We now shift gears from studying the underlining MICRO foundations of consumers, to studying the elements of MACRO behavior.

Macroeconomics tries to figure out what determines the pulse of the economy-in-the-large. It tries to figure out what causes increases or decreases in measures of economic activity like the total value of all production, the total number of people employed, or the *unemployment rate*--that is, the fraction of the labor force that is unemployed. Macroeconomics attempts to understand what determines both the overall level of consumer prices and how rapidly this price level is changing. (The proportional rate of change of the price level has a name you have heard thousands of times: it is called the *inflation rate*.)

An important reason to care about macroeconomics is that the macroeconomy matters to us. What happens to the macroeconomy shapes all our lives. A sudden increase in inflation is almost sure to enrich debtors (people who have borrowed) and impoverish creditors (people who have loaned money to others). Real incomes rise faster when good policies accelerate long-run growth. If you lose your job during a deep recession, you will have a hard time finding another. When you do find another, odds are it will pay a lot less. Changing jobs, or finding any job, is hard when the unemployment rate is high. Your bargaining power vis-à-vis your employer (or on the other side of the table your bargaining power vis-à-vis your employees) depends on the phase of the business cycle.

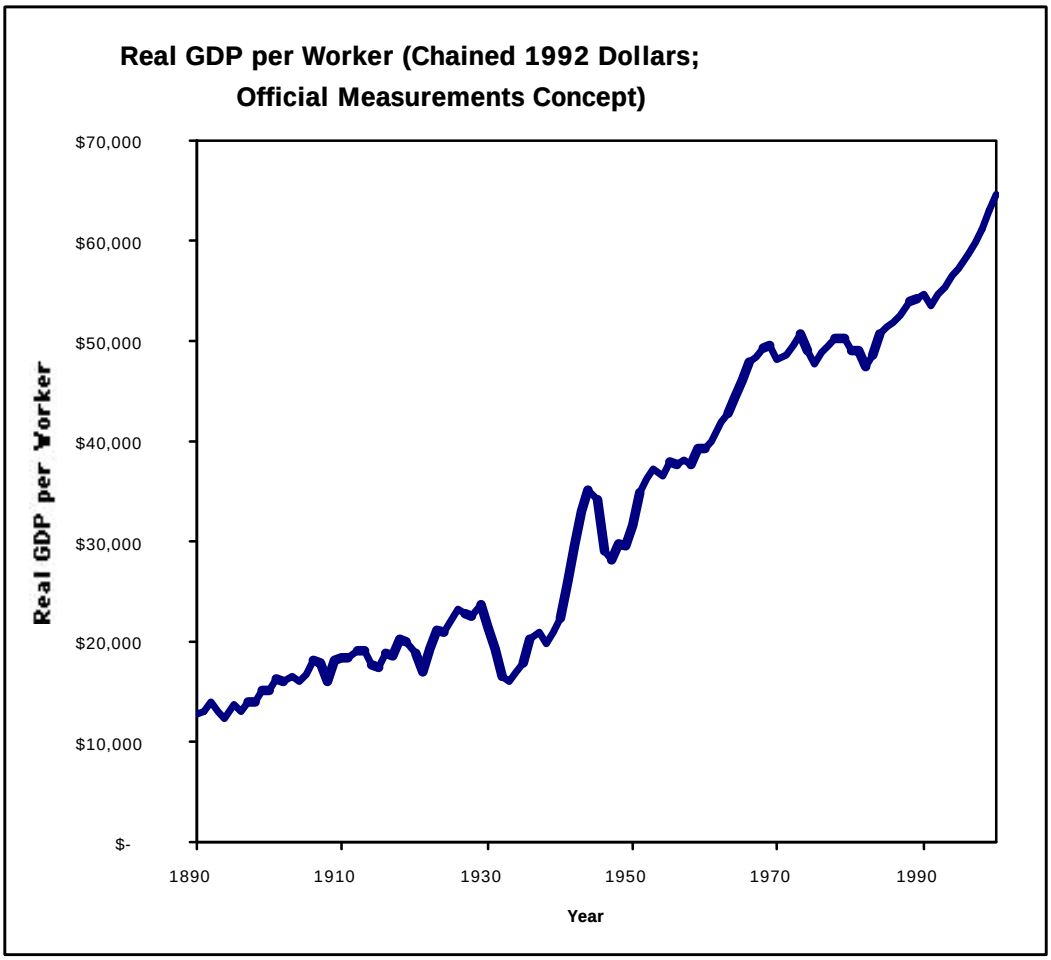
You cannot control the macroeconomy, but you can understand what it is doing and how it affects your opportunities. To some degree forewarned is forearmed: whether you understand your opportunities may depend on how much attention you pay to your macroeconomics teachers. Do not mistake the macroeconomy for destiny: some people do very well in their jobs and their businesses in a recession, and many people do badly in a boom. But the macroeconomy remains a powerful influence.

There is yet another important reason to care about the macroeconomy. Together we can make the state of the macroeconomy better. You vote. This is one of the most precious rights members of human societies have ever had. We elect a government. One of the most important things the government does is to try to manage the macroeconomy. The government's macroeconomic policy matters because it can *accelerate* (or decelerate) long-run economic growth and *stabilize* (or destabilize) the short-run business cycle.

In election after election, different candidates will present themselves and seek your vote. Afterwards the winning candidates will try to manage the macroeconomy. If you are not literate in macroeconomics, you will have a difficult time being a good citizen: you won't be able to judge which candidates could become effective macroeconomic managers, and which are essentially clueless or are cynically promising more than they could deliver.

Long-Run Growth and Business-Cycles.

Chart 1: U.S. Officially-Measured Real GDP per Worker, 1890 - 1999



Source: Angus Maddison (1995), *Monitoring the World Economy* (Paris: OECD). Extended by the author.

Chart 1 shows U.S. real GDP per worker in 1992 prices over the past century. Let's unpack the chart title, because there is a lot going on in it: "U.S." and "1890-1995" are relatively straightforward. "GDP" is an abbreviation for *GROSS DOMESTIC PRODUCT*. "Gross" means that we are not correcting for depreciation – the reduction in value of economic capital as it slowly wears out and approaches the end of its useful life. Four years ago my fiancé got a Toyota Celica costing some $20,000. Today the current value of this car is only $11,000 – four years worth of wear-and-tear that have brought it four years closer to the end of its useful life have also reduced its economic value by close to half.

- Measures of *NET DOMESTIC PRODUCT* correct for depreciation – calculate, for example, that a factory producing X during the year didn't really produce X but instead only X-Y, because the process of production put Y worth of wear-and-tear on the factory's capital stock.

- Measures of *GROSS DOMESTIC PRODUCT* do not correct for depreciation. Measures of net product are, conceptually, better – but they are very hard to do, the people at the Commerce Department's Bureau of Economic Analysis who create these numbers have little confidence in the accuracy of their depreciation estimates, and they prefer to focus on numbers they think they can measure adequately – even if it is not quite the concept they would ideally like to measure.

"Domestic" means that we are looking at all marketed and government production taking place inside the boundaries of the United States. We don't care that an office complex is owned by a foreigner – the services provided by it, to those who rent office space there, and the income generated by the rental are part of *domestic product*. Conversely, income generated abroad by factories located in Malaysia owned by U.S. citizens does not enter into *domestic product*.

- The alternative concept, "national" product, would *include* products made and income generated by extra-U.S. property owned by U.S. citizens, and would exclude products made and income generated by property in the U.S. that was owned by non-U.S. citizens. We now use domestic product because our estimates of cross-border income profits flows are riddled with error, and thus our estimates of *national product* are of significantly lower quality than our estimates of domestic product.

"Product." The *economic product* of a country, a region, an individual is the market value of goods and services produced over the course of a year. For example, my friend who is a lawyer "produces" some $100,000 of legal work each year. She works. Clients pay him – and they find it worthwhile to pay her. That $100,000 is her income, and it is also value-added for the economy as a whole: something produced over the course of a year which consumers were willing to pay her for.

"Real" and "(1992 Prices)." Measured economic product could change because of the volume of economic activity changed, or it could change because the prices at which goods and services sell changed – either because of general inflation or deflation, or because of shifts in relative prices. We want to ignore shifts in measured economic product caused by shifts in the price level. So we look at real GDP at 1992 prices. The idea is to take a representative slice of what was produced at some other data, and ask "what would this sell for if we brought if forward in time to 1992?" This way we manage to – imperfectly – control for shifts in price levels and in relative prices. Seasonal adjustment you do not have to worry about yet.

"Per Worker." Real GDP is a measure only of economic activity that passes through the market – is bought or sold (with a few exceptions). Within-the-household-production is counted in GDP if it is bought or paid for, and if not, it is not. As the share of the American adult population in the paid labor force has risen, so measured GDP has risen even though part of what has been going on has been the shifting boundary between categories of work that used to be outside, but are now inside the market. So we divide real GDP by the size of the American *labor force* to attempt to control for the shifting boundary between market and non-market work, and also to control for the overall growth of population. So there is the unpacked graph. It is a measure of the average productivity, controlling for inflationary and deflationary shifts in the price level, of the American labor force.

"Average" in the sense that we have taken the market value of all goods and services produced in the U.S. and divided by the number of workers. It is a *gross* measure in that it doesn't take account of depreciation and capital consumption – the fact that this year's production has placed wear-and-tear on the nation's accumulated capital stock. When we look at this graph, what do we see? It has gone up a lot over the past century. In 1890, real GDP per worker (at 1992 prices) was only some $12,000 a year. *Take what the average worker produced in 1890, bring it forward in time to 1992, and sell it – and you will get some $12,000 for it.* By contrast, real GDP per worker crossed $50,000 a year sometime in the last decade, and continues to rise.

- It would not be a mistake to say, roughly, that we today are at least 4.5 times as well-off as our predecessors who lived in the U.S. in 1890. In fact, the factor of 4.5 is almost surely an underestimate. We can today purchase or use a much broader range of goods and services than people could in 1890, real GDP measures take no account of the extra welfare produced by an enhanced range of choice among different types of commodities. The work year has also dropped from perhaps 2400 hours a year on average then to perhaps 1800 hours a year on average now.

- Make your guesses as to how much the expanded range of capabilities and power produced over the past century – as opposed to increased quantities of things we knew how to make a century ago – has contributed to your welfare, and adjust for the declining workweek, and come up with estimates that range from 10 to as high as 30 for the multiplication of the average productivity of the American worker over the past century.

- So the first thing to note is that there has been an enormous amount of economic growth over this past century. And we are going to spend some time decomposing that growth into its various sources and causes as this semester moves on.

- The second thing to notice is that the pace of growth is not all that smooth.

    - The economy falls off of a cliff at the end of the 1920s – the great depression.
    - Mobilization for World War II sees a steep increase that is not sustained at the end of the war as shifts shrink back from 12 to 8 hours and as government demand for the heavy industrial materials of modern war falls.
    - The first generation after World War II sees rapid growth – the Korean War Boom, the boom of the 1960s.
    - The second generation after World War II sees relatively slow growth – in the 1970s product per worker comes close to stagnating, and the 1980s did not see a bounce-back to make up any of the lost ground. When people talk of the "productivity slowdown" they are talking of the bend in this real GDP per worker curve at the end of the 1960s that separates the first, fast growth post-World War II generation from the more recent, slow growth period.

The third thing to notice is that the graph has wiggles. These wiggles are this country's "business cycles": expansions and recessions, episodes of rising and falling unemployment, and so forth.

- These business cycles have less of an impact on the country's overall economic welfare than does the secular tide of rising incomes and productivity traced over the whole century; they have less of an impact than do the episodes of productivity speed-up and slow-down seen in comparisons of pre- to post-1970 experience.
- But these business cycles – the little wiggles – are the *major* source of uncertainty over the one-to-ten year span of time that most of us plan for. And these business cycles are also the most clearly affected and influenced by government policy. So we will spend a lot of our remaining time on them.
- Moreover, the business-cycle-wiggles have much more important consequences for economic activity because of the correlation between business-cycle swings in output and swings in *unemployment*.

Real and Nominal GDP

When we add up final goods and services produced in order to calculate GDP, what weight do we give each good or service? We weigh each final good or service by its market value: we look at what each person paid for it to assign it its weight in the calculation of *nominal* GDP. Thus in 1995 nominal GDP (at 1995's prices) was $7,254 billion; in 1996 total nominal GDP (measured at 1996's prices) was $7,581 billion. The growth rate of nominal GDP between 1995 and 1996 was 4.5 percent.

But it is clear that this *nominal* measure of GDP using current-year prices to weigh the final goods and services produced is not a good measure of productivity or material output. This measure is next to no good at telling us the economy's productive power to satisfy human needs because it has the potential to confuse changes in the overall level of prices--inflation or deflation--with changes in total production. Suppose that production in the next year stayed unchanged but prices doubled. Nominal GDP would double. Suppose that the production doubled but prices stayed the same. Nominal GDP would double. Nominal GDP does not distinguish between these two sources of increase in total expenditure. But we do wish to distinguish between them. Hence economists reject nominal GDP in favor of real GDP--the value of final goods and services produced using not today's prices but instead the prices of some base year.

Whenever you hear someone say something like "real GDP in 1996 was $7 trillion 1992 dollars," understand that the "1992 dollars" means that 1992 is the base year of this real GDP calculation, and that every good and service is valued at the price it carried in 1992. When measured using 1995 prices, GDP in 1996--real GDP--was not $7,581 billion but only $7,410 billion. The difference--the gap between $7,410 and $7,581--was due to the 2.0 percent rate of price inflation--the 2.0 percent rate of growth of the level of prices--between 1995 and 1996. Real GDP between 1995 and 1996 rose by only 2.5 percent, not 4.5 percent.

Example: Weighting Goods and Services by Their Market Value

How do you weigh goods and services by their market values? Suppose that a representative consumer in our economy bought 11.5 pounds of fruit in a year:

Fruit	Quantity	Price
Oranges:	6 lbs	\$0.75/lb
Apples:	3.5 lbs	\$1.20/lb
Pears:	1 lb	\$0.90/lb
Bananas:	1 lb	\$0.40/lb

If these quantities of goods are the final goods and services produced in some particular year--year 1, let's call it--and if we then want to measure GDP-of-fruit, we simply multiply the quantities produced by their market prices:

$$GDP = (6\ \ lbs.\ \ oranges) \times (\$0.75/\ lb.) + (3.5\ \ lbs.\ \ apples) \times (\$1.20/lb.) + (1\ \ lb.\ \ pears) \times (\$0.90/lb.) + (1\ \ lb.\ \ bananas) \times (\$0.40/lb.)$$
$$= \$10.00$$

Nominal GDP-of-fruit in year 1 is \$10.00.

Example: Weighing Goods and Services by Base-Year Values

Thus if in the year following year 1--year 2--the prices of fruit and the quantities of fruit produced shift to:

Fruit	Quantity	Price
Oranges:	8 lbs	$1.00/lb
Apples:	3.5 lbs	$1.20/lb
Pears:	1 lb	$0.50/lb
Bananas:	1 lb	$0.40/lb

What is the nominal GDP in year 2?

Year 2: (8 lbs of Oranges) x ($1.00/lb) +
(3.5 lbs of Apples) x ($1.20/lb) + (1 lb of Pears) x ($0.50/lb) +
(1 lb of Bananas) x ($0.40/lb) = $13.1

Now we will calculate REAL GDP (with year 1 as the base year)

Year 1: (6 lbs of Oranges) x ($0.75/lb) +
(3.5 lbs of Apples) x ($1.20/lb) + (1 lb of Pears) x ($0.90/lb) +
(1 lb of Bananas) x ($0.40/lb) = $10

Year 2: (8 lbs of Oranges) x ($0.75/lb) +
(3.5 lbs of Apples) x ($1.20/lb) + (1 lb of Pears) x ($0.90/lb) +
(1 lb of Bananas) x ($0.40/lb) = $12

GDP Deflator (a measure of the price level)

GDP deflator = (Nominal GDP/Real GDP) x 100

Year 1 = (10/10) * 100 = 100

Year 2 = (13.1/12) x 100 = 109.2

The Price Level and Inflation

The other major feature of the macro-economy that you read about in the newspaper is inflation. Inflation upsets a lot of people a lot more than most economists think that it should:

- Feeling that measuring rods are unstable
- Feeling that income “lost” as a result of high inflation is a loss of *real* income.
- Consequences of high inflation are bad enough: deranging the price mechanism; lots of windfall gains and losses; difficulty in persuading people that the burst of inflation has come to an end.

The Consumer Price Index

Estimating the price level and its proportional rate of change--the inflation rate--is at the heart of macroeconomics.

The most frequently seen measure of the overall price level is the Consumer Price Index, or "CPI." (There are other measures of prices: the economy-wide GDP deflator, the domestic purchases deflator, and the Producer Price Index of prices paid not by consumers but by companies, to name three; but they are much less commonly reported than the CPI.) The CPI is calculated and reported once a month by the Bureau of Labor Statistics. It is an expenditure-weighted index: the Bureau of Labor Statistics gives each good or service a weight equal to its share in total expenditure in the base year.

Example: Calculating Price Indices

One standard example economists use is a price index for a consumer of fruit. Suppose in our base year our consumer buys $4.50 worth of oranges, at a price of $0.75 a pound; $4.20 of apples, at a price of $1.20 a pound; $0.90 of pears, at a price of $0.90 a pound; and $0.40 of bananas, at a price of $0.40 a pound. Then with $10 spent on fruit in the base year the price index for fruit will be given by:

$$\begin{aligned}\text{Price Index for Fruit} &= \frac{\text{Price of Oranges Today}}{\text{Price of Oranges in Base Year}} \times (\text{Orange Index Weight}) + \\ &\frac{\text{Price of Apples Today}}{\text{Price of Apples in Base Year}} \times (\text{Apple Index Weight}) + \\ &\frac{\text{Price of Pears Today}}{\text{Price of Pears in Base Year}} \times (\text{Pear Index Weight}) + \\ &\frac{\text{Price of Bananas Today}}{\text{Price of Bananas in Base Year}} \times (\text{Banana Index Weight})\end{aligned}$$

$$\begin{aligned}&= \frac{\text{Price of Oranges Today}}{\$0.75} \times (45) + \frac{\text{Price of Apples Today}}{\$1.20} \times (42) + \\ &\frac{\text{Price of Pears Today}}{\$0.90} \times (09) + \frac{\text{Price of Bananas Today}}{\$0.40} \times (04)\end{aligned}$$

And in the base year the price index will be defined to be equal to 100.

Now consider a year in which the price of oranges has risen to $1.50, the price of apples fallen to $1.00, and the prices of pears and bananas remained unchanged. Then our overall fruit price index will be:

$$\text{Price Index for Fruit} = \frac{\$1.50}{\$0.75} \times (45) + \frac{\$1.00}{\$1.20} \times (42) + \frac{\$0.90}{\$0.90} \times (09) + \frac{\$0.40}{\$0.40} \times (04)$$

$$= 138$$

Lastly, we will use the CPI to compute the inflation rate from a previous year.

Year 2: (138 – 100)/100 X 100 = 38%

Index Numbers Example: Calculating the Price Index

Fruit	Base-Year Expenditure	Base-Year Price	Subsequent-Year Price
Oranges	$4.50	$0.75/lb	$1.50/lb
Apples	$4.20	$1.20/.lb	$1.00/lb
Pears	$0.90	$0.90/lb	$0.90/lb
Bananas	$0.40	$0.40/.lb	$0.40/lb

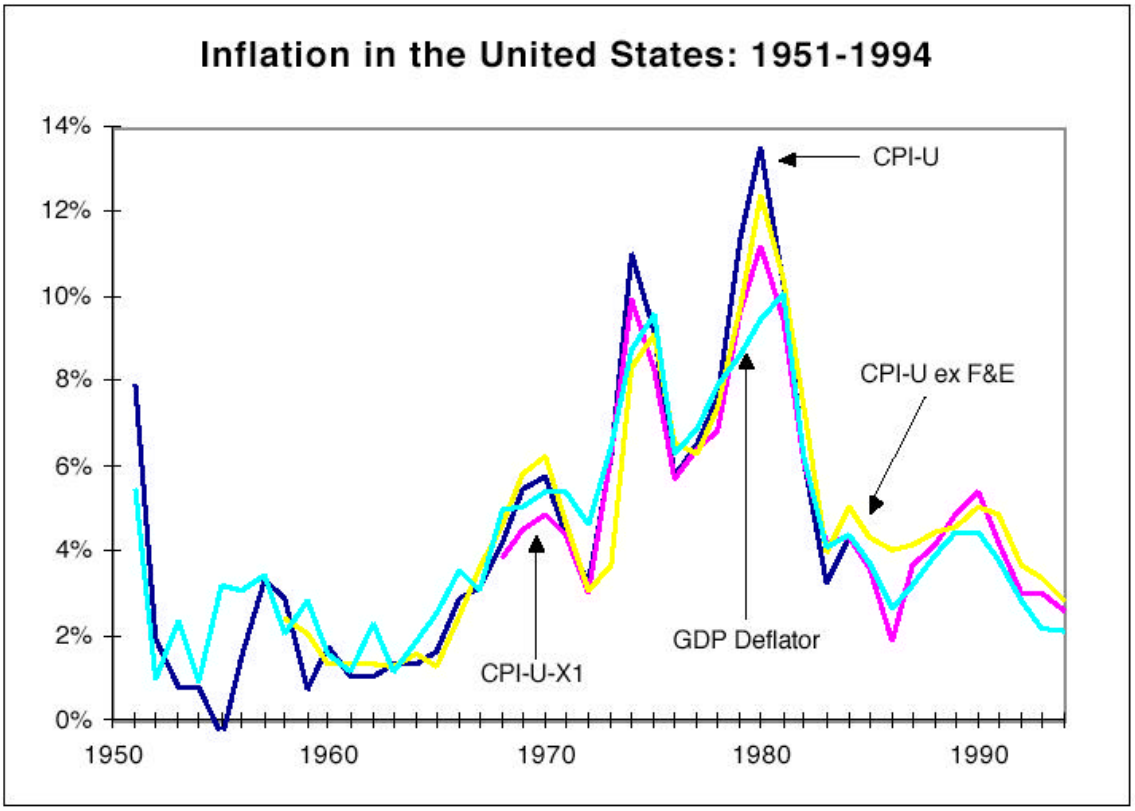
The Bureau of Labor Statistics changes the basket of goods and services used in constructing the CPI every five to ten years. It tries to keep the weighted "market basket" of goods and services used in calculating the CPI reasonably close to the goods and services that consumers are buying now. If not, the CPI would be of doubtful relevance: who would care about the rate of change of the price of a market basket that didn't represent what consumers were really buying?

The CPI is reported once a month in the form of the percentage change in consumer prices over the previous month. "Consumer prices in November rose 0.3% above their level in October," the newscaster will say. The twelve monthly changes in consumer prices over the course of the year are added up and become that year's inflation rate: "The consumer price inflation rate in 1999 was 2.7 percent," the newscaster will say.

Because the inflation rate is a measure of rate-of-change over time, it too is a *flow* variable. When we speak of the inflation rate, we speak of it as such-and-such percent *per year*. To speak of the inflation rate without a unit of time attached is incomplete. But people do, and we always assume that, when the period of time is omitted, the inflation rate is being given in percent per year.

What the inflation rate is depends on which price level it is based on. The CPI-concept inflation rate will not be exactly the same as the GDP-deflator-concept inflation rate. The chart below plots four different measures of American inflation: the GDP deflator, the CPI for all urban consumers (CPI-U), the CPI using an experimental method of taking account of housing prices (CPI-U-X1), and the CPI-U omitting volatile prices of food and energy, which can cause significant transitory fluctuations in the overall index.

Figure: Different Measurements of Inflation



Legend: Different measures of inflation tell slightly different stories about U.S. Inflation over the post-WWII period.

Source: Economic Report of the President, 1999 edition.

Components of GDP

So how does the Commerce Department's Bureau of Economic Analysis [BEA] construct its measure of GDP? It builds it up from components. It includes in its measure of GDP--which we will always denote by a Y in equations and diagrams--the values of:

- Goods and services that are ultimately bought and used by households (except for newly constructed buildings) make up consumption spending [denoted C].
- Goods and services (including newly constructed buildings) that become part of society's business or residential capital stock are investment spending [denoted I]. Gross investment is divided into two parts: depreciation simply replaces worn-out or obsolete capital; net investment increases society's total capital stock.
- Government purchases [denoted by a G] of goods and services make up the third component of GDP. Government purchases do not include any transfer payments: do not include any payments to individuals the government makes not in payment for anything provided to the government (whether a dam or an hour of a bureaucrat's time) but simply as a free transfer of money to the recipient.
- And as a balancing item to make the national income and product accounts consistent, net exports [denoted NX]--the difference between exports and imports--are also included in GDP.

Add all of these up to arrive at the level of GDP. This definition is called the national income identity:

$$Y = C + I + G + NX$$

This is the equation that you will write down most frequently as you take any macroeconomics course.

Imports and Exports

Goods (and services) produced abroad yet consumed or used here at home are our imports. Goods (and services) produced here and shipped abroad to be consumed or used there are our exports.

In the years just after World War II, imports and exports from the U.S. were about five percent of GDP--amounted to about one-twentieth of total economic output. The United States then was more-or-less a closed economy, and macroeconomics textbooks proceeded more-or-less ignoring the importance of international trade and finance, save for one "open economy macro" chapter near the end of the book that the course often did not get to. Today imports and exports from the U.S. are about fifteen percent of GDP--three times as large a share as fifty years ago--and are headed higher. The American economy is no longer a closed economy, and international economics issues can no longer be relegated to a chapter at the back of the textbook.

Similarly, "gross exports" are exports before the counterbalancing factor of imports have been subtracted. Usually we are most interested not in gross exports but in net exports--in the net flow of goods out of the United States to other countries. Gross exports are the total flow of goods out of the United States. Imports are the total flow of goods into the United States. Net exports are equal to gross exports minus imports.

Table Components of GDP in the Forth Quarter of 1999

Category of Investment		Billion Dollars, Annual Rate	Share
Total GDP		$9,478	
	Consumption Spending	$6,424	67.78
	Investment Spending	$1,672	17.64
	Government Purchases	$1,683	17.76
	Net Exports	$-301	-3.18

Source: National Income and Product Accounts, personal calculation.

More on GDP…

GDP is, at the same time:

- The total *income* of everyone in the economy
- The total *expenditure* on final goods and services in the economy
- The total *value added* in the (marketed sectors of) the economy.

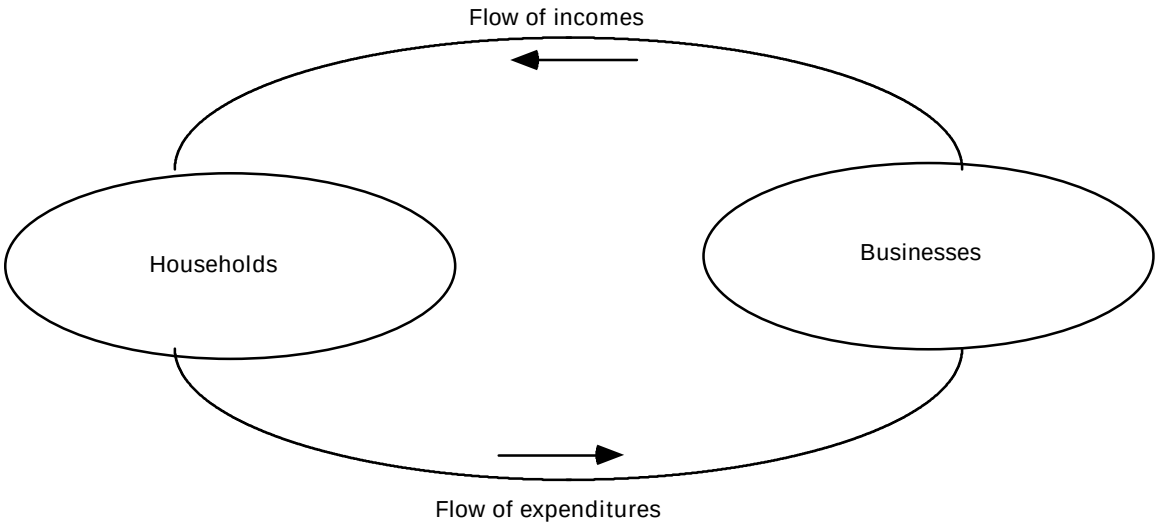
How can it be all of these things at once? Because we define them that way so that the only difference between total economy-wide income and total expenditure is the "statistical discrepancy."

The Circular Flow Diagram

Economists think of economic activity--the pattern of production and spending of the economy--as a circular flow of purchasing power thorough the economy. This circular flow metaphor allows us confidently to predict that changes in one piece of the economy will affect the whole, and how such changes will affect the whole. It allows us to simplify economic behavior, to understand the entire complex set of decisions taken by different actors in different parts of the economy by thinking of a few typical decisions taken by representative agents that govern one or the other parts of economic activity's circular flow.

All of these flows of spending then show up as purchases of goods and services from the same businesses that we started from: the businesses that pay incomes to households in return for the resources that they need to make the products to satisfy demand. This is the circular flow of economic activity.

Figure: Circular Flow Diagram

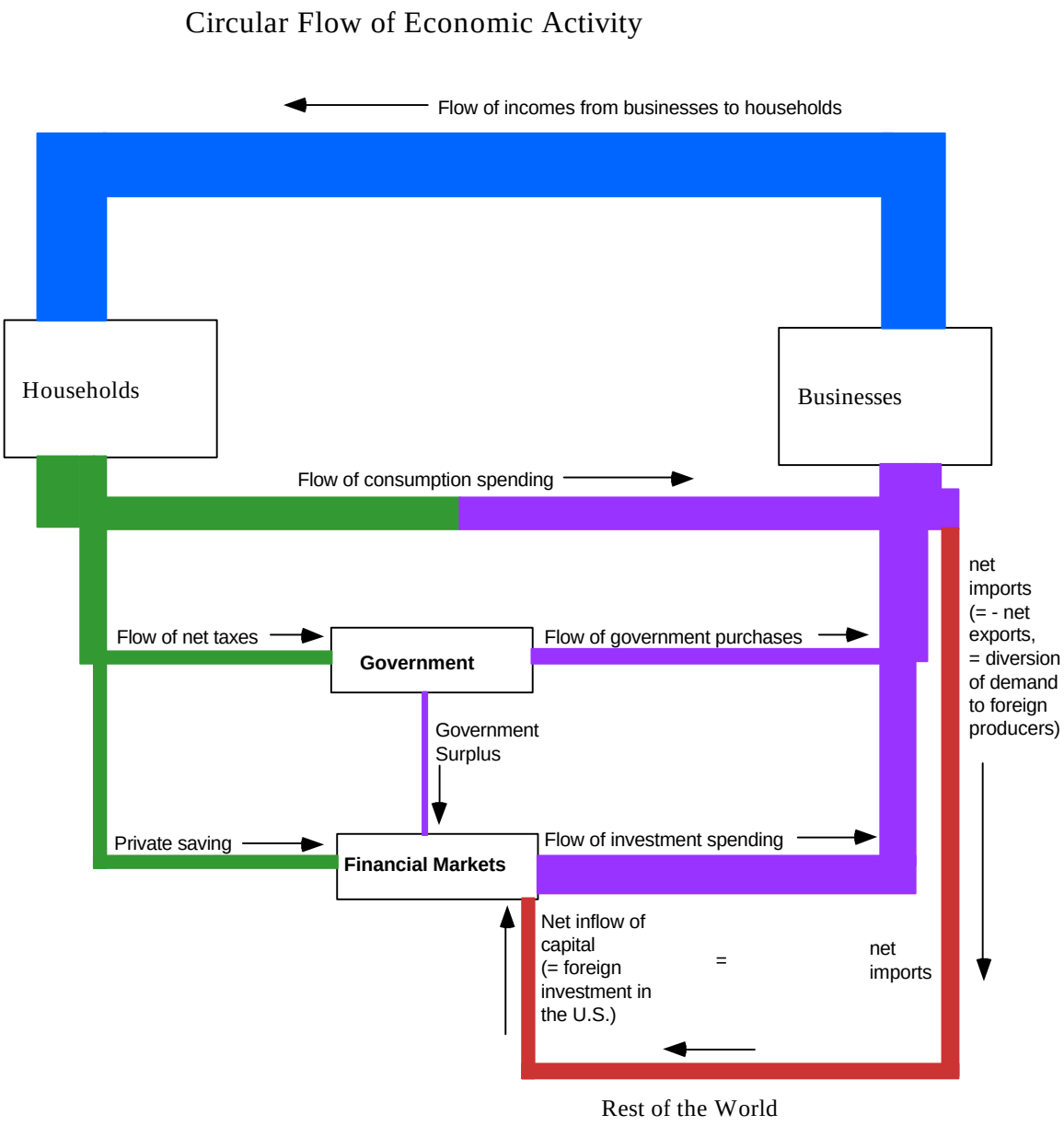


Money payments flow from firms to households as businesses pay their workers and their owners for their labor and their capital--this is the income side of the flow. Money payments then flow from households to firms as households buy consumer goods, pay taxes, and save, and as their taxes and savings then are spent by the government on goods and services that it buys and are loaned to and then spent by firms engaged in investments to boost their capital stock--this is the expenditure side of the flow.

Along the top of the diagram, expenditures by businesses as they purchase labor and other factors of production become the components of *household incomes:* wages and salaries, benefits, profits, interest, and rent. Along the bottom of the diagram, *household uses-of-incomes*--consumption spending, savings, and taxes--become the components of *aggregate demand:* consumption spending, investment spending, government purchases of goods and services, and net exports.

Within the *business sector,* businesses buy and sell intermediate goods from each other as they strive to produce goods and services and make profits. Within the *household sector,* households buy and sell assets from and to one another. These within-the-business-sector and within-the-household-sector transactions are important components of the economy. But because they net out to zero within the business sector or within the household sector, they are not counted as part of the circular flow of economic activity.

Figure: Circular Flow Diagram



Legend: The more complicated version of the *circular flow diagram.* This version is complicated by the addition of the government and financial markets to the diagram. Not all final goods and services are bought by households. Some are bought by the government (which taxes and borrows to raise its resources). Some are bought by businesses seeking to invest (which raise the needed resources by issuing stock, issuing bonds, and borrowing--all of which take place in *financial markets*). This version is also complicated by its recognizing that there is a world outside: a world outside that buys the products of domestic businesses, and that also invests through domestic financial markets.

Tracking the Circular Flow

Let's take a look at one particular piece in the circular flow: a dollar paid out by a business as a dividend to a shareholder.

When the dividend check is deposited, it becomes part of the shareholder's household income. Suppose that the household doesn't spend it, but simply keeps the extra money in the bank--saves it. The bank will notice that it has an extra dollar of deposits. It will loan that dollar out to a business seeking extra cash to add to its inventory. That business will then spend the dollar buying goods and services as it builds up its inventory. (It may buy them from the very company that originally issued the dividend check.) As soon as the dollar shows up as a component of investment spending, the circular flow is complete: the dollar has flowed from the business sector to the household sector, then flowed (as part of the flow of savings) into financial markets, and last flowed out of financial markets as part of business investment spending.

Different Measures of the Circular Flow

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

Economists also measure the level of economic activity at the point in the circular flow where businesses pay households for factors of production. Businesses need labor, capital, and natural resources to make things. All these factors of production are owned by households. When businesses buy them, they provide households with their incomes. This is total income or national income. It is the measure of the circular flow on the "income side."

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

The measure used most often is the expenditure side measure: GDP. If we compare the expenditure side measure of GDP with the income-side or uses-of-income-side measure of the circular flow, we find that (aside from differences created by different accounting conventions) they are equal. They are equal because the circular flow principle is designed into the National Income and Product Accounts (NIPA). Every expenditure on a final good or service is accounted for as a payment to a business. Every dollar payment that flows into a business is then accounted for as paid out to somebody. It can be paid out as income--wages, fringe benefits, profits, interest, or rent. It can be paid out to buy goods from another business, which then pays it out to somebody.

What if you do not want to do any of these three things with a piece of your income? Suppose you simply take the dollar bills that are your income and use them to buy something old and precious from another household--a bar of gold, say. And suppose you then keep the bar of gold in your basement. Doesn't this break the circular flow?

No, it doesn't. You no longer have the income, but the household that you bought the gold ingot from does. It will then either spend it on consumption goods, save it, or have it taxed away.

What if you decide that you are just going to take the dollar bills themselves and hide them in your basement? Then the Bureau of Engraving and Printing will notice that the total number of dollar bills circulating in the economy has dropped. It will print up more dollar bills, and hand them to the Treasury. The government will spend these extra dollar bills that replace the ones you have hidden.

The net effect is as if you had saved that portion of your income by loaning it out to the government and bought a Treasury bond--a promise by the government to repay your principal plus interest at the set time that marks the duration of the loan. There are only two differences. The first is that you have a stack of dollar bills in your basement rather than a piece of paper with the words "Treasury bond" written on it. The second is that the government doesn't pay interest on dollar bills hidden in your basement, while it does pay interest on bonds. You have saved this portion of your income in an inferior way by effectively making the government an interest-free loan.

Unemployment.

- Why does a given business-cycle swing – a fall of say, 5-percent in output relative to the long-run potential growth path of the American economy – have such big effects on economic welfare?
- Because the *distribution* of the costs of unemployment – and thus the business cycle – is so unequal.
- One of the major presumptions of the remainder of this course is that business-cycle fluctuations are, in a sense, very odd – much bigger than you would expect given the "normal" workings of a market economy as a social calculating mechanis for deciding what and how much to produce.
- Note, once again, the centrality of the *Great Depression* in our experience over the past century. We would all sleep much, much easier if you could guarantee that nothing like the Great Depression will ever come again.

Calculating the Unemployment Rate

Keeping unemployment low is one of the chief goals of macroeconomic policy. The unemployment rate is a key indicator of economic performance. An economy with persistent high unemployment is its productive resources. It has an overall level of output below its productive potential. And it almost surely has a low level of social welfare. Being unemployed is not pleasant. Fearing that one might become unemployed for no reason other than the turning of the wheel of the macroeconomy is not pleasant either.

Every month the Labor Department's Bureau of Labor Statistics [BLS] sends interviewers to talk to 60,000

households in a nationwide survey, the Current Population Survey [CPS]. It uses this CPS to estimate the unemployment rate: the fraction of people who (a) wanted a job, (b) looked for a job, but (c) could not find an acceptable job.

The BLS classifies the people it interviews into four categories:

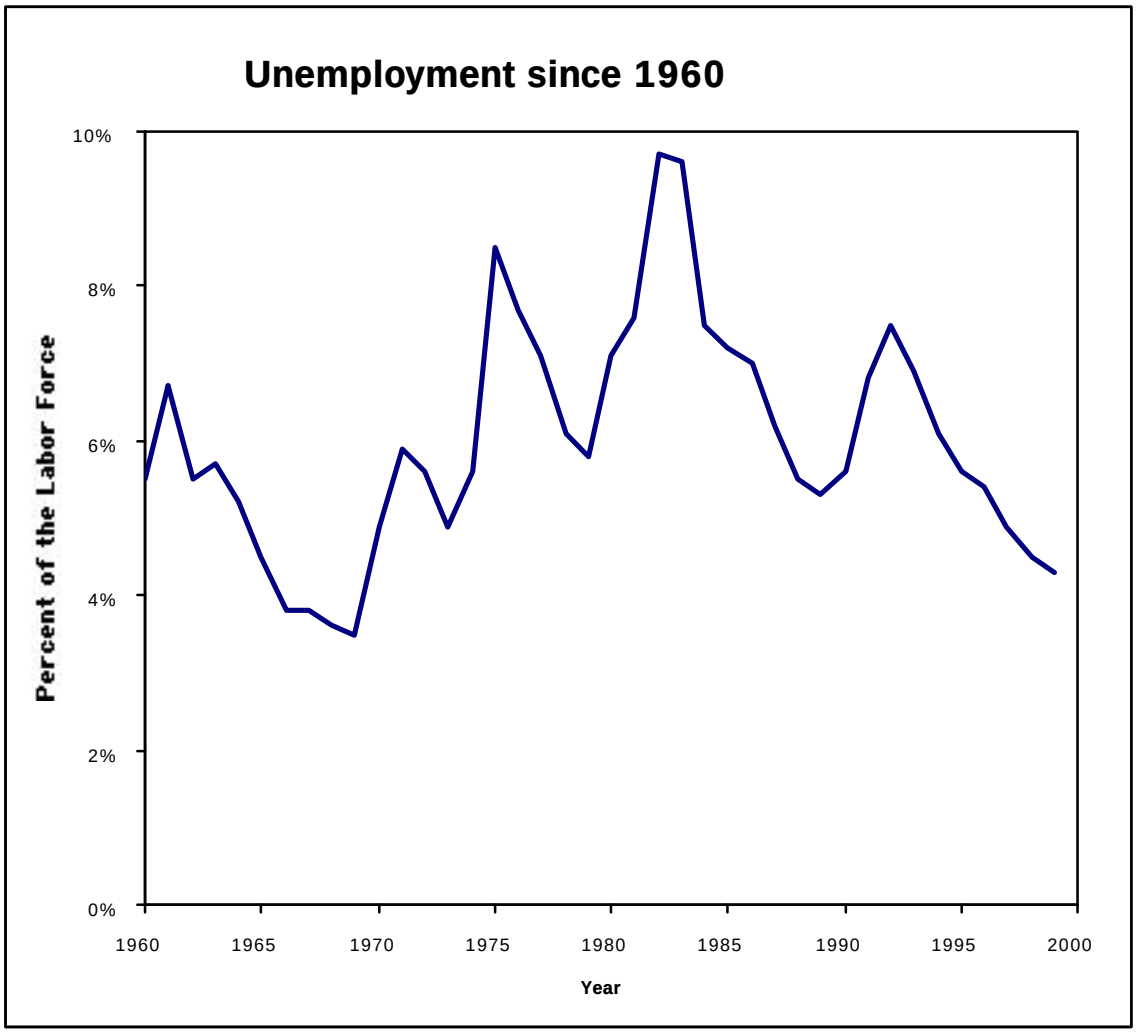
(1) Those who were employed--had a job, of some sort.

(2) Those who were out of the labor force and did not want a job right now.

(3) Those who did want a job right now, but who had not been looking because they did not think they could find one they would take.

(4) Those who did want a job right now, had been looking, but had not found a job that they would take.

Chart: The Unemployment Rate since 1960



Legend: The average unemployment rate rose from 4.5 percent in the 1960s to about 6 percent in the 1970s and 7 percent in the 1980s before falling back to less than 5 percent in the second half of the 1990s. Superimposed on these slow ups and downs are the more rapid rises of unemployment rate in business cycle recessions, and declines in unemployment in business cycle expansions.
Source: 1999 edition of the *Economic Report of the President* (Washington, DC: Government Printing Office).

The *labor force* is group (1) plus group (4): those who had plus those looking for jobs:

$$Labor\ \ Force = (Employed) + (Looking\ \ for\ \ Work)$$

The unemployment rate is the unemployed divided by the labor force:

$$Unemployment\ \ Rate = \frac{Looking\ \ for\ \ Work}{Labor\ \ Force} = \frac{Looking\ \ for\ \ Work}{(Employed) + (Looking\ \ for\ \ Work)}$$

In contrast to the inflation rate--a *flow* variable--the unemployment rate is a stock variable. It makes perfect sense to say that the current unemployment rate is 4.1 percent--with no unit of time added.

The official unemployment rate may underestimate of the real experience of unemployment. Someone in group (3)--who wants a job but has given up looking--may feel as unemployed as someone in group (4). Perhaps *discouraged workers* should be included, and the BLS should report a higher unemployment rate. Some in group (1) have part-time but want full-time jobs. Perhaps these *part-time for economic reasons* should be counted as unemployed--or as half-unemployed.