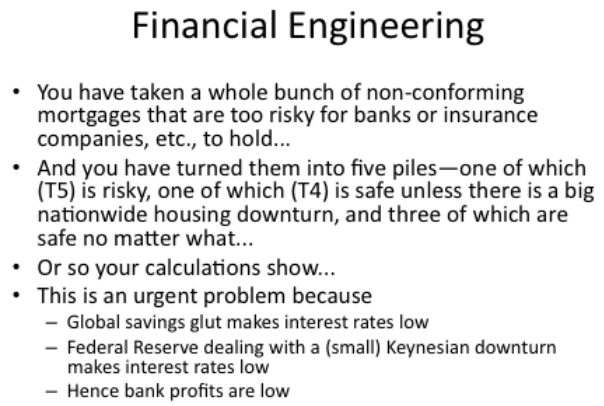
Second, the comparison between Europe and America is instructive. Europe managed to inflate giant housing bubbles without turning to American-style complex financial schemes. Spanish banks, in particular, hugely expanded credit; they did so by selling claims on their loans to foreign investors, but these claims were straightforward, "plain vanilla" contracts that left ultimate liability with the original lenders, the Spanish banks themselves. The relative simplicity of their financial techniques didn't prevent a huge bubble and bust.

A third strike against the argument that complex finance played an essential role is the fact that the housing bubble was matched by a simultaneous bubble in commercial real estate, which continued to be financed primarily by old-fashioned bank lending. So exotic finance wasn't a necessary condition for runaway lending, even in the United States.

## *The Housing Boom*

Between 1997 and 2007, all throughout the North Atlantic, real estate prices soared. The prices of housing more than doubled in the British isles, nearly doubled in Spain, and rose by 75 percent in the United States. Real estate prices rose North Atlantic-wise for at least four interconnected reasons: prices rose because of a "global savings glut," because of financial innovations to distribute risk and make it less costly and risky to bear, because of financial innovations that disguised risk and made those who were really bearing it ignorant that they were doing so, and because prices were rising and other people wanted to get in on the profits.




## *The Housing Bubble*

Between 1997 and 2007, all throughout the North Atlantic, real estate prices soared. The prices of housing more than doubled in the British isles, nearly doubled in Spain, and rose by 75 percent in the United States. Real estate prices rose North Atlantic-wise for at least four interconnected reasons: prices rose because of a "global savings glut," because of financial innovations to distribute risk and make it less costly and risky to

bear, because of financial innovations that disguised risk and made those who were really bearing it ignorant that they were doing so, and because prices were rising and other people wanted to get in on the profits.

### *Government Overlending? No…*

There are two more reasons for the housing bubble that you often hear of—government programs that provided subsidies to mortgage lenders and borrowers, and a Federal Reserve that cut interest rates too far. But these reasons played net to no role at all in the runup of prices. Government subsidies to mortgage lenders and borrowers via arge government-sponsored enterprise mortgage lenders like the Federal National Mortgage Administration—FNMA—"Fannie Mae"—had existed long before the 2000s. You could attribute a runup in housing prices in the 1940s and in the 1950s to their appearance, but not a runup in housing prices in the 2000s.

The lending that allowed the purchase of houses at rising prices was primarily made not by government-sponsored enterprises like Fannie Mae but by private specialized mortgage lenders like the now-bankrupt Countrywide. Fannie and its cousins accounted for a sharply reduced share of home lending during the price runup years of the 2000s. The point that U.S. government policies were not responsible is reinforced by all the other real-estate price runups—in U.S. commercial real estate, in Spain, and in the British isles. The U.S. housing price runup was part of a global phenomenon, and had a global cause.

A similar logic applies to claims that the housing bubble was the Federal Reserve's fault. The Federal Reserve did reduce the overnight rate on loans between banks from 6.5% per year in 2000 to 1% per year in 2003. But western Europe's central bank, the ECB, reduced interest rates by only half as much as did America's Federal Reserve—yet Europe's housing bubbles were if anything larger than those in the United States.

Moreover, suppose that the Federal Reserve does reduce interest rates by 3% per year too much, keeps them low for three years, and that all of that reduction gets passed through to mortgage borrowers. That break on interest rates means only that they can afford to pay an extra 9% to buy their house. That is an order of magnitude too small to account for any significant part of the housing price runup.

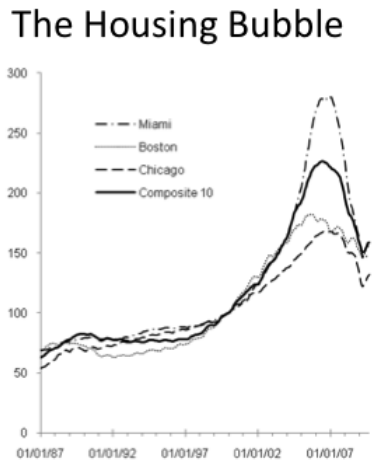
Was U.S. government policy at fault at all? Yes, but not because the Federal Reserve's cutting interest rates boosted prices or because the government encouraged Fannie and its cousins to lend into the housing bubble. The biggest faults of government policy were the failures of financial regulators to use their authority to stop excessive risk-taking. As Paul Krugman and Robin Wells write: "conservatives would like to put soft-hearted politicians at the center of this story, they don't belong there." But in a sense they do belong there—only their soft hearts aren't bleeding for working-class Americans hoping to buy houses, but for very rich mortgage speculators hoping to evade regulation and leverage up their large portfolios:

- A whole bunch of people who could not previously afford to buy houses could now afford to buy houses...
- Especially if they thought that the price of housing is unlikely to go down...

- Especially if interest rates were historically low for other reasons...
- Charles Kindleberger: "There is nothing so disturbing to one's well-being and judgment as to see a friend get rich..."

When the number of firms and households indulging in these practices grows large, bringing in segments of the population that are normally aloof from such ventures, speculation for profit leads away from normal, rational behavior to what has been described as "manias" or "bubbles."

Bubbles in general aren't at all unusual. On the contrary, as Yale's Robert Shiller explained at length in his justly celebrated book, *Irrational Exuberance*, they are a recurring feature of financial markets. Bubbles have happened in small economies and large, in individual nations and in the global economy as a whole, in periods of heavy public intervention and in eras of minimal government. The North Atlantic housing bubble, as Roubini and Mihm say, was a "white swan"—a common sort of event, not a highly unusual one, albeit much bigger than most.




Our guess is that the bubble got started largely thanks to the global savings glut, but that it developed a momentum of its own—which is what bubbles do. Financial innovations such as the securitization of mortgages may have made it easier for the bubble to inflate—but European banks managed to extend too much credit without such frills. However, it is clear that there were major failures in oversight.

## THE HOUSING CRASH

### *Some Bubbles Burst Harmlessly—or Nearly So*

What happens when bubbles burst? Invariably, a lot of paper wealth disappears. But that, in itself, isn't enough to turn a burst bubble into a catastrophe for the economy as a whole. The stock crash of 2000–2002 was a $5 trillion hit to US household wealth. It created a lot of pain for people counting on capital gains for their retirement, but it didn't trigger any broader systemic crisis. The housing bust was an $8 trillion hit—not all that much bigger than the stock crash, once one takes into account both inflation and economic growth in the interim. But it produced the worst global crisis since the 1930s. Why?

There are two main answers to the question of why some asset bubbles do so much damage when they burst. The narrow answer focuses on the financial sector; the broad answer argues that debt and leverage among nonfinancial players such as corporations and home owners are equally important. Which one you subscribe to has major implications for your view on how we should respond to the economy's continuing woes.

## *Credit, Finance, and Confidence*

Let's talk first about the financial sector—banks and bank-like institutions. Even Adam Smith knew that banks are peculiarly subject to crises of confidence. It's in the nature of their business: a bank may promise you that you have access to your money whenever you want it, but since most of the funds put in any bank's care are invested in long-term assets, no bank can actually meet that promise if a large fraction of its depositors simultaneously demand their money back. So banking depends on confidence: as long as people believe their money is safe and withdraw funds only when they have a personal or business reason to do so, their money probably is safe. But if a bank's customers develop doubts about the institution's soundness and decide en masse to pull their money out—that is, if there's a run on the bank—fear that the bank will fail can turn into a self-fulfilling prophecy.

The global real estate bust, unlike the bursting of the dot-com bubble, raised justifiable concerns about the soundness of banks. Financial institutions, by and large, weren't exposed to technology stocks. They were, however, very much exposed to losses from mortgage defaults. So it's not surprising, at least in retrospect, that the real estate bust triggered a run on large parts of the financial system. Or to use an old-fashioned term that has come back into common use, it triggered a financial panic.

But how could an old-fashioned panic happen in the modern world? Generations of economics instructors have told students that bank runs—like the famous scene in the movie It's a Wonderful Life—are a thing of the past, because modern depositors know that their money is insured by the FDIC. Why were they wrong? The now-familiar answer is that by 2007 the financial system had evolved to a point where both traditional bank regulation and its associated safety net were full of holes.

In the United States, conventional banking was increasingly supplanted by a variety of alternatives, these days usually grouped together as "shadow banking." For example, many businesses began parking their money not in bank deposits but in "repo" (repurchase) agreements—very short-term loans to hedge funds and investment banks. Repo yielded higher interest rates than ordinary deposits, because its issuers weren't bound by the reserve requirements or other rules that applied to conventional banks. But it wasn't government-guaranteed, and it was therefore subject to crises of confidence. Runs on repo brought down Bear Stearns and Lehman Brothers. And by many estimates, by 2007 repo and other forms of shadow banking accounted for about 60 percent of the overall US banking system—yet shadow banking remained largely unregulated and unsecured. "It's little wonder," write Roubini and Mihm, "that the shadow banking system was at the heart of what would become the mother of all bank runs."

In Europe, the breakdown of the traditional banking safety net took a somewhat different form. First of all, banks in the bubble areas of Spain, Ireland, Iceland, and the UK made loans that far exceeded their deposits, which they supplemented with wholesale funding—basically, borrowing from other banks and investors. This wholesale funding could and did dry up when the soundness of the original lenders came into question.

Beyond that, European banks were backed by their national governments, not by a pan-European safety net—which meant that when really major banking problems arose in some countries, the ability of those nations' governments to backstop their banks came into question. Iceland, where a handful of runaway bankers ran up a debt many times the country's GDP, is the famous example. But similar if less severe doubts about the government's ability to deal with banking debts have arisen in Ireland and Spain.

## THE PANIC

Why is there, all of a sudden, a big excess demand for safe high-quality assets?

### *Behind a Minskyite Panic*

Because there were a whole bunch of assets around that people thought were "safe," "high quality," "AAA". And they weren't. And people recognized that they weren't. And so all the debts of all the organizations that held MBSs became suspect. And all these assets ceased to be regarded as safe: supply declined.

And just as supply declined demand rose. People wanted to hold more safe assets for three very logical reasons:

- There was a depression
- There was a big downturn
- There was a financial crisis

Why all of a sudden is there less for people to hold?

So the real estate bust created a crisis of confidence in much of the world's financial system, and eventually paralyzed crucial parts of that system. Signs of strain began appearing in the late summer of 2007; all hell broke loose after the failure of Lehman in September 2008.

### How Did We Get Here?

- Why is there, all of a sudden, a big excess demand for safe high-quality assets?
  - Why do people want to hold more?
  - Why all of a sudden is there less for people to hold?
- People want to hold more for very logical reasons:
  - There is a depression
  - There is a big downturn
  - There is a financial crisis
- Why all of a sudden is there less for people to hold?
  - Because there were a whole bunch of assets around that people thought were "safe," "high quality," "AAA"
  - And they weren't
  - And people recognized that they weren't

### Implications of Financial Engineering

- A whole bunch of people who could not afford to buy houses can afford to buy houses
- Especially if they think that the price of housing is unlikely to go down
- Especially if interest rates are historically low for other reasons
- Kindleberger:
  - "There is nothing so disturbing to one's well-being and judgment as to see a friend get rich..."
  - When the number of firms and households indulging in these practices grows large, bringing in segments of the population that are normally aloof from such ventures, speculation for profit leads away from normal, rational behavior to what has been described as "manias" or "bubbles."

### Why the Difference?

- The dot-com bubble
  - Securities held by venture capitalists
  - By rich investors
  - As part of the portfolios of large mutual funds
  - By individuals
- Prices fall—but everybody knew these securities were risky anyway
- So the downturn was a mild Keynesian one—people cut back on spending in order to try to save more to make up their losses
- The housing bubble
  - Securities supposed to be distributed
  - But they weren't
- The originate-and-distribute model was broken
- "But they are 'AAA'!"
  - That you convinced Moody's to rate them AAA does not mean that they are AAA
  - And so all the debts of all the organizations that held MBSs became suspect

During the winter of 2008–2009 borrowing costs for almost everyone except governments soared, if they could get credit at all. And the world economy looked dangerously close to a complete meltdown.

Policymakers rushed in to prevent that outcome. Financial institutions were bailed out at taxpayer expense; guarantees were extended to restore confidence—Ireland, for example, took the extraordinary step of guaranteeing all Irish bank debt; central banks and government agencies stepped in as "lenders of last resort," providing credit where banks could or would not. These measures were successful in stemming the panic: by the early summer of 2009, most measures of financial stress had subsided to more or less normal levels. And as we noted at the beginning of this review, the world economy ended its headlong plunge and began growing again.

But as we also noted, it hasn't been much of a recovery. If the fundamental problem lay with a crisis of confidence in the banking system, why hasn't a restoration of banking confidence brought a return to strong economic growth? The likely answer is that banks were only part of the problem. It's curious that only one of the three books surveyed here so much as mentions the work of the late Hyman Minsky, a heterodox, long-neglected economist whose moment has come—in more ways than one. However, Roubini and Mihm give a good overview of Minsky's views—and Richard Koo, whether he knows it or not, is very much a Minskyite.

Minsky's theory, in brief, was that eras of financial stability set the stage for future crisis, because they encourage a wide variety of economic actors to take on ever-larger quantities of debt and engage in ever-more-risky speculation. As long as asset prices keep rising, driven by debt-fueled purchases, all looks well. But sooner or later the music stops: there is a "Minsky moment" when all the players realize (or are forced by creditors to realize) that asset prices won't rise forever, and that borrowers have taken on too much debt.

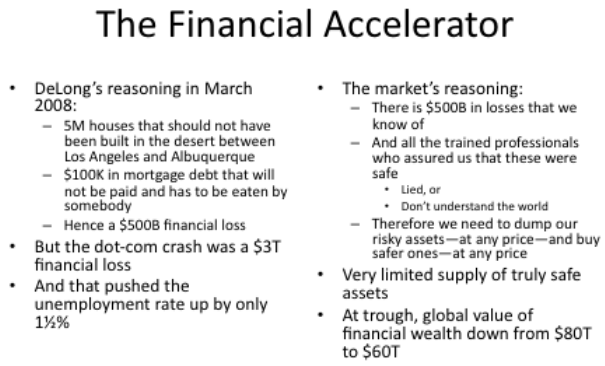
But isn't this new prudence a good thing? No. When one individual tries to pay down debt, that's all well and good—but when everyone tries to do it at the same time, the consequences can all too easily be destructive for everyone involved. The process of destruction is easiest to see in the financial sector, where everyone's attempt to pay off debt by selling assets all at the same time can lead to a vicious circle of plunging prices and rising distress. But the problem isn't necessarily restricted to finance.

Richard Koo's *The Holy Grail of Macroeconomics* argues, in fact, that the biggest problem facing economies in the aftermath of a Minsky moment (although he never uses the term) lies not in the financial sector but in nonfinancial sectors with too much debt on their balance sheets. Koo is the chief economist at the Nomura Research Institute. Much of his book is devoted to Japan's long era of stagnation from the early 1990s onward. This stagnation, he argues, mainly reflected the balance sheet problems of nonfinancial corporations, which were stranded with high levels of debt after the Japanese real estate bubble of the 1980s burst. He argues that the United States now faces a similar problem, with debt problems concentrated not among corporations but among home owners, who ran up large debts both in the course of buying houses and through using them as ATMs—that is, using refinancing to extract cash from rising home values, and spending that cash on higher consumption.

In Koo's analysis, simultaneous attempts by many private players to pay down their debts lead to a "fallacy of composition" that's closely related to the famous (but too often overlooked) "paradox of thrift." Each individual corporation or household cuts back on spending in an effort to reduce debt; but these spending cuts reduce everyone's income and keep the economy persistently depressed.

These broader problems of debt and deleveraging arguably explain why the successful stabilization of the financial industry has done no more than pull the economy back from the brink, without producing a strong recovery. The economy is hamstrung—still crippled by a debt overhang. That is, the simultaneous efforts of so many people to pay down debt at the same time are keeping the economy depressed.

So what's the answer? In the short run, the only way to avoid a deep slump when almost everyone in the private sector is trying to pay down debt simultaneously is for the government to move in the opposite direction—to become, in effect, the borrower of last resort, issuing debt and continuing to spend as the private sector pulls back. In the heat of a Minsky moment, budget deficits are not only good, they are necessary. Indeed, the surge in budget deficits around the world between 2007 and 2009 was arguably even more important than the financial rescue in keeping the real estate bust from triggering a full replay of the Great Depression.



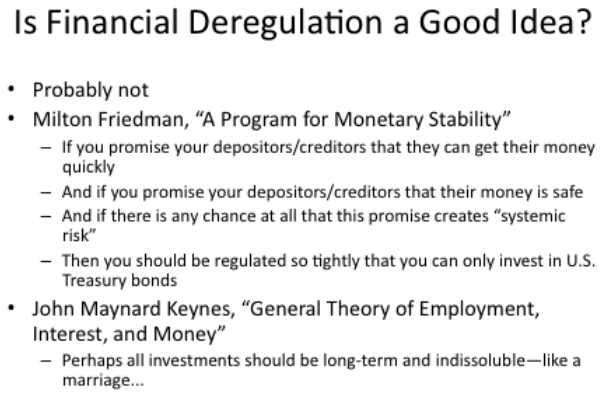

This surge in budget deficits, by the way, wasn't mainly the result of deliberate efforts to stimulate the economy. Instead, the main factors were a collapse in tax receipts as economies slumped, and secondarily a rise in automatic payments like unemployment insurance benefits. In the United States, the two-year federal deficit over 2009–2010 was around $2.5 trillion; the Obama stimulus plan accounted for less than a quarter of the total.

Determined to cut red tape and reduce regulatory burden are (l to r), OTS Director James Gilleran, Jim McLaughlin of the American Bankers Association, Harry Doherty of America's Community Bankers, FDIC Vice Chairman John Reich and Ken Guenther of the Independent Community Bankers of America.

## *A Relatively Small Fundamental Problem*

Back in 2008 it did not seem as though the

housing market was likely to become a large economic problem. Indeed, Professor DeLong reasoned in March 2008 as follows:




- There were 5 million houses that should not have been built in the desert between Los Angeles and Albuquerque.
- There was $100,000 in mortgage debt on the average overbuilt house that would not be paid, and that has to be eaten by somebody
- Hence there was a $500,000,000,000 financial loss from the housing crash that holders of financial securities would have to bear, one way or another
- But the dot-com crash was a $3T financial loss
- And the dot-com crash pushed the unemployment rate up by only 1½%

Hence the financial crisis was unlikely to have large effects on the economy.

But the market reasoned differently. The market reasoned as follows:

There were $500B in losses that we know of
And all the trained professionals who assured us that these were safe
Lied, or
Did not understand the world
Therefore we need to dump our risky assets—at any price—and buy safer ones—at any price

But there was then a very limited supply of truly safe assets. And at the worst of the financial crisis, the total global value of financial wealth had fallen from $80 trillion to $60 trillion.

## *Where Were the Regulators?*

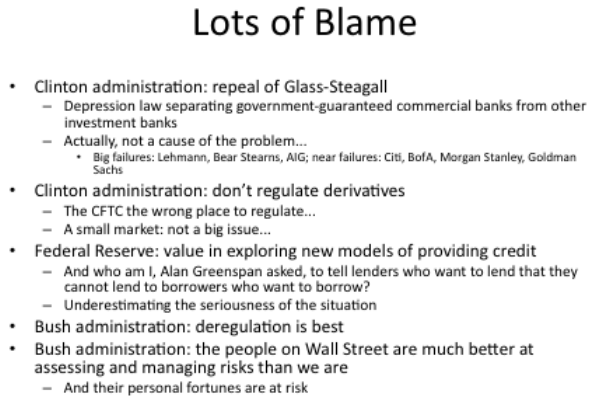
Where were the regulators? Was financial deregulation a good idea? Probably not. Milton Friedman wrote in his *A Program for Monetary Stability* that:

- If you promise your depositors/creditors that they can get their money quickly
- And if you promise your depositors/creditors that their money is safe
- And if there is any chance at all that this promise creates "systemic risk"
- Then you should be regulated so tightly that you can only invest in U.S. Treasury bonds

John Maynard Keynes wrote in his *General Theory of Employment, Interest, and Money* that

"Perhaps all investments should be long-term and indissoluble—like a marriage..." He wrote this precisely because he feared a panicked flight to safety, and the collapse of risky asset prices that such a panicked flight to safety would produce.

### *Who Is To Blame?*




There are lots of people to blame. You can blame the Clinton administration for acquiescing in Senate Banking Committee Chair Phil Gramm's desire to repeal Great Depression-era laws separating government-guaranteed commercial banks from other investment banks. (However, the biggest failures and near failures took place in organizations that did not mix commercil and investment banking: Lehmann, Bear Stearns, AIG). You can blame the Clinton administration for deciding not to regulate financial derivatives. You can blame the Federal Reserve for thinking that there was value in exploring new models of providing credit. And you can blame its chair, Alan Greenspan, for asking himself "who am I to tell lenders who want to lend that they cannot lend to borrowers who want to borrow?" and answering "I am nobody"—thus greatly underestimating the seriousness of the situation. You can blame the Bush administration for not just dipping its toe into the waters of financial regulation but engaging in an ideological crusade for deregulation, on the grounds that it is the people on Wall Street whose personal fortunes are at risk who are much better at assessing and managing risks than the government.

Ben Bernanke has admitted that the Fed failed to use its regulatory powers to rein in the excesses of the mortgage lenders—a tragic oversight. Alan Greenspan disregarded clear warnings by a member of the Fed board that mortgage lending had become dangerously excessive. And the widespread securitizing of mortgage loans has made the mess much harder to clean up. In a housing market that is now deeply depressed, mortgage holders and troubled borrowers would both be better off if they were able to renegotiate their loans and avoid foreclosure. But when mortgages have been sliced and diced into pools and then sold off internationally so that no investor holds more than a fraction of any one mortgage, such negotiations are impossible. And because of the financial industry lobbying that prevented mortgages from being covered by personal bankruptcy proceedings, no judge can impose a solution. The phenomenon of securitization, created in the belief that a large-scale housing crash would never happen, has trapped investors and troubled borrowers in a mutually destructive downward spiral.

## TEST YOUR KNOWLEDGE

1. Why were bankers so eager to hold the AAA-rated MBS created by other bankers?

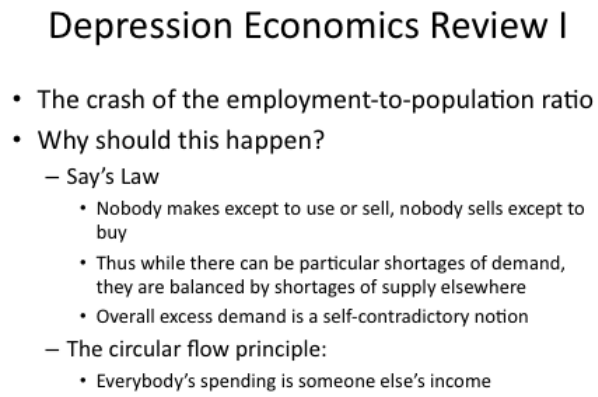
2. Didn't they know how their own origination departments created MBS, and were anxious to get rid of them?
3. Why did $500B of losses in mortgage loans trigger a $20T decline in global financial asset values?
4. Why did we fear at the end of 2007 that the "monetarist' remedy of expansionary open market operations would not be enough to keep the economy on an even keel?

*Lecture 8*

# 8. Depression Economics in a Nutshell

## *What You Need to Remember*

This is a good time to go over, once again, the essentials of "depression economics"—our understanding of the large downturns of employment and production that have periodically, at least since 1825, afflicted industrial economies, that afflicts us now, and that has carried our unemployment rate up to 9.6% and our employment-to-population ratio down by 5% from its 2007 heights.




### THE PUZZLE

The first thing to say is that episodes of high unemployment, low capacity utilization, and slack production like we are experiencing right now are in no sense "necessary" or "functional" parts of our economic system. The process of economic development—of a market economy planning production and allocating labor as it tries to pierce the veil of time and ignorance and gaze into an uncertain future—does entail necessary fluctuations in production between investment and consumption goods on the one hand and between different types of such goods on the other. There are times when the future seems likely to be such that it is appropriate to put a great deal of society's labor to work increasing our collective capacity. There are times when it is appropriate to focus on making goods for current consumption. There are times when it is appropriate to shift workers from sector to sector—from mines to telecommunications, or from raising horses to building automobiles. Et cetera.

But it is not appropriate for there to be times when a much larger proportion than normal of workers to be without jobs and of industrial capacity to be idle, times when there is not a specific glut of overproduction in declining sectors offset by underproduction in others but rather a "general glut" of overproduction everywhere, when as you look around the economy you see no sectors in which demand exceeds supply and there is upward pressure on prices but instead a lack of demand and a lack of desire to hire throughout the economy.

This serves no purpose. It is not "functional."

And it is not necessary—any more than that it is necessary for an automobile with a disconnected distributor cap to sit there, with its engine unable to catch. When an automobile has a disconnected distributor cap, you reconnect the distributor cap and it runs. When an economy is in a deep downturn, you ought to do the equivalent of reconnecting the distributor cap: the govern-

ment ought to engage in strategic interventions in the financial system to bring it back into balance and alleviate the general glut of idle capacity, unsold goods, and excess labor.

Second, there is a perspective from which the existence of the economic diseases of depression economics should not come as a surprise. A market economy is a decentralized system. Nobody plans what happens in any given month and checks to see if everybody's plans are consistent—if employers are planning to employ as many workers as are planning to work. And the system simply grew up: nobody set it up in such a way as to ensure that the decentralized plans of individuals all coordinate themselves. Why should everything work out? If human beings—also decentralized, unplanned systems albeit ones shaped by 800 million years of mammalian evolution—can fall into epileptic fits, why should economies do any better?

But, third, there is a perspective from which the economy's vulnerability to these epileptic fits of depression economics is indeed surprising. It is the perspective of the circular flow of economic activity, of Say's Law. The principle of the circular flow of economic activity tells us that every business's production is some worker's income, that every worker's income is some household's expenditure, and that every household's expenditure is some business's sale.

As Jean-Baptiste Say put it back in 1803, nobody makes without intending to use or sell. And nobody sells without intending to buy. Thus supply—the decision to produce and sell on the market—creates not precisely its own but an equal amount of demand. "By the metaphysical necessity of the case," said the then-young economist John Stuart Mill in 1829, the total planned sales of everybody in the economy must equal the total planned purchases.

Now, Say admitted, there is no guarantee that the planned sales and purchases will be all of the same things. The economy may plan to sell more cups of coffee than it plans to buy, and to buy more yoga lessons than it offers for sale. There can be people desperate to pay through the nose to learn how to do the posture of the Downward-Facing Dog who find that all they can buy is heavily-discounted mocha frappucinoes instead.

But these, Say argued in the early and middle stages of his career, are problems of structure, of disequilibrium. And the market will solve them. If the economy as a whole has planned to buy more yoga lessons than it plans to sell, there will be high prices offered for yoga lessons. Clever people can make the big bucks and get rich by figuring out how to satisfy the market demand. And the resources to redeploy into the fitness industry will definitely be there—nobody wants to be an unpaid barista. The bounded self-interest that Adam Smith saw as attached to participants in the market economy will create every incentive for people to, in a decentralized way, individually, take steps to match the economy's supply of particular commodities to its demand. Such actions do good for society: it's better if people who want to learn the Downward-Facing Dog and don't want to be heavily caffeinated can do so. And the people who undertake such actions do well for themselves: they get rich.

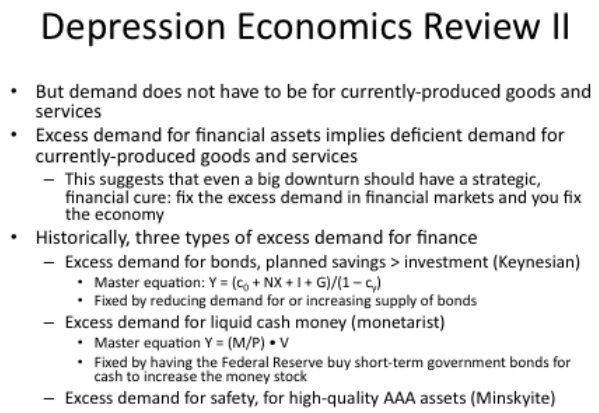
So the English financial crisis of 1824-1825 and the subsequent depression of 1825-1826 induced him to rethink his position. By the time he finished his *Complete Course of Political Economy* at the end of the 1820s he acknowledged that the financial system was vulnerable to crises and that such crises could indeed bring on episodes of depression economics—ones of high unemploy-

ment and widespread bankruptcy in all or nearly all sectors of the economy, not merely an episode of high unemployment in declining balanced by exuberant demand in rising industries.

## THE DIAGNOSIS

Say, however, never quite put his finger on what had gone wrong with his original "Say's Law" argument, with the circular flow principles.

That had to wait for John Stuart Mill, who put his finger on it in his *Essays on Some Unsettled Questions in Political Economy*. Mill pointed out that we do not live in a barter economy—in which we trade each other our cups of coffee for our yoga lessons—but instead in a monetary economy—in which we sell what we produce for money, and then buy what we desire with money.




Money is thus a special commodity. If there is a general economy-wide excess demand for money there will also be a general economy-wide excess demand for pretty much everything else. That is a "general glut." That is a fit of "depression economics."

The fact that the money that, at times, everybody wants is a special commodity poses a big problem for an economy. When there is excess supply of baristas and excess demand for yoga instructors the economy adjusts as employers fire surplus baristas, employers desperately seek extra yoga instructors by offering them high salaries and Xtreme benefits, and workers have every financial incentive to turn themselves from providers of caffeine to providers of inner peace. When there is an excess supply of baristas, yoga instructors, and ceramics producers and an excess demand for money, employers fire baristas, yoga instructors, and ceramics producers and other employers hire... what, exactly? It is clear if I had been pulling lattes how I should retrain myself as a yoga instructor. But if I had been pulling lattes or teaching Cat-Cow or making porcelain how do I retrain myself to make the commodity "money"? It is not clear.

If I am lucky enough to be in a small open economy with a large share of world trade in prouction there is an obvious answer. If all of us in our small open economy reduce the value of our currency—let its value fall or push its value down—then foreigners with money will be more eager to buy whatever we make with their money, and so you can enter the money-producing industry by going to work in an export industry and then selling what you produce abroad. But that does not work for the world as a whole, or if the trade share of production is small. Money is created not by individual workers but by governments, and by the confidence of the market in the soundness of the promises-to-pay of financiers. There is no obvious process by which ex-baristas,

ex-yoga instructors, and ex-potters can set themselves to work improving market confidence in the promises-to-pay of financiers or making the money issued by the government—well, actually there is, but we call that "counterfeiting" and frown upon it.

# THE CURE

## *Strategic Interventions*

Fortunately, Mill's diagnosis of the problem also carries within it implicitly a pointer to an easy solution. The problem is that there is an excess demand for money—that the economy wants more government-issued money or more reliable and trusted promises-to-pay on the part of financiers? Then give the economy what it wants. Have the government print up more cash. Have the government guarantee the promises of financiers. Such strategic interventions in the economy do not require overturning the social basis or organization of production. Yet they will succeed. If the excess demand for money is met, then Say's Law and the circular flow principle tell us that the excess supply of currently-produced goods and services will melt away as well.

That the needed interventions are strategic is part of what John Maynard Keynes meant when he said that an economy suffering from a fit of depression economics is like a car with a broken alternator: you do not need to do very much to put things to rights. That you needed to perform the strategic interventions was the rest of what John Maynard Keynes meant: if you wait for the economy to somehow cure itself of a fit of depression economics, you may have to wait quite a long time. There is no easy way to get rich by taking steps to improve market confidence in the promises-to-pay of financiers, so if the government does not step in there is no reason to think that the profit motive will rapidly produce a cure.

To say that in episodes of depression economics the government needs to undertake strategic interventions in financial markets to rebalance the economy is true. However, it is not quite specific enough. Historically, the causes of macro economic downturns have come in three strains—like Hepatitis A, B, and C—each associated with a different primary excess demand in financial markets, and each best cured by a different strategic intervention by the government in finance. We have seen excess demands for liquid cash money itself: call these excess demands for money. We have seen excess demands for savings vehicles—economy-wide desires to purchase less of currently-produced goods and services now and to instead purchase more of assets that allow you to carry purchasing power into the future and spend it later: call these excess demands for bonds. And we have seen excess demands for safe, high-quality assets—economy-wide desires to purchase less of investments that are subject to risk and more of assets where you can be confident that your wealth will not melt away while your back is turned: call these excess demands for safety.

These different strains of our macroeconomic fit of epilepsy have been analyzed by different sects of economists: those called monetarists focusing on excess demands for liquid cash money, those called Keynesians focusing on excess demands for bonds, and those called Minskyites focusing on excess demands for safety.

Let us review our analysis of the first two, and defer our analysis of the third—which is the strain of the malady we are currently suffering from—until later.

## *Monetarist Downturns*

Irving Fisher's and Milton Friedman's monetarists start with the belief that downturns in production and employment are due to an excess demand for liquid cash money. When something has disturbed the supply or demand for liquid cash money so that households and businesses have less of it than they wish, they slow down their spending in an attempt to build their cash balances up, and it is this slowdown in spending that launches the downturn.

A number of things can trigger such an excess demand for liquid cash money. Those are, here and now, of secondary importance. The important things for you to remember are three:

First, you can tell that you are in a monetarist downturn because liquid cash money will be, as John Stuart Mill liked to say, "in request," and all other commodities will be, as John Stuart Mill liked to say, "in disrepute." Particularly, households and businesses will be trying to sell other financial assets in order to build up their stocks of liquid cash money. Thus all other financial assets will be cheap—which is the same thing as that the interest rates quoted on them will be high.

Second, it is important for you to remember the recommended economic policy of the Monetarists: have a central bank that uses open-market operations—sales of short-term government bonds for liquid cash money, and purchases of short-term government bonds for liquid cash money—to keep the supply of cash money in balance with demand, they say. Without any excess demand for liquid cash money, monetarists say, there will be no deficient aggregate demand for goods and services. And so, monetarists say, there will be no downturns: no depressions, no recessions, no "general gluts."

Third, it is important for you to remember the quantity-theory-of-money equation:

$$Y = (M/P) \bullet V$$

The level of production and incomes Y is equal to the velocity of money V—a characteristic of banking institutions and household and business preferences that should not vary very much or very quickly—times the total stock of money in the economy M, divided by the overall price level P. This equation is at the heart of all quantitative monetarist analyses of the economy.

## *Keynesian Downturns*

Keynesians—although the Swedes say they should be called Wicksellians—focus on excess demand for bonds, excess demand for savings vehicles, the (planned) savings of the economy running ahead of the rate of investment that generates more asset vehicles that can be used to move purchasing power into the future, as the principal cause of downturns. When something has pushed the savings of the community ahead of its volume of investment, households and businesses will try to switch their spending away from currently-produced goods and services and into

long-duration assets. It is that attempted switch of spending away from currently-produced goods and services that launches the downturn.

A number of things can trigger such an excess demand for savings vehicles. Those are, here and now, of secondary importance. The important things for you to remember are three:

First, you can tell that you are in a Keynesian downturn because demand for ways of moving purchasing power into the future will be high. Thus prices of pretty much all long-duration financial assets will be high—which means that the interest rates quoted on long-term bonds will be low.

Second, it is important for you to remember the recommended economic policy of the Keynesians to get out of a downturn: do something to rebalance the flow of funds through financial markets to equalize (planned) savings and investment. Convince households to save less and so demand fewer bonds, convince businesses to invest more to finance capacity expansions and to issue and thus supply more bonds to finance their capacity expansions, have the government increase spending or cut taxes and borrow to do so, thus increasing the supply of bonds. Without any excess demand for savings vehicles, Keynesians say, there will be no deficient aggregate demand for goods and services. And so, Keynesians say, there will be no downturns: no depressions, no recessions, no "general gluts."

Third, it is important for you to remember the national income identity:

$$Y = C + I + G$$

The level of production and incomes Y is equal to the sum of the four components of final expenditure by the four groups of actors in the economy: consumption spending by households C, investment spending by businesses seeking to add to their capacity I, and government purchases. This equation is at the heart of all quantitative analyses of the economy.

## MINSKYITE DOWNTURNS

### *The Problem*

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. The key is not that the economy has too little liquid cash money or too few bonds to serve as savings vehicles for carrying purchasing power into the future, but instead that it has too few high-quality safe assets. It is not that people are cutting back on spending on currently-produced goods and services because they want to have more cash in their pockets or more bonds in their portfolio than exist. Instead, people are fearful that their wealth is unsafe: that they need to sell their risky assets and buy safe ones or else their wealth might simply melt away overnight, as whatever partnerships, companies, banks, or governments they have invested in shut their doors, fail, and default on their debts.

## *The Cure*

Thus the policy recommendation of the Minskyites: bailout.

The problem is that the economy does not have enough safe high-quality assets, and the private sector cannot create more because nobody trusts any partnership, company, or bank to be good for its current debts let alone for any new ones it might create. The solution is for the government to step in: to support shaky banks so that they can meet their obligations, to take over shaky companies and recapitalize them, to issue its own safe high-quality bonds and use the proceeds to buy up risky private assets, to generally calm the panic.

## *The Problems with Bailout*

There are many problems with bailout as a policy:

1. It is unfair, and it sets the stage for more trouble down the road.

2. It is unfair in that it enriches those very financiers and investors whose reckless, speculative, and heedless portfolio strategies that triggered the panic and the general rush by everybody to move a greater proportion of their portfolio into safe, secure, high-quality assets.

3. Those whose actions set the stage for the downturn should not profit. It sets the stage for more trouble down the road because every time Minskyite policies of bailout are adopted risk-loving financiers become more confident that the government will bail them out the next time as well, and so see even more of an incentive to engage in reckless, speculative, and heedless portfolio strategies.

As the late MIT economist Charles Kindleberger put it, writing of the need for a "lender of last resort" to perform the bailouts, but:

> if the market is sure that a lender of last resort exists, its self-reliance is weakened.... The lender of last resort... should exist... but his presence should be doubted.... This is a neat trick: always come to the rescue in order to prevent needless deflation, but always leave it uncertain whether rescue will arrive in time or at all, so as to instill caution in other speculators, banks, cities, or countries.... some sleight of hand, some trick with mirrors... [because] fundamentalism has such unhappy consequences for the economic system...

Or as former Federal Reserve Vice Chair Don Kohn put it, the lender of last resort should act because teaching a few thousand investment bankers a lesson that they deserve is not worth doing if the cost is the jobs of millions.

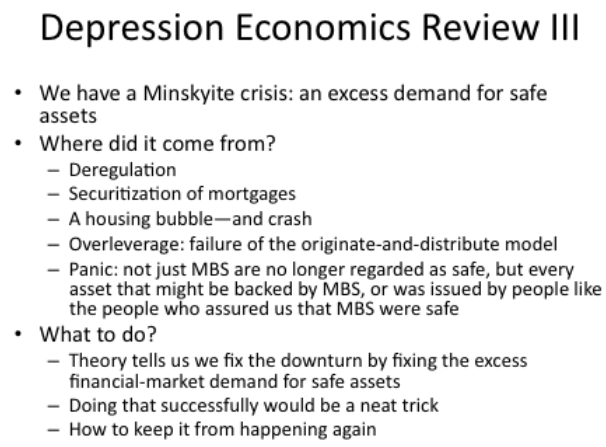
Back in the nineteenth century, London Economist editor Walter Bagehot had a plan for how to deal with such panics and crises. The central bank and the government should, he argued, support the market by buying up risky assets and issuing safe ones and so satisfying the market demand for extra safe-high quality assets. But it made sure that those whose excessive speculation had caused the problem did not profit. "Lend freely" to banks and other financial institutions that needed safe assets in order to avoid bankruptcy themselves, "but at a penalty rate"—at a high rate of interest which would make them poor in the long run as they were forced to hand over

their cash or ownership stakes in their firms to the government, and would make them wish that they had not been so reckless in the first place.

In the late financial crisis central banks and governments have followed the first half of Walter Bagehot's plan. They have indeed "lent freely" in order to increase the supply of safe, high-quality financial assets. But they have been unable or unwilling to implement their policies in such a way that their support for financiers is "at a penalty rate," and leaves financiers poor and wishing they had been more prudent before the crisis.

## *Where Did the Problem Come From?*

Another difference between Minskyite and other types of downturns is that an excess demand for high-quality safe financial assets usually has a cause in the misbehavior or misregulation of the financial system at an earlier stage. A Minskyite crisis comes about when people recognize that assets that they had thought were safe were not so: that many of the promises-to-pay of financiers that they had trusted are not, in fact, worth trusting. Thus a Minskyite crisis has its origins in the sudden shrinkage of the supply of safe assets. And the fact that there is now a crisis with great uncertainty boosts the demand for safe assets.




Thus Minskyite crises tend to be the largest and the most dangerous for our economies.

How did this particular Minskyite crisis in which we are embedded happen? We know the story. Deregulation of finance. The global savings glut. The securitization of mortgages. Financial engineering that was supposed to distribute risks to those who could afford to bear them instead distributed risks to people who did not understand what they were doing and concentrated risks in the overleveraged large banks instead. The housing boom. The housing bubble. The crash. The flight to safety. The financial accelerator. And the largest global downturn since the Great Depression itself.

If we did not already know it, how could we tell that we were in a Minskyite downturn? Well, we are not now in a monetarist downturn. In a monetarist downturn the prices of all bonds are low. Right now the prices of government bonds are very high. And we are not in a Keynesian downturn. In a Keynesian downturn the prices of all bonds are high. Right now the prices of risky private bonds—and the prices of bonds of governments with shaky finances—are low. It is this high price of risk, these very high spreads in bond interest rates, that tell us that our current downturn is primarily a Minskyite one.

## WHO IS RIGHT?

One last remark. Each of the sects except the Minskyite says that it is the one true church. All of them are, in that, wrong. All of them are right about the economy—sometimes. Each has been right at at least one moment in the past generations.

We can see when there is an excess demand for liquid cash money that you can use to purchase things in the economy. When there is an excess demand for liquid cash money, savers and investors are trying to sell all their other financial assets at whatever prices they can in order to get their hands on cash. Thus the prices of stocks, real estate, and bonds are low—which means that the interest rates on all kinds of bonds are very high, for when the price of a bond is low the interest coupon it pays every six months is a large proportion of its value. In 1982 there was such a liquidity squeeze in the U.S. economy: pretty much everybody was attempting to build up their cash balances and trying to sell other financial assets to do so, and interest rates reached their highest levels of the post-World War II period.

Where did this liquidity squeeze—this excess demand for liquid cash money—come from in 1982? It had been deliberately created by the Federal Reserve, which believed that it had to break the cycle by which Americans had come to expect that each year would see 10% inflation. The only way to do that, then Federal Reserve Chair Paul Volcker and his colleagues concluded, was to create a situation of high unemployment, slack capacity, low production, and depression economics so that neither firms nor workers would dare to ask for the price and wage increases that they had planned. It worked: the 1970s had been a decade of accelerating and the 1980s were a decade of low inflation. It came at a high cost: the unemployment rate peaked at 10.8% at the end of 1982.

We can see when there is an excess demand for bonds—for vehicles to carry purchasing power forward from the present into the future, when there is a savings glut. When there is an excess demand for bonds, savers are willing to pay almost any price for bonds and as a result the interest rates on pretty much all kinds of bonds are very low, for when the price of a bond is high the interest coupon it pays every six months is a low proportion of its value. In 2003 there was such a savings glut in the U.S. economy and indeed worldwide: pretty much everybody was attempting to buy up bonds to hold so that they could shift spending on goods and services from the present into the future, and interest rates as a group reached their lowest levels of the post-World War II period.

And over the past three years we have seen an excess demand for safe, high-quality assets. That has been the excess demand that has triggered pretty much everybody to cut back on spending on current goods and services as they try to build up more wealth in vehicles in which they can be confident it will not melt away. When there is an excess demand for high-quality assets, then the prices of risky assets— stocks, real estate, and corporate and other bonds seen as possible candidates for default—will be low, which means that the interest rates on risky bonds will be high, for when the price of a bond is low the interest coupon it pays every six months is a large proportion of its value. By contrast when there is n excess demand for high-quality assets, then the prices of safe assets—bonds issued by governments regarded as credit worthy, and private loans guaran-

teed or backed in some way by governments or by ample collateral—will be high because savers are willing to pay almost any price for high-quality bonds, and as a result the interest rates on high-quality bonds will be low, for when the price of a bond is high the interest coupon it pays every six months is a low proportion of its value. Credit spreads—the difference between the interest rates on high-quality bonds and risky bonds—will be extraordinarily high. And whenever a set of bonds shifts in investors' expectations from being high-quality to low-quality—as the bonds of the government of Greece did—the interest rate on those bonds will jump massively. That is what we have seen over the past three years.

You should recognize that these three classifications are ideal types and not pure types. People can try to switch their spending between all four categories. Think of it this way: when the economy is in balance, people as a whole (a) plan to spend enough but no more on currently-produced goods and services to buy the full-employment rate of production, (b) plan to hold the existing but no more than the existing stock of liquid cash money, (c) plan to add enough but not too much to their holdings of savings vehicles—bonds—to buy up all the newly-issued bonds that businesses are printing to finance their expansions and the government is printing to finance its deficit, and (d) plan to hold the existing but no more than the existing supply of safe AAA high-quality assets. It is extremely unlikely that two of these plans for categories will be precisely in balance and two will be out of balance—you are much more likely to find something like deficient demand for currently-produced goods and services accompanied by a small excess demand for liquid cash money, a small excess supply of savings vehicles, and a large excess demand for safe high-quality assets.

*Lecture 9*

# 9. Inflation Economics

## What You Will Learn

1. By the time you have finished this lecture, you should be able to:
2. Explain what the consumer price level is and what is its relation to the inflation rate.
3. Explain why the inflation rate is one of the four most often-reported economic statistics—and explain why even a moderately-high inflation rate is regarded as bad.
4. Explain how the quantity theory of money equation that we have seen before applies when we are not caught in a situation of "depression economics"
5. Use the quantity theory of money equation to roughly calculate the relationship between changes in the economy's money stock, its price level, and its inflation rate.
6. Explain how the central bank and the banking system together determine the economy's money stock.

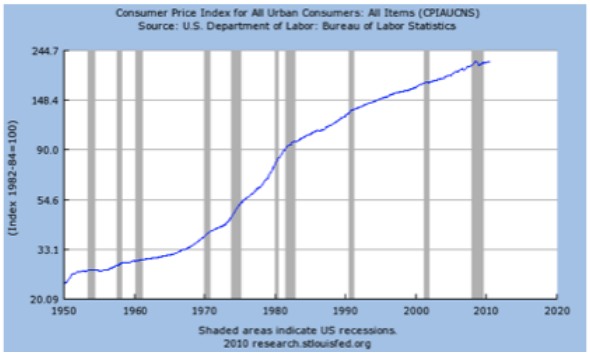
## The Consumer Price Level and the Inflation Rate

### *The Consumer Price Index*

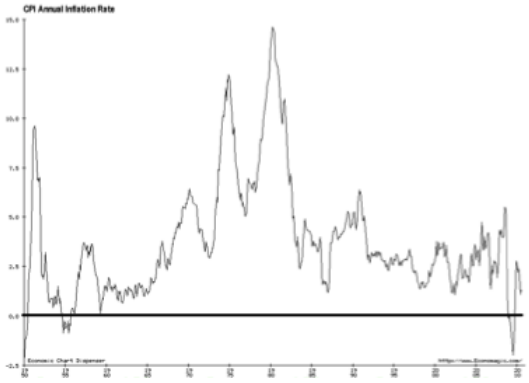
It is a very rare year indeed in the United States when the prices in dollars of goods and services do not rise. There are always some dollar prices that are falling—the prices of computers and cell-phone contracts, anyone? But weigh up all the dollar prices of all the goods and services in the economy, and the trend is upward.

Over time these price increases cumulate. The general level of prices in 1985 was more than three times what it had been in 1960. And between 1985 and 2010 the overall price level doubled. A dollar in 2010 thus had only about ⅙ of the purchasing power over goods and services of a dollar fifty years before.

The Consumer Price Index




The Inflation Rate




### *The Inflation Rate*

If the level of real GDP, the unemployment rate, and the stock market are the three most quoted economic statistics on

the morning news, the rate at which consumer prices are growing—the inflation rate—is the fourth.

In post-World War II America the inflation rate was relatively high during the Korean War of the early 1950s: reaching almost 10%/year. The inflation rate was low between the Korean War and the late 1960s: staying under 3%/year. The next fifteen years saw the consumer price index inflation rate rise in fits and starts, advances and retreats, from 3%/year to a post-World War II American high of nearly 15%/year in the early 1980s. The decision of Paul Volcker's Federal Reserve to give first priority to reducing and controlling inflation produced a rapid drop to a level of 5%/year of so for the late 1980s. And since the start of the 1990s the inflation rate has once again returned to a low level in which the odds are that in any given year it will be less than 3%/year or so.

## *Why the Salience of Inflation?*

The question of why the inflation rate is the fourth-most reported economic statistic—and one that is politically salient—is an interesting and somewhat puzzling one. In inflation, after all, nominal wages and prices go up together: what you lose by paying higher nominal prices you gain by receiving higher nominal wages. What you gain by charging higher nominal prices you lose by paying higher nominal wages. It is certainly true that nominal debtors gain from inflation as their liabilities are eroded, and nominal creditors lose from inflation as their assets are eroded. But these two effects sum to zero. Is that enough to make a high inflation rate a serious negative for an economy?

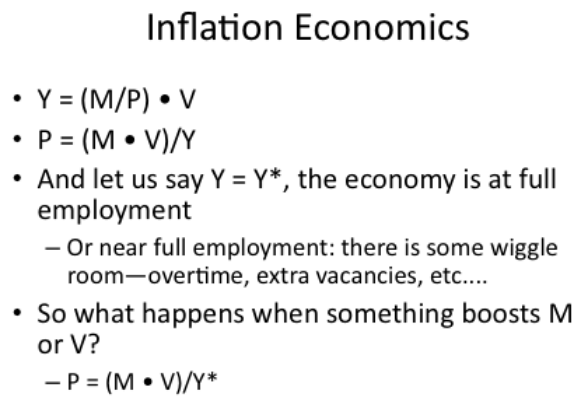
The answer seems to be yes. Inflation is perceived as a sign of a lack of competence on the part of the government, and as striking at the moral foundations of the economic order. Gains and losses from inflation are seen as unfair in a way that other economic gains and losses are not.

But let us turn the microphone over to John Maynard Keynes, writing just after World War I and explaining why inflation was an evil to be shunned:

> Lenin is said to have declared that the best way to destroy the capitalist system was to debauch the currency. By a continuing process of inflation, governments can confiscate, secretly and unobserved, an important part of the wealth of their citizens. By this method they not only confiscate, but they confiscate arbitrarily; and, while the process impoverishes many, it actually enriches some. The sight of this arbitrary rearrangement of riches strikes not only at security, but at confidence in the equity of the existing distribution of wealth. Those to whom the system brings windfalls, beyond their deserts and even beyond their expectations or desires, become 'profiteers,' who are the object of the hatred of the bourgeoisie, whom the inflationism has impoverished, not less than of the proletariat. As the inflation proceeds and the real value of the currency fluctuates wildly from month to month, all permanent relations between debtors and creditors, which form the ultimate foundation of capitalism, become so utterly disordered as to be almost meaningless; and the process of wealth-getting degenerates into a gamble and a lottery. Lenin was certainly right. There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency. The process engages all the hidden forces of economic law on the side of destruction, and does it in a manner which not one man in a million is able to diagnose.

## Inflation Is a Monetary Phenomenon

It is easiest to understand where inflation comes from if we start from the observation that times of inflation—and especially times of rising inflation—are not times of "depression economics." The levels of production and employment are then roughly equal to the economy's productive capacity. In the framework we have set up in which we write Y* to stand for potential output, our analysis of inflation economics can begin with the assumption that—roughly:




$$Y = Y^*$$

If we thus know what the level of production, incomes, and spending in the economy is going to be, it is then easy to use the monetarist quantity-theory-of-money relationship to understand where inflation is coming from. The monetarist quantity theory equation is:

$$Y = (M/P) \cdot V$$

Real spending (and incomes, and production) Y is equal to the economy's money stock M divided by the price level P times the velocity of money V. The left-hand side of the equation, Y, is pinned down by the fact that except in situations of depression economics Y will be equal to the economy's productive capacity Y*, so we can substitute it in:

$$Y^* = (M/P) \cdot V$$

It is also the case that—except in situations of depression economics, where the velocity of money drops as people hoard what they see as their inadequate stocks of cash, the velocity of money V is unlikely to be stable but to remain near a normal level determined by the mechanics of making payments and the operating procedures of the banking system. The pieces of the equation that can change are thus the money stock M—controlled by the central bank—and the price level P. So we can transform this monetarist equation to see what determines the price level P in a situation of "inflation economics":

$$P = (M \cdot V)/Y^*$$

Take the economy's money stock M, multiply it by the normal velocity of money V—the pace at which households and businesses normally spend their cash—then divide that by the economy's productive potential, and you have the price level. Or, rather, you have what the price level will soon be, as there are minor fluctuations in velocity and in production as changes in the money

stock M have their subsequent effects on the price level P through lags which are variable and can be long.

Thus if we want to keep the inflation rate $\pi$ low, we want to keep the rate of increase of the money stock low. We want the central bank to control the speed with which it engages in open-market operations and buys bonds for cash. And we do not want banks to greatly increase the amount of checking account deposits they hold beyond traditional limits of safety and prudence.

It is in this sense that Milton Friedman liked to say that:

> Inflation is always and everywhere a monetary phenomenon.

If you do not have an increasing money stock, you will not have (much) inflation. If you want to reduce the rate of inflation, you need to reduce the rate of growth of the money stock.

The reduction in inflation, however, may not be easy or painless. But that is a topic for the next lecture. And before we go on to the next lecture, we should first briefly look at how the money stock is determined.

## THE MONEY STOCK

What economists call "the money stock" is the sum total of all assets that are held and used as *means of payment*—that's purpose is neither to be useful nor to serve as a source of profit or interest nor to provide a hedge or insurance against calamity, but rather are held simply because they make it easier—nay, make it possible—to buy things. "Money" thus consists of cash: coin and currency in your pockets, in cash register drawers, and in bank vaults. But it also consists of anything that people generally or some people in particular will accept as payment. Reserve deposits that banks hold at regional Federal Reserve banks are "money" for them. Checking account deposits—at least from an in-state bank—are money. Unspent credit card limits may be money, as may be money in money market mutual funds.

### *How the Money Stock Affects Spending*

The way that changes in the stock of money affect the flow of spending should be familiar from our unit on depression economics. We saw in depression economics that when there was an excess demand for money—when the stock of money in the economy was smaller than the amount that people planned to hold to grease their transactions when incomes and production were at normal full-employment levels—then households and businesses attempted to switch spending from purchasing currently-produced goods and services to building up their stocks of money, and that put downward pressure on spending.

Things work similarly but in reverse in inflation economics.

When there is an excess supply for money—when the stock of money in the economy is larger than the amount that people planned to hold to grease their transactions when incomes and production were at normal full-employment levels—then households and businesses attempt to

switch spending into purchasing currently-produced goods and services as they attempt to draw down their stocks of money. This will put upward pressure on spending.

There are, on the upside, none of the psychological barriers to wage flexibility that we see on the downside. Firms would rather fire one worker in ten than cut the wages of all ten workers by ten percent. But they are happy to raise wages. Thus if the economy is near full employment we find that upward pressure on spending rapidly puts upward pressure on prices as well, and we have inflation.

## *How the Money Stock Is Determined: High-Powered Money*

The first and most obvious way that the moneys stock can increase (or decrease) is by Federal Reserve open-market operations. The Federal Reserve buys bonds for cash. The extra cash that it uses to pay for its bond purchases expands the economy's money stock. The Federal Reserve sells bonds from cash. The cash that the Federal Reserve collects is removed from the cash stock out in the economy for private-sector households and businesses to hold.

When the Federal Reserve buys short-term government bonds for cash, the cash that it buys it with takes the form of what economists call "high-powered money." It is either cash proper—little pieces of paper with pictures of people like George Washington on them—or a "reserve deposit" at the local regional Federal Reserve bank. Think of it as the bank's checking account. For the Federal Reserve is the bank's bank.

A normal person holds money in their checking account—makes checking account deposits—because he or she will, in the course of his or her daily life, write checks. These checks are promises to pay. It is then the bank's business to accept those promises to pay when their recipients show up with them, to honor them, and to deduct the amount from the checking account balance. Individuals want to hold large enough balances in their checking accounts so that they are not embarrassed by being unable to cover the checks presented.

Similarly, banks hold money in their reserve accounts because they will, over the course of their operations, have to pay other banks money. Suppose depositors of Wells Fargo deposit $10,000,000 of checks written on Bank of America in their Wells Fargo accounts while depositors of the Bank of America deposit only $8,000,000 of checks written on Wells Fargo in their Bank of America accounts. Bank of America then owes Wells Fargo $2,000,000. The regional Federal Reserve Bank of San Francisco will then clear this debt by transferring $2,000,000 from the reserve account of the Bank of America to the reserve account of Wells Fargo.

And so a bank will want to hold enough in its reserve account so that it will not be embarrassed by, some night, not having enough to cover the day's required clearing. Since the amount of clearing business to be done overnight grows bigger the more checking account deposits the bank itself has accepted, this puts a brake on the ratio between the checking account deposits at a bank and the bank's own reserve account at the regional Federal Reserve bank.

### *How the Money Stock Is Determined: Checking Account Deposits*

In general, banks as a whole will require that their reserve deposits not fall below a fraction—8%, 10%, 12%—of the total checking account balances of all of their customers. They require this for two reasons. First, it is the law: bank regulators require banks to maintain minimum "reserve ratios." Second, as noted above, it is very embarrassing for a bank to fail to meet its overnight clearing obligations. Moreover, such a failure would excite a great deal of regulatory scrutiny that a bank would like to avoid. So a bank may seek to keep excess reserves—and how many excess reserves it will keep depends on how confident it is of its ability to manage its risks.

We model these two considerations by using the letter R to stand for the high-powered money, the reserves, that the Federal Reserve buys and sells. And we use a μ—the Greek letter lowercase mu—to tell us how many dollars of checking account deposits a typical bank is willing to hold for each dollar of its reserve deposits. We can then write that the money stock M is determined by:

$$M = \mu R$$

with R being the economy's stock of reserves as determined by Federal Reserve open-market operations, and μ being the money multiplier determined by banks' collective confidence in their ability to manage their risks.

Thus there are two ways that the money stock can increase. The Federal Reserve can conduct open-market operations that increase the stock of high-powered money. The banking system can increase the money multiplier μ by becoming more confident in its ability to manage risks.

## SUMMARY

By the time you have finished this lecture, you should be able to:
Explain what the consumer price level is and what is its relation to the inflation rate.
Explain why the inflation rate is one of the four most often-reported economic statistics—and explain why even a moderately-high inflation rate is regarded as bad.
Explain how the quantity theory of money equation that we have seen before applies when we are not caught in a situation of "depression economics"
Use the quantity theory of money equation to roughly calculate the relationship between changes in the economy's money stock, its price level, and its inflation rate.
Explain how the central bank and the banking system together determine the economy's money stock.

## TEST YOUR KNOWLEDGE

*Lecture 10*

# 10. Aggregate Supply and Aggregate Demand

## *Inflation, Unemployment, and the Phillips Curve*

### What You Will Learn

By the time you finish this lecture, you should be able to:

- Explain the effects and psychological and institutional sources of downward-sticky wages.
- Explain and classify the sources of shifts in short-run aggregate supply and their affects on prices and production.
- Explain why economists say that the long-run aggregate supply curve is vertical
- Explain why the aggregate demand curve (likely) slopes downward and what causes shifts in aggregate demand.
- Use the model of short-run aggregate supply and aggregate demand to explain how shifts impact the price level, and real GDP for the economy.
- Move from the AS-AD graph to the Phillips Curve graph, and back again, to understand joint fluctuations in unemployment and inflation.

### Overview

In modern economies, when inflation rates are relatively low, changes in total nominal spending carry with them changes in real GDP because the short-run aggregate supply curve is upward sloping. Because of long-term contracts, informal agreements, divergences between expectations and actual realities, and other factors, wages and product prices are not perfectly and instantaneously flexible. The short-term aggregate supply curve is the tool we use to ascertain how much of each decline in total nominal spending shows up as a decline in prices and how much shows up as a decline in production. It shifts as resource prices, productivity, and wage levels change. And in the long run as the factors that make wages and prices somewhat downward sticky and give the short-run aggregate supply curve its upward slope themselves change, the long-run aggregate supply curve is vertical. With sufficient time to adjust, differences in the price level should not carry with them differences in the level of real GDP but, instead, in the long run the level of real GDP should be set at potential output by the resources, technologies, and organizational forms of the econom.

Alongside the short-run aggregate supply curve is the aggregate demand curve: the downward-sloping relationship between real aggregate demand and the price level. Chief among the factors that shift the aggregate demand curve are changes in wealth, shifts in expectations, and changes in government monetary and fiscal policy. Where the short-run aggregate supply curve intersects

the aggregate demand curve is the economy's short-run equilibrium level of real GDP and of average prices.

# AGGREGATE DEMAND

In lectures 2-8, we talked about "Depression Economics": we assumed that prices and wages were so sticky and sluggish to move that we could treat them as fixed without going far wrong, and that all we had to worry about was how shifts in aggregate demand and spending affected production and employment. In lecture 9, we began our study of "Inflation Economics": in it, we made the assumption that prices and wages were so flexible that unemployment was always at its "natural" rate, that employment was always at its full-employment level, and that production was always equal to potential GDP.

In this lecture we want to move in the direction of realism by relaxing this latter assumption. The easiest way to think about the issue is to construct a graph with the price level or the economy-wide inflation rate on the vertical axis, and the level of real GDP on the horizontal axis: the aggregate supply-aggregate demand graph.

## *The Aggregate Demand Curve*

Lectures 2-8 showed fluctuations in aggregate demand. But they did not answer the question of how the flow of aggregate demand would be different if the overall price level were different. To answer that question we need a new tool. That tool is called the aggregate demand curve. The aggregate demand curve shows how the level of real aggregate demand—real total spending—would be different if the aggregate price level were different.

Does the aggregate demand curve slope down? If the price level were lower, would total real spending be higher? There are three reasons to think that it would:

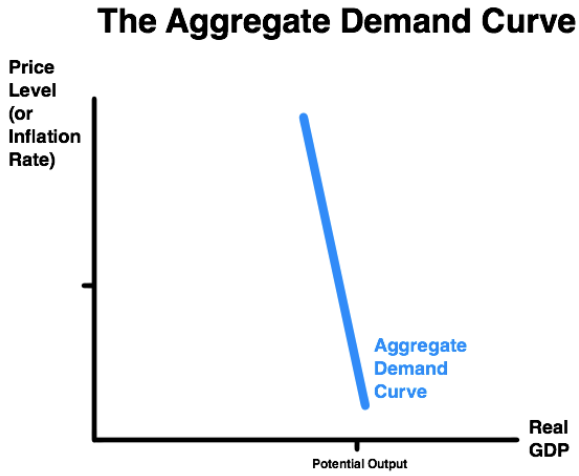
- **Export effects**: If wages and prices are lower our goods look especially attractive as bargains to foreigners, and so a lower price level generates more exports. Especially in a small economy that trades a lot with the rest of the world, this is by far the most important reason for the aggregate demand curve to slope downward

- **Wealth effects**: As long as the lower price level is not entirely expected to be permanent—as long as investors expect wages and product prices to recover somewhat toward their previous, more normal values in the future—then a lower level of wages and product prices means that the property and asset holders of the economy will find that their wealth has greater purchasing power. Thus they will tend to spend more. This "wealth effect" ranks behind the export effect in importance.

- **Real balance effects**: Before interest rates were set by the Federal Reserve, a lower price level tends to lead households and businesses to decide that they are holding too much cash and to try to lend out some of that cash and turn it into an interest-earning asset. Thus a lower price

level reduces the interest rate charged for loans, and such a reduction stimulates investment spending. Today our interest rates are set by the Federal Reserve, which controls the quantity of cash in the economy. Thus this channel is not operating today.

- However, partly offsetting these effects is another point: a lower price level might increase total spending, but the process of falling prices leads to bankruptcies as households and businesses find that the cash they are taking in cannot cover the interest and principal payments they had promised on the money that they had borrowed. Waves of bankruptcies generate fear and panic. Fear and panic leads households and businesses to raise their demand for safe financial assets, and this pushes down their desire to spend on currently-produced goods and services.




In spite of this last consideration, we draw the aggregate demand curve as a downward-sloping line—thinking of shifts caused by waves of bankruptcies and financial panics as shifts in the position of the aggregate demand curve rather than as moves along the aggregate demand curve, and relying on how a lower aggregate price level boosts exports and boosts the purchasing power of households' wealth.

Thus—like the individual market demand curves you studied earlier in the book—we draw the aggregate demand curve sloping downward with the price level or the inflation rate on the vertical axis and the level of real GDP on the horizontal axis. It probably does not slope downward very much: wealth effects and export effects are not the most powerful of forces affecting aggregate demand, but they are there.

## *Shifting the Aggregate Demand Curve*

A number of factors can and do produce shifts in the position of the aggregate demand curve. We have discussed many of these in lectures 2-7, but they are worth summarizing here. Rightward shifts of the aggregate demand curve can be caused by:

- **Increases in Wealth**: When households become richer, they tend to spend more on currently-produced goods and services. That means that aggregate demand will be higher at each possible price level, and that is a rightward shift in the aggregate demand curve. One example is rising house prices, which causes increased household wealth.

- **Optimistic Shifts in Business or Household Expectations**: Consumption spending by households and investment spending by businesses both depend in large part on expectations of the future. Households that think that the future will be bright and their future incomes will be

high will tend to spend more in the present. Businesses that think that demand will be high in the future will be more eager to spend now to add to their productive capacity. A pessimistic shift in expectations about the value of a currency can also boost aggregate demand: if foreign exchange speculators become more worried and sell their dollar-denominated assets, the value of the dollar falls, American goods look more attractive to foreigners, and our exports rise. That too is a rightward shift in aggregate demand.

- **Reductions in Risk**: As we saw *ad nauseum*, increases in perceived riskiness in 2008-2009 exercised a powerful contractionary effect on aggregate demand. Reductions in risk have the same effects in the opposite direction.

- **Expansionary Monetary Policy**: Whenever the Federal Reserve or the Treasury intervenes in financial markets by buying other assets for cash or by guaranteeing private debtors, they push up the prices of financial assets and pushes down interest rates. The consequent increase in financial wealth makes households want to spend more. The consequent reduction in interest rates makes borrowing to build capacity look more attractive to businesses. Both consequences shift aggregate demand to the right.

- **Increases in Government Purchases**: Whenever the government spends more buying goods and services the effects are as if anybody else spent more: the government's spending is as good a source of aggregate demand as anybody else's spending. An increase in government purchases shifts the aggregate demand curve to the right.

- **Cuts in Current Taxes**: A cut in taxes leaves households with more income in their pockets right now. They will save some portion of that increase in after-tax income and spend some, and so shift the aggregate demand curve to the right. In general a cut in taxes will not have as large an effect on aggregate demand as an equal increase in government spending: households will notice that the government is selling more bonds whenever it cuts taxes without changing spending, and that it will raise future taxes to pay off those bonds. They will make some effort to anticipate that larger future tax burden and some effort to save to prepare for it. [COMMENT: Mention the difference between a tax cut being viewed as temporary or permanent?]

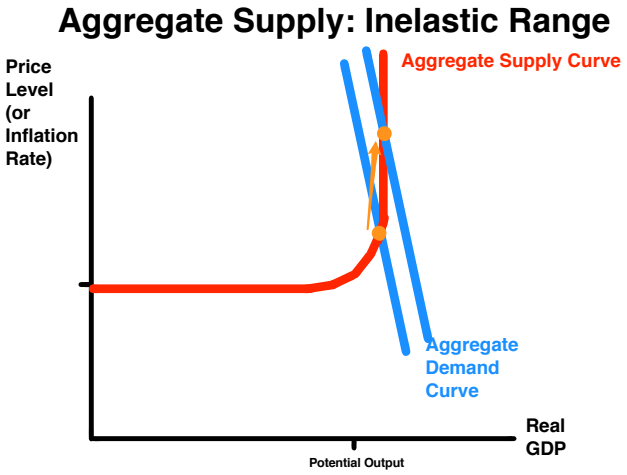
And similarly for leftward shifts in the aggregate demand curve.

# SHORT-RUN AGGREGATE SUPPLY

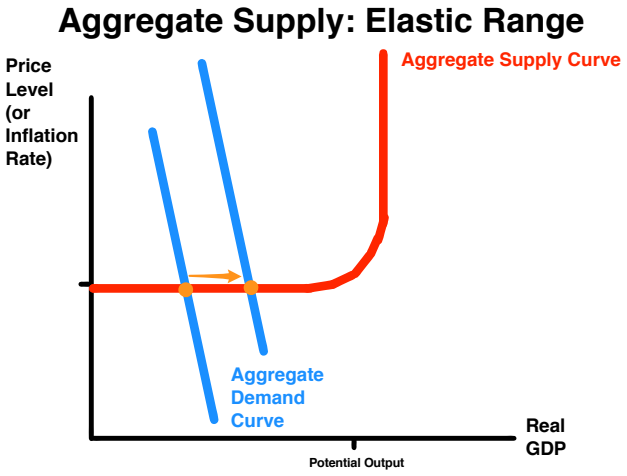
## *The Short-Run Aggregate Supply Curve*

It is a law of economics that where there is a demand curve there is a supply curve. The counterpart to the short-run aggregate demand curve is the short-run aggregate supply curve. Just as a fall in demand for one commodity leads producers to both cut back on the quantity produced and cut their prices, so a fall in aggregate demand for all currently-produced goods and services leads producers to cut back on quantities and to cut prices. But by how much of each? We model this short-run response of the economy in falling production and prices with a tool we call the short-run aggregate supply curve.

Over a range—when prices and wages are rising fairly rapidly, and when businesses and workers are forced to pay great attention not just to how much they are receiving but to how much they are paying for what they buy—the aggregate supply curve will be nearly vertical: even big shifts in the position of the aggregate demand curve will have next to no effect on production and employment, and will have substantial effects on prices and inflation. This was the case considered in lecture 9.

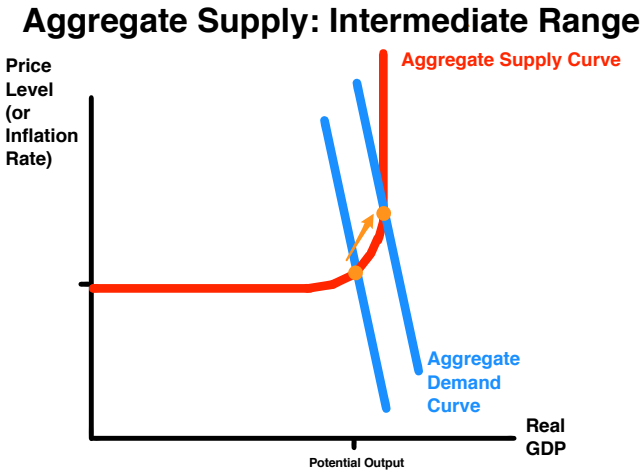



And over a range—when unemployment is high, and when prices and wages are barely increasing at all, or even decreasing, and businesses and workers are (rightly) assuming that changes in the overall rate of inflation or deflation are not something they need to pay attention to—the aggregate supply curve will be nearly horizontal: even small shifts in the position of the aggregate demand curve will have substantial effects on the level of production and employment, and little effect on the price level and the inflation rate.



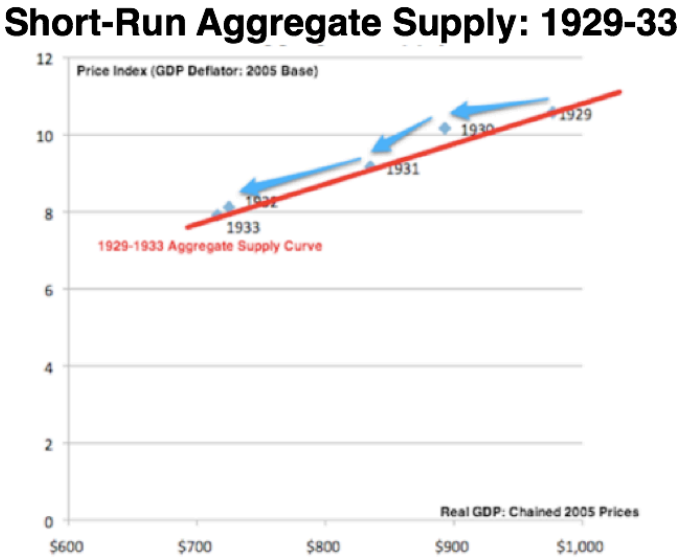

(Note that back in the Great Depression era things were somewhat different: then labor market institutions and expectations were different, and we could see back then substantial falls in average price and wage levels in a relatively short time.)

In between there is a range in which the short-run aggregate-supply curve is neither nearly horizontal nor nearly vertical, and in which shifts in the aggregate demand curve have substantial effects on both production and prices. That is the case that we consider in this lecture: the case of the Phillips Curve.



## *Examples of Aggregate Supply in the Short Run*

The short-run aggregate supply curve shows the short-run relationship betwee n the quantity of real GDP produced by an economy's workers and businesses and the average price level during that period of time in which workers' willingness to work and employers' desires to hire change little and in which many costs of doing business are "sticky" downward: slow to adjust. Each year between 1929 and 1933 production fell and prices fell as the economy moved downward and to the left along this short-run aggregate supply curve. By 1933 production and prices were both a quarter below their 1929 levels.




The short-run aggregate supply curve is drawn on a graph with real GDP shown on the horizontal axis and the overall price level—the average price of marketed goods and services—shown on the vertical axis. The short-run aggregate supply curve is upward sloping: when real GDP is higher, the overall price level tends to be higher; when real GDP is lower, the overall price level tends to be lower. The slope of the short-run aggregate supply curve indicates the extent to which falls in real GDP are accompanied by large or by small declines in the overall price level. When the short-run aggregate supply curve is steep, even a small decline in production is accompanied by a large decline in the overall price level. When the short-run aggregate supply curve is not steep but rather nearly flat, even a large decline in production does not carry with it a large decline in the overall price level.

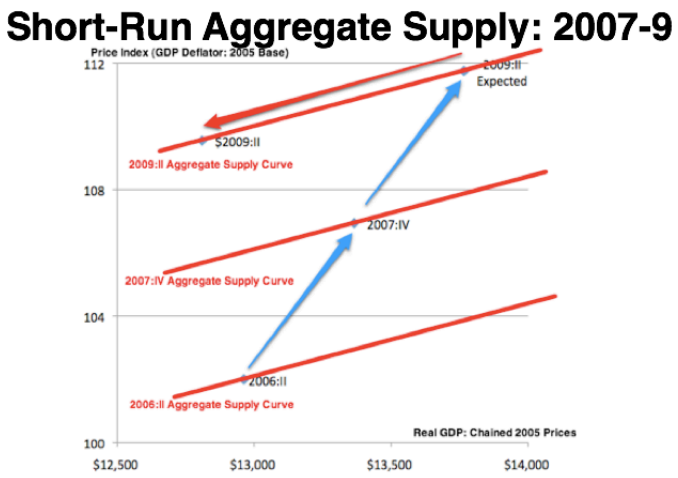
The short-run aggregate supply curve shows the tradeoff between the aggregate price level in the economy and real GDP. As real GDP increases, the price level tends to increase. As real GDP declines, the price level tends to decrease. The slope of the curve tells us how much the price level will change if there is a change in real GDP. A steeper curve has larger price changes than one that is shallow or flat for the same change in real GDP.

Looking over 1929-1933, back then the U.S. economy's aggregate supply curve was stable. Because workers and businesses back then did not expect either inflation or deflation but rather price stability, their willingness to work, to hire, and to produce did not shift over the four years 1929-1933. As we'll see, the expectation of price stability leads to a short-run aggregate supply curve that doesn't shift. Therefore, changes in the economy's position on the real GDP-price level graph over 1929-1933 represented movements along the short-run aggregate supply curve, not shifts of it.

The movements along the curve were substantial. Aggregate demand fell year after year as the economy slid into the Great Depression. Both production and prices fell. Unemployment spiked: total unemployment rose to 23% in 1933, and non-farm unemployment in the American economy rose to 28%.

In the U.S. economy in that era, the slope of the short-run aggregate supply curve was such that a fall in aggregate demand was divided roughly evenly between a decline in prices and a decline in production Real GDP in 1933 was only 73% of its value in 1929, and the price level in 1933 was only 77% of its value in 1929.

In the 2007-2009 Great Recession the short-run aggregate supply picture with the price index on the vertical axis is a little bit more complex. The short-run aggregate supply curve does not stay in exactly the same place on the real GDP-price level graph, but rather drifts over time.




In the mid-2000s everybody in the economy was expecting inflation to proceed at about 2.5% per year: they expected that each year would see prices on average 2.5% higher than prices were the year before. Moreover, investment, technological progress, and a growing labor force were also expanding potential output by about 3% per year. Thus every year saw the SRAS shift out by about 3% (as the economy's potential output grew) and also shift up by about 2.5% (as businesses, workers, and savers changed their willingnesses to pay and produce in accord with their expectations of ongoing low inflation).

Thus workers' and businesses' willingness to work, to hire, and to produce was steadily shifting over time: each year prices needed to be a little bit higher to elicit the same amount of production. We can see this at work between the second quarter of 2006 (2006:II) and the fourth quarter of 2007 (2007:IV), as the price level on its 2005 base rose from 102 to 106.9—by 4.9%—as production rose by 3.1%. If you had asked Americans at the end of 2007 where they expected the economy to be in the middle of 2009, they would have expected an additional 4.9% rise in the price level and an additional 3.1% rise in real GDP.

But that is not what happened between 2007 and 2009. Instead, total spending fell and by the middle of 2009 was 9% below the value that had been expected only a year and a half before. Prices in the middle of 2009 were some 2% below their expected value, and real GDP was 7% lower than expected. Note the difference in the slope of aggregate supply: at the start of the 1930s each 1% lower in prices carries with it 1% lower production; by the end of the 2000s each 1% drop in prices carries with it 3.5% lower production. Wages and prices in the macroeconomy were already sticky at the start of the 1930s. They have grown stickier since.

The presence of creeping inflation—of a price level creeping upwards at 2.5% per year or so and expected to continue creeping upward at that rate—means that over a year and a half the short-run aggregate supply curve will shift upward by about 3.75%. This is in contrast to the Depression era in which the general expectation was for price stability. Furthermore, wages and product prices had become more downwardly-sticky between 1930 and 2010. In 1930 each one percent decline in real output is matched by a one percent decline in average prices. By 2010 it takes a 3.5% decline in real output to reduce prices 1% below their previously-anticipated levels.

For these reasons, when we draw aggregate demand-aggregate supply graphs for the modern era, we usually put not the price level but the inflation rate on the vertical axis. It makes the graphs look much simpler.

## *Shifting the Short-Run Aggregate Supply Curve*

A number of factors can and do produce upward shifts in the position of the short-run aggregate supply curve:

- **An Upward Resource Price Shock**: The most important sudden upward shifts in the American economy's short-run aggregate supply curve took place in the 1970s, with the two successive triplings of the world price of the important natural resource of oil. With the price of the key input of oil higher, producers required higher prices in dollars for the final products they produced in order to supply the same amount. The short-run aggregate supply curve thus shifted upwards. Conversely, with the oil glut of the 1980s, oil prices sank making production and transportation less expensive. The short-run aggregate supply curve thus shifted downward.

- **An Upward Jump in Productivity or Productive Resources**: An upward jump in productivity means that businesses and workers can produce more output from the same amount of inputs. Think of Costco's ability to keep better track of the goods in its stores with radio-frequency identification tags. This means that workers have to spend less time running around the store, thereby making each worker more productive. After such a jump it is profitable to make and sell the same quantity of goods even at a lower price. So an upward jump in productivity generates a downward shift of the aggregate supply curve.

- **An Upward Jump in Expected Nominal Wage**s: If workers expect an ongoing process of inflation, they will demand higher nominal wages next year than they were paid this year. Such an increase of nominal wages makes it unprofitable for businesses to produce the same quantities of goods and services unless prices rise as well. An upward jump in nominal wages thus generates an upward shift in the short-run aggregate supply curve.

Downward shifts of the short-run aggregate supply curve have analogous but opposite causes.

Note that the thing most likely to produce an upward shift in nominal wages relative to previous expectations of what they would be is a high-pressure economy: a level of real GDP above the economy's fundamental productive potential and thus a low level of unemployment. Note that

the thing most likely to produce a downward shift in nominal wages relative to previous expectations of what they would be is a low-pressure economy: a level of real GDP well below the economy's fundamental productive potential and thus a high level of unemployment.

## *Why Are Prices Sticky Downwards Today?*

Prices and wages are, at the level of the economy as a whole, "sticky" downwards. When total spending falls—as it did from 1929-1939, and again 2007-2009—average wages and prices do not fall by as much as spending falls. Thus businesses do not employ the same numbers of workers at lower wages and make the same number of goods and selling them at lower prices. Instead, businesses respond to falls in aggregate demand by firing workers and shutting down their production lines in addition to if not instead of cutting wages prices.

Why are wages and prices in an economy downward-sticky in this way? There are five reasons:

1. Managers and workers find that renegotiating wage levels downward is a costly and disruptive exercise as people make all kinds of threats about how they will behave if the other party doesn't give in – threats that they do not mean but then feel forced to carry out. Hence cutting wage levels is best delayed as long as possible, and then it is best delayed a little longer than that.

2. Managers and workers lack information and so confuse changes in total economy-wide spending with changes in demand for their specific products: if it is demand for your particular product that has fallen, you won't be able to cut wages and still keep your same-quality workforce—better to get ahead of the game by shrinking your operations – i.e. firing workers.

3. The level of wages is as much a sociological as well as an economic variable—determined as much by what values people think is "fair" as by the balance of supply and demand. Workers take a cut in their wages as an indication that their employer does not value them—hence managers avoid wage cuts because they fear the consequences for worker morale and worker effort.

4. Managers and workers suffer from simple "money illusion"; they overlook the effect of price-level changes when assessing the impact of changes in wages or prices on their real incomes or sales, and so don't notice that other prices and wages are falling all around them when they consider whether to cut wages.

5. And if wages are sticky downwards, then prices must be sticky downwards too. Firms often have contracts for other production inputs such as steel, computer chips, and lumber. If they lower their prices but have the same input costs, they will make less money on each sale and possibly lose money. Therefore, firms that cut their prices fully in response to a fall in aggregate demand may lose money on each commodity they make—and they cannot make it up on volume.

## *Consequences of Downward-Sticky Wages and Prices*

Because wages and prices—both individual prices and wages and economy-wide average levels—are somewhat sticky, it is clear how a sudden rise in household or business desire to hold cash or other financial assets produces a downturn. People and organizations that would otherwise be spending cut back on their spending to build up their holdings of financial assets. Then businesses seeing spending on their products fall and inventories rise, and so they cut production and employment in addition to or instead of cutting wages and prices. They cut production and employment until their level of production is no greater than total economy-wide spending, and so inventories are no longer growing.

By the circular flow principle, as they cut production total economy-wide incomes will fall as well, for the flow of production is nothing other than the flow of incomes. And then those whose incomes have fallen will find themselves forced to cut back on their own flow of spending, so there will be a second round of falling spending, rising inventories, and falling production and employment.

Would it change things if wages and product prices were not sticky downward? Would we avoid downturns in production and employment largely if not completely if, when total spending were to drop, wages and prices dropped too and dropped by as much? Wouldn't the same flow of total nominal spending then be enough to buy the same quantities of goods and services and to employ the same number of people?

The issue is more complicated. If wages and product prices were not sticky downward, they would indeed adjust immediately and fully to a fall in total spending. But they are not the only prices in the economy. What about debts? Debts are defined as the owing of a specific number of dollars: they cannot decline when spending declines. And how about interest payments on debts? Businesses that had borrowed money to establish themselves or to expand would find that their nominal cash flow had fallen while their fixed debt repayments had not. They would be forced to declare bankruptcy. The debts that they owed would no longer be safe or liquid assets to hold or suitable vehicles for transporting purchasing power into the future via saving. The bankruptcies would generate fear and panic, a further excess demand in financial assets, and would produce a further fall in demand for currently-produced goods and services.

Back in the 1930s economists like Irving Fisher and Jacob Viner in their analyses of the Great Depression concluded that making the economy's wages and product prices less downwardly sticky in the short run was more likely to have made the Great Depression worse. It would have amplified the number and seriousness of bank failures. It would have made the downturn less severe. And University of Chicago monetarist economist Milton Friedman, taking a fresh look at the situation of the Great Depression at the start of the 1970s, concurred: an "unbalanced deflation"—a decline in nominal wages without a write-off of debts—would, he thought, have been the worst of all worlds.

If falls in wages and product prices were accompanied by equal relative falls in debt, then downward wage and price flexibility would be an effective way of keeping downturns in spending from causing large depressions.

We can see this at work if we take a look at a small country with few debts to the outside world that trades a lot. Then a decline in the value of the country's currency is a flexible cut in its wages and product prices to the outside world. Such exchange depreciation and devaluation are among the most effective recession-, downturn-, and depression-fighting policies that exist.

## LONG-RUN AGGREGATE SUPPLY

Workers' and businesses' expectations, contracts, and informal agreements are not set in stone, but change over time. Contracts are renegotiated. Informal agreements change with the times. Expectations shift. So in the long run all the wages and product prices in the economy—even the terms of debt contracts, if the run is long enough—are not downwardly-sticky but are rather flexible. And this makes a big difference as we shift from thinking about aggregate supply in the short run to aggregate supply in the long run.

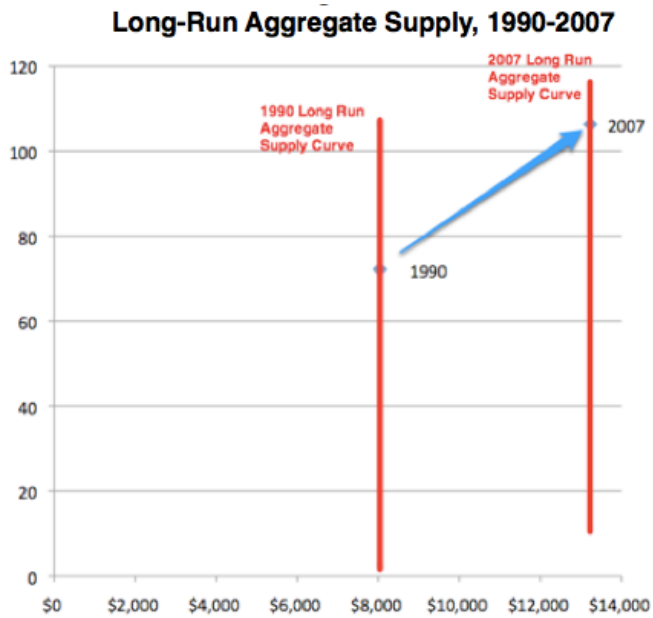
Moral philosopher David Hume in the mid-eighteenth century was the first economist to carry out the thought experiment of what would happen in an economy if everybody had sufficient time and warning and so could adjust all of their contracts and expectations. What then if there were to be twice as much money, and everybody knew that there were twice as much money? Then, Hume said in his essay "Of the Balance of Trade," all prices in the economy would be twice as high—but people would still work at the same jobs, produce the same commodities, and buy and sell the same products. Prices would be different and higher. But the level of production would be the same.

**Long-Run Aggregate Supply**


Economists today agree with Hume's logic: in this long run in which everybody has sufficient time and warning to adjust all of their contracts and expectations, differences in the price level are not accompanied by differences in the quantity of aggregate output supplied. Does anybody think that if the average inflation

rate in the United States over the past 40 years had been on average either one percentage point per year higher or lower—so that the overall price level today were either 50% above or 33% below its current level—that this would have any noticeable effect on the level of employment and the amount of useful goods and services produced this year? No.

We model this long-run response of the economy to differences in the price level with a tool called the long-run aggregate supply curve. The figure to the right shows this long-run aggregate supply curve. Note that it is vertical: a move along the long-run aggregate supply curve is a difference in the price level without a difference in the rate at which real GDP is produced. For why should there be any difference in real GDP just because prices are, say, twice as high? In the long-run, workers and firms can adjust their contracts, expectations, and informal agreements to account for changes in prices. The economy will have the same real GDP regardless of the overall price level, for in the long run everybody has had enough time and warning to get used to this difference in the overall level of prices, and has adjusted their contracts, expectations, and informal agreements accordingly.

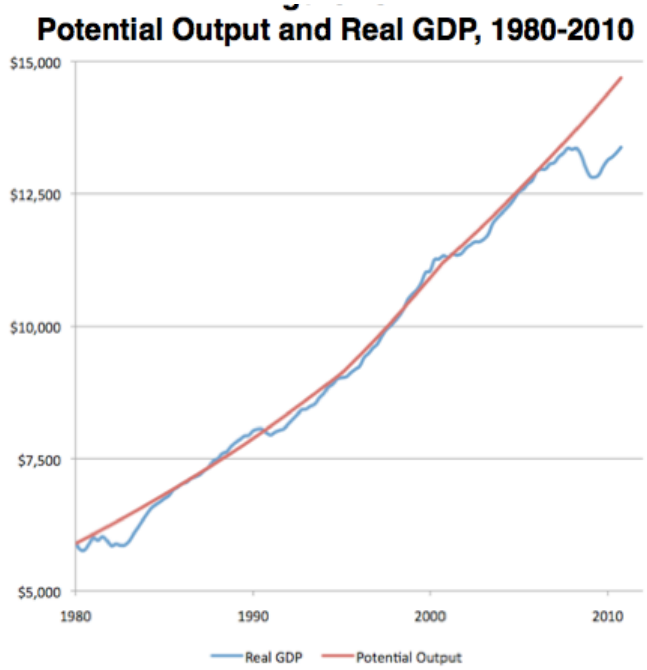



The vertical long-run aggregate supply curve shows the relationship between the aggregate price level and the quantity of useful goods and services produced under the circumstances when all prices in the economy are fully and completely flexible, or at least have had time to fully and completely adjust to any disturbances in demand.

The figure to the right shows the long-run aggregate supply curve as it stood in the mid-2000s and also back in 1990. In 2007—when the U.S. economy was at full employment, and so on its long-run aggregate supply curve—the long-run aggregate supply curve was vertical at a value of $13.2 trillion of annual real GDP (at chained 2005 prices). Back in 1990 the long-run aggregate supply curve was vertical at a value of $8.0 trillion of annual average real GDP (at chained 2005 prices). Note that the long-run aggregate supply curve is not fixed in the long run: increases in the labor force, investment, and technological and organizational progress shift it outward to the right over time.

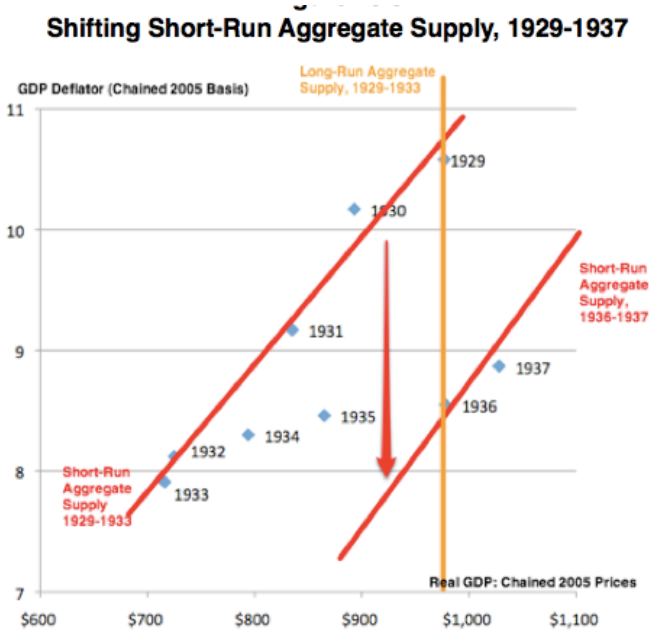
The level of real GDP at which the vertical long-run aggregate supply curve is placed is nothing other than the economy's productive potential, its level of potential output. It is the level of real GDP that the economy would produce if wage and product-price stickiness, if the existence of debts, and if deviations of workers' and businesses' expectations from reality did not push production either below or above the level of potential output in response to unexpected shifts in the

state of the economy. In those situations in which there have been no recent unexpected shifts, and thus in which everybody has had the opportunity to incorporate shifts in prices into their contracts and expectations, the economy will be on or near its long-run aggregate supply curve, and the level of real GDP will be at or near potential output. When there have been recent unexpected shifts in and shocks to the economy, the level of real GDP will not be equal to the level of potential output.




Note that the real economy out there will often be away from its long-run aggregate supply curve. Downward wage and price stickiness leads to episodes of recession economics in which real GDP is below potential output. Long-term contracts and errors of expectations lead to episodes of inflation economics in which real GDP is above potential output and there is upward pressure on the price level and the inflation rate.

Nevertheless, we do talk about and use the long-run aggregate supply curve even if the economy is exactly on it only at infrequent moments. Why? Because if the economy is not on the long-run aggregate supply curve, it is likely that the short-run aggregate supply curve that the economy is on is shifting in a way that tends to push the economy towards if not to a position on the long-run aggregate supply curve.




## *From the Short Run to the Long Run: Aggregate Supply*

We can see this process of adjustment at work back in the 1930s in the figure at the right. The economy can—as it was in 1929—be at a full-employment position where it is on both the short-run and the long-run aggregate supply curves. The economy can—as it was in 1933—be on the short-run but not on the long-run aggregate supply curve. Whenever the economy is not on its long-run aggregate supply curve, there are economic forces acting to change aggregate supply. Sticky wages and prices are then away from the levels at which work-

ers and businesses would have wanted to set them. Informal agreements and contracts are disappointing to one or both sides of the bargain. Expectations turn out to have been in error. Over time all of these factors change, and so the short-run aggregate supply curve shifts. If real GDP is below potential output—if the economy is to the left of the long-run aggregate supply curve—then the short-run aggregate supply curve shifts down over time. If real GDP is above potential output—if the economy is to the right of the long-run aggregate supply curve—then the short-run aggregate supply curve shifts up over time.

The Old Deal government of Herbert Hoover had unwittingly taken policy steps to make the Great Depression worse, and the New Deal government of Franklin Roosevelt attempted to fight the Great Depression, but some of its policies were clearly counterproductive and the rest were not at a sufficient scale to produce a rapid recovery. Thus government did relatively little that was macroeconomically significant to drive the 1933-1937 recovery—it simply stopped the tax-increase, spending-cut, and gold-standard policies of the Hoover administration that were pushing the level of production and employment down.

The response of the economy to deep depression was to set in motion economic forces to shift the short-term aggregate supply curve down. By 1936-1937 real GDP was back to its 1929 level, even though wage levels and the price level in the United States were 20% lower than they had been at the end of the 1920s. (Note that recovery was not complete by 1937: 8 years of technological innovation and labor force had significantly increased American potential GDP over the Great Depression decade, even though business investment had been severely depressed.) Economic downturns are not permanent: the economy does recover, eventually, from a downturn caused by a sharp, steep fall in total spending.

The key word, however, is "eventually." It can take as long as a decade for complete recovery to come if the private economy is left to its own devices. We saw that when the unemployment rate is elevated it can stay elevated for years, with little or none of the normal microeconomic market-equilibrium supply-and-demand pressures that we expect to see in the market economy.

The U.S. economy had still not completely recovered to full employment and potential output when World War II started—and it was the massive surge of total war government spending that brought U.S. production up to the level of potential output in 1942 and 1943.

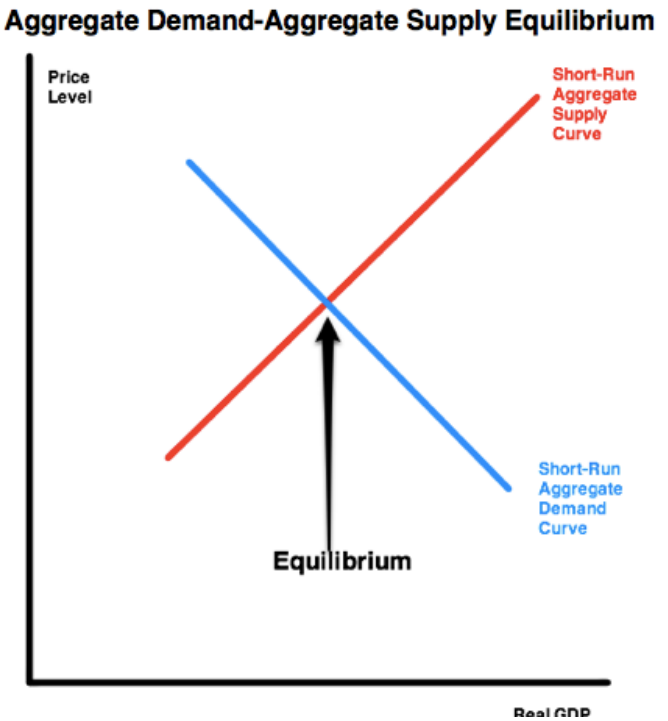
## SHORT-RUN EQUILIBRIUM

### *Aggregate Supply and Aggregate Demand*

It is a law of economics that where there is a supply curve and a demand curve there is a point where they met that is very interesting.

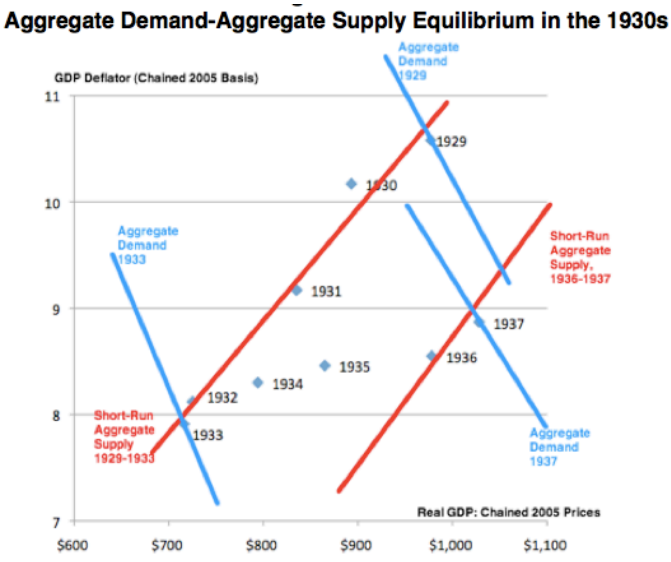
As shown in the figure at the right, where the short-run aggregate supply curve intersects the aggregate demand curve is where the economy will settle as far as its level of real GDP and of the

price level is concerned. At that level of average prices, firms are happy producing the current level of real GDP given the frictions and stickinesses, the contracts, informal agreements, and expectations, in the economy. At that level of average prices the flow of total spending from consumer households, businesses seeking to invest and add to their capacity, the government, and foreigners purchasing exports adds up to real GDP.



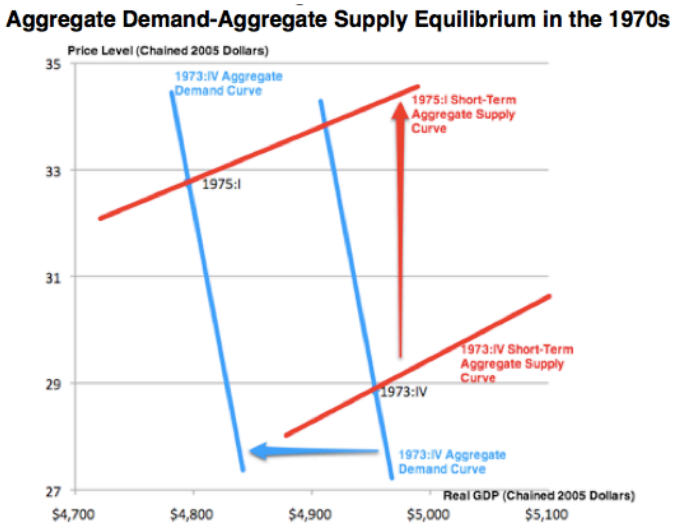

## *Shifting the Short-Run Aggregate Supply and Aggregate Demand Equilibrium*

In general as time passes both the short-run aggregate supply and the aggregate demand curves shift. The 1930s was a decade in which both curves moved substantially and rapidly. Figure 23.9 shows three such big shifts: the leftward shift of the aggregate demand curve between 1929 and 1933 as the U.S. economy fell into the Great Depression, a rightward shift of aggregate demand between 1933 and 1937 as the economy began its recovery, and a downward shift in the short-run aggregate supply curve between 1933 and 1937.




The net effect of all three of these shifts was to produce a short-run equilibrium in 1937 with real GDP back at its 1929 level, but with the price level below what it had been and what it had expected to be.

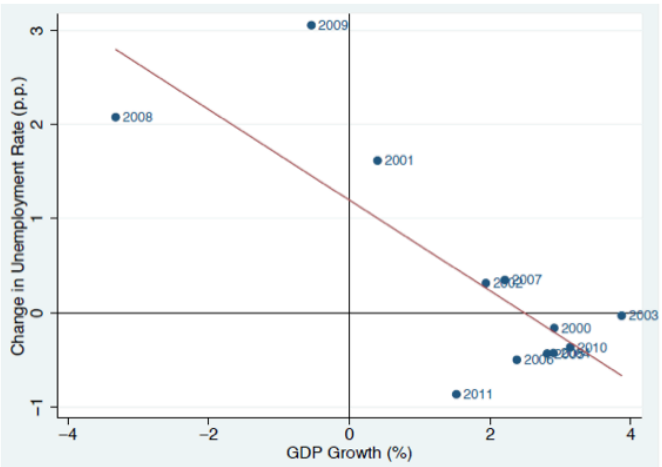
Another standard example of shifting aggregate demand and short-run aggregate supply curves is the 1973-1975 episode in the United States surrounding the 1973 oil price shock that followed the 1973 Arab-Israeli Yom Kippur War. Briefly, the OPEC tripled the world price of oil in late 1973, and that supply shock moved the short-run aggregate supply curve upward. The Federal Reserve then reacted to the rise in the inflation rate produced by this oil shock by raising interest rates in order to create unemployment by shifting the aggregate demand curve rightward and so reduce inflationary pressures. Figure 23.11 shows the net effect of these two shifts on the short-run equilibrium position of the U.S. economy between 1973 and 1975.




The combination of falling real GDP and rising price levels and inflation rates that we saw in the United States between 1973 and 1975 has a special name: stagflation. Previously we had seen episodes of recession or stagnation in which the aggregate demand curve shifted right and the price level fell or at least fell relative to what had previously been expected. Previously we had seen episodes of rising prices and inflation rates in which the high-pressure economy had had a high and growing level of real GDP. 1973-1975 was the first episode in which the economy saw both falling real GDP and rising prices and inflation rates.

# THE PHILLIPS CURVE

## *Okun's Law*




Real GDP is an estimated quantity, hard to construct, with many guesses incorporate into it construction, and subject to frequent and substantial revision. The unemployment rate, by contrast, is easy to estimate. The Bureau of Labor Statistics, every month, takes a random sample of households and asks, of every adult in those households, whether they are (a) unemployed and looking for a job and (b) in the labor force—unemployed and looking for a job, or have a job. (a) divided by (b) is the unemployment.

It is a fact that as production goes up and down relative to potential output the unemployment rate goes down and up relative to the "natural rate" of unemployment—the rate that would prevail because of search frictions and structural frictions if the government were perfect at doing its job of matching aggregate demand to aggregate supply, and so making Say's Law true in practice even though it is not true in theory. Most of the time this "Okun's Law" relationship, named after economist Arthur Okun, is quite precise. Sometimes it is not—there were significant deviations from the normal pattern of this "Okun's Law" in 2009 and 2011. In 2009 the unemployment rate rose fully 1.5 percentage points more than expected given the change in real

GDP from 2008-9. In 2011 the unemployment rate fell 1.2 percentage points more than expected given the change in GDP from 2010-11.

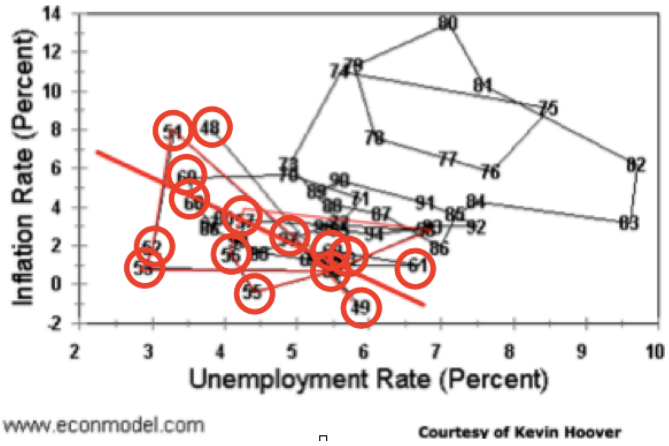
Nevertheless, most of the time you can win money by betting that:

[Change in Unemployment Rate] = 0.5 x ([% Change in Real GDP] - 2.5%)

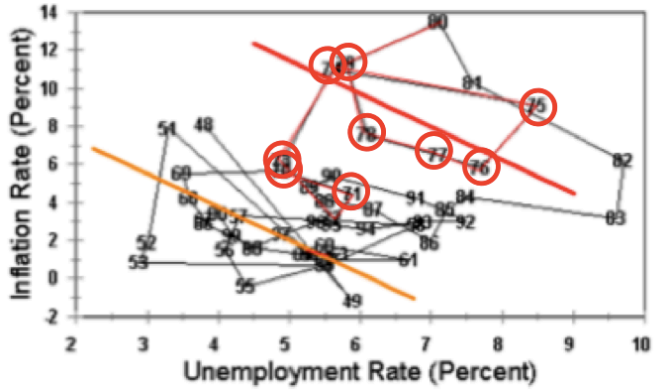
will hold closely.

## *The Phillips Curve*

This Okun's Law relationship means that there is an alternative way of representing aggregate supply and aggregate demand. Instead of plotting real GDP on the horizontal axis and the inflation rate on the vertical, plot the unemployment rate on the horizontal axis and the inflation rate on the vertical axis. The aggregate supply curve then slopes up and not downward. And we call it the "Phillips Curve". But it is the same concept if you remember that high unemployment means low real GDP relative to potential output, and low unemployment means high real GDP relative to potential output.

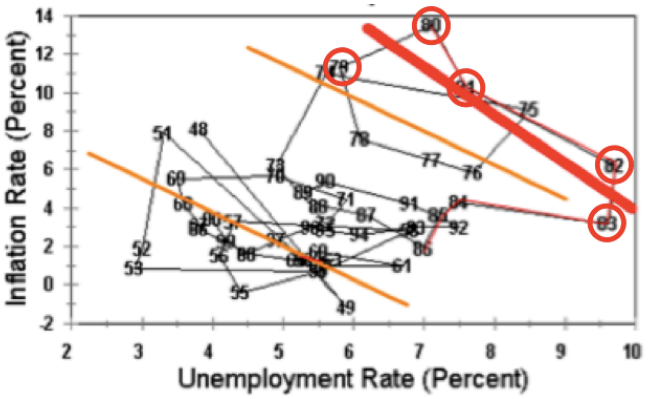



When you plot this Phillips Curve for the entire post-World War II period, you get a confusing cloud of data points. But when you break the post-World War II period down into different eras, you get a picture that makes considerably more sense. Between 1948 and 1969 for example, when unemployment was up beyond 6%, inflation was below 2%/year. When unemployment was below 4%, inflation was above 4%/year—except in 1952 and 1953, when inflation was subject to Korean-War price controls. For intermediate values of unemployment, inflation was between 2% and 4%.

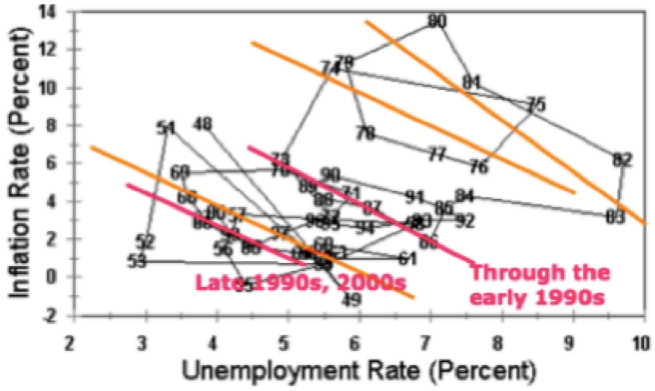



Then, between 1970 and 1973, it seemed as though the Phillips Curve shifted upwards. And then, in 1974 and for the rest of the 1970s, it seemed as though it shifted upwards again. Between 1974 and 1979 an unemployment rate of 8% looks like it carries with it an inflation rate of 6-

8%/year, and an unemployment rate below 6% carries with it an inflation rate of 11-12%/year. The pattern continues in the early 1980s: an unemployment rate near 10% is associated with an inflation rate of about 5%/year, while an unemployment rate in the 6-7% range is associated with an inflation rate that averages 12%/year.




Then the pattern changes again. In the late 1980s and early 1990s, an unemployment rate of 5% is associated with an inflation rate of about 6%/year, while an unemployment rate of 7% or more is associated with an inflation rate of 2% or so—or an inflation rate that is falling toward 2%. Afterwards, in the late 1990s and 2000s, the Phillips curve appears to be back to where it was in the 1950s and 1960s, with unemployment rates of 4% or less associated with inflation rates of 3-4%/year, and unemployment rates above 6% associated with very low inflation rates.




## *The Phillips Curve and Expected Inflation*

The natural way to make sense of these historical patterns is to conclude that sometimes inflation expectations are what economists call "well-anchored": businesses and households have firm expectation of what inflation will be, and bargain for wages and set their prices accordingly, without allowing recent economic news to change their expectations of inflation very much.

The Phillips Curve

- π: inflation
- Eπ: expected inflation:
- (P(t)-P(t-1))/P(t-1) = π(t)
- u: unemployment rate
- u*: the "natural" rate of unemployment, the NAIRU
- $\pi = E\pi + \beta(u^* - u)$

At other times, however, inflation expectations are not well-anchored. Then both households and businesses will be willing to change their expectations of inflation in response to news about the economy, and when news does arrive they will change their expectations of inflation. In this case the Phillips Curve will take on a convenient mathematical form:

$$\pi = E\pi + \beta(u^* - u)$$

where $\pi$ is the inflation rate, $E\pi$ is what the average business and household expects the inflation rate to be, $u^*$ is the economy's natural rate of unemployment, and u is the actual rate of unemployment. The more is actual unemployment below the natural rate, the faster will prices rise and the higher will the inflation rate be above its previously-anticipated level. The more is actual unemployment above the natural rate, the slower will prices rise, and the lower will the inflation rate be relative to its previously-anticipated level.

## The Phillips Curve II

- $\pi = E\pi + \beta(u^* - u)$
- Usually $E\pi$ will be just what inflation was last year
  - Sometimes not
  - President Mitterand of France at the start of the 1980s
- Usually $u^*$ will be very stable (say, 5% in the U.S. today)
  - Sometimes not: varieties of "structural" unemployment

In this second case, a good proxy for what businesses and households expect inflation to be will be simply what inflation was in the previous year. Then the Phillips Curve for any year t will simply be:

$$\pi_t = \pi_{t-1} + \beta(u^* - u_t)$$

This year's inflation is last year's inflation, plus some term that depends on the gap between the natural rate of unemployment and the current unemployment rate.

## The Unemployment Rate and the Change in Inflation


The figure to the right plots this equation between 1959 and 2009. The fit to the real economy is not perfect. The fit is, however, pretty good. Let the unemployment rate get above 7% and stay there, and inflation is certain to fall. Let the unemployment rate get below 5%, and inflation is certain to rise.

There are, however, powerful reasons not to expect this last Phillips Curve equation to hold perfectly. It does depend on expectations. Expectations can be well-anchored, and not shift even in response to news. Expectations can respond very quickly indeed: back in 1981 President Mitterand ran for the presidency of France on a platform of raising the inflation rate, and the inflation rate rose even before he was elected. It also depends on what the natural rate of unemployment is and that can change as well. As the baby-boom generation entered the U.S. labor force in the 1970s the natural rate of unemployment rose as the economy struggled to find jobs for the huge influx of new workers. Prolonged recessions can turn what was cyclical unemployment into "structural" unemployment as the unemployed lose the skills that made them valuable and lose the contacts with people who had jobs that enable them to search for new jobs effectively.

# THE FEDERAL RESERVE AND THE CONTROL OF INFLATION

## *Why Control Inflation?*

The fact that the Congress has charged America's central bank, the Federal Reserve, with not just promoting maximum employment and purchasing power but also with promoting "price stability"—low inflation—makes the Federal Reserve's task of playing its part in managing aggregate demand very difficult. The Phillips Curve relationship tells us that too-high aggregate demand and too-low unemployment will produce higher inflation.

Furthermore, the Phillips Curve relation ship tells us that higher inflation may get baked into the economy: that it may raise expectations of inflation, and thus generate higher inflation even after aggregate demand has returned to normal and is no longer running ahead of aggregate supply.

At this point, it would be natural to ask why anybody cares. In inflation, prices rise but wages rise too. If the average price you pay rises by 2% or 5% or 10%/year, but your wages also rise by 2% or 5% or 10%/year, why should you care? You are equally well-off either way. And if a higher inflation rate brings with it, as the Phillips Curve tells us that it does, a higher level of production and employment, that would seem all to the good.

There are three reasons to dislike inflation.

- Inflation disrupts the price system. People carry ideas about what the prices of goods and services are in the backs of their heads, and use them to comparison shop. If prices are rising at an even moderate pace of 6-10%/year, that back-of-the-head knowledge rapidly becomes obsolete, people become less ef-

### Why Does It Matter?

- Should we care about inflation?
  - I mean, if wages and prices rise at about the same amount, why is it a problem?
- Why would anybody ever do what Paul Volcker did in 1982?
  - That is, deliberately trigger a nasty episode of depression economics in order to push inflation down?

### Why Inflation Matters

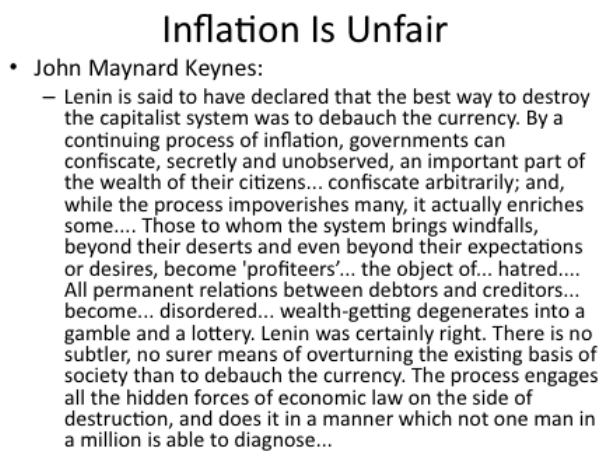
- Inflation deranges the price system and makes it "inefficient"
- Inflation is unfair
- Inflation is unpopular
  - Politicians whose central bankers allow inflation to take hold tend to lose the next election

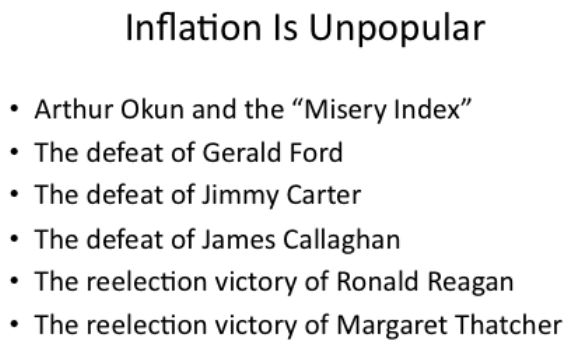
### Inflation Deranges the Price System

- A market economy works by people using prices to calculate what to do
- And a market economy works well when prices reflect actual social values and scarcities
  - That is, when low-priced things are "cheap" in the sense that they use up little of our resources; and high-priced things are "valuable" and hence worth making
- Inflation makes these calculations difficult, and error-ridden

fective at comparison shopping, more wrong economic decisions are made, and economic growth slows.

- Inflation is unfair: some people had been expecting to be paid or to be earning dollars that would buy more goods and services than they turned out to buy. Those people are big losers. Others find that the debts they owe are worth a lot less in terms of goods and services than they had thought they would be worth. They are big—and lucky, and unjustified—winners. John Maynard Keynes was probably the most eloquent critic of inflation as unfair—as likely to destroy the market economy, lead to Soviet communism, and "engage all the hidden forces of economic law on the side of destruction... in a manner which not one man in a million is able to diagnose..."



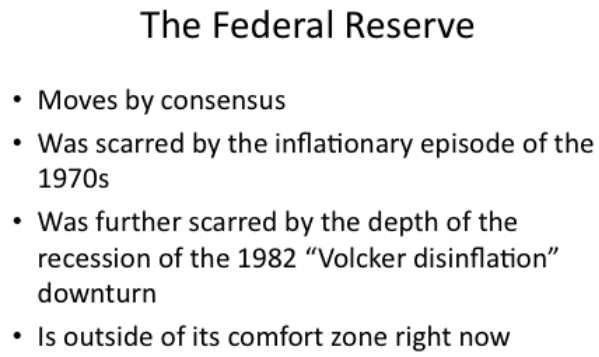

- Inflation is unpopular: voters tend to regard a government that tolerates inflation as a government that is not doing its job, and tend to vote against it at the next election. In the 1970s Jimmy Carter's economic advisor Arthur Okun constructed a "misery index" by adding up the inflation rate and the unemployment rate, and argued that the high value of the misery index was a good reason that voters should vote against President Gerald Ford and for Jimmy Carter. Voters were persuaded. Three years later Margaret Thatcher's advisors made the same case, and convinced British voters to vote against James Callaghan. Four years later Ronald Reagan's economic advisors pointed out that inflation and the misery index were higher than they had been at Carter's inauguration, and Reagan won the presidency. And in the 1980s both Reagan and Thatcher were able to successfully win reelection by pointing to progress in reducing inflation, even though real incomes had grown very slowly indeed while they were in office and unemployment remained relatively high.

The experience of Carter, Callaghan, Reagan, and Thatcher in the late 1970s and 1980s has created a strong presumption that it is important to keep inflation rates low, and that elected governments should not interfere with central banks as they try to accomplish this task.

How does the Federal Reserve accomplish this task of reducing inflation when necessary? By raising interest rates to reduce aggregate demand, and letting the Phillips Curve relationship then reduce the inflation rate.

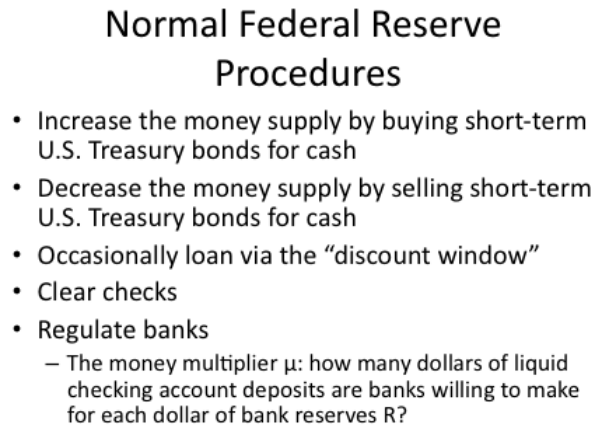
## *The Federal Reserve System*

The Board of Governors of the Federal Reserve consists of seven governors, all of them chosen by the president with the advice and consent of the senate to serve fourteen-year terms or to fill out the uncompleted portion of the term of a governor who has left the Board. One of the governors is chosen, once again by the president with the advice and consent of the senate, to serve a four-year term as Chair. A second is chosen to serve a four-year term as vice chair. These seven governors perform the Federal Reserve's tasks as a regulator of banks.




The seven governors also serve on the Federal Open Market Committee, which sets the level of interest rates in the economy. Also serving on the FOMC are the twelve presidents of the regional Federal Reserve banks, located in New York, Chicago, Cleveland, San Francisco, Minneapolis, Kansas City, St. Louis, Dallas, Atlanta, Richmond, Philadelphia, and Boston.

This institutional setup for the Federal Reserve has lasted, with minor changes, since the establishment of the Federal Reserve in 1913. It was intended to produce, and has produced, a relatively cautious, technocratic body largely insulated from partisan politics that moves by consensus. It was intended to produce, but has not produced, a body that focused on the concerns of farmer, workers, manufacturers, and business leaders in the heartland rather than just on monetary stability and the interests of banks and of financial centers.




The Federal Reserve was scarred by its failure to rapidly halt and cure the Great Depression of the 1930s. It was further scarred by the fact that its policy failures to maintain its credibility as the guardian of low inflation rates produced the more-than-10%/year inflation of the 1970s. It was

still further scarred by the fact that reducing inflation in the 1980s turned out to require interest rates so high that they produced a recession so deep that unemployment rose above 10%. And it is right now being even further scarred by the extended duration of the current Great Recession that began at the end of 2007. What shape Federal Reserve policy will take in the future is unclear—but it is highly likely to be very cautious, at least as it defines caution.

The normal tool that the Federal Reserve uses to manage aggregate demand is called the open-market operation. In an expansionary open-market operation, the Federal Reserve buys bonds for cash. Since there are then fewer bonds out there in the marketplace for investors to hold and investors have more cash that they would like to use to buy bonds, bond prices go up. Since the interest rate on a bond is its coupon payment—whatever the contract tells you the bond will pay out every six months—divided by its price, higher bond prices mean lower interest rates. And lower interest rates mean higher investment spending and higher aggregate demand.

Conversely, in a contractionary open-market operation, the Federal Reserve sells bonds for cash. Since there are then more bonds out there in the marketplace for investors to hold and investors have less cash that they would like to use to buy bonds, bond prices go down. Since the interest rate on a bond is its coupon payment—whatever the contract tells you the bond will pay out every six months—divided by its price, lower bond prices mean higher interest rates. And higher interest rates mean lower investment spending and lower aggregate demand.

The interest rates that the Federal Reserve directly controls through its open-market operations are the short-term nominal interest rates on government debt. But the interest rates that matter for aggregate demand are long-term real risky interest rates that businesses have to pay. The Federal Reserve could reduce long-term real risky interest rates not only by today's expansionary open-market operations but by:

1. Promising to continue to engage in expansionary open-market operations in the future and thus to keep short-term interest rates low "for an extended period"—now defined to last through 2014.

2. Promising to tolerate a higher inflation rate in the future than it normally would, and so reducing real interest rates for the same level of nominal interest rates.

3. Engaging in large scale "quantitative easing" purchases of risky assets for cash, and by thus reducing the amount of risky financial assets for the private sector to hold trying to lower the spread between the safe interest rate at which the government borrows and the risky interest rates at which companies borrow.

At times like the present, when the Federal Reserve has pushed its expansionary open-market operations so far that short-term safe nominal interest rates on government securities are at zero and cannot be pushed any lower, these other three modes of affecting aggregate demand take on increased importance. So far the Federal Reserve has only resorted to (1), and it has not resorted to (2) or (3).

## *Tolerating Inflation*

The cautious, technocratic, and politically-independent Federal Reserve is extremely unlikely, without a complete turnover in its personnel and a complete shift in the political climate, to tolerate an inflation rate of much more than 2%/year in the future, at least not in any future that we can right now foresee.

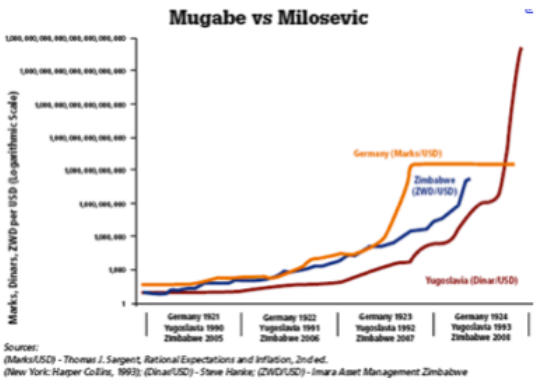
### Why Would Anybody Allow Inflation?

- If you want to stop inflation, simply stop letting the money stock increase
- But what if people expect inflation? Then not fulfilling those expectations will create high unemployment
- And what if you want to goose the economy? Richard Nixon
- And what if the government spends but cannot tax
  - It can borrow for a while
  - But then?

In the 1970s the Federal Reserve found itself faced with arguments that people expected more inflation than 2%/year—that people expected inflation at 4%, 6%, or 8%/year—that not validating those expectations would lead to high unemployment, and that a policy of accomodation and delay would avoid a deep recession and that sometime in the future an opportunity would open up to reduce inflation without a deep recession. The Federal Reserve believed those arguments for most of the 1970s, and was very unhappy with the results: the spike of inflation at the end of the 1970s, and the depth of the 1982 recession to reanchor inflation expectations.

But the Federal Reserve may not always stay politically independent. Economists wonder to what extent the acceleration of inflation in the early 1970s was due to Richard Nixon's appointment of his old friend and advisor Arthur Burns to chair the Federal Reserve, and Burns's belief that the reelection of Republican President Nixon was strongly in the country's interest.

### Hyperinflation




Other central banks have found themselves under obligation to politicians who want to spend but find themselves unable to tax to print up as much money as the politicians desire in order for them to carry out their desired spending programs. Such a strategy, if followed for long, results in what economists call "hyperinflation": prices that rise not just at the rate of 2% or 5% or even 10%/year, but prices that rise at 10% or more per day. If prices rise at 10% per day, they double in a week. In a month, such prices rise 16-fold. And by the end of a year the price level will be 7 quadrillion—that is 7,000,000,000,000,000—times as high as it originally was.

Such a hyperinflation sees a breakdown of the monetary economy: the abandonment of money for barter, bilateral credit, and for other monetary systems. Such a hyperinflation also sees a collapse of production to half or less of its normal potential-output value before the process comes to an end.

Such things happen: here is a 100 trillion dollar bill from Zimbabwe, printed in 2007.

$Z100,000,000,000,000

*Lecture 11*

# 11. Budget Economics
## *The Government's Resources, the Government's Promises, and the Economy*

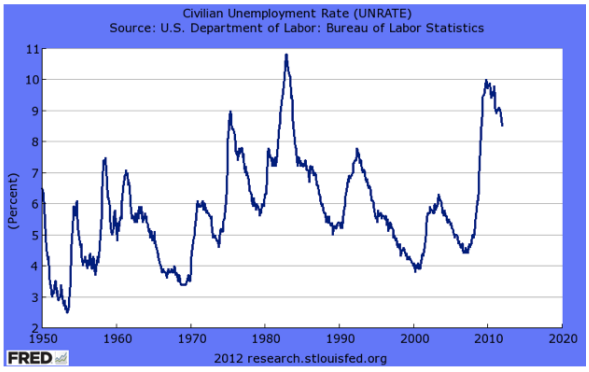
The government's deficit (or, rarely, budget surplus) affects the macroeconomy in three "runs". In the short run, a government deficit can serve as a valuable tool to rebalance the economy in a depression if interest rates are very very low and the Federal Reserve cannot cut interest rates further. In the medium run, a government surplus crowds in investment and boosts the rate of growth, and in the long run a government that does not or cannot pay its bills gets into a world of hurt.

## THE AMERICAN BUSINESS CYCLE AND THE BUDGET

**Unemployment**: Consider the unemployment rate in the United States since World War II. It goes up. It goes down. It varies between 2.8% and 10.8%. It does not go up and down as much as it did back before World War II. Unemployment picked at 23% in 1933 in the Great Depression. And if you focus on the nonfarm economy—which nowadays is virtually the entire economy—fluctuations in the nonfarm economy were larger before the Great Depression than they have been since World War II.

The unemployment can and does jump suddenly: by 4.8 percentage points in eight months at the start of this current unpleasantness.. We Keynesian and monetarist economists feel that such a large rapid unemployment rate rise is a very bad thing, and something government ought to do something about.

Unemployment




It is true that the government cannot do anything about hurricanes or earthquakes in advance. But the government can do something about sudden rapid rises in the unemployment rate. For when the unemployment rate rises suddenly and steeply, it is not because something bad has happened to our ability to use technology and effort to get things done. What has happened, instead, is that our complicated economic division of labor has partially fallen apart. This has nothing to

do with the natural world in which human society is embedded. It is, instead, a software glitch—a glitch in our collective social economic relationships.

A government that takes managing these social economic relationships to be one of its responsibilities ought to be able to do something about this—to largely if not completely shave off the peaks of the unemployment rate.

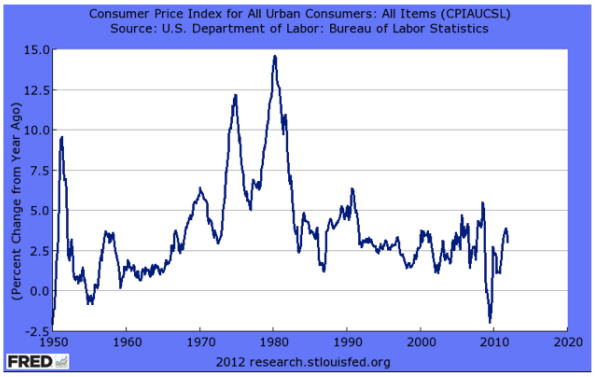
And, indeed, for 20 years starting in the mid-1980s we thought that we had gotten it right. Starting in the mid-1980s we had no large recessions for nearly a generation. The recession that peaked in 1992 was one of the smallest on record: the unemployment rate went up by only 2% rather than by 5%, 4% or 3%. And so economists began writing papers about the "great moderation" of the business cycle—about how the Federal Reserve had finally learned the tools to successfully manage the business cycle and keep it small.

Those of us who were economic historians bided our time. We noted that this was the third time in the twentieth century that economists had written papers about a "great moderation" and about how, guided by economists, the business cycle had finally been tamed and managed through proper government policy.

The third time came in the late 1980s. The second time had come in the 1960s, when then-Council of Economic Advisors Chair Walter Heller, from Madison, Wisconsin, chief economic advisor to President Lyndon Johnson, wrote his New Dimensions of Political Economy. He patiently explained how his school of Keynesian economists had finally gotten the problem of business-cycle management right. He was so convincing that in response to his book the Department of Commerce changed the name of its monthly Business Cycle Digest to BCD, and then announced that BCD stood for the Business Conditions Digest.

The first time came in the 1920s, when Yale economist Irving Fisher announced that the combination of Prohibition—the successful war on some drugs—and the creation of the Federal Reserve had put America into a state of semi-permanent boom, in which stock prices had reached and would remain on a permanently high plateau.

Inflation




Both of the previous declarations by economists of victory over the business cycle had been, to say the least, premature.

That was why we economic historians bided our time and kept our powder dry.

**Inflation**: High unemployment is not the only macroeconomic problem that the government needs to try to manage. There is also inflation: an overall general rise in the price level, in the average dollar prices of things.

In the post-World War II era, peak consumer price inflation rate of 14% came just at the end of Jimmy Carter's term. That meant that Ronald Reagan was able to take credit for the reduction of inflation—Reagan explicitly shared credit with the actual architect of the inflation-control policy, then- Federal Reserve Chair Paul Volcker.

We left-of-center economists say that unemployment is a much bigger problem than inflation. When the unemployment rate is 10%, then because the U.S. economy can perfectly well operate sustainably at an unemployment rate of 5%—which it can—more than 5% of the labor force who could have jobs do not have jobs, and more than 5% of the goods and services that we could be producing we are not producing. Those are large real economic losses: they make us, collectively, poorer.

Right now our excess output gap is running at $100 billion a month: that is $100 billion a month of nice things that we could have but do not have because we have failed to manage the business cycle. We all like to have nice things. We all deserve nice things. We all could have more nice things—if only we managed the business cycle to keep unemployment at its normal level.
By contrast, the costs of inflation are not so clear. On average wages and prices went up 14% in 1979. In 1980 everybody was spending 14% more in dollars on your average nice thing. But in 1980 the average wage was 14% higher than it would have been had inflation in 1979 been zero.

Now understand: average. Some people's incomes went up by more than 14%, some people's went up by less, the market baskets of commodities that some people bought went up by more than 14% in price, the market baskets of commodities that other people bought went up by less. If your wage goes up by more than 14% and the price of a market basket of things you buy goes up by less, you win from inflation. If your wage goes up by less than 14% and the price of a market basket of things you buy goes up by more, you lose from inflation. Inflation is a redistribution thing. In general, creditors and rentiers and pensioners and people on fixed incomes lose from inflation, while manufacturers and debtors gain.

When calculating the cost of inflation, you have to recognize that the gains to winners from the process offset the losses of the losers. They cancel each other out. When calculating the cost of unemployment, it is all loss: there are no winners, no offsets, there are just people without jobs and useful commodities not produced. With inflation, explicit losers are matched to winners.
The biggest net cost of inflation is a second-order effect. Uncertainty that causes worry is a bad thing. And that is a much smaller cost. The convention—started by Democratic Party economist Arthur Okun in the 1970s because it was politically convenient at the time—of adding together inflation and unemployment in a "misery index" as if an extra percentage point of each was equally bad is seriousy misleading.

This leftie tradition to worry more about unemployment than inflation goes back quite a long time, all the way back to 1924 and to John Maynard Keynes's Tract on Monetary Reform:

> We see, therefore, that rising prices [inflation] and falling prices [deflation] each have their characteristic disadvantage. The Inflation which causes the former means Injustice to individuals and to classes--particularly to investors; and is therefore unfavorable to saving. The Deflation which causes falling prices means Impoverishment to labor and to enterprise by leading entrepreneurs to restrict production, in their endeavor to avoid loss to themselves; and is therefore disastrous to employment.... Thus Inflation is unjust and Deflation is inexpedient. Of the two, perhaps Deflation is, if we rule out exaggerated inflations such as that of Germany [in 1923-1924], the worse; because it is worse, in an impoverished world, to provoke unemployment than to disappoint the rentier. But it is not necessary that we should weight one evil against the other. It is easier to agree that both are evils to be shunned…

Inflation and unemployment—what Keynes termed then "deflation"—were, he said, both bad things. Inflation meant injustice to individuals and to classes, particularly to investors who get it in the neck when they got their money paid back in depreciated dollar worth less. Deflation and unemployment meant impoverishment to labor and to enterprise. Keynes's view is that deflation is the worst because the world is still poor and it is worse to provoke unemployment than to disappoint the rentier—think of Paris Hilton, or the Walton heirs, somebody who is living off of some previous act of enterprise but themselves doing nothing useful. But even Keynes said that it was easy to agree that both are evils to be shunned.

It has been the job of the government ever since FDR took it on himself one day in March 1933 to try to managed the economy to try to shun these two evils. The technocratic task of shunning them is difficult, for policies to reduce unemployment may trigger inflation, and policies to reduce inflation are highly likely to trigger unemployment.

The political calculus of inflation and unemployment is different from the leftie economic calculus. Inflation is a thing that annoys people. They are annoyed by the pointless redistributions of wealth. They attribute their increasing wages measured in dollars to their desert and the increasing prices they must pay to the government's inept mismanagement. They worry about the uncertainty caused. Inflation is not something that in and of itself directly destroys wealth. However, it does destroy the careers of politicians.

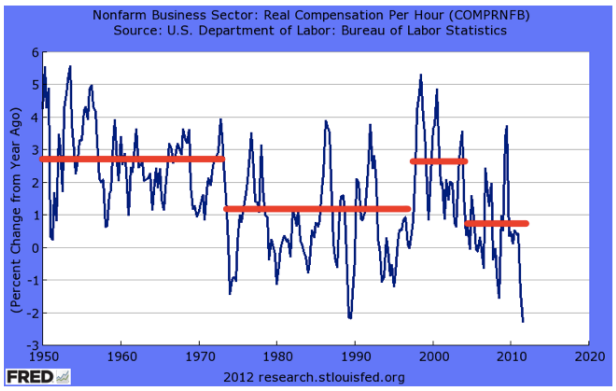
Thus in our political system both the presidential and congressional pieces worry equally about inflation and unemployment. And for complex reasons I do not understand the Federal Reserve worries 90% about inflation and only 10% about unemployment.

**Growth**: Controlling inflation and unemployment are not the only goals of government macroeconomic policy. There is also spurring and sustaining economic growth: managing the economy so that we grow richer over time.

We would like to have a more rapid rate of economic growth, to the extent that it can be accomplished without imposing too-great sacrifices on the current generation.
When we economists look at the general trend of post-World War II growth, we divide the period into four eras.

First comes the great golden age of the social-democratic mixed economy, lasting until 1973 or so. During this era the average rate of real wage and salaries per hour in the United States—including benefits—grows at a rae of 2.8% per year. That means that inflation-adjusted real incomes double every generation: each generation lives, in a material well-being sense, twice as well as its predecessor.

Growth




econd, in the mid 1970s the economy's growth rate falls off a cliff. The rate of growth of GDP per hour worked drops to 1.2% per year. This is called the productivity slowdown. It has produced an enormous literature about why it happened. People line up along the political spectrum in the usual way: blaming the fecklessness of the poor and the breakdown of traditional morality on one hand, blaming over-aggressive bosses who aren't interested in building up the capital of their workers and nasty private equity firms that want to screw down real wages even at the expense of productivity on the other. After 40 years there is still no accepted consensus. Everyone's favorite theory has effects about one fifth the size of what it ought to be in order to do the job. The productivity slowdown remains a mystery. Maybe five theories are each 20% correct, and maybe we are missing something big: we do not know.

This slowdown in the rate of economic growth was very troubling. Truth to tell, the rich barely noticed—the incomes of those at the top of the income distribution continued to grow at their pre-1975 pace, or even faster. The coming of the productivity slowdown was also the start of rising income and wealth inequality.

But, third, those of us who looked at the aggregate income statistics all breathed a sigh of relief in the late 1990s when the productivity slowdown appeared to go away. We attributed the speedup of economic growth to two causes, one major and one minor. The major cause was the rise of Silicon Valley: the coming of the information technology computer and communications booms that gave Americans something of extraordinarily high value to invest in. The minor cause was the restoration of fiscal sanity by President Clinton and the Democratic Congressional Caucus: no longer was the U.S. government running huge deficits that served as a drag on capital accumulation and growth. Productivity growth seemed back to normal, And we congratulated ourselves. And we looked forward to a bright future.

That lasted for about eight years. Then comes period four. Over the past seven years we have had to change our minds, and say that the productivity slowdown is back.

Now the productivity slowdown may, in truth, not be back. Our estimates of the pace of economic growth may be way off.

For example: back 1987 the Encyclopedia Britannica Corporation asked me to write an article, offering to pay either $2000 or an Encyclopedia Britannica. I took the encyclopedia, and thought myself well-compensated.

We gave it away to the library when we moved last year. Wikipedia is better.

Does that mean that everyone in the United States now has the equivalent of $2000 more of wealth because they have access for pennies to something I was willing to pay $2000 for? No. I am a high-value demander of encyclopedias. Nevertheless, previous generations would have been willing to pay—their rich did pay—fortunes for things we get essentially for free, whether it is access to Wikipedia or the ability to watch Hamlet in our living rooms whenever we please. You can argue that that is a big deal, that—properly measured, counting the things we get for free, there has been no productivity slowdown. That is an open research topic.

## THE THREE RUNS OF BUDGET POLICY

We have inflation. We have unemployment. We have growth. We have a government that accepted in 1933 the job of trying to manage all three. How does it try to do so? How should it try to do so?

I am now going to do a standard economist thing. I am going to say that these questiosn have not one but rather three sets of answers, that the three answers are different, and what the answer is depends on the "run" over which we are looking. I am going to say that there is a short run, a medium run, and a long run. I am going to say that which run it is appropriate to think about depends on the urgency of the problems faced and the time scales over which action is contemplated.

**Short Run**: First we are going to consider the short run. The short run is a period of time in which the productive capabilities of the economy do not change significantly, and in which prices in the economy do not completely adjust to clear markets and maintain full employment. thus the big deal in the short run is for the government to manipulate the economy to try to boost or curb demand in order to match demand—total economy-wide spending—to the supply that is the economy's productive potential. If total spending exceeds potential output, you get accelerating inflation. If total spending falls short of potential output, you get high unemployment and lost production.

**Medium Run**: Then there is the medium run. In the medium run we assume that prices adjust so that we don't have to worry about any gap between aggregate demand—total spending—and aggregate supply—productive potential. then the principal task in the medium run is not to match demand to potential so you get close to full employment: the market system has already done that for you. The principal tasks in the medium run are (i) to keep inflation low (both because it is unjust and because it makes voters very unhappy with your incumbent political masters) and (ii) to do whatever you can to make economic growth high.

**Long Run**: Third and last, there is the long run. In the long run you are no longer focused on inflation or growth or unemployment, but instead on the big political questions of the financing of the social insurance state. How big is it going to be? Who is going to pay for it? How is it going to work. This is a question that must be solved. For the long run comes when the people who ordinarily lend money to the government to cover a gap between taxes and spending decide that they are not interested in lending money to a country that does not have a credible plan for financing its social insurance state. And if a country has not balanced its long-run budget when the long-run arrives, then the market balances its budget for it—and does so in a way that nobody in the country likes. Think Argentina. Think Greece..

Argentina is the most extreme example of a country that has never been managed to get its public finances in order in the long run. This means Argentina has gone from being twice as rich as Sweden in 1900 to about a quarter as rich as Sweden today. This means, among other things, that Buenos Aires, which was seventh in the world in telephone density per capita on the eve of WWI, is the most beautiful Belle Epoque city in the world today—definitely worth going to visit, especially if you like to eat lots and lots of meat. But it does mean that something like seven-eighths of the prosperity that an economy located in temperate-zone America typically achieves has been stolen. And has been stolen largely because of failures of long run budgeting. So: be scared of in the long run.

**Understanding the Runs**: What is the time frame appropriate for each run? How do we stitch the conclusions reached by analyzing different runs together?

Those are very good questions.

Economists do not have very good answers to them.

The time frame appropriate for the short run seems to vary between one year and 20 years, depending. The time appropriate for the long run seems to vary between three years and 50 years, depending.

Right now in Greece the long run has arrived.

In Argentina in 2001 the long run arrived in 72 hours, even though only three months before the IMF had been writing learned treatises about how the fundamentals of the Argentinean economy were indeed sound. And then the long run woke up and came walking in, and the Argentinean economy collapsed.

Because we do not have good answers, arguing about runs with a professional economist is a lot like playing the game of Calvinball—the exciting game without any rules that can never be played the same way twice.

Usually the professional economists in the room will agree on what the rules are, and about when its is time to shift from a long to a short to a medium run analysis. But not always.

And I have not found any way to explain to outsiders how we reach the decisions about runs that we economists do—at least not without turning them into full-fledged economists themselves.

## The Budget in the Short Run: Fiscal and Monetary Policy

Now let us focus on the short run. The short run is the run in which sticky prices can keep demand below supply, and in which the government should shoulder its Rooseveltian responsibility of matching total spending to productive potential. The short run is the run in which the government undertakes the task of making Say's Law—that supply creates its own demand, that for every producer and seller there will be a buyer—true, or true enough, in practice even though it is false in theory.

**Keynesian Doctrine**: John Maynard Keynes wrote open letters and private letters to Franklin Delano Roosevelt in the 1930s telling Roosevelt what he, Keynes, thought that the government ought to do. The government, Keynes wrote, should use its spending programs as a balance wheel to keep the economy in a stable semi-boom. The government should have a long list of potentially useful infrastructure and social betterment projects. Whenever unemployment got too high, the government should pull one of these out of its back pocket and set people to work doing it. Conversely, whenever the economy was booming and rising inflation threatened the government should step back and greatly restrict its expenditure on infrastructure and social betterment.

**The Successful War on Keynes**: From 1940 to 1990, Milton Freedman and his Chicago School acolytes waged a 50-year war against Keynes.

They won a complete and total intellectual victory. At least, we neoclassical and neoliberal economists think they won a complete and total intellectual victory. At least,we surrendered to them.

It was not that Friedman thought that the laissez faire economy left to its own or on some automatic gold standard would avoid the business cycle. Friedman feared the business cycle. Friedman feared instability arising from a laissez-faire unregulated monetary system. Friedman feared the gold standard.

Where Friedman differed from Keynes was that, where Keynes thought the government would need to spend directly as its strategic intervention to keep aggregate demand high enough to maintain an acceptable level of employment, Friedman thought that the government's strategic interventions did not have to be so large, and could be smaller and more indirect. Friedman thought that all that needed to happen to curb the business cycle was for the Federal Reserve to keep the economy-wide stock of money growing at a stable, constant rate. If it did so, Friedman predicted, private spending would grow at a stable, constant rate as well. And business cycles would be small.

Friedman's dispute with Keynes was that where Keynes thought that fiscal policy was needed for successful stabilization policy, Friedman believed that monetary policy alone could do the job—and should do the job, as monetary policy was more insulated from destructive rent-seeking politics.

Over in Barrows here at Berkeley we have a sociologist, Marion Fourcade-Gourinchas, who studies economists. She regards us as experimental animals: capable of interesting behavior, and worth studying, but not creatures to whom one should ascribe any substantial degree of rationality, or even agency. From her perspective, we economists are not sentient beings thinking intellectual issues through in a logical fashion. From her perspective, we economists are really the bearers and puppets of sociological forces we do not understand. She will talk about how Friedman's victory was not an intellectual one but rather the result of (i) widening income inequality, (ii) the funding patterns of think tanks and of higher education, (iii) the rise of business schools, and (iv) by the desire of professors to teach students who at least aspire to join the upper class what they want to hear..

Whether you think Friedman had evidence or merely sociological forces on his side, by 1995 it was difficult to find an article in the American Economic Review or the Journal of Political Economy or the Quarterly Journal of Economics saying that Milton Freedman was broadly wrong—that fiscal policy had any significant role to play in stabilizing aggregate demand. Indeed, I commissioned what I still think of as the best such article from John Taylor for the Journal of Economic Perspectives. And I wrote one such article myself for the Journal of Economic Perspectives.

**Friedman's Argument Explained**: Friedman's argument started with the quantity theory of money.

We say that total spending, the level of production Y times the average prices at which things are sold P, is equal to the amount of money in the economy M times the velocity of money V:

(1) $P Y = M V$

The Federal Reserve controls the money supply M. To expand the money supply, the Federal Reserve buy bonds and prints cash to pay for them and so boosts M. To shrink the money supply, the Federal Reserve sells bonds for cash and squirrels the cash away. In normal times, people want to spend the money in their pockets and bank accounts at a fairly constant rate—the variable V in equation (1) does not vary very much.

So if you want to boost P Y, have the Federal Reserve buy bonds and print cash to pay for them and so boost M, so production and employment will jump up and inflation will accelerate. And if you want to shrink P Y, have the Federal Reserve sell some of its bonds and so take cash out of the economy, and production, spending, and inflation will fall and the unemployment rate will rise.

Moreover, Friedman said, suppose that the government does something to disturb this relationship—takes steps that have the effect of in some way altering V. Then the Federal Reserve can

counteract those steps. If the rest of the government has raised V, the Federal Reserve can lower M to offset it.

Indeed, back when I was working for the U.S. Treasury there were substantial worries within the administration about Clinton's plans to try to reduce the deficit. Wouldn't the cut in government spending raise unemployment? And Alan Greenspan, then at the head of the Federal Reserve, promised that he would not let that happen. Greenspan was an advocate of balancing the budget. And if adopting the right fiscal policy threatened to raise unemployment, Greenspan all but promised, he would raise the money stock to make sure that any such effect was neutralized. And, in 1993-1995, he did so.

So as of 1995 there was a rough consensus that the budgeting decisions of the federal government should be made on what we economists call classical principles, benefit-cost principles. Does this expenditure make sense? Is this tax worth raising? The Federal Reserve could and would undo and neutralize whatever effect the federal government's spending and taxing decisions had on the total level of spending.

This rough consensus held that the government's budgetary decisions in normal times should take no account of any influence of spending and taxing decisions on the overall level of economic activity, inflation, and unemployment. Those issues should be left to the technocrats of the Federal Reserve.

**Why Friedman's Argument Does Not Apply Right Now**: But right now we have a problem: these times aren't normal, are they?

Normally, holding your wealth in money rather than in bonds is expensive: you are losing interest. Bonds pay interest. Money does not. This fact that money doesn't pay interest and bonds do is what pins down the velocity of money V in the economy. If you hold money you are either going to try to spend it on goods and services or find a business issuing a new bond because it wants to spend money adding to its capital stock. Either way, the transmission belt from the money stock to the spending level is working.

But what if, in the aftermath of a financial crisis, the short-term interest rate on bonds goes to 0? What if it is no longer the case that money pays no interest and bonds do? Well, then you would rather hold money than bonds: money is safer, because your bonds will lose value if interest rates go up.

In the aftermath of a financial crisis, boosting the economy's money supply no longer reliably induces people to ramp up their spending. The transmission belt slips, if it does not snap altogether, and the Federal Reserve loses its ability to use its standard monetary policy tools of altering the money stock to govern the economy-wide level of spending.

What should you do then?

## *The Housing Bubble and the Lesser Depression*

The Housing Bubble and the Financial Crisis: Some economists, of whom the most prominent is Stanford's John Taylor, claim that in the mid-2000s all was fine in the Garden of Eden of deregulated finance–until the serpent of the Federal Reserve brought the apple in the form of extraordinarily low interest rates in 2003.

I have never been able to make sense of Taylor's argument.

Taylor says the Federal Reserve kept interest rates two percentage points to low for three years. If you are buying a long-duration asset like housing, such an interest rate break leaves you willing to pay 6% more than you would otherwise have been willing to pay. Are we really supposed to build a 50% nationwide housing bubble on top of the 6% impetus? Only a market already fully infected with the bubble disease could see such a small impetus have such a large impact.

The primary blame seems to me to lie with the deregulatory gasoline and gunpowder poured onto the floor, rather than with the match and the spark. In such a market anything could have set off the bubble and the crisis. And to argue that it was the Federal Reserve rather than China or the collapse of risk standards in mortgage lending seems to me to make a foundationless political argument, rather than an economic argument: to make claims that you have no evidence are true, but that it would be politically convenient if they were true.

That, at least, is my view of how the financial crisis that led to the collapse of interest rates and the collapse of monetary velocity came about.

**The Financial Crisis and Interest Rates at the Zero Nominal Lower Bound**: The reason that in normal time the Federal Reserve can rely on the fact that people want to spend the money on their pockets, and so can rely on increases in the money supply to increase the flow of spending, is that in normal times it is costly to keep your money in your pockets without spending it. Back in 1979, when I went to college and when the inflation rate was then 12%, you lost 1% of the purchasing power of the cash in your pocket for every month that you kept it there.

That cost is not enough to be decisive in any one person's decisions. But as a marginal factor that affects the decisions of large numbers of people—150 million workers in the U.S. economy—it has an impact. At the aggregate level in normal times you get a nice relationship between how fast people are spending the money in their pockets and what the interest rate is. The law of large numbers tells.

But what if, in the aftermath of a financial crisis like right now, the short term interest rates on bond goes to zero? What happens when everyone is petrified of investing in equities or mortgages or anything else—because God knows what might happen—people become so scared of any kind of risk that they drive the price of safe government bonds so high that the interest rate on them is zero?

It is easy to understand why people might develop such an appetite for safe Treasury bonds. Consider MF Global, a Wall Street firm run by former head of Goldman Sachs, former governor of New jersey, former senator from New Jersey John Corzine that stole $1.5 billion from its custom-

ers to place a double-or-nothing bet on its gamble for resurrection to avoid bankruptcy. It lost. Everybody knows where the money went. But the people who have the stolen money do not want to give it back and have the law on their side. MF Global is bankrupt so that there is nothing to sue. And it turns out that MF Global's principals and employees will in all likelihood escape criminal penalties by blaming it on accounting systems that allowed individuals to remain ignorant of what was going on as the firm stole the customers' money.

The Federal Reserve Loses Traction: When the interest rate on safe government bonds is zero, you do not care whether you have $20 or $50 or $100 or $250 in cash in your pocket. And so the Federal Reserve loses its ability to control the flow of spending .

We have been in this situation three times since the Starmaker began Her work: at the nadir of the Great Depression, in Japan in the aftermath of the collapse of its property bubble at the start of the 1990s. And today..

So our times aren't normal.

And when the times aren't normal the normal rules do not apply.

How do you boost demand to match supply when the Federal Reserve's normal transmission belt slips or snaps? One thing you can do is have the Federal Reserve try all kinds of weirdo experiments in the hope that some of them will have traction—"quantitative easing" and other forms of "non-standard monetary policy".

Another thing you can do is eliminate the middleman. Normally the Federal Reserve boosts the money supply and so induces people to spend more. But the government can simply spend more—and in generating demand for commodities produced by business so that business firms will then hire the unemployed and put them to work, the government's money is as good as anybody else's.

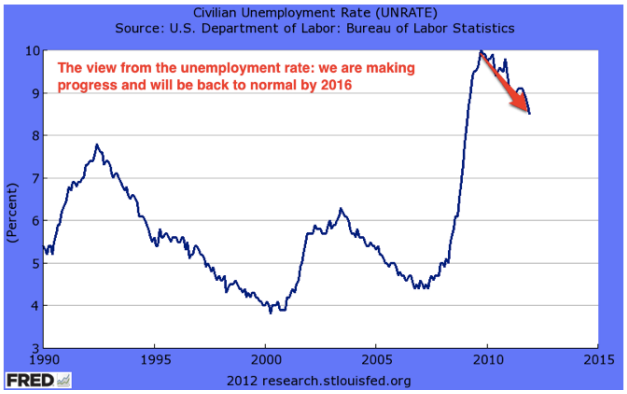
## *The Utility of Fiscal Policy in a Depressed Economy*

This is the situation I think we are in now.

And, in the unusual and exceptional situation that we are in right now, the Federal Government's budget deficit is an extraordinarily useful and appropriate stabilization policy too for boosting aggregate demand and so eliminating excess cyccliical unemployment.

As long as the unemployment rate is substantially elevated above its normal levels,

The Short Run: How Long Will It Last?



the government should spend more and tax less—although the "tax less" link is not as strong as the "spend more" link in boosting production and reducing unemployment. The "tax less" link works by making people feel richer and make them spend more. But that link is not nearly as certain as government spends more link.

That is what to be done in the short run.

How long is this short run going to last?

If you take the view from the unemployment rate, the unemployment rate hit 10% in late 2009. Since then, for two years, the unemployment rate has been coming down. It has been falling at a rate of about three quarters of a percent per year.

If the current pace continues—and there is no big reason why it should not, but then there is no big reason why it should—then the view from the unemployment rate is that we are making definite progress in fixing our current Lesser Depression. We will be back to the normal range of the unemployment rate by 2016.

At that point the short run will end. We should then turn our attention to our medium-run and long-run problems, at least until the next short-run problem comes along.

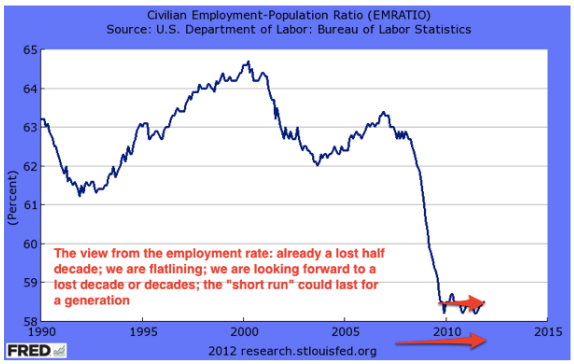
## *The Transformation of Cyclical into Structural Unemployment*

But if you take a look not at the unemployment rate but at the employment rate, right things look very different.

The employment rate, the share of American adults who have jobs, fell to a level in 2009 that it had not seen since before the days of modern feminism. Since 2009 it has flatlined.

If you focus on the employment rate, the short run is not coming to an end. It could last for decades—as it has lasted for decades in Japan.

The Short Run: How Long Will It Last?




There is a very depressing potential reconciliation of the conflicting unemployment and employment views. The reconciliation is that what is happening is what happened to a bunch of Western Europe in the 1980s: we are seeing the transformation of short-run cyclical into long-run structural unemployment.

If back at late 2009 we had had a much more aggressive and much simulative short-run fiscal policy, we could have quickly taken our 5% excess unemployed and put them back to work. They

had only recently lost their jobs. They still were connected to the labor force. They still thought that they would, kind of they had a future in employment.

But by now a quarter of those who were cyclically unemployed at the end of 2009 have dropped out of the labor force. We do not know when they are going to come back or if they are going to come back or what would pull them back into the labor force.

Odds based on the experience of Europe in the 1980s are that something like two thirds of these people will never come back into sustained stable employment. In that case we will no longer be able to get the unemployment rate down below 5% before inflation starts to accelerate, but only 6% or, if a strong recovery is further delayed, perhaps 7%.

Perhaps half a percentage point of what has happened to labor force participation since 2007 may be a continuation of demographic trends leading to lower long-term labor force participation. But we would have expected that to have been offset by an increase in labor force participation coming from the collapse of the wealth of those near retirement as their home equity and 401(k)s declined.

Thus the fear is that by 2016 we will be in a situation in which we have a huge structural unemployment problem of the ex-employed—who will then be clinically depressed, with atrophied skills, having lost their potential attachments to people who might help them find jobs. Inaction at fixing the Lesser Depression will have turned the United States into one gigantic Fresno. And what will we have done to Fresno by then?

If that happens, then 2016 will be a disaster. But 2016 will be a disaster that using budget deficits to goose the economy and boost aggregate demand cannot help, for the big problems then will not be on the demand but rather on the supply side.

Thus if that happens, then in 2016 it will still be time to turn our attention away from short-run stabilization policy as far as the government is concerned to the medium run. And to deal with our then-structural unemployment problem it will then be time to resort to other tools—tools that are the property of labor economists, sociologist and psychologists to try to figure out how to get labor force participation and employment back to where we really would like it to be.

Even though you are not allowed to say this at the University of Chicago, it is not the case that the four and a half percent of the adult population who had jobs back in 2007 and do not have jobs now are having a wild party and enjoying their leisure as they mooch off of the government. And it is not the case that they made a rational decision to substitute leisure for labor, and even though they have lower market incomes they are actually on a higher utility surface now than they were back in 2007.

Instead, our cyclically unemployed right now are mostly living in their sister in-law's basement, fighting with their spouse because there is no money. They really do not like living in their sister in-law's basement at all.

One calculation I have been doing suggests that each month our Lesser Depression continues with the strong recovery delayed costs us $100 billion in jobs not performed and commodities not produced, and costs us $267 billion in the present value of lower future production because of the transformation of cyclical into structural unemployment.

## THE BUDGET IN THE MEDIUM RUN

Now let us leave our depressing world of today and go to a much more pleasant future fantasy world: Hillary Rodham Clinton's first term, Mitt Romney's second term, Ron Paul's third term, whatever. Let us think of a future in which we are no longer worrying about having to take the federal government's budget and use it to try to boost spending in the economy to match spending to the economy's productive potential and thus eliminate cyclical unemployment. Let us look forward to a future when we can turn responsibility for curbing the business cycle to the Federal Reserve.

**The Logic of Crowding-Out in a Full-Employment Economy**: In that world we can and should worry, instead, about the medium -un consequences of running a federal deficit.

Here I have would like to put two more equations up on the screen. The first equation says that our short-run problems are solved: that the Federal Reserve System has recovered its traction and has successfully set the economy's level of aggregate demand Y to the economy's supply-side level of sustainable potential output Y*:

(2) $Y = Y^*$

The second equation is the national-income identity: the statement that production is either consumed by households C, invested by businesses boosting their capacity I, or purchased by the government G (and there are net exports NX, which I am going to ignore).

(3) $Y = C(Y-T) + I + G$

This medium run equation tells us is that if we boost government spending G, we should also take steps to reduce consumption spending by raising taxes T. We should accompany our policy to boost government purchases by making consumers feel poorer and so inducing them to spend less on household consumption C. Why? Because in the medium run the level of output Y is set at the economy's productive potential Y*. And in the medium run if we boost G but do not reduce C then the arithmetic necessity of the case requires that business investment I decline.

**Consequences for Growth of Crowding Out**: If business investment I declines, economic growth slows: businesses are no longer building factories and adding machines.

We do not want economic growth to decline further—over the past decade we have not had as much economic growth as we would like, we have no economic growth to spare.

With the rise in income inequality, it looks as though our trend rate of real wage growth right now is only 0.7% per year—including benefits, which means that takehome real wage growth is zero because healthcare eats up all of that increase. You really don't want to be putting downward pressure on the economic growth rate right now.

And this was why people like Paul Krugman and me were yelping and screeching in 2004 and 2005 and 2006 about the fact that the Bush administration was running budget deficits.

Right now we are yelling because we think Obama is not running large enough budget deficits. Where is the consistency? What is the rationale? Are we just playing for Team Democrat? No.

We would say that there are short-runs and medium-runs. If you are in the medium-run—if you have no more-urgent short-run problems—you want your government to be running a surplus to crowd-in investment and speed economic growth. If you are in the short-run—if your big problem is cyclical unemployment, idle factories, depressed demand—you want to be running a deficit to help put America back to work and put off dealing with the medium run until you have solved your more urgent short-run problems. Back in 2004-2007 we had no big short-run problems—our biggest problem was the medium-run problem of the structural deficit. Since 2008 our biggest problem has been the short-run problem of the Lesser Depression.

There is no inconsistency between what we were saying back then and what we are saying now. We are not political hacks. We are simply able to distinguish between situations in which it is short-run problems that need to claim our attention and those in which it is medium-run problems that need to do so.

**The Politics of Medium-Run Budget Balance**: There is a big problem with the medium-run advice that we economic advisors give politicians.

The problem is how this advice translates into politician-speak.

The economist says that program X would be wonderful—the Medicare drug benefit, Medicare Part D; tax cuts for the rich; the Affordable Care Act, Larry Summers's infrastructure bank, etc. The programs sound wonderful. In Lyndon Johnson's day it was our need to fight the Vietnam War to save South Vietnam from the global communist conspiracy. (Consider how much happier the people of Vietnam would have been from 1975-2000 if their government had been like the government of Thailand or Malaysia or the Philippines or Taiwan.)

Then comes the economist, who says: that program is fine, but we also want to maintain the rate of economic growth, so you have to accompany your program with other policies that curb consumption. You have to do something to make Americans feel poor so they stop buying as many things for their households.

If there is one thing that an incumbent office-holder does not want to hear, it is an advisor telling him or her that they need to take steps to make Americans feel poor just as the reelection campaign gears up.

So we economists give our medium-run advice. And politicians—not all politicians: Bill Clinton was a notable exception, and Barack Obama would be an exception if he could find a Republican willing to negotiate with him—say "that's very interesting", and they go off and find other economic advisors who will give them other and very different non-technocratic advice.

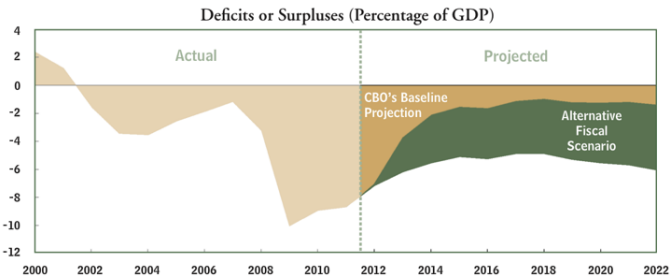
And sometimes the economists short-circuit the process, and censor themselves. I have not heard stories that any of George W. Bush's Chairs of his Council of Economic Advisors—neither Glenn Hubbard nor Greg Mankiw nor Ed Lazear—made themselves annoying to the president by pushing for technocratic fiscal policies in the same way that Austan Goolsbee, Christina Romer, Janet Yellen, Laura Tyson, and company made themselves annoying to Clinton and Obama.

This is a perennial problem of American government.

**PAYGO**: This is why whenever Congress has a temporary 96-hour fit of sanity it will do things like try to impose PAYGO provisions on itself, to restrict the ability of future congresses to enact popular programs without having to fund them and so neutralize their effect on medium-run investment and thus on economic growth. The fit soon passes, however, and then Congress turns all its attention to figuring out how it can circumvent the PAYGO rules it has just imposed on itself.

I would note that from a budgeting perspective these attempts of Congress to bind itself to medium-run technocratic rationality place enormous pressure on agencies like the Congressional Budget Office that are responsible for keeping score. I remember back in 1993 people were telling me this was putting much too much pressure on the CBO as an institution: that it could not possibly survive as a provider of relatively impartial and technocratic information. Well, it's 19 years later. Doug Elmendorf is hanging in there as head of the CBO. He is tough. I know if I were him I would get up in the morning, stumble downstairs in my bathrobe to get my coffee—and then turn around and go back to bed rather than going to the office. He soldiers on.

The Medium Run: Baseline and Alternative Fiscal Scenario Deficits




**Medium-Run Deficit Projections**: Here, fresh off the presses we have the CBO's brand-new Budget and Economic Outlook, with its two projections. which has two things, two projections.

The first is the CBO's baseline projection—what happens if congress obeys PAYGO restrictions: if every time there is a 40 point of order in the senate about a violation of the Budget Enforce-

ment Act as amended and as reintroduced and so forth, 42 senators stand up and say: "nope, we are not going to do this".

The Congressional Budget Office's current-law "baseline" scenario forecasts what will happen if current laws are unchanged—or, rather, if PAYGO survives and if Congress raises taxes to cover additional spending and cuts spending to cover additional tax cuts. The CBO's legislative mandate is to tell congress what spending and taxes are likely to be in the future if no laws are passed to change entitlement and mandatory spending, and if discretionary appropriated spending evolves according to simple and clearly laid down rules. But the CBO is uncomfortable with that because it believes that certain changes in the law are so likely to pass that they should be included in the baseline. So what the CBO has done starting under Reischauer, continuing under O'Neill, under what's his name [Crippen], under Holtz-Eakin, under Orszag, and now under Elmendorf—with associated Acting Directors in between—has been to start pushing forward this thing they call the "Alternative Fiscal Scenario", the ALS. The AFS is the CBO director's view of what Congress is actually likely to do without much of a fight. The Alternative Fiscal Scenario forecasts what will happen if future congresses make the same carve-outs to PAYGO as past congresses have.

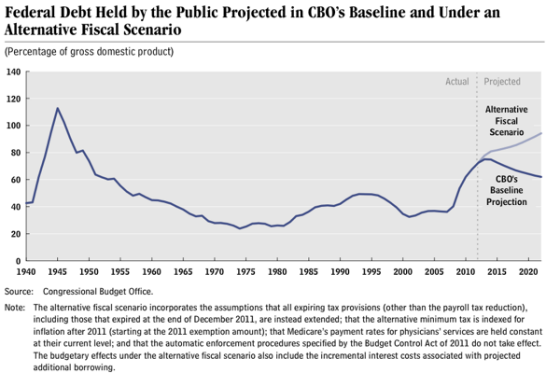
The baseline projection scares me a little. I would like to see continued fiscal stimulus out to the 2016 that I think the short run is going to last. Suddenly cutting the budget deficit back by this much this quickly seems to me a bad idea from the short-run perspective. But the baseline projection is almost surely not going to happen, because it assumes that the Alternative Minimum Tax is not going to be "patched" and the Medicare SGR is going to be imposed.. And we all know that Boxer and Feinstein and Gillibrand and Schumer would give everything valuable they have to their colleagues to get the AMT patched.

There is the hope that over the decades PAYGO will commit congress to budgetary responsibility: be an implementation of what Milton Freedman called for in 1947 in his Program for Fiscal — Congress should be flatly prohibited from considering anything that didn't have its own endogenous revenue component attached. But there are ways to game the system. One way is to make every program or every tax preference "temporary" so that it is, right now, cheap to pay for.As Adam Smith liked to say when people told him that if such a policy was enacted Great Britain would be ruined, "there is a lot of ruin in a nation".Nevertheless, after 2016, when we hope to be in a medium run world, having the three or four percent of everything produced kind of diverted away from productive investment to funding the governments is not a great thing to do. Economic growth is going to take a hit—maybe a third of a percent per year, maybe a half, that we would rather avoid. And if you believe not in the CLB but in the AFS the hit is bigger: a full percent of GDP off of the economic growth rate in the late 2010s after we have recovered from the current Lesser Depression and are back to full employment.

And then at some point the members of congress realize that making programs and preferences temporary so that they are always about to expire is a marvelous fundraising tool to raise money-from people who benefit from those programs. The Medicare SGR for the doctors, the AMT patch for the upper middle classes of California and New York, the R&E tax credit for Silicon Valley.

The ability of the US government to actually do its medium-run job of balancing the medium-run budget is breaking down. On the other hand, it has been breaking down since before John Ellwood first went to Washington back in the early 1970s. The permanent fiscal crisis of the U.S. government is out there someplace. But it is not here. And it is not now.

Baseline and Alternative Fiscal Scenario Debts Held by the Public




Yet.

The CLB scenario shows the U.S. debt-to-GDP ratio falling somewhat over the next decade. The AFS shows the U.S. debt-to-GDP rising over the next decade. The latter would be unwelcome (if we do recover from the Lesser Depression over the next several years) as it implies lots of crowding out and slow growth in the late 2010s. The AFS is a scenario in which we fail to accomplish our medium-run mission.

And while that would be a shame, a failure to solve our budget deficit problems over the next decade would not be a catastrophe. At least, the bond market does not think it would be a catastrophe: the bond market, even knowing all that it knows about U.S. politics, is very happy to lend the U.S. government money right now at very low interest rates. We could do it, and do it without major but only minor damage to the prospects for U.S. economic growth.

So far.

## THE BUDGET IN THE LONG RUN

Now let us shift from the medium run, in which it is nice to have a balanced budget so as not to crowd out investment and slow economic growth, to the long run.

In the long run the bond market will no longer happy lending money to a government that has no coherent plan to pay it back.

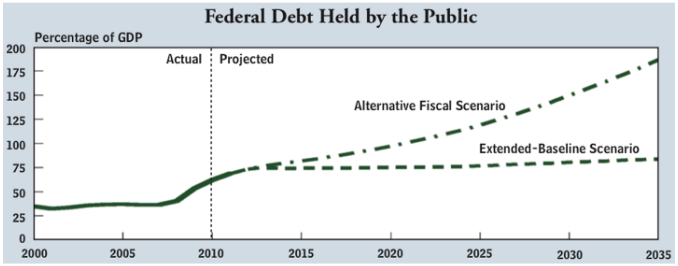
Suppose you lend money to General Electric. You can drive around the country and see that there are General Electric factories. You can drive to Long Beach and you can see containers being landed containing goods in which embody General Electric's intellectual property. You are confident that there is going to be value there to pay you back when you lend money to General Electric.

How about when you lend to the government?

Here in the Anglo-Saxon world—never mind how few of us in it have any substantial proportion of our ancestors coming ashore with Hengest, Horsa, Esc, Ella, Cymen, Wlenking, and Cissa to loot, pillage, rape, and burn—we have not seen any government default since the "stop of the exchequer" of Charles II Stuart, when he simply got sick of paying his bills and decided to balance his budget by defaulting on his debt and then accepting bribes from Louis XIV of France, who was desperately anxious that Britain not help the Dutch resist his invasion.

But the U.S. in the future may be different.The AFS is the CBO director's view of what Congress is actually likely to do without much of a fight. In the ALS the deficit never gets down to much less than 5% of GDP even in 2018. Thereafter it starts rising again. The Medicare SGR postponement, the AMT patch, and most of all continued extension of the Bush tax rate reductions not just for the top 1% but for the top 30% who regard themselves as deserving of lower taxes bust the budget in the context of rising health-care costs dominate rising deficits as we look further and further into the future.

The Long Run: Beyond 2020




Now up to 2022 we are not in uncharted territory. We have seen debt to GDP ratio levels that high before, in the aftermath of World War II. The American economy can sustain that level of debt.

It is certainly not the case that bond markets think that there is going to be a problem with the US paying back its national debt over the next 10 years or 30 years or so. Right now people are asking 1.8% for holding a 10 year US government bond—if you think there is 2% inflation people are actually willing to hold a 10 years government bond even though they expect to lose purchasing power thereby. That is very different from the early 1980s when people were genuinely scared, or even 1992 when I went into the Treasury when the interest rate on 10-year debt was 7.8%.

The current configuration of asset prices is simply not what you would expect to see in a country that's on the point of view of a fiscal catastrophe. If there is a chance, you would be expecting somebody right now would be dumping their Treasury bonds—and we would see a much higher interest rates.

The problems, therefore, come not in the next generation but beyond that: beyond 2035, say. By 2035 the AFS has our debt at 180% of GDP. The AFS assumes that the Affordable Care Act is not implemented—except for the parts of it that cost money. The AFS assumes that the tax on "Cadillac" health plans is not implemented, the Bush tax cuts are extended forever, the Inde-

pendent Payment Authorization Board fails to take a hammer to Medicare reimbursement rates for specialists.

The lesson I draw is that either by 2035 we will either have changed our political economy enough that the AFS will be irrelevant or we will be on our way to Argentina-land. Parenthetically, my last thirty years of experience make me think that there is a very easy way to resolve our long-run fiscal problems. Simply eliminate from office the Republican Party we have had since 1980. If we do, we are fine. If we do not, we have a big problem after 2035 or so.

But 2035 is far off The people who will be taking this course in 2035 are now in utero. Does that mean that we can ignore the long run for a decade, and worry just about the short run and medium run for a while?.

About five days a week I think we can ignore the long run for another decade. And others—Paul Krugman, for example—think seven days a week that we have at least a decade before we have to start seriously worrying about the long run.

## *The Invisible Bond Market Vigilantes*

The fact that we think most of the time, or all the time, that the long run is far off is what leads us, when we post to our weblogs, to post pictures like the one above. Here we are making fun of the Bowles-Simpson Commission and oof ther people who say that immediate fiscal retrenchment is necessary because "the bond market vigilantes" are coming. We post pictures of Monument Valley on the Navajo Reservation. We ask people to spot the bond market vigilantes, cresting the horizon, coming to kill us all because our fiscal policy is unsustainable. And we have a good time.

Five days a week I am happy to ignore the long run for at least an additional decade. But today is Thursday. And on Thursdays I think differently.

On Thursdays I look back at January 2010, and observe that back in January of 2010 nobody was worried about the fact that Greece was spending money and did not seem to have any plans for taxes. People were happy holding Greek government debt back then even through it paid you only 2% a year i interest more than German government debt paid.

What a change between January 2010 and October 2011!

By October 2011 Greek government debt was paying you 25% a year more than German government debt was paying. And last week it had 50%. The long run came to Greece, and the long run came to Greece in less than 2 years, starting from a situation that looked perfectly normal. The long run is here in Portugal. The long run may be coming soon to Italy and Spain. European political economy is right now in an uproar as they try to figure out how much debt of countries regarded at risk of default gets guaranteed, who guarantees it, and what systems are put into effect to try to keep this from happening again.

So, because this is Thursday, I say that simply because the fundamental fiscal crisis of the U.S. social insurance state is not scheduled to come before 2030 does not mean that the long run can be ignored for decades. The long run might not arrive until 2030 or 2040. But the long run might come very soon indeed. The long run comes as soon as bond traders lose confidence that fiscal problems will be solved before the long run comes.

Today I think there is a 10% chance that at some point in the next decade we Americans will be saying that the long run is here, and we will suddenly need to deal very quickly with the fact that we have promised a very extensive social insurance state—especially as involves health care for the elderly and the poor—and we have been unwilling to make any plans to tax in order to actually fund that.
And let me stop this lecture here.

# APPENDIX: THE ROLE OF CHINA IN THE GOVERNMENT BUDGET, AND OTHER ISSUES

## *The Role of China*

Right now China is trying to move three million people a year from subsistence farming in the countryside to industrial and service employment in the cities.

The best way they can think of to generate jobs for those three million people per year is to buy up U.S. government bonds, so that the people who sell them the US government bonds then have renminbi they will then turn around and use to buy exports from China.

This is not quite a free-market transaction. China's State Council is not acting as a profit-maximizing economic agent. But it is acting as it is for completely plausible and realistic reasons. China's State Council wants, more than anything else, to maintain full employment in Shanghai. Otherwise their heads are likely to end up on pikes.

They are not going to make a rapid transition to relying on domestic demand rather than exports to maintain full employment in Shanghai. But they are also not going to suddenly stop purchasing U.S. government bonds. A sudden stop would be much more damaging to the Chinese economy and to the futures of the members of China's State Council than it would be to the US economy.

## *A Note on the Gold Standard*

Should we eliminate the Federal Reserve and return to the gold standard because the Federal Reserve caused, or allowed, a bunch of inflation in the 1970s?

The Federal Reserve did indeed create a lot of inflation in the 1970s. They say they are very sorry, and promise not to do that again.

Note that it is entirely possible that under a gold standard we might well see similar amounts of inflation: there is nothing that guarantees price stability under the gold standard. Whether you hvve inflation or deflation under the gold standard in very much very much on what was happening in gold mining, on whether or not silver is a monetary metal alongside gold, on how much precious metals the institutions of the banking system require, and so on.

If what you want is price stability, the gold standard is not the way to get there.

If what you want is small fluctuations in unemployment, the gold standard is really not the way to get there.

Lots of people after the First World War thought it was important to get back to the gold standard for credibility, consistency, and anti-inflation reasons. Then the world fell into the Great Depression for many reasons, but one of the biggest was because of the way the post-WWI gold standard operated—as my colleague Barry Eichengreen will tell you not at four hour length but at 40 hour length ex tempore. Ever since, very few people have still thought that a gold standard is a good idea. The fact that some of these people may come in first or second in Republican presidential primaries is very worrisome. But it does not mean that the position that we should restore the gold standard has heavy intellectual weight.

Almost everyone who was in favor of the gold standard in the 1920s dropped their belief in the 1930s. And I have seen no evidence to make me think that that dropping was a mistake.

## *A Note on Uncertainty*

If uncertainty about future government policy was a big deal, we would expect to see it in bond prices and in the stock market. Entrepreneurs unwilling to invest because they fear future taxes and regulations are also entrepreneurs willing to sell their current stock positions for a song and shift their money to the Cayman Islands. Thus you expect the stock market now to be low when uncertainty about future government policy is disturbing enterprise. You expect interest rates on government bonds to be rather high as well, for one way uncertainties about future policies get resolved is through inflation. And right now they are not.

If you actually ask people, you learn that there is considerable economically-damaging uncertainly—but the uncertainty is all about how much spending there will be next year or the year after. The markers that would indicate that enterprise was being hobbled by uncertainty about government policy per se—those markers just are not there. This seems to me to be a side issue—another argument that is based on political wishes rather than on economic evidence.

*Lecture 12*

# 12. Growth Economics
# *From the Discovery of Fire to the Great Transformation*

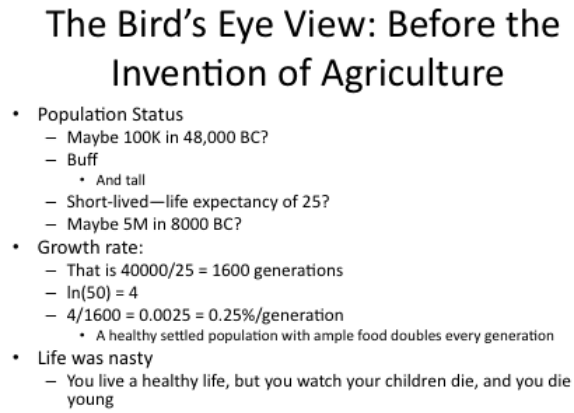
## What You Will Learn

When you finish this lecture, you should be able to:

1. Explain why human standards of living were so low up to the era of the Industrial Revolution.
2. Explain why human population growth in the 50000 years before 1800 was both remarkably fast for an animal and yet remarkably slow by the standards of us modern humans.
3. Explain why the coming of the Industrial Revolution is such an important historical question.
4. Explain why the coming of the Industrial Revolution is such a puzzling historical question

## From the Invention of Fire to the Neolithic Revolution

Human beings first started to settle down and begin to farm and herd some 10,000 years ago—say 8000 BC. It is worth spending a little time looking at the "economy" in Old Stone Age days, in the first days of what the anthropologists call "behaviorally modern humans," the first days in which we were more than just jumped-up East African Plains Apes with big brains and the ability to make some fairly crude stone tools.




### *Behaviorally-Modern Human Beings*

Sometime before 50,000 BC we learned to talk. About 50000 BC the first of us began to venture out of our evolutionary cradle somewhere near the Horn of Africa and to spread out not just through Africa but across the Red Sea to Eurasia and then to pretty much every place in the world save Antarctica. There were probably about 100,000 of us, in northeast sub-Saharan Africa, in 50000 BC. There were probably about 5 million of us 40,000 years later at the time of the invention of agriculture.

For an animal species to leave its evolutionary homeland and multiply its numbers fifty-fold as it spreads out and finds niches pretty much all over the world is an impressive thing for an animal

species to do in as short a time period as a few tens of thousands of years. But we are a very special kind of animal, and we look at it differently.

### *Population Growth Rates in the Middle Stone Age*

Experience tells us that a pre-birth control settled population with ample resources and food supplies roughly doubles every generation. That is what the British settlers on the east coast of North America did. That is pretty much what every agricultural population expanding with its agrarian toolkit into new lands has done. That is not the speed with which the human pre-agricultural hunter-gatherer population grew in the 40,000 years before 8000 BC. 40,000 years is about 1600 generations. If a population of 100,000 doubles every generation, than after 1600 generations its numbers are:

$$100{,}000 \bullet 2^{1600} = 10^{485}$$

That is roughly one with four hundred zeroes following it humans for every single particle in the universe. Compound growth is an awesome thing. Human hunter-gatherer populations very quickly ran into the carrying capacity of their environment. And population growth rates were glacially slow by human standards throughout the Middle Stone Age.

How fast did human populations grow in the Middle Stone Age? At a pace of about 0.25% per generation. At a pace of about 0.01% per year. Each generation, of every four hundred new people who would be there if we had been a settled agricultural population with ample food growing along our normal pattern, only one survived. That tells us how close to the margin of subsistence we were back then before the invention of agriculture. Thomas Robert Malthus would not have been surprised: in pre-birth control societies, human numbers grow as people have kids until poverty, disease, and malnutrition keeps the extra children over and above two of each set of parents from surviving to reproduce.

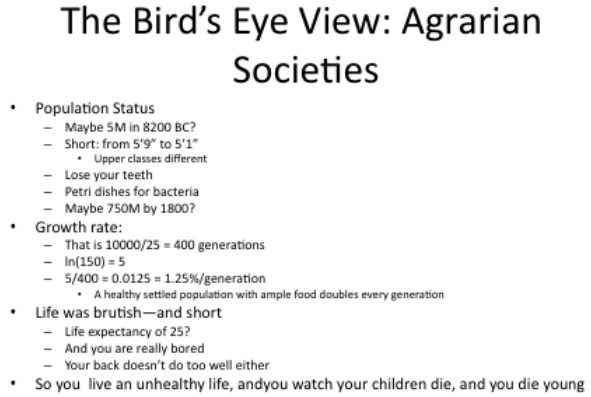
### *Living Standards in the Middle Stone Age*

Our Middle Stone Age hunter-gatherers look to have been buff. The heights of the adults in the skeletons that we have found are about our height. Life as a hunter-gatherer was one in which you were not protein- or calcium-deprived to any significant extent. But even though life was healthy, it was short: a life expectancy at birth of 25 or so (a nomadic existence is very yard on human babies who cannot even walk at all until they reach their first birthday, and must be carried). And life was brutish as well: there was little of the high cultural human inheritance that we all take for granted.

Were they happy, our stone-tool-using hunting-and-gathering Middle Stone Age ancestors? I suspect not very. I suspect they regarded their lives as pretty nasty. After all, they watched most of their children die before they could themselves reproduce. That is not something that any Darwinian creature can look on with any sense of equanimity.

## THE AGRARIAN AGE

How did things change with the invention of agriculture and herding around 8000 BC? First, we had the long march of human technology through selective breeding of plants and irrigation and metalworking and literacy to the very complex high-culture agrarian societies of the first half of the second millennium AD. A substantial speeding-up of the pace of technological and organizational progress. But it was still glacially slow by our standards.




## *Population Growth in the Agrarian Age*

Consider the pace of population growth, which in a human population near subsistence is a good proxy for how fast technology is improving and thus increasing the environment's carrying capacity for the species. Hunter-gatherers had an average rate of population growth of about ¼ % per generation. Settled agriculturalists had an average rate of population growth of about 1 % per generation.

That is faster by a factor of four.

That is still far, far below the doubling per generation that we expect from a pre-birth control pre-female literacy human population with a standard of living substantially above bare Malthusian subsistence. It is perhaps 1/100 of what we expect from a healthy population above subsistence.

Nevertheless, that pace of technological, organizational, and economic advance carries the human population from perhaps 5,000,000 in 8000 BC to perhaps 500,000,000 by 1500—750,000,000 by 1800. That hundred-fold multiplication of the human population of the world above its pre-agricultural human carrying capacity is a wonderful accomplishment, and one carried out in an eyeblink on any evolutionary time scale. But the population growth rate still averages only 1% per generation.

## *Living Standards in the Agrarian Age*

We strongly suspect that human standards of living were at the median significantly lower in the agrarian age than they had been in the hunger-gatherer age. Hunter-gatherer life is dangerous when you are an adult: you are hunting things that are not tame and that do not especially want to be eaten. And hunter-gatherer life is very hard on babies who cannot walk and must be carried. Settlement must have significantly diminished infant mortality—which means that some other aspects of life must have gone south to prevent lowered infant mortality from producing even more of a leap upward in the rate of average population growth than we in fact see. Even though life was easier, you still watched most of your children die before they could reproduce. So life in the agrarian age was still nasty.

And life was still short: we see few if any signs that median humans in the agrarian age had any greater expected lifespan at birth than the 25 years of the hunter-gatherers.

And life was brutish—but in a different way than the life of the hunter-gatherers was brutish.

For one thing, the people of the agrarian age were short. Adult male hunter-gatherers seem to have averaged something like 5'7"-5'8". Adult male agriculturalists appear to have averaged some 5'1"-5'2". Adult hunter-gatherers seem to have kept most of their teeth. Adult agriculturalists seem to have lost most of their teeth. This suggests absolutely massive protein and calcium deficiencies. We know what calcium deficiencies do to height and the ability to masticate—some of us remember our great-grandmothers saying: "have a baby, lose a tooth." What did protein deprivation in utero and thereafter do to brain development? If any of us were to feed our children a diet that would make them 5'1" or so at their adult height, Alameda County Child and Protective services would come and take our children away, and we would never seet them again.

Moreover, settled agricultural populations—and even more so settled urban populations—are like petri dishes for infectious diseases as well.

Life, moreover, was a lot more boring in the agrarian age: ploughing, hoeing, weeding, planting, harvesting, threshing, grinding, weaving, spinning, over and over and over again. Hunter-gatherers face an interesting set of challenges each day as they gather and hunt. Agriculturalists—not so much. But at least we could do what we humans do best: gossip—about what we always like to gossip about, the fear of violent death especially of children and how to avoid it, sources of food and other valued resources, and who is sleeping with whom.

Plus there is the problem of social order and hierarchy in the agrarian age. It is hard for the social status pyramid to be too steeply pointed when you are hunters and gatherers. Nearly everybody, or at least everybody male if there is a strongly gendered division of labor, has hunting and weapons skills. The amount of stuff you can accumulate is pretty much limited to what you and your family can carry. And if you do not like what the Big Man is doing when he tries to boss you around, you can light out for the territory. All of this changes with the invention of agriculture. Farmers have limited hunting and weapons skills. Lords can build castles in which to put their stuff. And farmers cannot abandon their fields without risking starvation.

The coming of agriculture opens up a new career path: that of a thug with a spear, telling the peasants to give him their stuff or else. Once the peasants are giving you their stuff so that you do not spear them, then you can spend a *lot* of time training to be a better thug with a spear. So agrarian societies are open to inequality, domination, and oppression in ways that earlier societies are not.

Thus things were different at the top of the societal socioeconomic-political pyramid: it is good to be the king.

## *Was the Invention of Agriculture All a Big Mistake?*

All of these considerations lead UCLA professor Jared Diamond to claim that the invention of agriculture was a mistake—the most enormous mistake in the history of the human race. It, Diamond claims, substantially lowered the living standards of human beings for ten millennia, and lowered them drastically.

Now there are three responses you can make to Diamond:

1. The invention of agriculture was an essential step on the road to making Jared Diamond, and we don't see Jared Diamond leaving Westwood and UCLA to go hunt and gather, do we? Peasants may well have had a lower standard of living than hunter-gatherers, but we have a much higher standard of living, and our descendants will as well.

2. Even the poor of the agrarian age had direct or indirect access to an enormous storehouse of civilization—art, culture, ritual, entertainment, etc.—that is of enormous value not just to the rich of their civilization but to them as well.

3. The worth of a human civilization, Aristotle would say, lies not in the average level of well-being it produces but in the heights it attains. The point of it all (if there is a point) is to have sculptors like Phidias, playwrights like Sophokles, and philosophers like... well, like Aristotle.

You can accept or reject these criticism of Diamond as you wish. It is a free country.

As a card-carrying economist, a discipline that since its utilitarian beginnings has always held that the highest aim is to seek the greatest good of the greatest number, I must reject (3) utterly, must say that (2) is of little weight—for the peasantry had little access to high culture—and say that (1) runs into the problem of time preference: 10,000 years of upfront costs, work, and suffering must reap enormous returns indeed to be worthwhile in any utilitarian calculus.

## *If the Loom Could Weave the Cloth without a Hand to Guide It…*

Another word about Aristotle, however. Aristotle not only defended his civilization and a thing of value, but also argued that the more steeply-peaked the distribution of wealth and power, the better:

> Because the city-state is made up of households, we first consider household management.... A complete household consists of... master and slave, husband and wife, father and children. We have therefore to consider what each of these three relations is and ought to be.... Consider first master and slave both from a practical and a theoretical standpoint. Some think that the rule of a master over a slave is a science, and that household management, slave mastership, and political rulership are all the same thing. Others say that the rule of master over slave is contrary to nature... a distinction... that exists by law only... and being being contrary to nature is unjust....
>
> Property is a part of the household.... As in the crafts the workers must have their own proper tools, so it is in the management of a household. Now tools are some living, others lifeless; a ship pilot has a lifeless instrument in the rudder and a living instrument in the look-out man.... And so... a slave is a living possession... an instrument which takes prece-

> dence of all other instruments. For if every instrument could accomplish its own work, obeying or anticipating the will of others, like the statues of Daedalus, or the platforms of Hephaestus, which, says the poet, "of their own accord entered the assembly of the Gods"—if the shuttle would weave the cloth and the plectrum play the lyre without a human hand to guide them, craftsmen would not need assistants nor masters slaves...

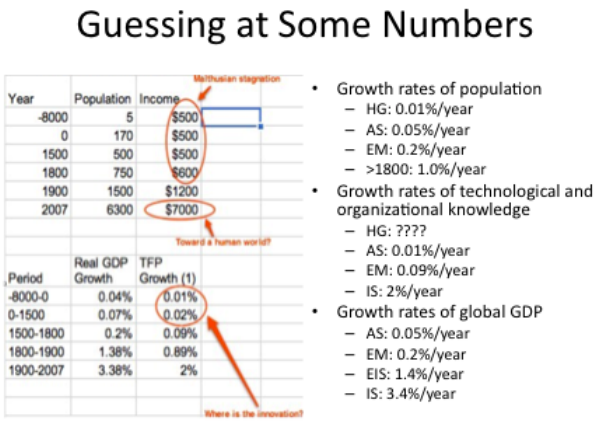
But in Aristotle's world there were no automatic looms to weave cloth or iPods to play music without the guiding of a human hand. So in Aristotle's world if you were to have civilization—if you wanted to have Aristotles—you needed slaves. Lots and lots of slaves.

And now, of course, we do have automatic power looms. And iPods.

# THE TRANSITION TO MODERN ECONOMIC GROWTH

## *Guessing at Some Numbers*

We can take the extremely sketchy information we have before 1800 and combine it with what we know once modern governments acquired the bureaucratic capacity and the curiosity to try to track the sizes of their economies to construct a set of guesses of the size of the human planetary economy since 8000 BC.



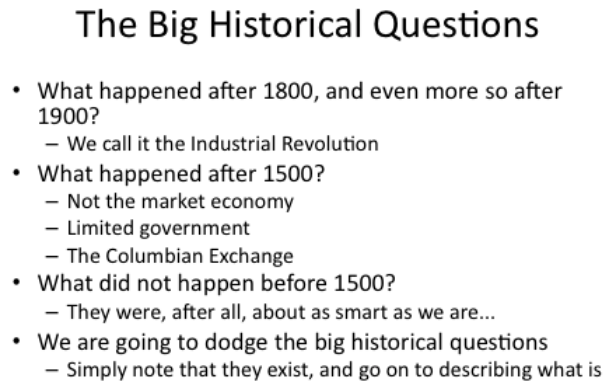

Planetwide, it looks like population growth averaged 0.05% per year in the agrarian age before 1500, jumped to 0.2% per year in the era of the commercial revolution from 1500 to 1800, and then jumped to an average planetary rate of about 1% per year around 1800. We very much hope that it is slowing down. The United Nations projects that it is slowing down, and that human global populations are likely to top out at 9-10 billion in 2050 or so. If they do not, and if population worldwide keeps growing at 1% per year, we will then have 16 billion people on the globe by 2100 and 43 billion people on the globe by 2200. Life will then become very interesting, and probably not in a terribly good way—but at least each of our descendants will have lots of company.

Planetwide, it looks like the total growth rate of world GDP—the growth rate of GDP per capita plus the growth rate of population—just kept pace with population growth at 0.05% per year in the agrarian age up to 1500, increased to a total global world GDP growth rate of 0.2% per year in the 1500-1800 span of the commercial revolution, then jumped discontinuously to about 1.4% per year as the Industrial Revolution began to spread around 1800, and then accelerated again to a pace of 3.4% per year in the twentieth century. It may be accelerating further: it depends on whether India and China maintain their 6%-10% per year rates of economic growth when they

become large enough to dominate the growth rate of world GDP or whether they slow down to the 3% per year growth rate of the rich North Atlantic powers.

### *The Great Transformation*

It is thus clear that the Industrial Revolution was the Great Transformation—that afterwards nothing is at all like what it was back in the agrarian age. Something very big happened. What it was that happened, and why it happened then and not earlier, and whether it could have easily or not so easily been otherwise is the big historical question.



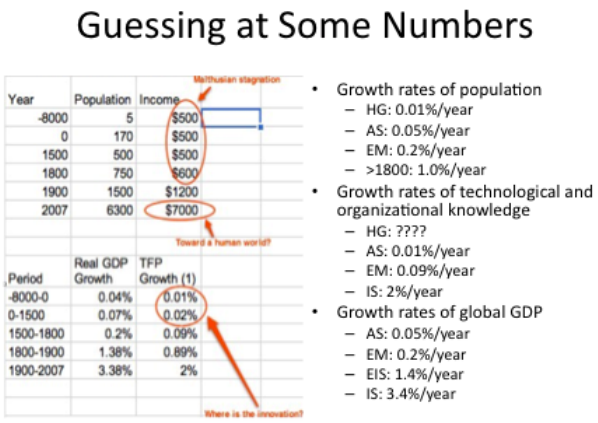

When you think about it, this big historical question is indeed puzzling. What happened after 1800 was not the coming of a market economy. Classical Greece had a market economy. Sung, Yuan, Ming and Qing China had market economies—but no Industrial Revolution. People back then were about as smart as we are. We don't think we have anything to teach Michelangelo about sculpture or Cicero about oratory or Caesar about conquest or Augustus about how to organize an empire or Sophokles about how to write a play. But we have a huge amount to teach our ancestors about how to run an economy and how to efficiently organize production.

I am not going to answer this big historical question. I am going to dodge it—go take a global economic history course, or perhaps a macroeconomics course focusing on economic growth. I don' t have time to cover it. It is really interesting. It is really complicated.

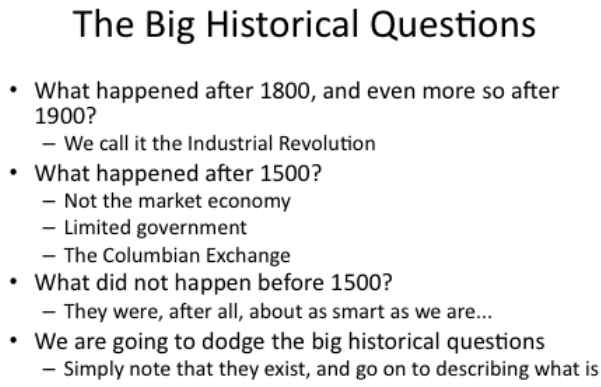
## SUMMARY

Human beings first started to settle down and begin to farm and herd some 10,000 years ago—say 8000 BC. The pace of technological, organizational, and economic advance carries the human population from perhaps 5,000,000 in 8000 BC to perhaps 500,000,000 by 1500—750,000,000 by 1800. That hundred-fold multiplication of the human population of the world above its pre-agricultural human carrying capacity is a wonderful accomplishment, and one carried out in an eyeblink on any evolutionary time scale. But the population growth rate still averages only 1% per generation. And we strongly suspect that human standards of living were at the median significantly lower in the agrarian age than they had been in the earlier hunger-gatherer age.

We take the sketchy information before 1800 and combine it with what we know since, and it looks like population growth averaged 0.05% per year in the agrarian age before 1500, jumped to 0.2% per year in the era of the commercial revolution from 1500 to 1800, and then jumped to an average planetary rate of about 1% per year around 1800. It looks like the total growth rate of world GDP just kept pace with population growth at 0.05% per year in the agrarian age up to 1500, increased to a total global world GDP growth rate of 0.2% per year in the 1500-1800 span of the commercial revolution, then jumped discontinuously to about 1.4% per year as the Industrial Revolution began to spread around 1800, and then accelerated again to a pace of 3.4% per year in the twentieth century.




It is thus clear that the Industrial Revolution was the Great Transformation—that afterwards nothing is at all like what it was back in the agrarian age. Something very big happened. What it was that happened, and why it happened then and not earlier, and whether it could have easily or not so easily been otherwise is the big historical question. I am going to dodge this big historical question—go take a global economic history course, or perhaps a macroeconomics course focusing on economic growth. I don' t have time.




## TEST YOUR KNOWLEDGE

1. What was the rate of population growth during the hunter-gatherer age, in the Middle Stone Age before the Neolithic Revolution?
2. What was the rate of population growth during the post-invention of agriculture Agrarian Age?
3. What do we know about average living standards both before the Neolithic Revolution and during the Agrarian Age?
4. What do we know about the pace of improvement of global knowledge during the Agrarian Age?
5. How does the pace of growth of global knowledge during the Agrarian Age compare to the pace of growth since the Industrial Revolution began?

*Lecture 13*

# 13. The Shape of Modern Economic Growth

## *From 1800 to the Present Day*

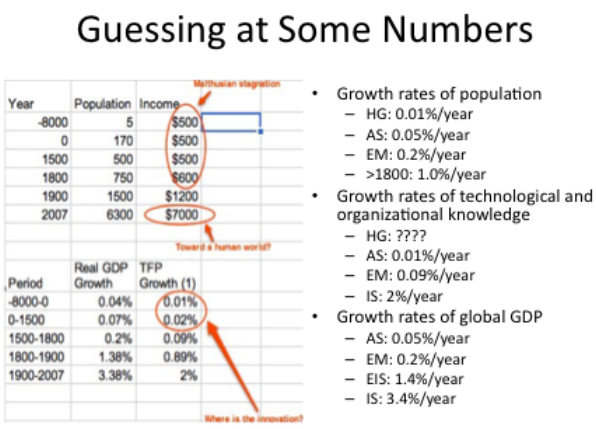
### WHAT YOU WILL LEARN

By the time you finish this lecture, you should be able to:

1. Explain why the world in 1968 was so much richer a place than the world in 1800.
2. Explain why the world in 1968 was so much more unequal a place than the world in 1800.
3. Explain why the world in 2010 is so much richer a place than the world in 1968.
4. Explain why the world in 2010 is so much more equal a place than the world in 1968.

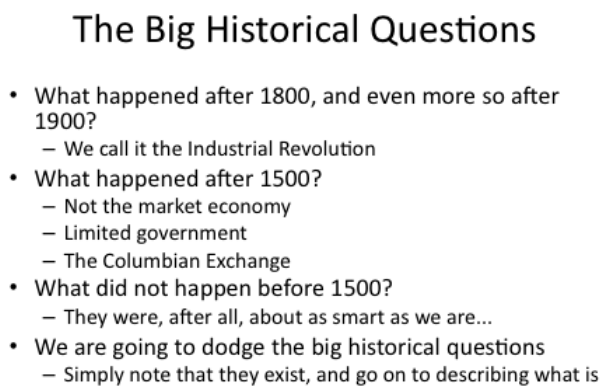
### RECAPITULATION

Human beings first started to settle down and begin to farm and herd some 10,000 years ago—say 8000 BC. The pace of technological, organizational, and economic advance carries the human population from perhaps 5,000,000 in 8000 BC to perhaps 500,000,000 by 1500—750,000,000 by 1800. That hundred-fold multiplication of the human population of the world above its pre-agricultural human carrying capacity is a wonderful accomplishment, and one carried out in an eyeblink on any evolutionary time scale. But the population growth rate still averages only 1% per generation. And we strongly suspect that human standards of living were at the median significantly lower in the agrarian age than they had been in the earlier hunger-gatherer age.




We take the sketchy information before 1800 and combine it with what we know since, and it looks like population growth averaged 0.05% per year in the agrarian age before 1500, jumped to 0.2% per year in the era of the commercial revolution from 1500 to 1800, and then jumped to an average planetary rate of about 1% per year around 1800. It looks like the total growth rate of world GDP just kept pace with population growth at 0.05% per year in the agrarian age up to 1500, increased to a total global world GDP growth rate of 0.2% per year in the 1500-1800 span of the commercial revolution, then jumped discontinuously to about 1.4% per year as the Industrial Revolution began to spread around 1800, and then accelerated again to a pace of 3.4% per year in the twentieth century.

It is thus clear that the Industrial Revolution was the Great Transformation—that afterwards nothing is at all like what it was back in the agrarian age. Something very big happened. What it was that happened, and why it happened then and not earlier, and whether it could have easily or not so easily been otherwise is the big historical question. I am going to dodge this big historical question—go take a global economic history course, or perhaps a macroeconomics course focusing on economic growth. I don' t have time.



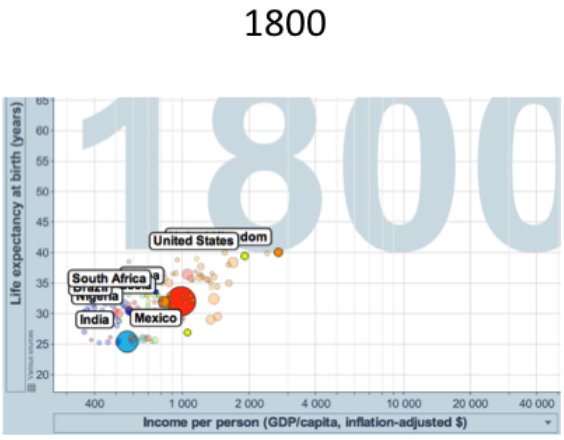

What I do have time to do is to outline the shape of global growth from 1800 up to the present day.

## DIVERGENCE AND CONVERGENCE

The world in 1968 was a much richer world than had existed in 1800. The world in 1968 was also a much, much more unequal world than had existed in 1800.

### *The World in 1800*

When the Industrial Revolution began to spread in 1800 there was perhaps one country in the world in which living standards were at a level that we today might rate at $3,000 per capita per year: the United Kingdom. And there were perhaps three more countries—the Netherlands, Belgium, and the United States—in which living standards were what we would regard today as within hailing distance of $2000 of our dollars per capita per year.

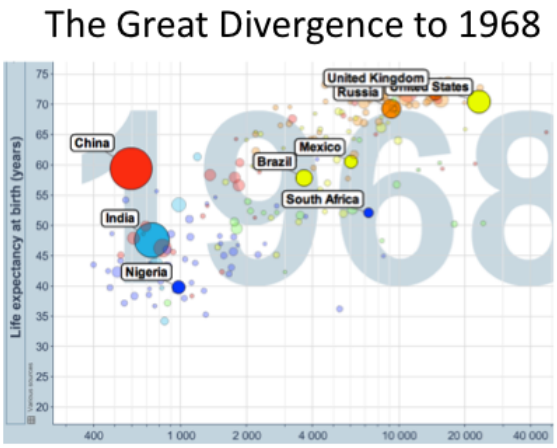



The rest of the world was spread out at "agrarian age" standards of living and levels of labor productivity. China at the end of the reign of the Qing Emperor Qianlong was doing relatively well: India was doing relatively average for an agrarian age civilization. Both were already significantly behind the North

Atlantic industrializing core of the world economy in the application of machine technology to production and the raising of labor productivity.

## *From 1800 to 1968*

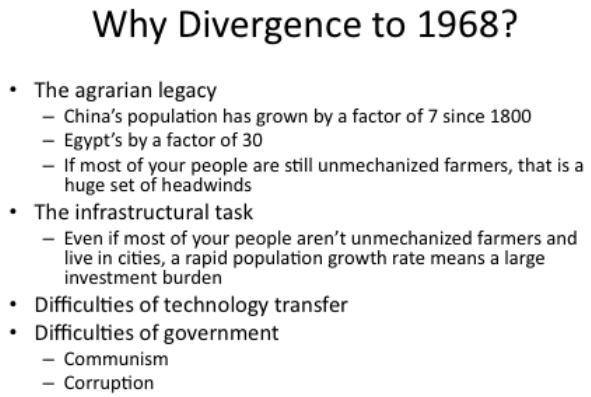
From 1800 to 1980, according to the estimates of productivity levels compiled by gapminder.com, the United States multiplied its productivity level twelvefold: from $1900 to $23,000 of today's dollars per capita per year. That is a labor productivity growth rate of 1.5% per year. Some other countries—the United Kingdom, the British dominions, western Europe, Japan—more or less kept pace. But the bulk of the world did not. Few countries were poorer in 1968 than they were in 1800: China, under Mao and in the throes of the Great Proletarian Cultural Revolution in 1968, is the major example.




Most countries were richer than they had been in 1800. But not as much richer by as much as the United States had grown richer. Here India in the big example, with incomes per capita per year at about $550 of our dollars in 1800 and $750 in 1968.

Many economies did much better than India. Brazil at $3500 per capita per year, Mexico at $6000 per capita per year, and South Africa at $7,200 per capita per year serve as substantial exmaples.

But there were also a lot of countries like Nigeria, at $1000 per capita per year in 1968.




Why this divergence up to 1968? Britain in 1800 was already five times as wealthy as the agrarian age standard. The sources of Britain's wealth in 1800, and of the rapidly growing wealth of the largely North Atlantic core of the global industrial economy in the 1 ⅔ centuries afterwards, was no mystery. It is always easier to catch-up and imitate than to do something for the first time. So why did the gap between the North Atlantic and the rest not shrink but grow on average, and grow enormously up to 1968?

Four reasons come to mind: the agrarian legacy, the infrastructural task, the difficulties of technology transfer, and the difficulties of government.

Consider, first, the agrarian legacy.

China's population has grown by a factor of 7 since 1800. Egypt's has grown by a factor of 30. Each has moved between ¼ and ½ their population off of dependence on the land—out of farming—and have irrigated new lands. But that means that average farm sizes in China and Egypt today are about ¼ the sizes of their ancestors' farms in 1800.

You need huge increases in fertilizer and other inputs to get the same crops out of ¼ of the acreage, even with the extra sweat the farmer's family can put in.

That shrinking of average farm sizes is an enormous headwind hindering economic growth. It does not end until societies go through the demographic transition: until women learn to read and use birth control and so control their own fertility and the spacing of their children.

Consider, second, the infrastructural task. Suppose you manage to move the bulk of your population out of subsistence agriculture and into manufacturing and service occupations. Those occupations will be predominantly urban. Many of them will require a cheap and effective network for long-distance trade. You will have to build cities, railroads, highways, and ports to house and serve your rapidly-growing (remember: no demographic transition yet) population. You will have to do this while you are still desperately poor. And the enormous magnitude of the infrastructural task associated with these sectoral shifts diverts a huge amount of resources from their alternative use of raising labor productivity.

Consider, third, the difficulties of technology transfer. Back after World War I, try as it could, Ford Motor Company could not get productivity in its British operations up to even half of productivity in its American operations. Calcutta textile factories had to work immensely hard to achieve productivity levels of even ⅕ of those of British factories in the late nineteenth century. There is a great deal about technology that is not contained in even the best owner's manual or manufacturer's guide—and so for most of the past two centuries technology transfer from rich to poor nations has been painfully slow.

But the largest and most important obstacle to global convergence has been government, in two forms, communism and corruption. Corrupt governments are not terribly interested in economic growth unless and until it creates valuable things for them to steal. And communist governments, for fundamentalist-religious-ideological reasons, believed that they could not allow the market system of exchange to retain more than a toehold inside their countries.

Karl Marx, you see, thought that market economies were simply devices to mask and obscure the extraction of surplus value from the workers by the ruling class. Under ancient slavery, Marx said, it was clear how the rich got their wealth: they owned the poor as slaves, took what the slaves made, and beat or killed them if they resisted. Under medieval serfdom, Marx said, it was clear how the rich got their wealth: the knights kept the poor tied to the land they farmed, and demanded feudal tithes and corvee labor in return for "protecting" them against other knights.

Under market capitalism, Marx said, it looks as though everybody is equal, and that every contract and economic agreement is voluntary. But when some—the capitalists—are very rich and the workers are very poor, the bargains that they will strike will be as unequal and as oppressive as ancient slavery and medieval feudalism. It is actually not equal at all. Equality under the law—equal rights to make bargains and contracts—is a cruel deception.

Much better, Marx said, to abolish private ownership of the means of production and market exchange. Much better, Marx said, to have everything administered fairly according to a common plan. Then you won't need an oppressive government to protect the property and rank of the rich from the poor, and so the state will "wither away." And the narrow horizons of bourgeois private-property definitions of "justice" will be crossed: we will no longer say that goods should be allocated according to fair and mutually-agreed on bargains, but rather instead:

> society will inscribe on its banners: "From each according to their ability, to each according to their need!"

How well did this work?

How well did eliminating markets on the grounds that Marx was suspicious that they were merely obfuscating surplus extraction devices do?

We had a 20th century "natural experiment" involving nearly two billion people—most of them experimented on involuntarily. And so now we see.

The Communists abolished the market economy. Marx's viceroys on earth, wherever they reigned, stamped it out. This left them with the question of how to plan and coordinate economic life. And so they replaced the market with a generalized version of the Rathenau-Ludendorff World War I Imperial German war command economy. They tried to take as much advantage as possible of economies of scale—to be sure that production was coordinated so that machines did not stand idle but were instead used on the widest possible scale. They devoted immense material resources to organizing five-year plans for industrial development to try to rationalize production. They devoted immense resources to trying to root out corruption and "wrecking"—sending millions of people to labor camps or to their deaths or both for economic sabotage in order to raise productivity.

How Much Does Market Organization Matter?

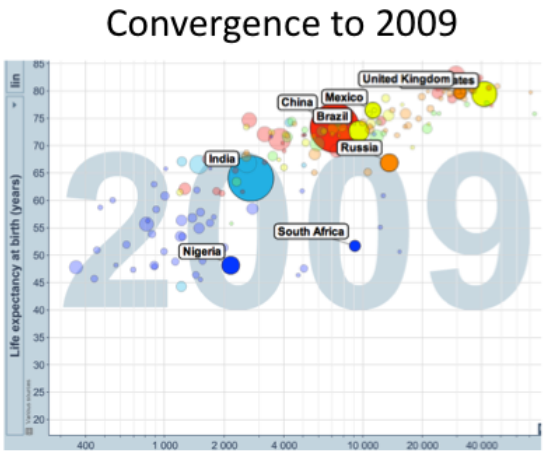
| East-Block Country | GDP per Capita | Matched West-Block Country | GDP per Capita | Percentage Gap |
|---|---|---|---|---|
| N. Korea | $700 | S. Korea | $7,660 | 91% |
| China | $490 | Taiwan | $9,500 | 95% |
| Vietnam | $170 | Philippines | $850 | 80% |
| Cambodia | $150 | Thailand | $2,110 | 93% |
| Georgia | $580 | Turkey | $2,970 | 80% |
| Russia | $2,340 | Finland | $19,300 | 88% |
| Bulgaria | $1,140 | Greece | $7,390 | 85% |
| Yugoslavia | $3,240 | Italy | $19,840 | 84% |
| Hungary | $3,350 | Austria | $23,510 | 86% |
| Czech Republic | $2,710 | Germany | $23,560 | 88% |
| Poland | $2,260 | Sweden | $24,740 | 91% |
| Cuba | $460 | Mexico | $3,610 | 88% |
| | | | | |
| Geometric Mean: | $930 | | $8,030 | 88% |

And when all was said and done, they found that their economies were less than 20% as productive as those of the market economies on the other side of the Iron Curtain.

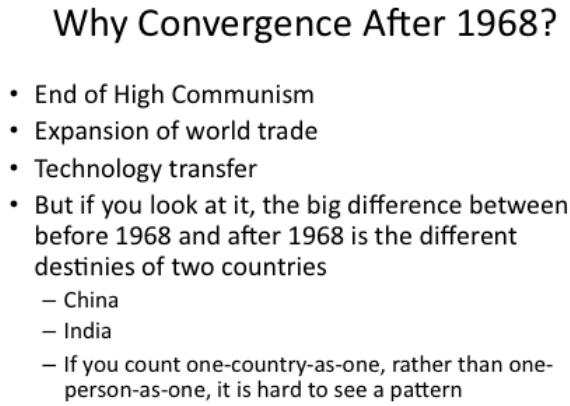
And that five-fold productivity gap almost surely understates the true gap. Communist economies copied a lot of technology from the market economies of the North Atlantic and gave back little. Market economies appeared superior not just in static productive efficiency but in dynamic invention, innovation, and technological progress as well.

## *From 1968 to 2010*

Starting around 1968—when China, ⅕ of humanity all by itself, begins to recover from the Great Proletarian Cultural Revolution—the global inequality tide begins to turn. The onward march of wealth in the North Atlantic core of the world economy continues. But now the poorer countries are, on average, growing faster than the rich. First Japan becomes a full member of the rich industrial core. Then South Korea, Taiwan, Singapore, and Hong Kong follow it. Countries as diverse as Nigeria, Brazil, Mexico, and—most important—China and India begin to significantly close the relative income gap vis-a-vis the richest nations of the world.




There are a number of reasons for this. The end of communism—or at least of all forms of communism that did not have "Chinese characteristics"—played perhaps the largest role. The liberalization and expansion of world trade that gave poor countries easier access to the world's division of labor and to world markets helped. Improved communications technologies and closer contact among peoples aided technology transfer. All of these played a role.




But if you look at it, the big difference between before 1968 and after 1968 is that two large countries were relatively unlucky before and relatively lucky after 1968. Which two large countries? China and India. The pattern of convergence is very apparent if you look across people. It is much less apparent if you look across governments, especially because Africa has a larger share of the world's governments than of people and many African countries have gone backward in economic development along various dimensions since 1968.

# AN ECONOMIC GROWTH EQUATION

## *Categories of Income*

Start our analysis of the numbers of economic growth by dividing people's incomes up into three categories. People receive incomes in three different ways:

- From selling or renting out the machines and buildings and natural resources that they own.
- From the work they do.
- From the skills they have that amplify the productivity of the work that they do.

Factors of Production and Economic Growth

- Physical capital and resources (K)
- Labor (L)
- Human skills, acquired via education and experience (H)
- Factor income version of the circular flow:
  - $Y = rK + wL + sH$
- Difference it:
  - $\Delta Y = r(\Delta K) + w(\Delta L) + s(\Delta H)$
  - What would you expect an extra lathe to be worth? Well, about what the average lathe is worth.
  - Thus this equation tells you what you would expect the rate of economic growth to be as a result of factor accumulation

Call natural resources, machines, and buildings by K, for capital. Call raw work L, for labor. Call the skills people apply H, for human or education capital. We can then divide the incomes in the economy as a whole into these three streams:

$$Y = rK + wL + sH$$

The amount of income that goes to the owners of capital is equal to the amount of capital in the economy K times the average return paid to capital, r. The amount of income that goes to the owners of labor is the amount of labor in the economy L times the average unskilled wage w. The amount of income that goes to those with special skills gained through training, experience, or education is equal to the amount of those skills H times the average premium paid to skills s. And all of these together add up, by the circular flow principle, to the economy-wide level of incomes Y.

Factors of Production and Economic Incentives

- A growth equation:
  - $\Delta Y = r(\Delta K) + w(\Delta L) + s(\Delta H)$
- Incentives
  - Capital: incentives to save and invest
  - Skills: incentives to go to school, and to pay attention on the job
- Benefits of a private market system:
  - Pushes the decisions about factor accumulation out to the periphery
  - Gives people at the periphery the right incentives

## *Factor Accumulation and Economic Growth*

Now let us look at economic growth: how the economy-wide level of income changes over time.

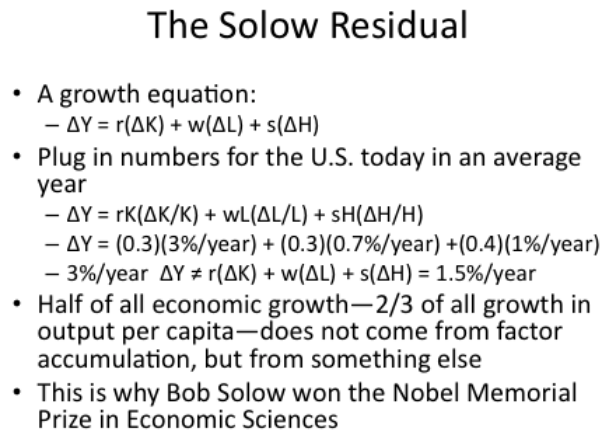
Between last year and this year, investments increased the capital stock of the economy K, population growth increased the labor force of the economy L, and the gaining of extra education

and experience by our workforce increased the stock of human capital of the economy H. By how much would we have expected these increases in productive resources—in what economists call *factors of production*—to have boosted the total level of production and incomes in the economy Y?

The natural expectation would be to think that the extra capital would earn an income about equal to the average of the previous capital, and the extra labor would earn an income about equal to the previous wage, and the extra skills would also earn an income about equal to the previous return to skills. Thus if we continue to use our Greek capital Δ to indicate differences, we might expect the difference between last year's and this year's level of production and incomes Y to be equal to:

$$\Delta Y = r(\Delta K) + w(\Delta L) + s(\Delta H)$$

But when we do such calculations, we find that they go substantially awry. In an average year, the labor supply of the United States increases by about 0.7% and about 30% of income in the United States is earned by unskilled labor—so we would have expected the increase in unskilled labor to give us about 0.2%/year of growth in real production and incomes. In an average year the skills of the workforce increase by about 1% and about 40% of income is earned by skills of one sort or another—and so we would have expected the increase in skills to give us about 0.4%/year of growth in real production and incomes. And in an average year the capital stock of the economy increases by about 3% and about 30% of income is earned by capital—and so we would have expected the increase in capital to give us about 0.9%/year of economic growth.




Add up these three sources of growth from increasing supplies of factors of production and we find that they amount to about 1.5%/year. But look at the United States economy in an average year, and real GDP is about 3.0%/year higher than in the previous year. Half of economic growth comes from factor accumulation, from the piling-up and use of more of the factors of production labor, skills, produced capital, and natural resources. And the other half—in already industrialized countries, at least—comes from improvements in technology that have never been seen before, and from improvements in what are already global best-practice organizations.

## SUMMARY

The world in 1968 was a much richer world than had existed in 1800. The world in 1968 was also a much, much more unequal world than had existed in 1800. From 1800 to 1980, according

to the estimates of productivity levels compiled by gapminder.com, the United States multiplied its productivity level twelvefold: from $1900 to $23,000 of today's dollars per capita per year. That is a labor productivity growth rate of 1.5% per year. Some other countries—the United Kingdom, the British dominions, western Europe, Japan—more or less kept pace. But the bulk of the world did not. Few countries were poorer in 1968 than they were in 1800: China, under Mao and in the throes of the Great Proletarian Cultural Revolution in 1968, is the major example. Most countries were richer than they had been in 1800. But not as much richer by as much as the United States had grown richer.

Why did the gap between the North Atlantic and the rest not shrink but grow on average, and grow enormously up to 1968? Four reasons come to mind: the agrarian legacy, the infrastructural task, the difficulties of technology transfer, and the difficulties of government.

Starting around 1968—when China, ⅕ of humanity all by itself, begins to recover from the Great Proletarian Cultural Revolution—the global inequality tide begins to turn. The onward march of wealth in the North Atlantic core of the world economy continues. But now the poorer countries are, on average, growing faster than the rich. There are a number of reasons for this. The end of communism—or at least of all forms of communism that did not have "Chinese characteristics"—played perhaps the largest role. The liberalization and expansion of world trade that gave poor countries easier access to the world's division of labor and to world markets helped. Improved communications technologies and closer contact among peoples aided technology transfer. All of these played a role.

But if you look at it, the big difference between before 1968 and after 1968 is that two large countries were relatively unlucky before and relatively lucky after 1968. Which two large countries? China and India.

## TEST YOUR KNOWLEDGE

1. About much damage does High Stalinist abolition of markets do to an economy?
2. About how fast has worldwide labor productivity grown over the past two centuries?
3. What is the "demographic transition"?
4. Why did the world switch around 1968 from becoming a more unequal place to becoming a less unequal place?
5. Why do we fear that the market economy is not a good social calculating machine for producing the "right" amount of TFP growth?
6. About how much better is our technology here in San Francisco Bay today than technology in Gilgamesh's Uruk back in the early days of agriculture?