

Lecture 2

2. Depression Economics

Why We Need a Separate Approach

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. Consider a simple economy composed of farmers, weavers, and barbers. “Could we wind up with a situation in which the barbers were offering too many haircuts and bloodlettings 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 barbers 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?” It was a worry that something like that might happen all the time. The market economy was new.



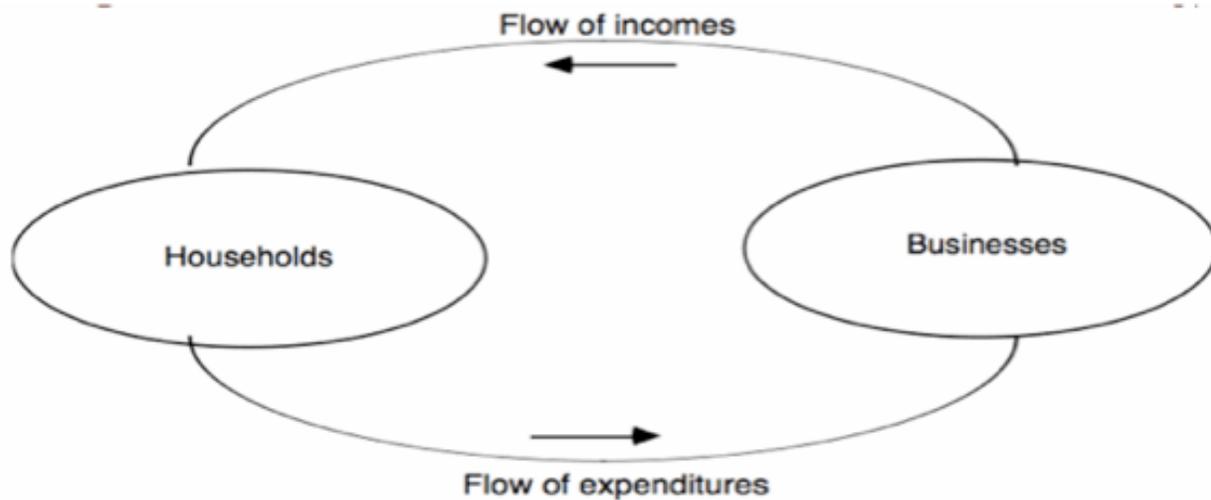
Say’s Law and the Circular Flow

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.

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 intermediaries 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.

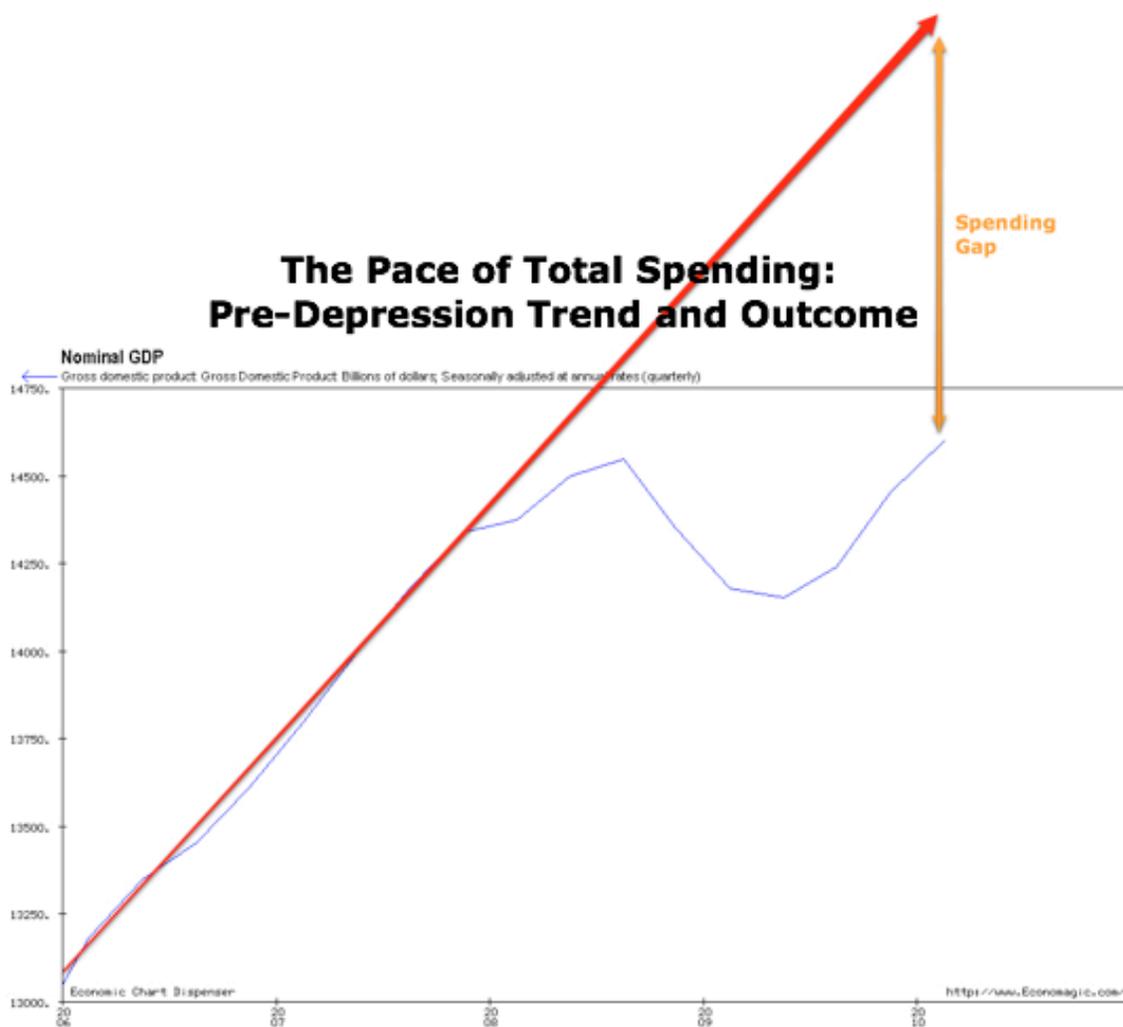
For Jean-Baptiste Say in 1803 was right. For every buyer there is a seller. Everyone's cost is somebody else's income. And purchasing power does proceed throughout the economy, greasing a flow of production, sales, income, and purchases that in the U.S. economy now amounts to \$14 trillion worth of commodities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

THE NEED FOR DEPRESSION ECONOMICS

The Coming of the Great Recession

As I said last time, the flow of production at the end of 2009 was \$13.1 trillion per year—fully 8.5% lower than what three years before we had all expected it to reach three years earlier. 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—had vanished.



Between the start of 2005 and the end of 2007 the pace of nominal total spending in dollars in the United States grew at 5.2% per year. Then it collapsed, as the economy sank into the “Great Recession.” As of mid-2010, the economy had still failed to close any of the gap between the pace of total economy-wide expenditure and its pre-2008 trend.

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. The 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...

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.

John Stuart Mill and 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.

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 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:

Consider 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.

But meanwhile 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.

Depression Economics

But now let us switch to 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. And so things 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 even 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.

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.

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. So now let us turn to one model of where economic downturns come from: the income-expenditure framework.

THE INCOME-EXPENDITURE FRAMEWORK

Downward-Sticky Wages

Let us start 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.

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 nearly 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

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. To determine how much they will cut production, we need to figure out what total economy-wide expenditure will be.

Consumption Spending

We can divide total spending into four components:

1. Consumption spending by households (C),
2. Investment spending by businesses seeking to expand capacity (I),
3. Government purchases by... governments (G), and
4. Net exports, the difference between exports and imports, the balancing item—which in the United States, for my lifetime, have almost always been negative.

We can add up these four components and call their sum E, for the flow of total expenditure.

$$C + I + G + NX = E$$

Now this equation is needlessly complicated for now. Let us add up I, G, and NX—we are going to want to break them down later—and call their sum “O” for “other,” non-consumption spending

$$I + G + NX = O$$

And so we can write the flow of total economy-wide spending E as:

$$O + C = E$$

Look at consumption spending. It will be higher the higher are households’ incomes. It will depend on the confidence that households have in the economy—which depends on how much of their incomes they expect to be taxed away, on whether they think that they need to boost their cash balances due to uncertainty, on whether they have confidence that they will be able to borrow money if they need to, and other factors. To start thinking about household decisions, 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.

Production, Spending, 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 if expenditure E is greater than income and production 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 and is stable 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 (or up) in production, incomes, and in 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 very simple algebra. If we substitute Y in for E :

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

Since we would like to figure out what Y is, we should subtract $c_y \times Y$ 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:

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

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:

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

And so arrive at our destination: our formula for what the economy-wide 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 C_0 of consumer spending.

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

You are done.

The Methodology of Economics

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.

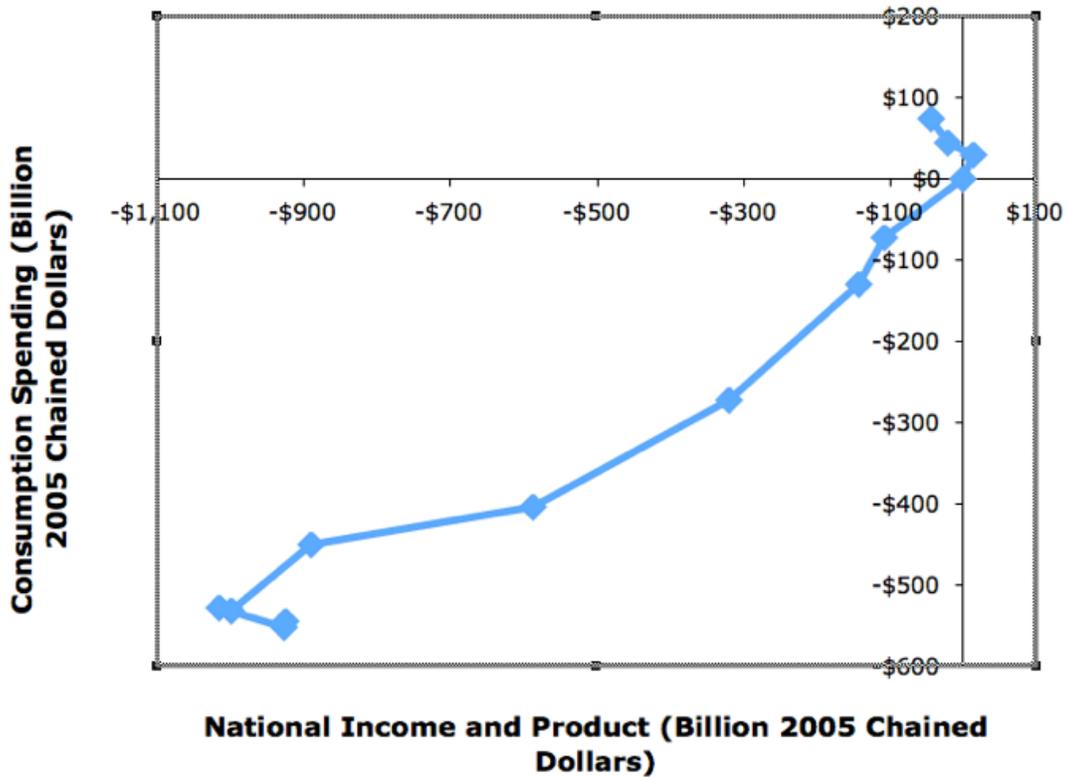
In a way, learning an intellectual discipline like economics is similar to learning a new language or being initiated into a club. Economists' way of thinking allows us to see the economy more

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?

Deviations from Peak Values Relative to Trend, 2007Q1-2010Q1



The decline in national income and the decline in consumption spending during the “Great Recession”

Quite well, actually—impressively well for such a simple and crude model. At the deepest part of the recession—the third quarter of 2009—total other spending $O = NX + I + G$ 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.

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:

$$c_y = 0.5, \text{ and}$$

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

We get:

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

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

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

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.