PART I: PRELIMINARIES
Chapter 1: Introduction to Macroeconomics

J. Bradford DeLong
http://www.j-bradford-delong.net/
delong@econ.berkeley.edu

9,118 words

Questions

1. How much richer are we than our parents were at our age?

2. How much richer will our children be than our grandparents were?

3. Will changing jobs be easy or hard in five years?

4. How many of us will *have* jobs in five years?

5. Will the businesses we work for vanish as demand for the products they make dries up?

6. Will inflation make us poor by destroying our savings or rich by eliminating our debts?

1.1 Overview

What Is Macroeconomics?

What is macroeconomics? *Macroeconomics* is that subdiscipline of economics that tries to answer the six questions that begin this chapter. Answers to all these questions depend on what is happening to the economy as a whole, the economy-in-the-large, the *macroeconomy*. "*Macro"* is, after all, nothing but a prefix for "large." Macroeconomics is that branch of economics related to the economy as a whole.

Macroeconomists' principal task is to try to figure out why overall economic activity rises and falls. Why are measures like the total value of all production, the total income of workers and property owners, the total number of people employed, or the unemployment rate higher in some years than in others? Macroeconomists also attempt to understand what determines the level and rate of change of overall prices. The proportional rate of change in the price level has a name you have undoubtedly heard thousands of times: it is called the *inflation rate*. Finally, along the way macroeconomists study other variables--like interest rates, stock market values, and exchange rates--that play a major role in determining the overall levels of production, income, employment, and prices.

Why Macroeconomics Matters

Why does macroeconomics matter? Why should we care about the questions at the heart of macroeconomics? There are at least three reasons.

Cultural Literacy

First (but least important), macroeconomics is a matter of cultural literacy. Much discussion in newspapers, on television, and at parties concerns the macroeconomy, which should not be surprising: the twentieth-century U.S. economy has been, all in all, extraordinarily successful. Today we are on average some 50% richer than our parents were when they were our age. If economic growth continues at its recent pace, our children may be five or more times as rich as our grandparents were.

In su, our modern industrial economy has delivered increases in material prosperity and living standards that no previous generation ever saw. (We shall discuss this topic at greater length in Chapter 5.) This increasing material prosperity means that the economy has a cultural salience today it did not have in previous centuries, when productivity was stagnant and material standards of living improved only as fast as a glacier moves.

Thus, if you want to follow and participate in public debates and discussions, you need to know about macroeconomics. If you don't, you won't underwstand news reports on changes in the economy, such as those listed in figure 1.1.

<NOTE TO EDITOR: ITEMS IN BLUE ARE TIME-SENSITIVE: THEY NEED TO BE UPDATED IMMEDIATELY BEFORE THE MS. GOES INTO PRODUCTION, AS CLOSE AS POSSIBLE TO THE PUBLICATION DATE...>

Figure 1.1: The Daily Flow of Economic News

Tuesday, February 13, 2001
10:49 am ET [PLUG] PLUG POWER INITIATED WITH 'BUY' RECOMMENDATION AT UBS WARBURG
10:48 am ET [MDTL] MEDIS TECHNOLOGY INITIATED WITH 'STRONG BUY' RECOMMENDATION AT UBS WARBURG

10:48 am ET [APWR] ASTROPOWER INITIATED WITH 'BUY' RECOMMENDATION AT UBS WARBURG
10:48 am ET [CPST] CAPSTONE INITIATED WITH 'BUY' RECOMMENDATION AT UBS WARBURG
10:47 am ET [FCEL] FUEL CELL ENERGY INITIATED WITH 'STRONG BUY' RECOMMENDATION AT UBS WARBURG
10:46 am ET [CF] CHARTER ONE FINANCIAL INITIATED WITH 'BUY' RECOMMENDATION AT UBS WARBURG
10:45 am ET [FTO] FRONTIER OIL Q4 EARNS 5 CENTS VS. 90 CENTS YR AGO QTR
10:44 am ET [$BTK,ATIS] AMEX BIOTECH INDEX CLIMBS 1.7%, ADVANCED TISSUE SCIENCES UP 4.3%
10:33 am ET [$GIN,VRSN] GOLDMAN SACHS INTERNET INDEX RISES 3.1%, LED BY VERISIGN UP 7.9%
10:22 am ET [$SOX,RMBS] PHILADELPHIA SEMICONDUCTOR INDEX CLIMBS 3.5%, LED BY RAMBUS UP 7.3%
10:15 am ET [NVLS] NOVELLUS SYSTEMS CUT TO 'SELL' FROM 'HOLD' AT WELLS FARGO VAN KASPER
10:14 am ET [OPMR] OPTIMAL ROBOTICS DROPPED TO 'MARKET OUTPERFORM' FROM 'STRONG BUY' AT ROBERT W. BAIRD
10:12 am ET [NFB,CBNY] NORTH FORK TO ACQUIRE COMMERCIAL BANK OF NEW YORK FOR $175 MLN IN CASH
10:11 am ET O'NEILL, IN HOUSE TESTIMONY, CALLS ON CONGRESS TO QUICKLY ENACT TAX RELIEF PACKAGE
10:10 am ET TREASURY'S O'NEILL: BUSH TAX PACKAGE 'JUST RIGHT' IN SIZE
10:04 am ET [$COMPQ] NASDAQ: UP 59 AT 2,459
10:04 am ET [$SPX] S&P 500: UP 5 AT 1335
10:04 am ET [$RUT] RUSSELL 2000: UP 4 AT 510
10:03 am ET [$INDU] DOW JONES INDUSTRIALS: UP 24 AT 10,970
10:02 am ET TREASURY'S O'NEILL: BUSH TAX PLAN PROVIDES RELIEF TO ALL INCOME TAX PAYERS

Figure Legend: Economic news and flows past us constantly throughout the day. The total volume of information is overwhelming. Thus one of the major problems of macroeconomics is figuring out how to process all this information—how to make sense of it without drowning in information overload and without throwing valuable news away.

Source: CBS Marketwatch, http://www2.marketwatch.com/newscenter/default.asp?doctype=rt&section=MWNews, February 14, 2002, 7:53 AM PST.

Self-Interest

A second (and more important) reason to care about macroeconomics is that the macroeconomy matters to you personally. Each of us is interested in particular issues in *micro*economics. Farmers and bakers are interestd in th eprice of wheat; computer manufacturers and users are interested in the price of microprocessors; and one of us is *very* interested in the price of economics professors. What happens in these individual markets--for wheat, for microprocessors, and for economics professors--shapes the lives of farmers, bakers, computer programmers, and economics professors.

But what happens in the macroeconomy shapes *all* our lives. A rise in inflation is sure to enrich debtors (people who have borrowed) and impoverish creditors (people who have lent money to others). An expanding economy will make real incomes rise. A deep recession will increase unemployment, and make those who do lose their jobs have a hard time finding others. 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.

Though you cannot control the macroeconomy, you can understand how it affects your opportunities. To some degree, forewarned is forearmed: whether or not you understand your opportunities may depend on how much attention you pay this course. The macroeconomy is not destiny: some people do very well in their jobs and businesses in a recession, while many do badly in a boom. Nevertheless it is a powerful influence on individual well-being.

To paraphrase Russian revolutionary Leon Trotsky: you may not be interested in the macroeconomy, but the macroeconomy is interested in you.

Civic Responsibility

A third important reason to care about macroeconomics is that by working together we can improve the macroeconomy. You get to vote, one of the most precious rights human beings have ever had. In electing our government, we indirectly make macroeconomic policy. As we will see in the next section, 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, candidates will present themselves and seek your vote. Those who win will try to manage the macroeconomy. If you are not literate in macroeconomics, you won't be able to tell those candidates might become effective macroeconomic managers from those who are clueless or cynical, promising more than they can deliver. For as Box 1.1 describes, some politicians do try to use macroeconomic policy for their own short-term political gain.

Box 1.1--Economic Policy and Political Popularity

Politicians believe strongly that their success at the polls depends on the state of the economy. They think that fairly *and* unfairly they get the credit when the economy does well and suffer the blame when the economy does badly. One of the most outspoken political leaders on this topic was mid-twentieth-century American politician Richard M. Nixon, who publicly blamed his defeat in the 1960 presidential election the Eisenhower administration's unwillingness to take action against an economic slump:

"The matter was thoroughly discussed by the Cabinet....[S]everal of the Administration's economic experts who attended the meeting did not share [the] bearish prognosis.... [T]here was strong sentiment against using the spending and credit powers of the Federal Government to affect the economy, unless and until conditions clearly indicated a major recession in prospect....I must admit that I was more sensitive politically than some of the others around the cabinet table. I knew from bitter experience how, in both 1954 and 1958, slumps which hit bottom early in October contributed to substantial Republican losses in the House and Senate.... The bottom of the 1960 dip did come in October.... the jobless roles increased by 452,000. All the speeches, television broadcasts, and precinct work in the world could not counteract that one hard fact."

Source: Richard M. Nixon, *Six Crises* (Garden City, NY: Doubleday, 1962), pp. 309-311:

Economic historians continue to dispute the causes of the "stagflation"--a combination of relatively high inflation and relatively high unemployment--that struck the American economy in the early 1970s, after Richard Nixon finally became President. Was it the result of his manipulation of economic policy for political goals so that during his 1972 reelection campaign the economy would look better than it had in 1960? The evidence is contradictory. But no matter how much Nixon's policy contributed to stagflation, all agrees that his major goal was not to create a healthier economy over the long term but to make the economy look good in 1972.

Macroeconomic Policy

Growth Policy

The government's *growth policy*--what it does to accelerate or decelerate long-run economic growth--is surely the most important aspect of macroeconomic policy. Nothing matters more in the long run for the quality of life in an economy than its long-run rate of economic growth.

Figure 1.2: Long-Run Economic Growth: Rapid in Sweden, Slow in Argentina, 1900-2000

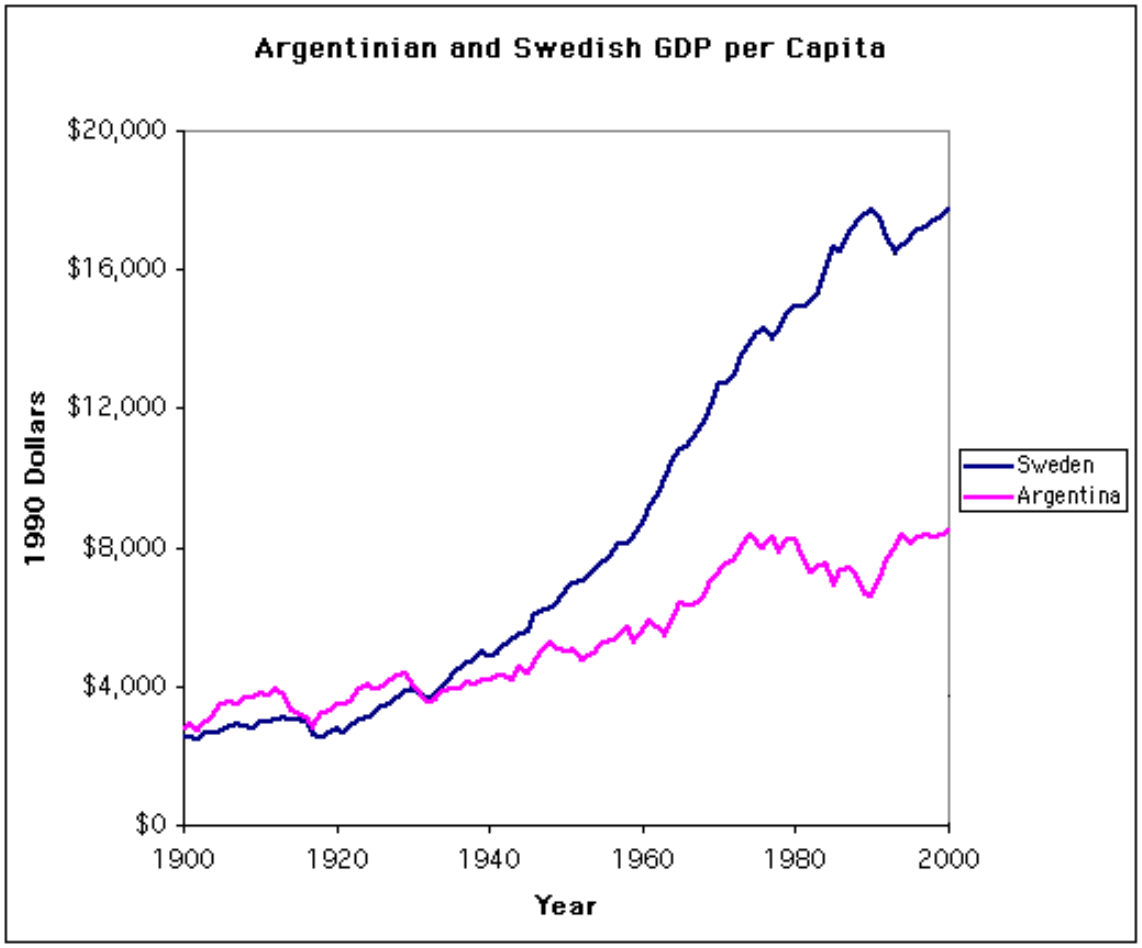

Figure Legend: At the start of the twentieth century, Argentina was richer--and seen as having a brighter future--than Sweden. But economic policies that were mostly bad for long-run growth left Argentina far behind Sweden.

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

Think of a country like Argentina which was once one of the most prosperous nations in the world. In 1929, for example, Argentina was fifth in the world in the number of automobiles per capita. Yet today Argentina is classified as a "developing" country, and as figure 1.2 shows has fallen far behind rich developed industrial economies like Sweden. Why? Destructive economic policies have retarded economic growth. Today Argentines are richer than their predecessors back at the beginning of the twentieth century, but they are not nearly as well off as they might have been had Argentinian economic policies been as good and Argentinian economic growth as fast as in Sweden.

In Scandinavian countries like Norway and Sweden, where throughout the twentieth century economic policies have been supportive of growth, the past hundred years have led to extraordinary prosperity. Today economic output per person in Scandinavia is among the highest in the world. According to semi-official estimates, Scandinavians today are more than six times as wealthy as their predecessors back at the start of the twentieth century.

In the long run, nothing a government can do does more good for the economy than to adopt good policies for economic growth.

Stabilization Policy

The second major branch of macroeconomic policy is the government's *stabilization* policy. History does not show a steady, stable, smooth upward trend toward higher production and employment. Typically, levels of production and employment fluctuate above and below long-run growth trends. Production can easily rise several percentage points above the long-run trend, or fall five percentage points or more below the trend (see figure 1.3). Unemployment can fall so low that businesses become desperate for workers and will spend much time and money training them. Or it can rise to ten percent of the labor force in a deep recession, as it did in 1982.

Such fluctuations in production and employment are commonly referred to as *business cycles.* Periods in which production grows and unemployment falls are called *booms*, or *macroeconomic expansions.* Periods in which production falls and unemployment rises are called *recessions*, or worse, *depressions.* Booms are to be welcomed; recessions are to be feared.

Today's governments have powerful abilities to improve economic growth and to smooth out the business cycle by diminishing the depth of recessions and depressions. Good macroeconomic policy can make almost everyone's life better; bad macroeconomic policy can make almost everyone's life much worse (see Box 1.2). For example, policy makers' reliance on the gold standard as the international monetary system during the

Great Depression was the source of macroeconomic catastrophe and human misery. Thus the stakes that are at risk in the study of macroeconomics are high.

Business cycle fluctuations are felt not only in production and employment but also in the overall level of prices. Booms usually bring inflation, orrising prices. Recessions bring either a slowdown in the rate of inflation, or "disinflation" as it is called, or an absolute decline in the price level, called deflation. Interest rates, the level of the stock market, and other economic variables also rise and fall with the principal fluctuations of the business cycle.

Figure 1.3: Fluctuations in Total Production Relative to the Long-Run Growth Trend

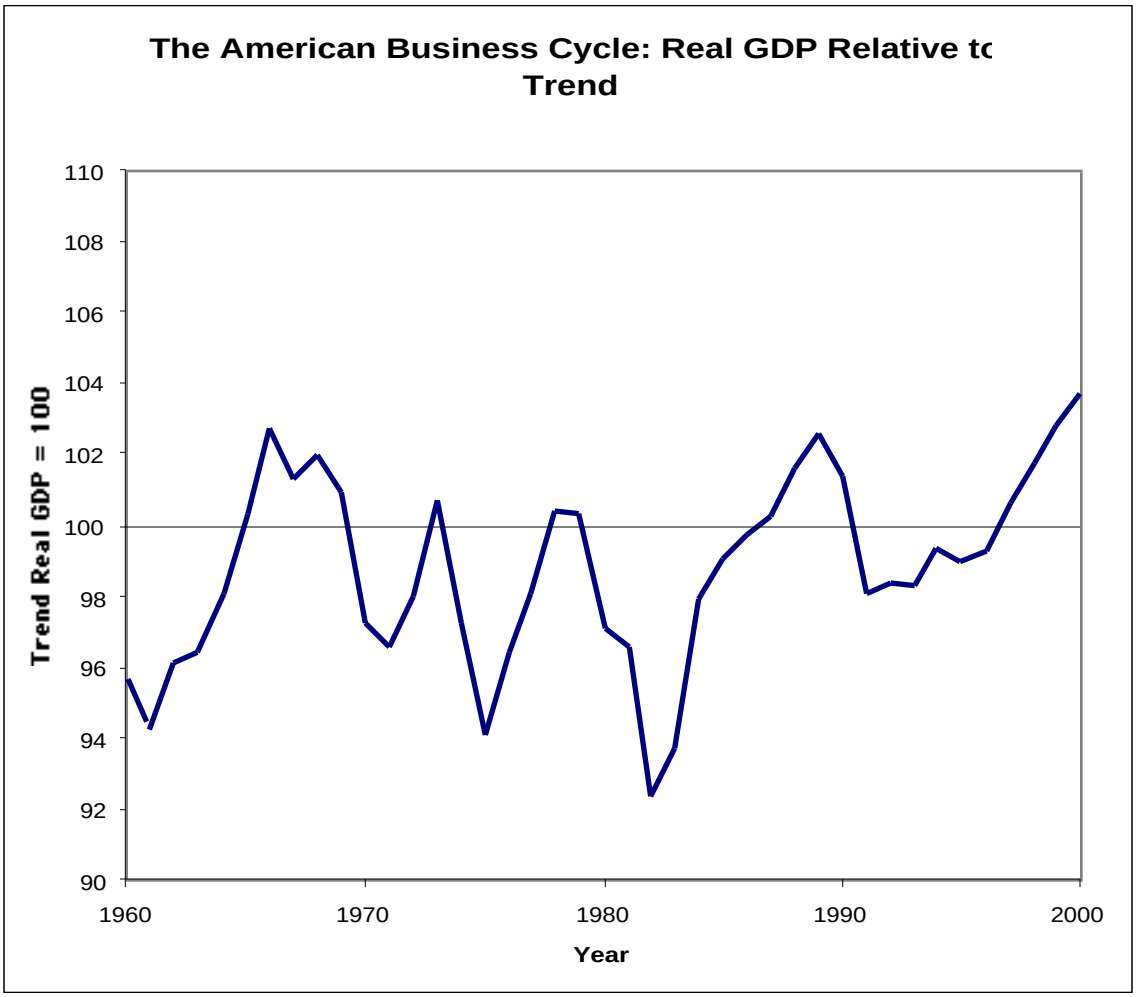

Figure Legend: Since 1960 business cycle fluctuations have caused the level of production in the United States to fluctuate as much as eight percent below or four percent above the trend level of real GDP.

Source: Author's calculations based on real GDP estimates contained in the 1999 edition of the *Economic Report of the President* (Washington, DC: Government Printing Office).

Box 1.2-- Macroeconomic Policy and Your Quality of Life

At the end of 1982 the U.S. macroeconomy was in the worst shape since the Great Depression. The unemployment rate was more than ten percent. In an average week in 1983, some 10.7 million Americans were unemployed--actively seeking work, but unable to find a job that seemed worth taking. That year the average unemployed American had already been unemployed for more than twenty weeks. The average household income in the United States was eight percent below its long-run trend.

By contrast, at the end of 2000 U.S. unemployment was just four percent, and average household income was four percent above trend. In which year would you rather be trying to find a job?

Bad macroeconomic policy makes years like 1982 and 1983 much more common than years like 1999 and 2000. Though good macroeconomic policy cannot maintain the degree of relative prosperity seen in 2000 indefinitely, it can all but eliminate the prospect of years like 1982 and 1983.

Macroeconomics Versus Microeconomics

By itself macroeconomics is only half of economics. For more than half a century economics has been divided into two branches, macroeconomics and *microeconomics*. Macroeconomists examine the economy in the large, focusing on feedback from one component of the economy to another and studying the total level of production and

employment. In contrast, *microeconomics,* which was probably the subject of your last economics course, deals with the economy in the small.

Table 1.1: The Two Branches of Economics

The Two Branches of Economics	
Macroeconomists:	**Microeconomists:**
Focus on the economy as a whole.	Focus on the markets for individual commodities and on the decisions of single economic agents.
Spend much time analyzing how total income changees, and how changes in income cause changes in other modes of economic behavior.	Hold total income constant.
Spend a great deal of time and energy investigating how people form their expectations and change them over time.	Don't worry much about how decision makers form their expectations.
Consider the possibility that decision makers might change the quantities they produce before they change the prices they charge.	Assume that economic adjustment occurs first through prices that change to balance supply and demand, and only afterward do producers and consumers react to the change prices by changing the quantities they make, buy, or sell.

Microeconomists study the markets for single commodities, examining the behavior of individual households and businesses. They focus on how competitive markets allocate resources to create producer and consumer surplus, as well as on how markets can go wrong.

These two groups of economists also differ in their view of how markets work. Microeconomists assume that imbalances between demand and supply are resolved by changes in prices. Rises in prices bring forth additional supply, and falls in prices bring

forth additional demand, until supply and demand are once again in balance. Macroeconomists consider the possibility that imbalances between supply and demand can be resolved by changes in quantities rather than in prices. That is, businesses may be slow to change the prices they charge, preferring instead to expand or contract production until supply balances demand. Table 1.1 summarizes these differences in approach.

In every generation, economists attempt to integrate microeconomics and macroeconomics by providing "microfoundations" for the macroeconomic topics of inflation, the business cycle, and long-run growth. But no one believes that the bridge between microeconomics and macroeconomics has yet been soundly built. Economists are divided roughly evenly between those who think that the failure to successfully integrate the two branches of microeconomics and macroeconomics is a flaw that urgently needs to be corrected, and those who think it is a regrettable but minor annoyance. Thus less knowledge may carry over from microeconomics to macroeconomics than one might expect or hope. Be careful in trying to apply the principles and conclusions of microeconomics to macroeconomic questions--and vice versa.

1.2 Tracking the Macroeconomy

Economic Statistics and Economic Activity

Macroeconomics could not exist without the economic statistics that are systematically collected and disseminated by governments. Estimates of the value and composition of

economic activity, principally those contained in the so-called *National Income and Product Accounts* [NIPA] reported by the U.S. Commerce Department's Bureau of Economic Analysis, are the fundamental data of macroeconomics. We cannot try to explain fluctuations in economic activity unless we know what those fluctuations *are.* But what is "economic activity"?

Whenever you work for someone and get paid, that is economic activity. Whenever you buy something at a store, that is economic activity. Whenever the government taxes you and spends its money to build a bridge, that is economic activity. In general, if a flow of money is involved in a transaction, economists will count that transaction as "economic" activity. Overall, "economic activity" is the pattern of transactions in which things of real useful value--resources, labor, goods, and services--are created, transformed, and exchanged. If a transaction does not involve something of useful value being exchanged for money, odds are that NIPA will not count it as part of "economic activity."

In the United States, individual economic statistics are released month-by-month and quarter-by-quarter, a "quarter" being a three-month period: a quarter of a year. Thus you will often hear economists and other analysts talk about the "change in inventories in the second quarter." Table 1.2 shows a sample of the kinds of economic data that economists, politicians, and others including investors in the stock and bond markets use to assess the course of the economy. The sheer number of statistics is confusing at first glance, but all the statistics are either (i) direct measures of six key economic indicators that together tell most of the story, or (ii) primarily useful as partial forecasts of or as factors that help determine the six key indicators of economic activity.

.

Table 1.2: The Flow of Economic Data

CBS MarketWatch Economic Data for 2000-2001

http://cbs.marketwatch.com/news/current/econ_data.htx

Last Update: 8:49 AM PST February 13, 2001

	Apr 2000	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec 2000	Jan 2001
Production										
GDP		5.6Q2			2.2Q3			1.4Q4		
Nonfarm payrolls	410	171	57	-40	-79	195	66	59	19	268
Jobless rate	3.9	4.1	4.0	4.0	4.1	3.9	3.9	4.0	4.0	4.2
Trade gap	29.2	29.6	29.8	31.8	30.1	33.7	33.6	33.0		
Productivity		6.3Q2			3.0Q3			2.4Q4		
Housing starts	1.65	1.59	1.57	1.53	1.52	1.54	1.53	1.57	1.57	
Prices, inflation										
CPI	0.0	0.1	0.5	0.2	-0.1	0.5	0.2	0.2	0.2	
CPI core	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.1	
PPI	-0.4	0.1	0.9	0.1	-0.4	0.8	0.4	0.1	0.0	
PPI core	0.1	0.3	0.0	0.1	0.2	0.2	-0.1	0.0	0.3	
NAPM prices	76.0	65.8	61.2	61.9	56.2	58.1	56.5	57.5	62.2	65.7
CRB index	212	223	224	218	227	225	221	229	229	224
Purchases deflator		2.1Q2			2.0Q3			1.9Q4		
Capacity utiliz.	82.5	82.7	82.7	82.3	82.6	82.4	81.9	81.4	80.6	
Income, wages										
Personal income	0.6	0.3	0.5	0.2	0.3	1.1	-0.2	0.2	0.4	
Hourly earnings	0.4	0.1	0.3	0.4	0.4	0.2	0.6	0.4	0.4	0.0
Employment costs		1.0Q2			0.9Q3			0.8Q4		
Consumer spending										
Retail sales	-0.5	0.1	0.4	0.8	-0.0	0.8	-0.1	-0.6	0.1	0.7
Personal spend.	0.2	0.3	0.5	0.6	0.4	0.8	0.3	0.3	0.3	
Home sales	4.88	5.09	5.31	4.82	5.28	5.16	5.00	5.26	4.87	
Manufacturing										
NAPM Index	53.1	53.1	52.1	51.7	49.9	49.6	48.3	47.9	44.3	41.2
Industrial prod.	0.7	0.7	0.5	-0.2	0.7	0.2	-0.3	-0.3	-0.6	
Factory orders	-3.8	4.7	5.2	-8.1	2.0	1.7	-4.0	1.7	1.1	
Inventory ch.		72.0Q2			66.4Q3			61.1Q4		
Equip. and software		17.9Q2			5.6Q3			-4.7Q4		
Financial markets										
S&P 500	1452	1422	1455	1431	1518	1437	1429	1315	1320	1366
3-month T-bill		5.82	5.99	5.86	6.14	6.28	6.18	6.29	6.36	5.94	5.29
10-year T-note		5.99	6.44	6.10	6.05	5.83	5.80	5.74	5.72	5.24	5.16
30-year T-bond		5.85	6.15	5.93	5.85	5.72	5.83	5.80	5.78	5.49	5.54
Foreign exchange										
US$-Euro		$0.94	$0.91	$0.95	$0.94	$0.90	$0.87	$0.85	$0.86	$0.90	$0.94
Yen-US$		106	108	106	108	108	107	108	109	112	117

Figure Legend: A selection of recent economic data. Most of these data are reported monthly. A few series are reported *quarterly*--that is, they are calculated four times a year only, once for the January-March period, once for April-June, once for July-September, and once for September-December.
For a detailed description and analysis of what all these numbers mean, consult the Glossary.

Source: CBS Marketwatch: Recent Economic Data:
http://cbs.marketwatch.com/news/current/econ_data.htx

Six Key Variables

You can get a good idea of the pulse of recent economic activity by simply looking at the six key economic variables. Together they summarize the state of the macroeconomy. If you want to be able to say more than "the economy is good," or "the economy is not so good," you need to understand and be able to analyze these six variables

These six key indicators are:

- Real Gross Domestic Product
- The unemployment rate
- The inflation rate
- The interest rate
- The level of the stock market
- The exchange rate.

The first two are the most important: they are directly and immediately connected to people's material well-being. The other four are indicators and controls that are not directly and immediately connected to people's current material well-being, but which profoundly influence the economy's direction. Let's look at each of these indicators more closely.

Real GDP

The first key indicator is the level of *real Gross Domestic Product*, called "real GDP" or often just "GDP" for short. "Real" means that this measure corrects for changes in the overall level of prices. If total spending doubles because the average level of prices doubles but the total flow of commodities does not change, then real GDP does not change. Economic variables are either "real"--that is, they have been adjust for changes in the price level--or "nominal"--that is, they have not been adjusted for changes in the price level. "Gross" means that this measure includes the replacement of worn-out and obsolete equipment and structures as well as completely new invsetment. ("Gross" measures contrast with "net" measures, which include only investments that add to the capital stock. "Net" measures are better than gross measures, but the information needed to construct them is nor reliable.)

"Domestic" means that this measure counts economic activity that happens in the United States, whether or not the workers are legal residents and whether or not the factories are owned by American companies. ("Domestic" measures contrast with "National" measures which count all the economic activity conducted by U.S. citizens are permanent residents and by the companies they own.) Finally, "product" means that real GDP

represents the production of *final goods and services.* It includes both *consumption goods* (things that consumers buy, take home or take out, and consume) and *investment goods* (things like machine tools, buildings, highways, and bridges, that boost the country's capital stock and productive capacity). It also includes government purchases: things that the government (acting as our collective agent) buys and uses.

Real GDP divided by the number of workers in the economy is the most frequently used summary index of the economy (see Box 1.3). It is a measure of how well the economy produces goods and services that people find useful--the necessities, conveniences, and luxuries of life. It is, however, a flawed and imperfect index. It says nothing, for instance, about the relative distribution of the nation's economic product. And because it measures market prices, not user satisfaction, it is an imperfect measure of material well-being. Nevertheless real GDP per worker remains the best readily-available economic index.

Box 1.3-- U.S. Real GDP per Worker

In the year 2000, calculated using 1992 prices, officially-measured U.S. real GDP per worker--the total value of all final goods and services produced in the United States, divided by the number of workers in the labor force--reached $65,000. The measured productivity of the average American worker had quintupled since 1890, when the standard estimate of 1992-price real GDP per worker was some $13,000. Amazingly, this upward leap in economic well-being was accomplished in a little over three generations.

Figure 1.4 shows this upward trend in real GDP per worker. Despite temporary setbacks in recessions and depressions--of which the Great Depression of the 1930s--was by far the largest--the principal event of the twentieth century was this quintupling of measured

real GDP per worker. Other macroeconomic events visible in the figure include the World War II boom, the 1974-1975 and the 1980-1983 major recessions, the 1990-1991 minor recession, and the two-decade long period of stagnation from the early 1970s to the early 1990s--a period that saw the 1973 and 1979 sharp oil price increases by OPEC, and the large investment-reducing government budget deficits of the 1990s.

Note that this figure says nothing at all about how economic growth was distributed. In fact, the years between 1930 and 1970 saw the middle and working classes diminish the relative income gap between themselves and the rich. The years between 1970 and the present have see this gap open wider once again.

Figure 1.4 Officially-Measured Real GDP per Worker in the United States

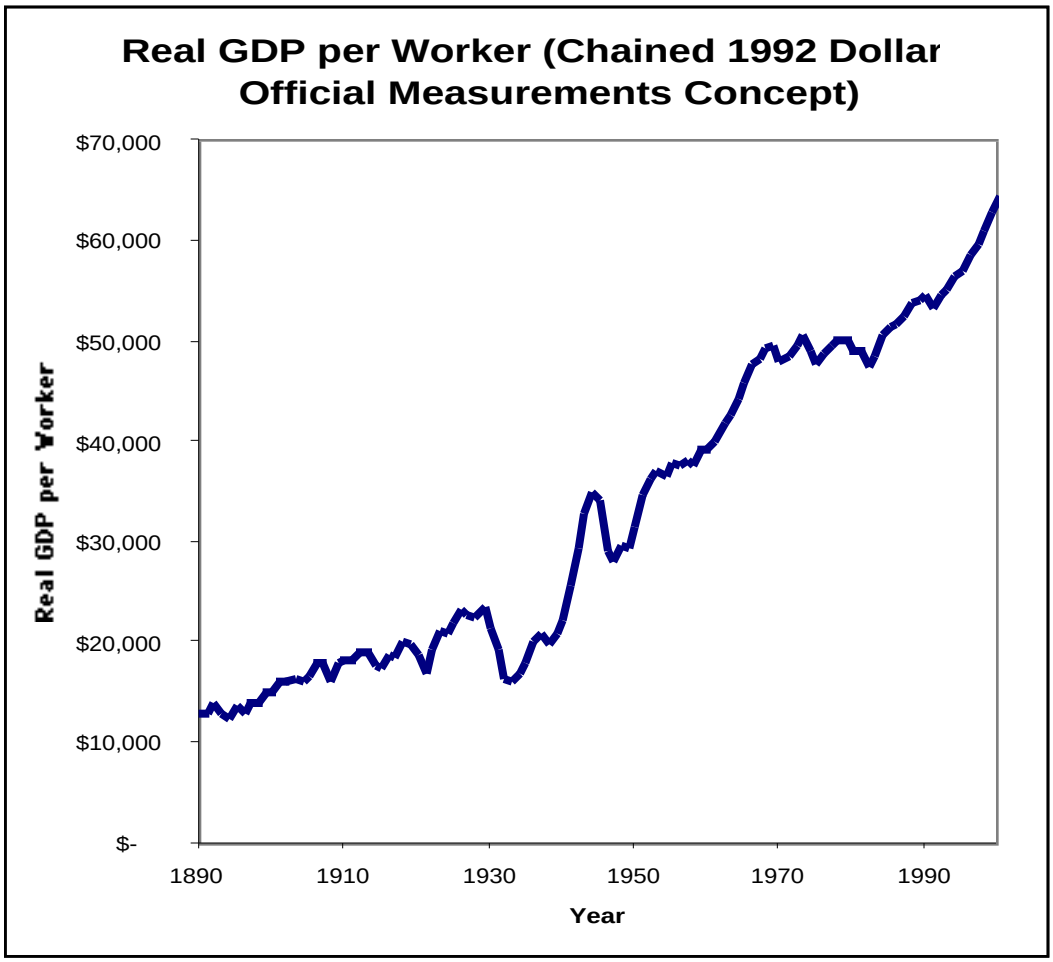

Figure Legend: Measured U.S. real GDP per worker has multiplied fivefold since 1890.

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

The Unemployment Rate

The second key quantity is the *unemployment rate*. The unemployed are people who want to work and who are looking actively looking for jobs, but who have not yet found one (or have not yet found one that they find attractive enough to take rather than continue to look for a still better job). The unemployment rate is equal to the number of unemployed people divided by the total labor force, which is just the sum of the number of unemployed people and the number of people who have jobs. The U.S. Labor Department's Bureau of Labor Statistics conducts the Current Population Survey: a random survey of America's households, every month. The estimated number of unemployed workers obtained from the survey is then divided by the estimated total labor force, also obtained from the survey. The result is that month's unemployment rate. It is released to the public on the first Friday of the next month.

Most people consider unemployment to be a bad thing, and it usually is. Yet it is important to notice that an economy with no unemployment at all would probably be a badly-working economy. Just as an economy needs inventories of goods--goods in transit, goods in process, goods in warehouses and sitting on store shelves--in order to function smoothly, it needs "inventories" of jobs-looking-for-workers ("vacancies") and workers-looking-for-jobs ("the unemployed"). An economy in which each business grabbed the first person who walked through the door to fill a newly-open job and in which each worker took the first job offered would be a less productive economy. Workers should be somewhat choosy about what jobs they take. They should decline jobs when they think that "this job pays too little," or "this job would be too unpleasant." Likewise, employers should be choosy about which workers they hire. Such *frictional unemployment* is an inevitable part of the process that makes good matches between workers and firms--matches that pair qualified workers with jobs that use their qualifications.

During recessions and depressions, however, unemployment is definitely not "frictional." In these downturns in the business cycle the unemployment rate can rise far far above the level of a normal and healthy process of job search. The market economy breaks down, failing match workers willing and able to work with businesses that could put their skills and labor-power to making useful goods and services. Economists call this type of unemployment *cyclical unemployment.* In the United States in the Great Depression the unemployment rose to 25%. In Germany during the Great Depression the unemployment rate rose to 33%.

When the unemployment rate is high, the market economy is not functioning well. The unemployment rate is the best indicator of how well the economy is doing relative to its productive potential.

Box 1.4--The U.S. Unemployment Rate in the Twentieth Century

In the twentieth century the U.S. unemployment rate dipped as low as 1.5 percent during World War II and as high as 25 percent during the Great Depression, the principal macroeconomic catastrophe of the past century. No other recession or depression in the nation's history, not even the depression of the early 1890s, came close to the Great Depression's devastating impact (see Figure 1.5).

Figure 1.5: The U.S. Unemployment Rate

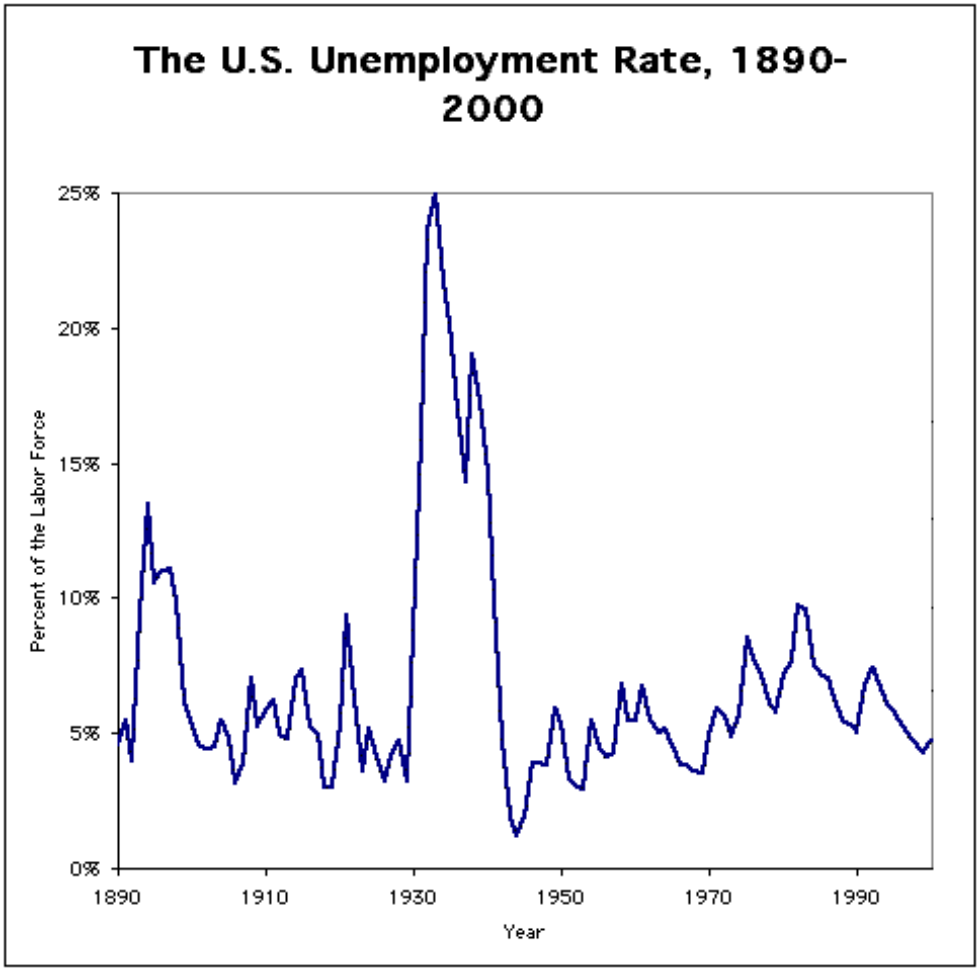

Figure Legend: Since World War II the highest rate of unemployment has been the

nearly ten percent of 1982. Before World War II, peaks in unemployment were much higher, especially during the Great Depression of the 1930s.

Source: Author's calculations from 1999 edition of *The Economic Report of the President* (Washington, DC: Government Printing Office), and from Christina Romer (1986), "Spurious Volatility in Historical Unemployment

Estimates," *Journal of Political Economy*.

Since World War II, the U.S. unemployment rate has fluctuated between 3 and 10 percent, with the highest rates occurring in the decades of the 1970s and 1980s.

The Inflation Rate

A third key economic indicator is the *inflation rate*, a measure of how fast the overall price level is rising. If the inflation rate this year is five percent, that means that in general things cost five percent more this year than they cost last year in money terms, in terms of the symbols printed on dollar bills. A very high inflation rate--more than 20 percent a month, say--can cause massive economic destruction, as the price system breaks down and the possibility of using profit-and-loss calculations to make rational business decisions vanishes. Such episodes of *hyperinflation* are among the worst economic disasters that can befall an economy. But not since the Revolutionary War has the U.S. experienced hyperinflation. Box 1.5 tracks the inflation rate in the United States over the past century.

Strangely, moderate inflation rates--a little more than 10 percent a year, say--are highly unsettling to consumers and business managers. Moderate inflation should not seriously compromise consumers', investors', and managers' ability to determine the best use of their financial resources or to calculate profitability. Yet all these groups are strongly averse to it. Politicians in the industrialized economies have discovered that if they fail to preside over low and stable inflation rates then they are likely to lose the next election.

Box 1.5-- U.S. Inflation Rates in the Twentieth Century

In the United States in the twentieth century significant peaks of inflation occurred during World Wars I and II, when overall rates of price increase peaked at more than twenty percent per year (see Figure 1.6). Before World War II, deep recessions like the Great Depression of the 1930s were accompanied by *deflation:* a decline in the level of overall prices that bankrupted businesses and banks, exacerbating the fall in output and employment.

Figure 1.6: Inflation in the United States

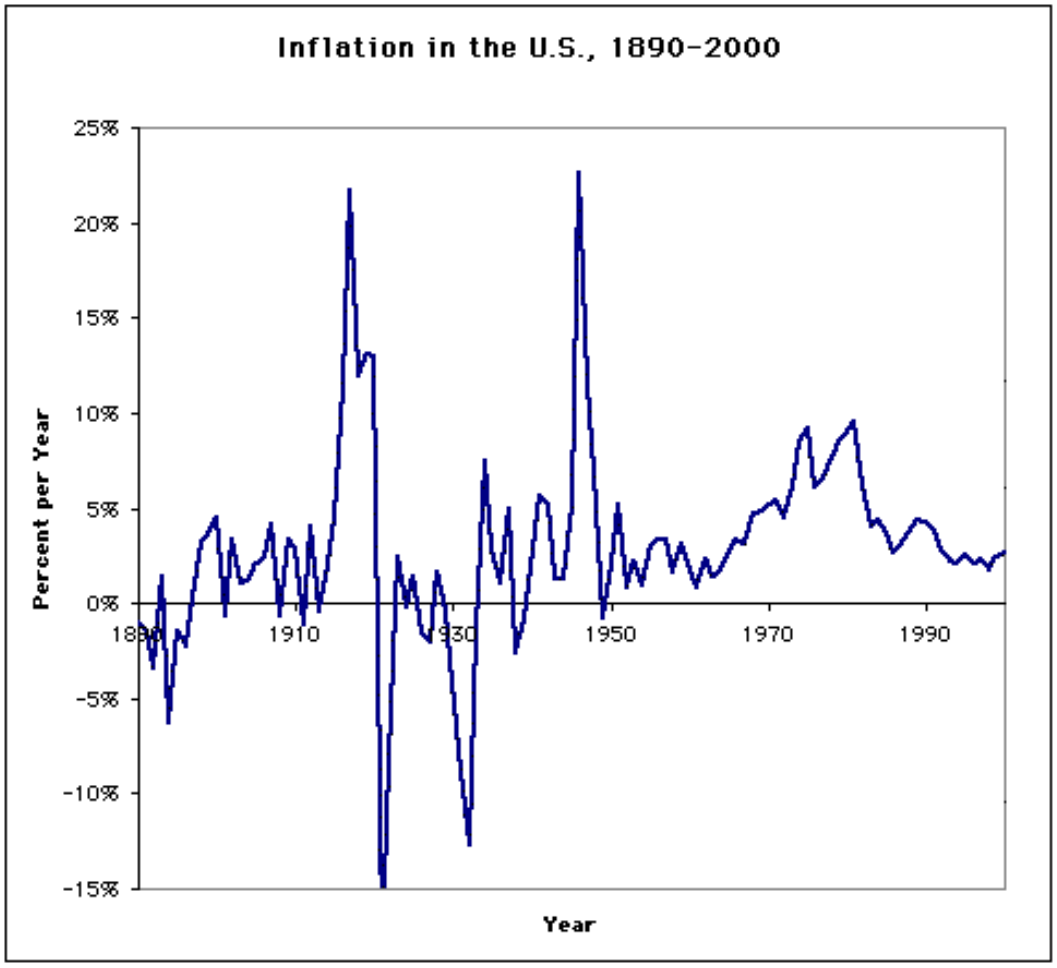

Figure Legend: Before 1970, periods when inflation rose above 5 percent were confined to major wars.

Source: Author's calculations from the 1999 *Economic Report of the President* (Washington, DC: Government Printing Office, and from *Historical Statistics of the United States* (Washington, DC: Government Printing Office, 1975).

Since World War II there has been only one single year--in the late 1940s--during which the price level declined. Otherwise, there has been inflation. Post-WWII inflation has come in two varieties: the "creeping" inflation of the 1950s, early and mid 1960s, and 1990s, too small and slow for anyone to pay much attention to it; and the "trotting" inflation of the late 1960s, 1970s, and 1980s--too high to ignore, and too tempting a political football for politicians to resist blaming the current government.

The steep decline in inflation that occurred in the early 1980s is called the "Volcker disinflation," after then-Federal Reserve Chair Paul Volcker. Alarmed by the accelerating inflation of the late 1970s and early 1980s, Volcker decided to raise interest rates in order to decrease aggregate demand. In doing so he risked a deep recession, which came in 1982-1983. But his action did stop the rise in inflation and reduce it back to the "creeping" range.

The Interest Rate

The fourth key economic indicator is the *interest rate*. Though economists speak of "the" interest rate, there are actually many different interest rates applying to loans of different durations and different degrees of risk. (After all, the person or business entity to whom you lend your money may be unable to pay it back: that is a risk you accept when you make a loan.) The different interest rates often move up or down together so that economists speak of *the* interest rate, referring to the entire complex of different rates. But interest rates do not move in concert all the time. The causes of variations in the *yield*

curve, which describes the pattern of interest rates, are an important part of macroeconomics.

The interest rate is important because it governs the redistribution of purchasing power across time. Those people or business enterprises who think they can make good use of additional financial resources borrow, promising to return the purchasing power they use today with interest in the future. Those business enterprises or people who have no immediate use for their financial resources lend, hoping to profit when the borrower returns the borrowed sum--what financiers call the *principal*--with interest.

When economists think about interest rates, they almost always prefer to focus on the *real* interest rate rather than the *nominal* interest rate. The nominal interest rate is the interest rate in terms of money--for example, how many dollars' worth of interest a borrower must pay to borrow a given sum of money for one year. The real interest rate is the interest rate in terms of goods and services--for example, how much purchasing power over goods and services a borrower must pay in order to borrow a given amount of purchasing power for one year. The difference between the two is that nominal interest rates do not take proper account of the effect of inflation; real interest rates do.

Whenever interest rates are low--that is, when money is "cheap"--investment tends to be high, because businesses find that a wide range of possible investments will generate enough cash to pay the interest on borrowed money, repay the principal of the loan, and still produce a profit. Whenever interest rates are high--that is, when money is "dear"--investment tends to be low, because businesses find that most possible investments will not generate enough cash flow to repay the principal and the high interest. Box 1.6 shows changes in real interest rates in the United States since 1960.

Box 1.6--Real Interest Rates

Interest rates on long-term debt, like the ten-year notes issued by the U.S. Treasury, are usually higher than interest rates on short-term debt, like the three-month Treasury Bills. Whenever long-term interest rates are shorter than short-term interest rates, the yield curve is said to be "inverted." An inverted yield curve is one of the signals of a possible coming recession.

Interest rates have fluctuated widely in the United States since 1960 (see Figure 1.7). Real interest rates--that is, interest rates adjusted for inflation--have even been negative at times. During the 1970s nominal--money--interest rates were so low and inflation so high that the interest and principal on a short-term loan bought fewer commodities when the loan was repaid than the original principal could have purchased when the loan was made. In the early 1980s--the Volcker years--interest rates increased radically. Since then they have remained higher than their levels of the 1950s and 1960s.

Figure 6.7: U.S. Real Interest Rates, 1960-1999

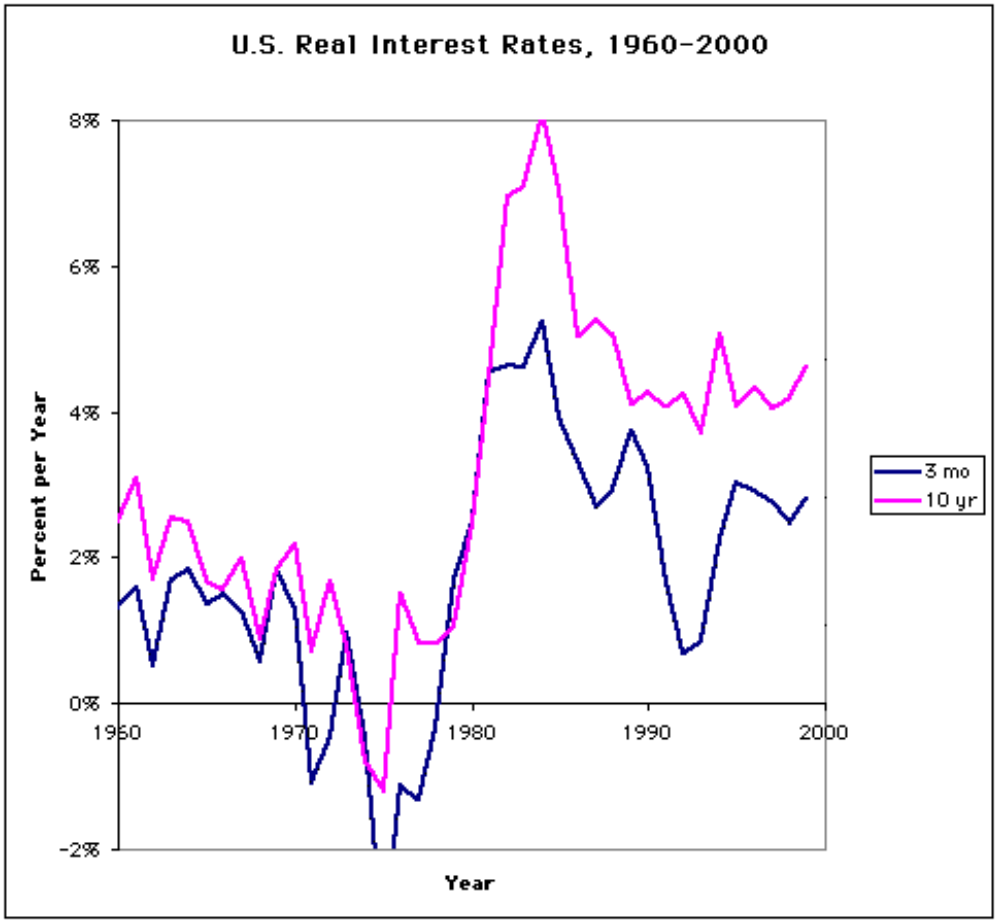

Figure Legend: Since the Volcker disinflation of the early 1980s, real interest rates in the United States have been markedly higher than during the 1970s, and even the 1960s. The *yield curve* has also been relatively steeply sloped--that is, the gap between long-term interest rates (like the interest rate on the ten-year U.S. Treasury note) and short-term interest rates (like the interest rate on the three-month U.S. Treasury bill) has been relatively large.

Source: Author's calculations from the 1999 edition of *The Economic*

Report of the President (Washington, DC: Government Printing Office), and from *Historical Statistics of the United States* (Washington, DC: Government Printing Office, 1975).

The Stock Market

The *level of the stock market* is the key economic indicator you hear about most often--you hear about it every single day unless you try hard to avoid the news. The level of the stock market is an index of expectations for the future. When the stock market is high, investors expect economic growth to be rapid, profits to be high, and unemployment to be relatively low. (Note, however, that there is an element of tail-chasing in the stock market: perhaps it would be more accurate to say that the stock market is high when average opinion expects that average opinion will expect that future economic growth will be rapid.) Conversely, when the stock market is low, it is because investors expect the economic future to be relatvely gloomy.

At times--like the end of the 1960s, or the end of the 1990s-- the stock market appears significantly overvalued compared to its standard historical patterns. During such episodes investors are implicitly forecasting a major boom and continued rapid productivity growth. If their forecasts turn out to be wrong, these investors will be severely disappointed with their stock market investments. Box 1.7 shows the course of the U.S. stock market over the past century.

Box 1.7-- The Stock Market

For more than a century and a quarter, the United States has had a thick market in equities--the "stocks" of a corporation, pieces of paper that indicate ownership of its shares. One of the major indices that tracks the performance of the stock market as a whole is Standard and Poor's composite index--the S&P 500. Figure 1.8 plots the *real* value—that is, the value adjusted for inflation—of this stock market index over time.

Figure 1.8: Real Stock Index Prices

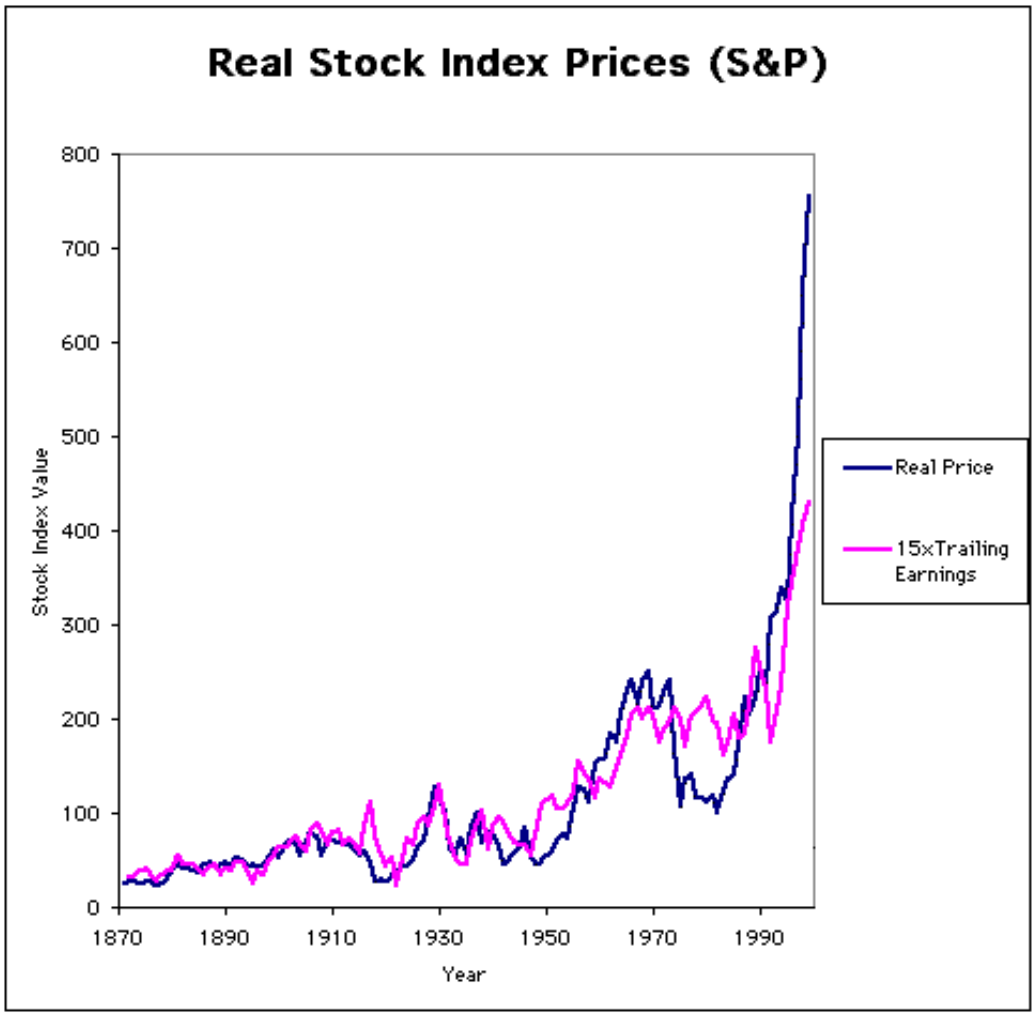

Figure Legend: Since 1997 real stock index prices have far

exceeded their standard, conventional valuation of fifteen times earnings. Economists differ over whether this phenomenon is due to (a) an irrational speculative mania, (b) an increased tolerance for risk, or (c) expectations of rapid future economic growth on the part of investors.

Source: Author's calculations from data in Robert Shiller (1987), *Market Volatility* (Cambridge: MIT Press), as subsequently extended by Shiller.

Over the past century, on average, a share of stock has traded for about fifteen times its past year's, or "trailing", earnings per share. Earnings per share are calculated by taking a corporation's annual profits and dividing by the number of shares of stock the corporation has outstanding. The fifteen-times-earnings figure is only an average: companies with good prospects for growth sell for more than fifteen times their earnings, and corporations seen as in decline sell for less.

There are some years in which expectations of the future of the economy are relatively depressed, and stock indices like the S&P 500 sell for much less than the fifteen-times-earnings rule-of-thumb. Consider 1982, when the stock market as a whole was worth 40 percent less than fifteen-times-earnings.

The Exchange Rate

The sixth and last key economic quantity is the *exchange rate*. The *nominal exchange rate* is the rate at which the monies of different countries can be exchanged one for

another. The *real exchange rate* is the rate at which the goods and services produced in different countries can be exchanged one for another.

The exchange rate governs the terms on which international trade and investment take place. When the domestic currency is *appreciated*, its value in terms of other currencies is high. Foreign-produced goods are relatively cheap for domestic buyers, but domestic-made goods are relatively expensive for foreigners. In these circumstances imports are likely to be high; exports are likely to be low. When the domestic currency is *depreciated,* the opposite is the case. Domestically-made goods are cheap to foreign buyers. Thus exports are likely to be high. But domestic consumers' and investors' power to purchase foreign-made goods is limited. Thus imports are likely to be low. Box 1.8 details the effects of changes in the U.S. exchange rate since 1977.

Box 1.8--The Exchange Rate

The terms on which people in one country can buy goods and services made in other countries--and sell the goods and services they make themselves--are summarized in the *exchange rate.* The nominal exchange rate tells how many units of foreign currency can be bought with one unit of the domestic currency: it is the value of a foreign currency. The real exchange rate adjusts for differences in the rate of inflation between countries. Thus it measures the relative price of tradeable goods: how much in the way of foreign-produced goods can be bought with one unit of domestically produced goods.

Figure 1.9: The U.S. Real Exchange Rate: The Dollar Against a Composite Index of Foreign Currencies

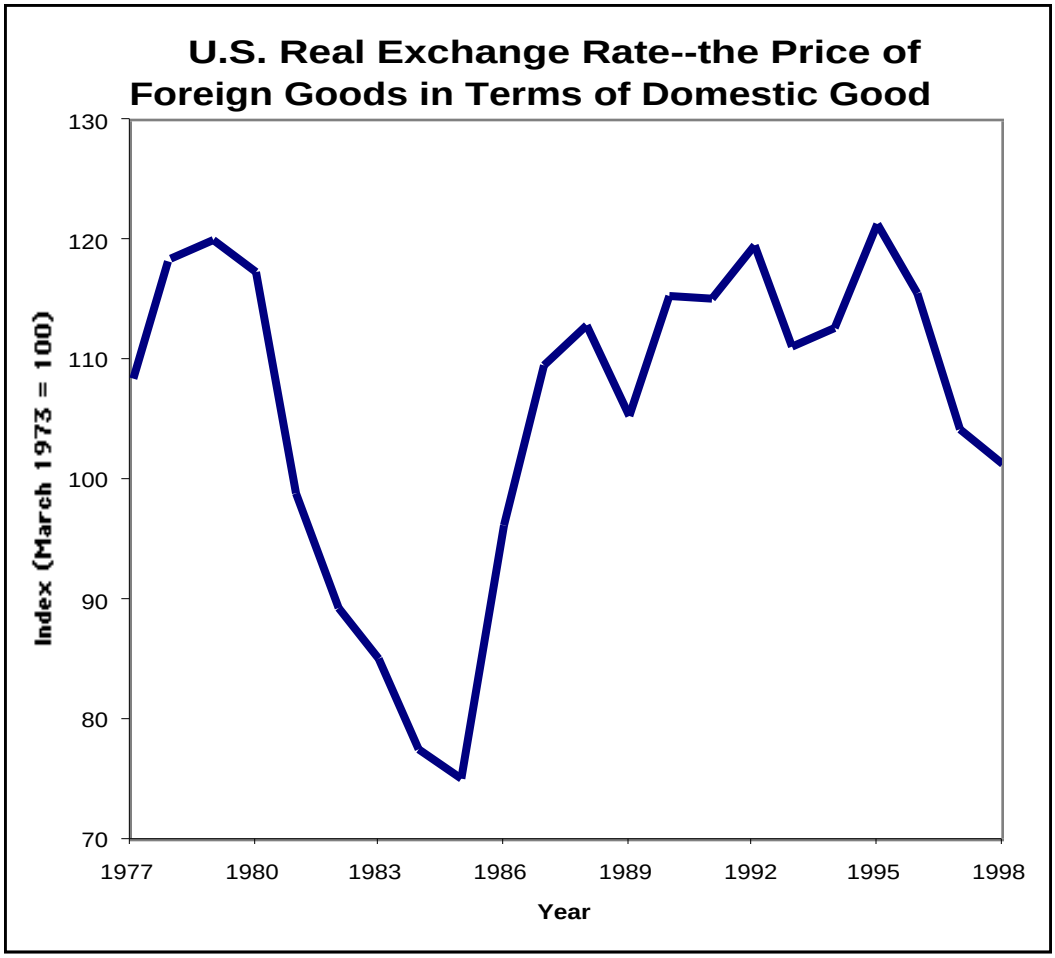

Figure Legend: The most significant fluctuation in the U.S. exchange rate came during the large depreciation of foreign currencies in the early and mid 1980s.

By 1985 foreign-made goods were less than two-thirds as expensive relative to U.S. made goods than they had been at the start of the decade.

Source: Author's calculations from 1999 edition of *The Economic Report of the President* (Washington, DC: Government Printing Office).

Before the early 1970s, the U.S. exchange rate was *fixed* vis-a-vis other major currencies in the Bretton Woods System. The U.S. Treasury stood ready to buy or sell dollars in exchange for other currencies at fixed parities determined by each country's posted valuation of its currency in terms of gold.

Since the early 1970s the U.S. exchange rate has been *floating*--free to move up or down in response to the market forces of supply and demand (see Figure 1.9). When U.S. interest rates have been relatively high compared to other countries--as in the early 1980s--the dollar has *appreciated.* In such a case the dollar will have become much more valuable, as many people have tried to invest in America to capture the high interest rates. We then say that the value of the exchange rate is relatively low. The exchange rate is defined as the value (in terms of dollars) of foreign currency: when the relative value of the dollar rises, the value in dollars of foreign currency falls.

When U.S. interest rates fall relative to those in other countries, the dollar tends to *depreciate:* to fall in value so that U.S. goods are cheap to buy and easy to sell. When the dollar’s value is low and the dollar has depreciated, the exchange rate—the value in dollars of foreign currency—will be relatively high.

Real GDP, the unemployment rate, the inflation, the interest rate, the stock market, and the exchange rate--these are the six key economic indicators. Know the values of these six key variables in context--both their relative levels today and their recent trends--and you have a remarkably complete picture of the current state of the macroeconomy.

1.3 The Current Macroeconomic Situation

The United States

As of the winter of 2001, the United States macroeconomy teetered on the brink of a recession. The consensus of observers of the economy was that the Federal Reserve had overdone it and raised interest rates too far too fast in late 1999 and 2000. Thus by the start of 2001 economic growth in the United States had slowed to a very weak pace. The consensus forecast was that the year 2001 would see U.S. real GDP grow by no more than 1.8%, and a recession--an absolute fall in real GDP for two quarters--was a definite possibility.

The Federal Reserve reacted to the bad economic news over the winter of 2001 by sharply and rapidly lowering interest rates. But Federal Reserve policies affect the economy only with significant lags. Reductions in interest rates at the start of 2001 would not have any noticeable effect on the economy until the very end of the year. And the tax cuts proposed by the new President, George W. Bush, would take even longer to affect production and employment.

As Americans contemplated the prospect of a recession, the bright spot was that the Federal Reserve was ready and anxious to take steps to fight any slowdown. The larger recessions of the post-World War II period had all come to pass because the Federal Reserve was more concerned with fighting inflation than with avoiding recession. In the winter of 2001, however, inflation continued to be less than 2 percent per year and was not seen as a threat by anyone.

The slowdown at the very end of 2000 had been preceded by a remarkable decade-long economic boom. Policymakers and economists advocating the Clinton deficit-reduction program in the early 1990s had claimed that deficit reduction would make possible a high-investment economic expansion, which would then become a high productivity growth expansion. Up until 1996 there had been no signs that high investment was leading to high productivity growth. But by the late summer of 1999 productivity growth had been strong for four years in a row. Perhaps political claims in the early 1990s that deficit reduction would ignite a high-investment and high-productivity growth recovery were coming true. Perhaps the U.S. economy was simply benefiting from the sudden wave of rapid productivity growth driven by the technological revolutions in data processing and data communications.

In the United States the strong growth in production and sales in the second half of the 1990s had pushed the unemployment rate down to a level—four percent--not seen in a generation. A tight labor market was good news for workers: employers appeared eager to pour resources into training them for their jobs. Yet the tight labor market and the strong demand for employees was not showing up in strong real wage growth. Real wages in the year up through December 1999 had grown at only 1.9 percent. On the other hand, relatively slow nominal wage growth meant that inflation remained low as well.

This low inflation proved a puzzle to economists: practically all had confidently forecast (using their estimates of the Phillips Curve relationship between inflation and unemployment) that unemployment below 5 percent would surely lead to accelerating inflation. Yet it had not done so.

Europe and Japan

As of the winter of 2001, economic growth in the eleven countries belonging to the European Monetary Union--and having the "euro" for their principal currency--was slowing. Rising oil prices and rising interest rates (in large part a result of the fear on the part of the newly-formed European Central Bank that its currency, the euro, had depreciated too far) had reduced growth in late 2000 below what had been forecast.

There was certainly room for economic expansion in Europe. The preceding year had seen consumer prices throughout the euro zone rise by less than 2 percent. Economic forecasters were projecting 3 percent real GDP growth for 2001. Unfortunately, such a rate of growth would have little or no effect at reducing European unemployment, which remained stuck near 10 percent. The challenge for European policy remained one of avoiding rises in inflation while attempting to reduce western Europe's distressingly high and stubborn rate of unemployment.

Japan ended 2000 with an annual real GDP growth rate of 1.8%. This is an astonishingly low growth rate given the large amount of unused capacity in the Japanese economy and the extraordinarily low levels of nominal short-term interest rates in Japan. One reason for the low growth rate is that people are unsure whether prices have further to fall: Japan is actually undergoing deflation, with prices falling by 0.7 percent in 2000. Real GDP growth in Japan for 2001 is projected to be only 1.4%, certainly less than the rate of growth of potential output.

Perhaps it is time for the Japanese government to pursue a policy of thorough-going inflation to boost demand that has been extremely sluggish for nearly a decade. But the

conventional wisdom is that Japanese demand and production is unlikely to pick up until ongoing "structural" problems--in particular the fear of lenders that those who want to borrow from them are really bankrupt--are resolved. Requiring businesses to declare the true value of their real estate holdings is commonly pointed to as the key blockage to investment, higher demand, and economic recovery.

As of the winter of 2001, the financial crisis in East Asia had been over for nearly two years. The panic that started in 1997 on the part of investors in New York, Frankfurt, London, and Tokyo, and the consequent withdrawal of their money from emerging market economies imposed very high costs: massive bankruptcies, high interest rates, increases in unemployment, falls in production. However, foreign investors appear to have regained confidence in East Asian economies. Recovery and growth is rapid throughout the region, save in Indonesia.

1.4 Chapter Summary

Main Points

1. Macroeconomics is the study of the economy in the large--the determination of the economy-wide levels of production, of employment and unemployment, and inflation or deflation.

2. There are three key reasons to study macroeconomics: first, to gain cultural literacy; second, to understand how economic trends affect you personally; and third, to exercise your responsibility as a voter and citizen.

3. The six key variables in macroeconomics are: real GDP, the unemployment rate, the inflation rate, the interest rate, the level of the stock market, and the exchange rate.

Important Concepts

Macroeconomics

Microeconomics

Inflation

Deflation

Real GDP

Real GDP per worker

The unemployment rate

The (real) exchange rate

The interest rate

The stock market

Expansion

Recession

Depression

Analytical Exercises

1. What are the key differences between microeconomics and macroeconomics?

2. Why are real GDP and the unemployment rate important macroeconomic variables?

3. What macroeconomic issues are in the newspaper headlines this morning? Has chapter one of this textbook been any use in understanding them?

4. Why is the inflation rate an important macroeconomic variable?

5. Why are the interest rate and the level of the stock market important economic variables?

6. Roughly, what was the highest level that the U.S. inflation rate reached in the twentieth century? What was the highest *peacetime* unemployment rate?

7. Roughly, what was the highest peak in the U.S. unemployment rate in the twentieth century? What was the second-highest peak in the unemployment rate?

8. Roughly much higher is the U.S. stock market today than it was back at the start of the twentieth century?

9. Roughly how much higher is *measured* real GDP per worker today than it was in 1973?

10. Count backward from 1973 by the same number of years *n* that separate this year from 1973. Roughly how much higher was *measured* real GDP per worker in 1973 than it was that number *n* years earlier?

Policy-Relevant Exercises

1. What was the rate of real GDP growth in the United States in 2000?

2. What was the rate of real GDP growth in the United States in the first half of 2001?

3. What was the latest number that the Commerce Department's Bureau of Economic Analysis reported for real GDP growth? What period did it cover?

4. What is the current unemployment rate?

5. What is the current inflation rate? If you find more than one inflation rate listed, are they consistent with each other?

6. What is the current level of the short-term real interest rate? Of the long-term real interest rate? Of the short-term nominal interest rate?

7. What is the current level of the stock market? How does it compare to the level of the stock market at the beginning of the year 2000?

8. How does the current level of the stock market compare with the historical average, roughly fifteen times a stock market index's trailing earnings?

9. What is the current value of the exchange rate? Is the exchange rate higher or lower than it was at the beginning of the year 2000?

10. Has the exchange rate exhibited any extraordinary fluctuations over the past two decades? If so, what effects do you think they had on the economy?