Measuring Macroeconomic Performance

Suppose that someone asked you to evaluate the performance of a major league baseball player—say, Jeff Bagwell. You are asked to evaluate how well he is performing now, and how his performance has changed over time. How would you undertake such an analysis? Well, you would probable examine things such as Bagwell's batting average, slugging percentage, on-base percentage, home runs per at bat, and many other statistics. You would evaluate how these statistics compare to other major leaguers, and how the statistics have varied over Bagwell's career.

Sports enthusiasts and statisticians have developed many statistics to measure the performance of baseball players. Similarly, macroeconomists and statisticians have developed many statistics to measure the performance of the economy. We shall introduce some of these macroeconomic statistics in this set of notes.

Some popular macroeconomic statistics measure:

- aggregate output: the value of total production of goods and services in the economy.
- aggregate income: the total amount of income received by all citizens in the economy
- average price level: the average level of prices of a large number of goods and services produced in the economy.
- unemployment rate: the portion of the nation's adult population that cannot find work.

Aggregating means "collecting and summing."

A product can be either a good or a service. A good is a tangible product, such as a hammer. A service is an intangible product, such as a psychiatrist's advice.

We shall discuss some specific statistics that measure output, income, prices, and unemployment below. By following how these statistics change over time, we can gauge how well the economy is performing over time.

Measuring Aggregate Output

Perhaps the most popular measure of the performance of the economy is the measure of the total value of the goods and services produced in the economy—aggregate output. Indeed, when one discusses the "size" of an economy, one usually is referring to the value of the output produced in the economy.

The most popular measure of the aggregate output of an economy is known as Gross Domestic Product, also known as GDP:

Gross Domestic Product is the total value of all final goods and final services produced in the economy (over a specified amount of time, such as a year).

Let's dissect this definition:

- How do statisticians determine the value of a good or a service?
  Usually the selling price of the good or service is used as its value. (Why? Economists assume that if you willingly buy something, then it must have a value to you of at least the price that you paid for it. Otherwise, why would you voluntarily buy it?)
  Example 1: You buy a pizza for $10. The statistician counts the value of that pizza at $10 in the GDP.
- *What's a final good and what's a final service*?
  One can categorize a good or a service into two types: final or

intermediate. An intermediate good or an intermediate service is used as an ingredient in another good or service. In contrast, a final good or a final service is never used as an ingredient in another good or service.

Example 1: You buy a pepperoni pizza. The pizza is a final good—its value is included in the GDP calculation. The cheese, flour, tomato sauce, etc. are intermediate goods whose value is not directly included in the GDP calculation

Example 2: You buy a new Ford Taurus, made in Detroit, to drive around town. The Taurus is a final good—its value is included in the GDP. The tires, radio, leather seats, headlights, etc. are intermediate goods whose value is not directly included in the GDP calculation.

Example 3: You buy a Toshiba digital camera made in Japan. This good is excluded from the U.S. GDP calculation, since it is not produced in the U.S. economy.

Why aren't intermediate goods/services included directly in the GDP calculation? Because the values of intermediate goods/services are already reflected in the price of final goods/services. Consider a Ford Taurus, for which you paid $16,000. Would you have paid $16,000 if the car had no tires or seats? No way! The values of the tires, seats, and all other intermediate goods contained in the Taurus are already reflected in the selling price of the Taurus.

Calculating GDP

There are many ways to calculate GDP. We'll eventually discuss three specific ways to calculate GDP; all of these calculations, if done without error, should arrive at exactly the same value for GDP. First, here's the most obvious way to calculate GDP, sometime known as the direct method:

The direct method: the easiest way to explain this method is to do an example for a hypothetical (i.e. fake) economy. So let's pretend that in the fake economy of Publand, only two final goods (and no final services) were produced in 1999—pepperoni pizzas and root beers. More specifically, in 1999 400 pizzas were produced and sold for $10 each, and 1000 root beers were produced and sold for $2 each.

Publand's 1999 GDP	= total value of pizza	+ total value of root beer
	= $10 x 400	+ $2 x 1000
	= $4000	+ $2000
	= $6000	

Next, let's consider another way to calculate GDP, sometimes know as the expenditure method. Suppose we asked each and every buyer in Publand how much money he/she spent on pizza and root beer in 1999, and we summed the total (hey! we just aggregated!). What total value would we get? Yes….$6000! (This assumes that there were no exports of pizza or root beer out of Publand.)

The general idea: All products are either purchased or build up in a firm's inventories.

So, we can calculate GDP indirectly by aggregating all of the expenditures of all buyers of goods and services produced in the economy, then add any increase in firms' inventories. This is commonly done by separating expenditures into categories as follows:

GDP = sum of all expenditures on final goods and services

GDP = personal consumption expenditures
+
gross private domestic investment
+
government purchases of final goods and services
+
exports of final goods and services
–
imports of final goods and services

Abbreviated:

GDP = C + I + G + EX - IM

Let's discuss these different categories of expenditures:

Personal consumption expenditures (also known as consumption, abbreviated C):

This is the sum of all expenditures on final goods and services by consumers, excluding purchases of new housing.

Example: Your purchases of pizza, your rent of apartments, your college tuition payment, your digital camera purchases—all are included in this category. If you buy a new house—it ain't in this category.

Since houses aren't really consumed—they are usually still standing long after the consumer is gone—houses are not included in the consumption category.

Gross private domestic investment (also known as investment, abbreviated I):

This category includes:

- Nonresidential investment: Purchases of final goods and services by firms
- Residential Investment: Purchases of new housing
- Inventory investment: Increase in the aggregate value of firms' inventories. (If inventories decrease, then inventory investment is negative.)

Examples: If Ford buys a robot, then it's included in nonresidential investment. If you buy a house, then it's in residential investment. If Compaq's inventory of unsold computers rises, then it's in inventory investment.

Careful! the term Investment is used differently by macro-economists than it is by people in the financial world who trade stocks and bonds!

Government Purchases of Final Goods and Final Services (abbreviated G):

Any time that any government in the economy—Federal, state, or local—buys a final good or a service, then it's included in this category.

(Warning! When government gives money away without buying anything, e.g. when it pays unemployment benefits, this is known as a transfer payment; it is not a purchase, and therefore transfer payments are not directly included in G or in any category of expenditures.)

Examples: If government buys a tank or pays to build a highway, then these are included in G. If government pays Social Security benefits, then these are not included in G.

Exports of final goods and final services (also known as Exports, abbreviated EX):

When a buyer located in another country buys a final good or service that was produced in the U.S. then this is part of U.S. exports.

Examples: If a Japanese consumer buys an IBM server made in Alabama, then it's in U.S. exports. If a Canadian buyer buys a Honda Accord made in Ohio, then it's included in U.S. exports.

If we subtract imports from exports, EX – IM, then we have what's called net exports. If net exports is a negative number, then the economy has a trade deficit.

Imports of final goods and final services (also known as Imports, abbreviated IM):

Notice that imports are subtracted in the GDP calculation. Why? Hey, I'm so glad that you asked. Here's the reason. Remember, when we calculate GDP we're trying to calculate the production of final goods and services produced in this economy; we want to exclude imported stuff. Well, here's the thing: included in C, I, and G are imports, because consumers firms and governments buy imported things. We need to subtract these imports if we want a calculation of GDP. So we do it here, by subtracting IM. Fascinating, ain't it?

Example: When a consumer buys a digital camera, it's included in IM. When a firm buys a foreign robot, it's in IM. When a government buys a foreign camcorder, it's in IM.

A real world example of the expenditure approach:

Here's U.S. GDP for 1999. (The U.S. economy is by far the world's largest economy; that is, it has the largest GDP by far. No other country's GDP is even half the U.S. total.)

U.S. 1999 GDP (rounded, in $billions) = C + I + G + EX – IM
= 6268 + 1650 + 1634 + 990 – 1244
= 9299

That's 9 trillion, 299 billion dollars!

And now, a third way to calculate GDP: the Income Approach

Suppose that you run a business, and folks spend a lot of money buying your products. What do you do with all of that money? All of these:

1. Pay your workers and suppliers—income for them
2. Keep some of the money as income for yourself
3. Pay sales taxes to government
4. Replace or repair equipment that's wearing out

Well, Items 1 and 2 above are earned income. Item 3 is a type of indirect business tax. Item 4 is called depreciation.

Let's generalize this example of one firm to the whole economy. Remember, that GDP—the total value of the output of all producers, is the sum of all money that firms take in from people buying their products. What happens to this GDP? Well, most of it is paid as income to people—the national equivalent of items 1 and 2. Some of it is paid as indirect business taxes to government. The rest is used to replace or repair worn out equipment.

Indirect business taxes are taxes paid by firms on products sold; sales taxes and gasoline taxes are examples.

We can use the information in the above paragraph to derive a specific relationship between GDP and national income. First, a definition of national income:

National income is income earned by the economy's citizens for supplying factors of production (such as labor) to producers.

So here's the thing. When firms located in the U.S. pay out money that is received by people as income, most of it goes to Americans, and this is our nation's national income. But, some of this money is paid to foreigners, because some production in the U.S. takes place in foreign-owned firms; this is called net factor payments to the rest of the world.

What's the term used for the payments needed to replace worn out equipment? Depreciation! More specifically, depreciation is the reduction in value of installed capital equipment.

Now that we have these definitions straight, we're ready to show where the GDP goes—that is, what the producers do with the money they receive for selling their products:

A factor of production is anything that a firm needs to produce a product that is not an ingredient in the product. Examples: labor, robots, manufacturing plants.

Warning! Do not confuse national income with disposable personal income, a measure of income that we'll discuss later in these notes.

GDP = national income
+
net factor payments to the rest of the world
+
indirect business taxes
+
depreciation

Notice that if we rearrange the above equation we get another way to express the relationship between national income and GDP:

national income = GDP – net factor payments to the rest of the world
- indirect business taxes – depreciation

Hey, who cares about the relationship between GDP and National Income? Well, it ain't the most important thing in life. The most important thing in life is to have an ample supply of peanut butter M&Ms on hand when typing notes. But I digress. We'll see the importance when we start to build models of the economy later in the semester. One goal is to increase the incomes of citizens—increase the national income—thus increasing the material standards of living of citizens. Perhaps you can tell from the last equation that if we can increase the level of production in the economy—the GDP—then we will also probably increase national income, making people materially better off.

A Closer Look at National Income

You're dying to know the five major components of national income, right? Here they are. (All of these are considered *earned* income; that is, people are supplying something of value to producers in exchange for this income)

National income = compensation of employees + proprietors' income
+ corporate profits + net interest + rental income

Another Measure of Income: Disposable Personal Income

Most of us work, and we know that there is a difference between the amount of income that we earn and the amount that we have left over to spend once government gets involved:

Disposable personal income is income available for spending and saving by households.

What is the relationship between National Income and Disposable Personal Income? Glad you asked. The government takes some of our earned income away as personal income taxes. They also take money away as FICA taxes (also known as social insurance taxes) Also, most corporate profits (which are a component of national income) are kept by corporations; only the dividends are actually given to households to spend or save. Finally, individuals receive unearned income, including interest income received from governments and other consumers, and government gives unearned income—transfer payments—to some individuals.

So, to go from National income to disposable income we must:

--subtract personal income taxes
--subtract FICA taxes
--subtract all of corporate profits except for dividends
--add interest earned from governments and other consumers
--add transfer payments

Once individuals have this disposable personal income, what do they do with it? One of these things:

1. Spend it (This is consumption!)
2. Save it (This is personal savings!)
3. Pay interest on debts to businesses (such as credit card interest)
4. Send money to foreigners.

To summarize this disposable personal income thing:

This equation summarizes the relationship between disposable personal income and national income:

disposable personal income = national income – personal income taxes
- FICA taxes – (corporate profits – dividends)
+ interest earned from government and consumers
+ transfer payments

and this equation summarizes what individuals do with their disposable personal income:

disposable personal income = personal consumption expenditures +
personal savings +
interest payments to business +
personal transfers to foreigners

Preview of coming attractions: Notice that if government cuts taxes, this leaves individuals with more disposable personal income. They will likely spend some of this income, causing higher consumption. Since consumption is a component of GDP, GDP rises. We will see these cause & effect relationships more clearly later in the semester when we build our models of the economy.

Measuring Performance Over Time: Real Statistics are Better than Nominal Statistics

Here's a brief example that illustrates the difficulty in measuring changes in the performance of the economy (or of any other thing that is measured in dollars) over time:

In 1960 an entry level accountant earned $10,000 annually. In 1999 a worker at McDonald's earned $12,000 annually. Whose income had greater purchasing power? Answer: the accountant in 1960. Why? Because prices were much, much higher in 1999 than in 1960.

Inflation—the general rise in the average level of prices over time—makes it difficult to compare statistics measured in dollars over time. Everyday statistics observed by everyday people—known as nominal statistics by economists—have a fatal flaw—they change due to inflation. One should NOT use nominal statistics to try to gauge changes in the economy (or anything measured in dollars) over time.

One definition of nominal is "normal."

Hey…it's difficult to measure changes in the economy over time, but it ain't impossible—hah!!! Economists have developed a technique to deflate nominal statistics—to remove the effects of inflation from changing the statistics over time. They call these deflated statistics real statistics.

Moral: Use real statistics to measure changes in economic performance over time. Do not use nominal statistics.

Deflating Nominal Statistics to Real Statistics: An Example, Using GDP

Just how do economists deflate nominal statistics into real statistics? We shall demonstrate, using GDP of a hypothetical economy as an example. Keep in mind, however, that this same technique can be used to deflate any statistic measured in dollars from nominal to real—consumption, wages, national income, etc.

Consider the fake economy of Sourland, where only two final goods and/or services are produced—pickles and lemons. In the table below, I list the quantity of pickles and lemons produced during three recent years, along with the price per pickle and price per lemon in each of those years.

year	Quantity of pickles	price per pickle		quantity of lemons	price per lemon
1997	10	$3		2	$7
1998	20	$4		4	$9
1999	20	$5		4	$11

First, let's calculate nominal GDP for each year. (Later, we'll remove the effects of inflation, calculating real GDP for each year.) Remember, nominal GDP for a year is the total value of the production of that year, which could have been observed and calculated by anyone in that year. *Nominal GDP is calculated using the prices of the goods/services in the year that they were produced.*

1997 nominal GDP = Value of pickles produced in 1997 + value of lemons produced in 1997
= (10 x $3) + (2 x $7) = $44

1998 nominal GDP = Value of pickles produced in 1998 + value of lemons produced in 1998
= (20 x $4) + (4 x $9) = $116

1999 nominal GDP = Value of pickles produced in 1999 + value of lemons produced in 1999
= (20 x $5) + (4 x $11) = $144

We'd like to be able to use GDP measured over the years to measure how fast the economy is really growing over time—that is, how fast the actual production of goods and services is growing over time. Perhaps you can see, using our Sourland example, that *we should NOT use nominal GDP to measure how fast production is growing over time*. Let me explain:

When the value of a statistic doubles, it grows by 100%. Sourland's economy grew by 100% from 1997 to 1998

Suppose we want to measure how much greater production was in Southland in 1998 compared to 1997. We can actually figure this out, in this simple fake economy, without any GDP statistic. Just look at the table on the previous page. Production of pickles doubled from 10 to 20 from 1997 to 1998, and production of lemons also doubled (from 2 to 4) from 1997 to 1998. Hence we can conclude that the economy doubled in size from 1997 to 1998.

But look at the nominal GDP statistics for 1997 and 1998: nominal GDP grew from $44 to $116—much more than double! If we were dumb enough to use nominal GDP as a true measure of production, then we would get an overstated amount of growth in production compared to the actual growth amount! Oh, what a disaster! It's worse than being on the Titanic with Britney Spears and those 'Nsync dudes!

Indeed, '97-'98 nominal GDP growth = ($116-$44)/$44 = 1.64, or 164%

We get similar problems if we try to use nominal GDP to measure Sourland's growth from 1998-1999. Looking at the table on the previous page, we can see that production was exactly the same in 1999 as it was in 1998—20 pickles and 4 lemons. Yet nominal GDP grew from $116 to $144 from 1998 to 1999. If we were dumb enough to use nominal GDP to measure GDP growth, then we would mistakenly conclude that the economy grew from 1998-1999 when in fact it did not. Oops…I did it again!

Let's avoid this disaster—remember: never use a nominal statistic to measure changes over time! Instead, let's develop a real statistic—real GDP. It's not too difficult; to remove the effects of inflation from real GDP, we freeze the prices of all products to equal their values in a fixed base year:

When calculating real GDP, the values of goods and services are frozen at their prices in a chosen base year—no matter when the goods and services are produced.

In the real world, one wants a fairly recent base year. But one can't change it too often, for practical reasons.

Let's calculate real GDP for Sourland. We need to pick a base year. I shall randomly pick 1997 as the base year. In 1997 pickles were priced at $3 each; hence we shall value each pickle at $3 no matter when it was produced. Similarly, in 1997 lemons were priced at $7 each; hence we shall value each lemon at $7 no matter when it was produced. So, real GDP in each year is:

1997 nominal GDP = Value of pickles produced in 1997 + value of lemons produced in 1997
= (10 x $3) + (2 x $7) = $44

1998 nominal GDP = Value of pickles produced in 1998 + value of lemons produced in 1998
= (20 x $3) + (4 x $7) = $88

1999 nominal GDP = Value of pickles produced in 1999 + value of lemons produced in 1999
= (20 x $3) + (4 x $7) = $88

Notice how the value per pickle is fixed at $3 and lemons at $7—their prices in the base year of 1997.

Oh, the joys of being alive! Notice how real GDP doubled from 1997 to 1998? This is the correct measure of the growth of the economy, since pickle and lemon production doubled from 1997 to 1998. Notice also that real GDP remained constant from 1998 to 1999? This is also a correct growth measure, since pickle and lemon production remained constant from 1998 to 1999.

Notice also that real GDP equals nominal GDP in the base year. This is logical, since both measures are using 1997 prices in their calculation.

Moral repeated: Use real statistics—NOT nominal statistics—when measuring the performance of a variable over time. This moral holds true not only for GDP, as in our Sourland example, but also for income, wages, consumption, profits, and anything else that's measured in dollars.

Measuring Inflation

We know that prices rise over time, and we'd like to measure how fast prices are rising, on average, over time. When we do this, we are measuring inflation:

"Basket" just means "group"

Inflation is the increase in the average price level of a basket of goods and services over time.

To measure inflation, clearly we need somehow to measure the average price level of a basket of goods over time. When we do this for a specific basket of goods and services, we are creating a price index:

A price index measures the average price level of a basket of goods at different points in time.

In the U.S. there are a number of different price indices calculated by the U.S. government (and many more calculated by nongovernment economists). I shall mention two here:

Every price index has a base year; usually, the index is constructed so that it equals 100 in the base year. As prices rise over time, the value of the price index also rises.

1. The consumer price index (CPI) measures the average price level of approximately 10,000 goods and services consumed by the "typical" urban consumer.

2. The (implicit) GDP deflator measures the average price level of all final goods and services produced in the economy.

How are these price indices constructed? It ain't witchcraft. The CPI is a weighted average of 10,000 goods and services, which were determined (using a Consumer Expenditure Survey) to be purchased by non-rural consumer. Each good or service is

given a weight in the CPI based upon the percentage of the typical consumer's budget that was spent on the good or service in the year that the survey was done (the CPI's base year).

The GDP deflator is fairly simple to calculate:

GDP deflator in year Z = (Nominal GDP in year Z / Real GDP in Year Z) x 100

(Why does this calculation result in a price index? Well, the exact mathematical proof is beyond the scope of this course. But here's the intuition: remember, nominal GDP rises over time for TWO reasons—because production rises AND because price rise. But real GDP only rises for ONE reason—because production rises. So if we divide nominal GDP by real GDP, we are roughly doing this:

price increase x production increase / production increase

The "production increase" cancels out in the division, and we are left only with a measure of price increases—exactly what a price index measures.)

Hey! Let's use our Sourland example to calculate a price index for Sourland—the GDP deflator! For ease of exposition, in the table below I repeat the calculations that we did in the previous pages for Sourland's real GDP and nominal GDP:

year	nominal GDP	real GDP	GDP deflator
1997	$44	$44	($44/$44) x 100 = 100
1998	$116	$88	($116/$88) x 100 = 132
1999	$144	$88	($144/$88) x 100 = 164

In a real economy, there isn't one inflation rate; there are as many inflation rates as there are price indices.

Notice that the GDP deflator equals 100 in 1997—the base year. Let's use the GDP deflator to calculate inflation rates for Sourland. (An inflation rate is the percentage change in the average price level over some amount of time.)

1997-1998 inflation rate = (132 – 100) / 100 = .32 or 32%

1998-1999 inflation rate = (164 – 132) /132 = .24 or 24%

1997-1999 cumulative inflation rate = (164 – 100) / 100 = .64 or 64%

Inflation in the U.S.:

The annual inflation rate in the U.S. has averaged between 2% and 4% for most years during the late 1960s, late 1980s and 1990s. In the 1970s and early 1980s, however, inflation rates were sometimes much higher; in 1980, for example, the inflation rate, measured using the CPI, was 13.5%.

Some U.S. CPI numbers:

year	U.S. CPI
1913	10.0
1950	25.0
1970	39.8
1983	100
1995	151.5
1996	155.8
1997	159.9
1998	162.3
1999	165.4

That's right: it's Clark Kent

This Dude Worries About Inflation. Who Is He?

Costs of Inflation:

What's so bad about inflation?

Myth: Inflation erodes purchasing power

It is simply not true that inflation systematically erodes purchasing power over time. Don't believe me? Compare the 1913 and 1999 CPIs for the U.S. Prices today are 16 times higher today than they were in 1913. Yet we all know that Americans have a much higher purchasing power today than in 1913. You see, inflation pushes up not only prices, but also nominal incomes.

Exception: hyperinflation, defined as "really high" inflation (say, 100% or more annually) does erode purchasing power. The only cause of hyperinflation: government printing way too much money.

True: Inflation has menu costs

If prices rise, business must periodically alter the price lists that tell their customers how much their products cost. This is a waste of valuable resources, known as menu costs.

True: Inflation has shoe leather costs

When inflation is high, interest rates tend to rise. But of course, if you have cash in you wallet, it earns zero interest. So during times of high inflation, people keep more of the wealth in interest-bearing accounts and less in their wallets. But when they need money to spend, they have to go to their financial institution to get cash. This results I far more trips to the financial institution than under low inflation conditions. What a waste of valuable time. This is known as shoe leather costs.

True: Unexpectedly HIGH inflation redistributes purchasing power from lenders to borrowers.

Suppose you want to buy a $10 pizza but have no cash. So you ask Grandma for a $10 loan, which you promise to repay next week. Grandma was about to buy her own pizza, but because she loves you, she lends you the $10 and you eat the pizza.

Unexpectedly, all prices suddenly double (so a pizza costs $20).

Now when you repay Grandma, she can't buy a pizza! In effect, you borrowed 1 pizza's worth of money from her and only repaid her ½ pizza's worth of money.

Grandma, the lender is worse off. You, the borrower, are better off.

If Grandma had expected the inflation, then she would have asked for $20 back and been unharmed by the inflation.

(If you have a lot of student loans with fixed interest rates, like me, then you want inflation to be high. Or if you have a big mortgage with a fixed interest rate, you want inflation to be high. Remember: inflation will probably not erode your earnings, but it will reduce the burden of your debts.)

In the real world, the interest rate paid on loans can be "indexed" for inflation, rising when inflation rises and falling when inflation falls, to protect against the capricious effects of unexpected inflation.

True: Unexpectedly LOW inflation redistributes purchasing power from borrowers to lenders.

Suppose you want to buy a $10 pizza but have no cash. So you ask Grandma for a $10 loan, which you promise to repay next week. Grandma was about to buy her own pizza, but because she loves you, she lends you the $10 and you eat the pizza.

Unexpectedly, all prices suddenly fall by 50% (so a pizza costs $5).

Now when you repay Grandma, she can buy 2 pizzas! In effect, you borrowed 1 pizza's worth of money from her and only repaid her 2 pizza's worth of money.

Grandma, the lender is better off. You, the borrower, are worse off.

Very True: High inflation is also unstable, making planning difficult, hampering long term economic growth.

This is probably the most burdensome problem with inflation. When it is high, it is unstable, and businesspeople have difficulty making plans because they do not know how high prices and wages will be in the future. In effect, high inflation increases uncertainty; this tends to reduce long term economic growth.

Unemployment

Inflation and unemployment are sometimes called the "twin evils" of macro-economics.

What is it:

To define the unemployment rate, we must also define the terms *unemployed*, *employed* and *labor force*:

A person is officially unemployed if he/she meets all of the following criteria:

1. 16 years or older
2. Not working at all for pay (not even for an hour a week).
3. Seeking work

A person is officially employed if he/she meets all of the following criteria:

1. 16 years or older
2. Working for pay

The labor force is the sum of the officially unemployed and officially employed

Labor force = employed + unemployed

Now, let's define the unemployment rate:

Unemployment rate = unemployed / labor force

Example: U.S. unemployment rate, July 2000:

= 5,650,000 / 140,399,000 = .0402 , rounded to 4%

Notes: The official unemployment rate is an imperfect measure of the current state of the labor force, since it does not account for

--discouraged people who have given up looking for work
--people working part time who would rather be working full time
--people working at jobs that do not suit their skill levels

Why are people unemployed?
Sometimes economists categorize the source of unemployment into one of the following (somewhat arbitrary) categories:

Categories of unemployment:

Structurally unemployed: people who have no skills to suit virtually any available type of job.

Frictionally unemployed: Well-qualified new entrants to the work force and well-qualified people between jobs who are searching for work. (This is sometimes known as *good* unemployment, because these people are looking for a job to suit their skills—this is good for them and good for the economy.)

Cyclically Unemployed: When there is insufficient national production (GDP) to employ all well-qualified people. This is the type of unemployment that concerns macroeconomists.

Note: The "best" unemployment rate is certainly not 0%, since one does not want to eliminate all frictional unemployment; it is good for people to spend time finding a job to match their skills, rather than taking the first job that comes along.

Full Employment:
When the economy is functioning well, there is sufficient GDP so that all people with good job skills who want to work are either working or can find work if they look for a reasonable amount of time. Full employment is the lowest level of employment at which cyclical unemployment is zero.

The full employment unemployment rate (also known as the natural unemployment rate) is the highest unemployment rate at which cyclical unemployment is eliminated.

Full employment GDP (also known as potential GDP) is the lowest level of GDP at which cyclical unemployment is eliminated.

What is the natural unemployment rate in the U.S.? Macro-economists disagree, placing it somewhere between 3.5% and 5%.

Note: When the economy is operating at full employment, the unemployment rate is not zero. Only cyclical unemployment is zero; all other types of unemployment may be at nonzero levels.

Costs of cyclical unemployment:

1. Output lost forever. When there is cyclical unemployment, people with good job skills are idle—unused. This is a waste of valuable resources, resulting in lower production that can never be regained (since one cannot turn back time—alas!).
2. UnAmerican? Americans like to believe that each individual can succeed if he/she puts enough effort into life. This ain't true when there's cyclical unemployment, since many people who have worked hard to acquire good job skills cannot find any job, despite their best efforts.

Macroeconomic Goals: 0% unemployment and 0% inflation? No!!!

One might think that government should set a goal of 0% unemployment and 0% inflation, to rid the economy of the costs of these evils. But no!

--Some unemployment (frictional) is good.

--As we'll see in detail later, some methods that government has to reduce unemployment result in higher inflation in the short run.

-- As we'll see in detail later, some methods that government has to reduce inflation result in higher unemployment in the short run.

This short run tradeoff that sometimes exists between inflation and unemployment is called the Phillips Curve tradeoff. More about this later in the class.