Chapter 1

Introduction: Macroeconomic Problems

1.1 INTRODUCTION

The purposes of this chapter are to introduce you to the subject matter of macroeconomics, to illustrate the major macroeconomic problems, and, finally, to introduce you to the statistical data that we will be featuring in this book. We will omit the usual "this is how economists think" material that frequently appears at the front of an economics text, since by the end of this book you will have a very good idea of how they think, at least when they study macroeconomic problems.

1.2 WHAT MACROECONOMICS COVERS

Macroeconomics is motivated by the desire to understand and influence the direction taken by a nation's economy. To do this, macroeconomists

(a) construct data sets that *measure* the general *performance* of the economy;
(b) construct models, generally built around the same data, that *explain the past performance* of the economy;
(c) utilize the same models and data to *forecast the future* path of the economy; and
(d) *address* the major *policy issues* that arise in connection with the broad goals of the nation.

Obviously, point (d) is partly achieved by utilizing the models and insights developed in points (a), (b), and (c).

The starting point for all of these is a set of what we call the *objectives* for the national economy. This is where the policy comes in. The U.S.

government, presumably because its citizens want it to, has passed a series of laws that instruct certain specific government agencies and the President of the United States to pay attention to certain key macroeconomic variables. For macroeconomists, the most important variables are:

- the quantity of goods and services produced in the economy;
- unemployment; and
- inflation,

with the overall purpose being (a) to improve the standard of living of the average American and (b) to deal with the situation when that standard either gets threatened or worsens, as it sometimes does.

The way we usually put this is to say that the government and its agencies are responsible for maintaining a satisfactory growth rate; for avoiding or ending the troublesome recessions that sometimes occur in the U.S. economy; and for maintaining the purchasing power of the dollar, both internally, and, less often, externally. Here, *externally* refers to the value of the dollar compared to, say, the British pound. *Internally* refers to controlling inflation. There are other lesser macroeconomic tasks that are sometimes mentioned, such as the attainment of a Federal budgetary surplus or a surplus on the balance of trade, but if the tasks just mentioned are performed well, then the average American will have a rising standard of living and a steady job. That is surely the bottom line. This is a very general framework, and we could substitute the name of any other developed country for the United States in this section.

1.3 THE PERFORMANCE OF THE U.S. ECONOMY

To see what the actual problems might be, we need to go over the data for the U.S. economy for the recent past. We will explain how some of the data are constructed in Chapter 2, but here we just need to get going by illustrating the nature of the problems that we often face, using the numbers that government statisticians have put together. We will concentrate, in the remainder of this section, on five key areas:

- growth;
- unemployment;

- inflation;
- the Federal budgetary deficit; and
- the foreign trade deficit/surplus.

We are including the last two in this list because, while they are not separate objectives (who cares if the deficit is getting larger, if we have satisfactory growth and employment?), they are the subject of much discussion in the media, and certainly are very politically controversial, particularly the Federal deficit or surplus.

Growth and Cycles: The Behavior of Real Gross Domestic Product

Let us start with the broad performance of the economy. One way to measure performance is to look at the behavior of the broadest aggregate that we have, real Gross Domestic Product (GDP). GDP is *total spending on goods and services* within a nation's borders and thus is a good measure of total economic activity in the economy. It is related to employment in the economy. That is, more spending causes production to increase and more production tends to generate jobs, so that (normally) a growing economy generates growing employment. Figure 1.1 shows real GDP in the U.S. economy from 1960 through 1998.[1]

In this first graph, we show the level of real GDP in 1992 in dollars. What *real* means, in practical terms, is that inflation (a rise in the *average* of all prices in the economy) has been taken out of the figures on total spending, using 1992 as the base year. We will explain the exact method for calculating real values in Chapter 2, but for now all you need to appreciate is that the concept *real GDP* approximates the underlying real value of the total production of goods and services in the economy.

The graph also shows the recessions in the 1960 to 1998 period. These are shaded in the graph, and the shading begins at the point at which real GDP begins to decline; the shading continues until the economy begins to expand again. We refer to the last date before the shaded area begins as the

[1]Most of the data used in this book come from the FRED database at the website of the Federal Reserve Bank of St. Louis (www.stls.frb.org). Only when some other source is used will there be a note in the text.

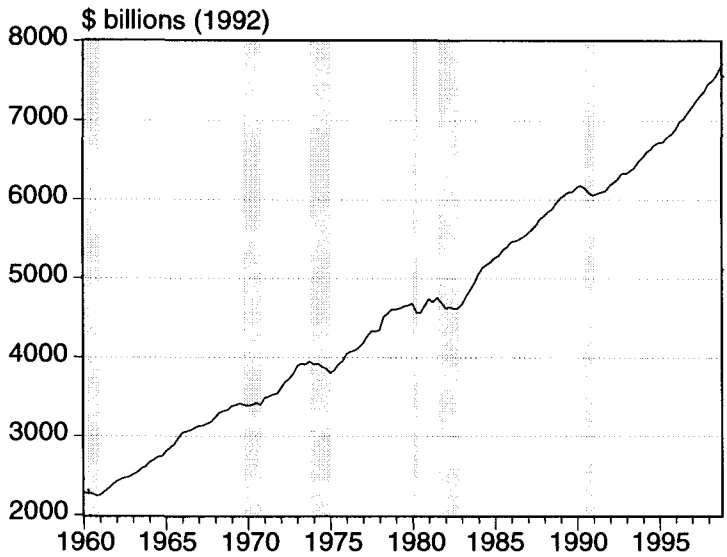

Fig. 1.1. Real GDP in the United States, 1960–1998.

peak of the business cycle, and the last date of the shaded area as the *trough* (or lowest point) of the recession. Put in another way, in this period, the economy was growing at all times except those that are shaded![2]

Because the graph is a little imprecise, and also because economists actually use other numbers in addition to real GDP to determine when we are in a recession, Table 1.1 shows the exact dates of all the recessions since the end of World War II. The dates of U.S. recessions are established by the National Bureau of Economic Research. The GDP figures are only available quarterly, while the entries in Table 1.1 are monthly, so you should think of the quarterly numbers in the last column in Table 1.1 as a rough guide rather than an official measure of the depth of the recession. What the table shows is nine recessions since World War II, ranging from 6 months to 18 months in length. The largest decline in real GDP in the table is 4.3 percent, while the smallest is less than one percent. What is most

[2]In the *Computer Appendix*, we explain exactly how this graph was constructed (in EViews and Excel). We will not repeat this footnote again, but many of the methods used in the text are explained (the first time they are used) in the *Computer Appendix*.

Table 1.1. Recessions in the United States, 1948–Present.

Dates	Duration (months)	Decline of Real GDP (%)
Nov. 1948–Oct. 1949	11	1.1
July 1953–May 1954	10	2.2
Aug. 1957–Apr. 1958	8	3.4
Apr. 1960–Feb. 1961	10	0.8
Dec. 1969–Nov. 1970	11	0.9
Nov. 1973–Mar. 1975	16	4.3
Jan. 1980–July 1980	6	2.6
July 1981–Nov. 1982	16	2.9
July 1990–Mar. 1991	8	1.6

remarkable is that there are three long periods without any recession; much of the 1960s, the 1980s, and the 1990s. Even more remarkable is the fact that since November 1982 there have been only eight months of recession in the United States. That is definitely a record!

Figure 1.1 also tells us something about the *growth rate* of the economy, since the graph for real GDP is inclined upward throughout the period; that is, the recessions appear to be set-backs in what is otherwise a relentless upward drive of the U.S. economy. We can calculate the rate of this expansion too, but to do so, we must pause and do a little algebra.

When we calculate the percent changes in real GDP for the last column of Table 1.1, we take the peak value of real GDP and compare it to the lowest value of real GDP in the succeeding quarters, before GDP turned up again. This comparison can be done by using the following formula[3]:

$$\%\ \text{Change} = \frac{(\text{Peak Value}) - (\text{Trough Value})}{(\text{Peak Value})} * 100 \qquad (1.1)$$

This is a common way of doing percent changes.[4]

[3]Note that we are using an asterisk (*) to indicate multiplication here (and elsewhere in this book).

[4]Here is an alternative: [1 – (Trough/Peak)] * 100.

We can use the same technique for all such calculations. For example, suppose we look at the percent change in real GDP from the third quarter ($6,928.4 billion) to the fourth quarter ($6,993.59 billion) in 1996. Putting these values into the equation produces a change of 0.94 percent.[5] This is the change from the third quarter to the fourth quarter that year. We generally express such changes as *annual rates*, so we next multiply this number by four. The result is 3.76 percent, and this is the growth rate for that quarter. A pretty good growth rate, on the whole.

But there is another method, involving a little algebra, that is especially appropriate when longer periods are involved; we will call this the *log-change method* in this text. From your algebra, you may recall that if a variable grows, then it can be described by the following equation:

$$X_t = X_0 e^{gt} \tag{1.2}$$

In Eq. (1.2), X is the variable in question (it could be real GDP), g is the growth rate, t is a date, and e is the standard exponential (the number 2.718 ...). X_0 is the value of the variable at time "0" (the starting date) and X_t is its value at time t (the date at the end of the period). Here is how this equation would look with the numbers we used to explain Eq. (1.1).

$$6993.59 = 6928.4 * e^{g*1}$$

Note also that we have not used the date for time t, but only the number 1. What we did was rescale the dates to be 0 and 1, since only one period is covered by this particular growth rate calculation.

Using another little trick from a basic algebra course, we can take the natural log of both sides of Eq. (1.2), in which case we obtain the following expression:

$$\text{Log } X_t = \log X_0 + gt \tag{1.3}$$

This can then be rearranged to the following:

$$g = \frac{\log X_t - \log X_0}{t} \tag{1.4}$$

[5]We calculated (6993.59 – 6928.4)/6928.4 to obtain this answer.

Table 1.2. Growth rates for real GDP in the United States based on business cycle peaks.

Dates	Start	End	No. of Quarters	Growth Rate
1948.4–1953.2	1316.4	1695.3	18	5.62
1953.2–1957.3	1695.3	1851.2	17	2.07
1957.3–1960.1	1851.2	1976.9	10	2.63
1960.1–1969.3	2283.34	3404.35	38	4.20**
1969.3–1973.4	3404.35	3936.18	17	3.42
1973.4–1980.1	3936.18	4674.28	25	2.75
1980.1–1981.3	4674.28	4758.39	6	1.19
1981.3–1990.2	4758.39	6174.44	35	2.98
1990.2–1998.4	6174.44	7678.54	34	3.35

**The data from 1960 are from FRED. The earlier numbers are from the DRI/CITIBASE. The later numbers are calculated by a "chaining" procedure; this is explained in Chapter 2.

This is a calculation you can easily make either with a calculator or in a standard statistical program. Note that g is the growth rate in question. For example, for the change in real GDP from the third to the fourth quarter of 1996, the application of Eq. (1.4) yields a value for g of 0.936 after multiplying the original result (0.00936) by 100. Converting it to an annual rate, you get 4*0.936 = 3.74 percent growth. This is comparable to the 3.76 percent we got using the formula for the percent change.

For multiple periods, such as those in Table 1.2, there are two reasonable ways to proceed. You can calculate all the quarter-to-quarter percent changes (or growth rates), using Eq. (1.1) [or Eq. (1.4)], add up all the changes, and then divide by the number of changes. Alternatively, you can save some time and use Eq. (1.3) on the beginning and ending values in the series, at the cost of leaving out some possibly interesting information that lies in between the two endpoints of the data.

Here is an example of a multiperiod calculation using Eq. (1.4). Let us calculate the growth rate for the first row of Table 1.2. Using the data there, the formula in Eq. (1.2) would look like the following:

$$1695.3 = 1316.4 * e^{g*18}$$

To calculate g (the growth rate), you should use the following expression [Compare this with Eq. (1.4)]:

$$g = (\log(1695.3) - \log(1316.4))/18$$

This produces 0.10405. Note again, that we then multiply this result by 400 (= 4 times 100) to convert the quarterly changes to annual and to convert the percentage change to percent. What this shows is that the growth rate of real GDP was 5.62 percent from the peak in 1948 to the peak in 1953. We often refer to the growth rate in real GDP as *the growth rate of the economy* because real GDP is the most comprehensive measure of economic activity that we calculate.

It is pretty apparent that since the recession in the mid-1970s, the U.S. economy has grown less rapidly than it did in the 1960s. We will try to explain why as we move along in this book, but the alleged causes that seem to be on most commentators' minds concern lower productivity, increased competition from abroad, lower savings by Americans, and slower U.S. population growth. Whether or not this slower growth is a problem is not easy to say, but we should note that the growth rate from the second quarter of 1990 through the fourth quarter of 1996 was a very robust 3.35 percent. In any case, this is as far as we can go here, since it is *not* up to the economist to decide if this is adequate growth or not (it probably is!). In later chapters, we will consider what the authorities may do to raise the U.S. growth rate using macroeconomic policy, although you should be forewarned that it is not much!

Unemployment

Unemployment numbers are rapidly becoming the main information that the public, the media, and politicians use to judge the severity of the business cycle in many countries. Unemployment, to be sure, is definitely a cyclical variable — rising in recessions and contracting in expansions. For better or for worse, it is cycles in unemployment that seem perilous to the health of politicians, particularly those at the national level. For example, in 1992, President Bush failed in re-election partly because the voters thought he was responsible in some way for the relatively high unemployment rates

during that election year (it was 7.3 percent of the labor force as late as two months before the election).

Unemployment is, of course, the number of workers without jobs. We normally do not look at the numbers this way, but as the number of workers out of work *divided by* the total number of workers. We call this the "unemployment rate" (or ratio) and it appears in Fig. 1.2 for the period 1960 through 1998; it is calculated as follows:

$$\text{Unemployment Rate} = \frac{\text{Unemployed}}{\text{Labor Force}}$$

It is expressed as a percent.

Figure 1.2 shows the unemployment rate data for the United States. Notice that very distinct unemployment cycles show up in these data. We have added the dates (in months) when the unemployment figures reached their peaks in this period. Note that this corresponds, *but only roughly*, to the low point in the general business cycle as indicated by the end of the shaded areas in the graph. Notice also that successive cyclical peaks in the unemployment ratio seemed to get higher in the 1970s and early 1980s; also notice that since the late 1960s, the minimum level of unemployment

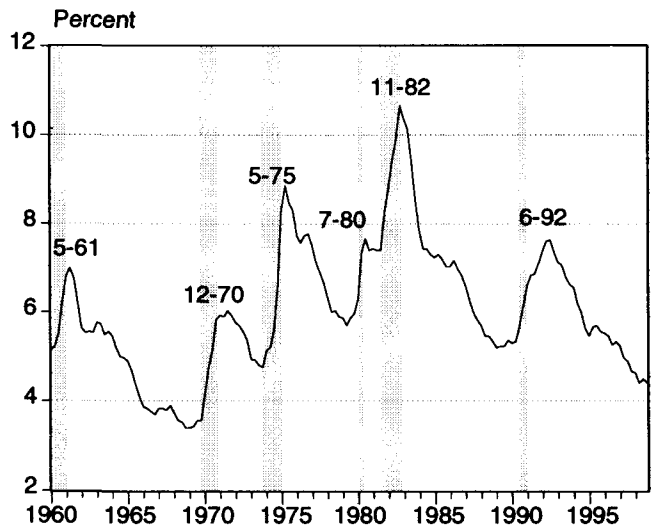

Fig. 1.2. The unemployment rate in the United States, 1960–1998.

never gets much lower than five percent. We will have occasion to consider why this is so in Chapter 12. But note that in the late 1990s, rates as low as 3.9 percent have been recorded!

As we have mentioned, the media tend to emphasize the unemployment aspects of the cycle often, it seems, to the point of defining the business cycle in unemployment terms rather than in terms of the general behavior of the economy. Many economists feel that this is unfortunate, because labor market mechanics, which we will discuss in Chapter 12 in more detail, make an unemployment number somewhat unreliable as a *general* indicator of prosperity. While the following table is no substitute for what we will do later, we offer the following comparison, drawn from the data used to construct Table 1.2 and Fig. 1.2, to suggest that there is sometimes a major difference between GDP cycles and unemployment cycles.

What we have in Table 1.3 are the dates of the "official" (NBER) *trough* (lower turning point) of the cycle in the first column, the dates of the unemployment *peak* (the higher, the worse) in the second column and the difference between the two in the last column. It is expressed as a "lag" since *in this period* the unemployment peak *never* occurred before the economy itself turned upward.

It seems, then, that the unemployment figures — which are included in the official calculations of the cycle dates, incidentally — generally lag behind the cycle, with the peak unemployment *never* coming before the trough in the economy as a whole since World War II. Even more startling,

Table 1.3. Unemployment and business cycles compared.

Cyclical Trough	Unemployment Rate Peak	Unemployment Lag in Months
Oct. 1949	Oct. 1949	0
May 1954	Sep. 1954	4
Apr. 1958	July 1958	3
Feb. 1961	May 1961	3
Nov. 1970	Dec. 1970	1
Mar. 1975	May 1975	2
July 1980	July 1980	0
Nov. 1982	Nov. 1982	0
Mar. 1991	June 1992	15

of course, is the very long lag for the peak in unemployment in the most recent recession (the one that ended in March 1991). Very generally speaking, this was partly the result of labor market dynamics and not the cycle itself (the economy was growing and creating some new jobs at the time). However, this is not the way it was publicized; instead this was often referred to as the downsizing of the labor force at the time. The numbers in Table 1.3 surely suggest that what happened was historically unusual, which partly explains why the U.S. government did not respond to the rising unemployment rate (the government evidently expected it to get better a lot sooner than it did!). There is however no way we can forecast what may happen after the next recession, whenever that may occur.

Inflation

The variables we have considered to this point, real GDP, employment, and unemployment, are *real* variables that measure the *real* state of health of the economy. This is our main interest in this book. But there is another variable that is much discussed, particularly when it goes wrong, and that is the *rate of inflation*. Inflation is not a real variable, but what we call a nominal variable. Actually, inflation is the *rate of change* of a nominal variable, the variable in question being the *average* of all prices in the economy. We call this average of prices the *price level*. Be careful in thinking about this. The price level is a measure of average prices in the economy; *inflation is the rate of change of the price level*. We already did a similar calculation with GDP (level and rate of growth).

We will show several ways to calculate a price index (and therefore the rate of inflation) in Chapter 2. We will try to explain what causes inflation at various points later in this book. For now we just want to suggest what the extent of inflation was and recently has been. Figure 1.3 shows the behavior of the price index (the price *level*) in the United States since 1960. The index is expressed as a number based in 1992 (1992 = 100). We have used the chained GDP deflator as the best measure of average prices for the United States.[6] It is true that the media use the consumer price

[6]We will explain the chaining of price indices in Chapter 2. It is an important topic!

index (CPI) but as will be explained in detail in Chapter 2, the CPI is seriously flawed in the direction of overstating inflation. The GDP deflator is also a *broader* measure than the *consumer* price index since it includes the prices of investment goods, government purchased goods, and some foreign goods, in addition to the prices of consumer goods.

In the figure, the price level always seems to rise in the United States.[7] Indeed, it is very important to notice in Fig. 1.3 that the price level rises right straight through the recessions that are marked in the figure by shaded arrows. At one time it was popular to call this "stagflation" — a combination of stagnation and inflation. However, the term is essentially descriptive and does not really describe a process. In fact, inflation and real GDP are mostly driven by different forces, so we will just drop the term "stagflation" so as to avoid any ambiguity in our discussion.

Figure 1.3 actually describes the behavior of the price level while what we are most interested in is the *inflation rate* in the U.S. economy. The way

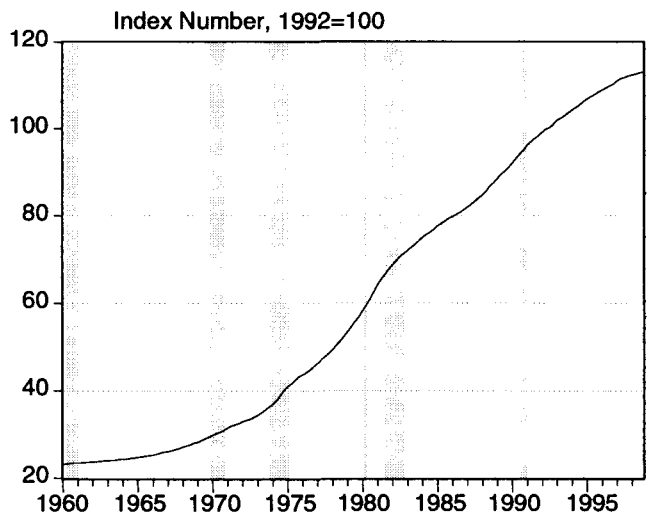

Fig. 1.3. The price level in the United States (GDP deflator), 1960–1998.

[7]Before World War II, the price index sometimes rose and sometimes fell, averaging close to a zero change over very long periods. We will discuss why the situation changed, later in this book.

we calculate inflation rates is to take the rate of change of the price level; you can do this by any of the means we have already described in this chapter; the way we did it in constructing Fig. 1.4 was to use the log-change formula for the growth rate (of the price level) given as Eq. (1.4). The data that we used are for the chained GDP deflator, as already discussed. These are expressed as annual rates of inflation.

Looking first at the trends in the inflation rate, we see that there was a general upward drift in inflation rates until 1980:11 (the first quarter of 1980) and then a sharp drop and a slight downward drift thereafter. Very clearly, the general performance of the inflation rate has recently been in a satisfactory direction. In fact, recent rates have been under one percent per year! It is also noticeable that there is a lot of change in the inflation rate, and there are two distinct spikes where the rate exceeded the "double digit" inflation standard of ten percent. One was during the recession in 1973–1975, and one was in 1980. We will have a lot to say about these episodes and what caused them elsewhere in this book, but for now we should at least alert you to the fact that inflation has a lot to do with how monetary policy has been conducted in the United States. Indeed, since 1979, monetary policy has moved quickly to counteract inflation and that, really, accounts for the turnaround that is so obvious in Fig. 1.4.

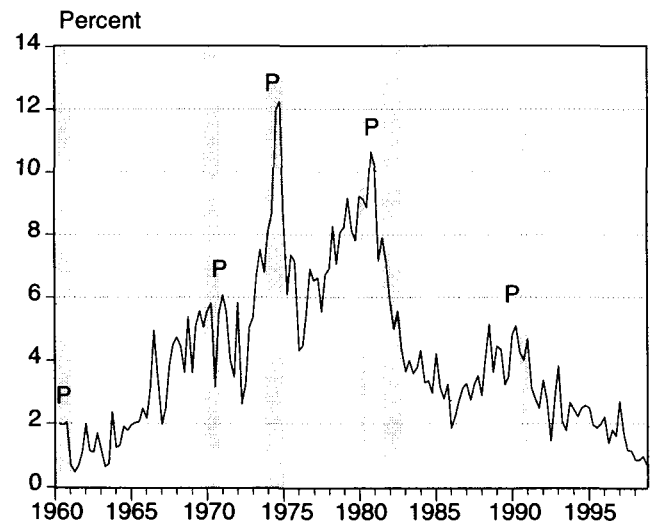

Fig. 1.4. Inflation in the United States (GDP inflator), 1960–1998.

In Fig. 1.4, there is another surprising discovery: inflation peaks (marked by a "P" in the graph) all occurred *after* the economy reached its peak. The peak in the economy occurs where the shading begins. It is also clear that lower turning points behave in a parallel fashion: the trough in the economy usually occurs before the trough in the inflation rate. Typically, the media explains inflation as the result of an overheated and expanding economy. This is clearly not an adequate explanation, since a declining economy cannot by any stretch of the imagination be called "overheated", can it? Furthermore, the recession period should show falling inflation rates if overheating was all there were to it, and recession periods frequently do not. Once again, we have to promise you a more exact explanation of what is behind the behavior of the inflation rate later, when we have had a chance to analyze money and monetary policy.

The broad figures of this subsection thus indicate that the inflation rate performance of the United States was not very good in the 1970s and early 1980s but has improved considerably since then. In fact, as Fig. 1.4 bears witness, both the trend of inflation and the variability of the inflation rate seem less in recent years and that is surely good news. Indeed, it has been argued that even this measure of inflation (based on the GDP deflator) overstates the reality by as much as one percent. If so, by the end of 1998, there may have been basically no inflation in the U.S. economy, not that this necessarily implies anything about the future.

The Federal Deficit/Surplus

One of the most controversial sets of macroeconomic data that we will look at in this course involves the Federal budget. The Federal government, like any government, basically has two main sources of revenues:

- taxes, and
- bond issues.

With the proceeds from these two sources, the government spends on goods and services (we call them "government expenditures"). To the extent that the government pays for its expenditures by issuing bonds (by borrowing

from the public), it is running a *deficit*. There is a simple equation that combines these ideas as follows:

$$\text{Taxes} - \text{Expenditures} = \text{Deficit (or Surplus, if positive)}$$

Thus, essentially, a deficit arises when tax revenues are not enough to cover expenditures. Clearly, just as a matter of definition, you can reduce a deficit by increasing taxes, decreasing expenditures, or both. "Both" seems to be what the current political consensus between the Republicans and the Democrats is all about, although the Democrats seem less committed to reductions in expenditures than do the Republicans. Note that if taxes exceed expenditures we refer to the result as a "surplus". A deficit, thus, has a negative sign and a surplus a positive sign, at least in the expression just shown. As you know, the Federal government started producing surpluses in 1998.

Let us now look at some data, to see what a satisfying result has occurred in the United States recently, and why. What we do, as before, is compare the growth of the economy with the deficit. For the growth of the economy, it is a fact that since 1960, GDP of the United States has risen quite a lot. Think of GDP as expressing the ability to cover the deficit out of current income. After all, the U.S. GDP represents the "tax base" available to the government. What we have done in putting together Fig. 1.5, accordingly, is to divide the *nominal* deficit by the *nominal* GDP for the United States for the same quarter of the year. We used nominal figures because the data for the deficit are only supplied by the government in nominal form. By "nominal", once again, we mean that the figures include inflation. What our calculation does is (a) remove inflation (there is *approximately* the same inflation in the numerator as in the denominator of the deficit–GDP ratio) and (b) account for our greater ability to pay for a deficit out of our larger GDP.

Starting with the trend, it is certainly noticeable that the relationship appears to drift downward over much of the period. On the other hand, there is an upward trend from the early 1980s to the present, ignoring both the "spikes" and the earlier figures in the graph. In fact, at the end of the period, the deficit ratio is positive (as it was in the 1960s) indicating a Federal budgetary surplus (all of 1998 was in surplus, actually).

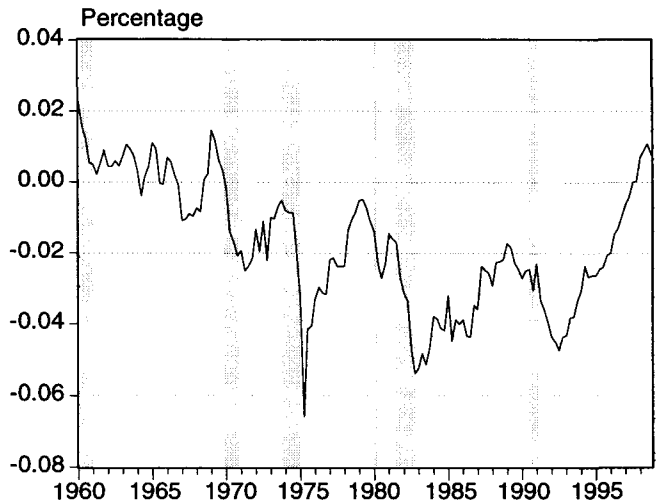

Fig. 1.5. The deficit–GDP ratio in the United States nominal figures, 1960–1998.

In the figure, we have also marked recessions by shading those time periods as a way of pinning down the cyclical behavior of the deficit. Here, it is clear that there are sharp cyclical low points in the deficit ratio, but, especially in recent years, the deficit ratio reached its low point considerably later than the economy; in fact, many of the deficit troughs occured after the recession was over! There is a simple explanation for this: Much of the change in the deficit over the cycle is due to the need for the Federal government to make payments for "income maintenance". These are largely in the form of unemployment compensation and welfare. The former rises very sharply *after* the recession has started and continues until the unemployment ratio begins to decline. Indeed, as this graph also bears out, in the 1990–1991 recession, the decline in the deficit ratio continued for some time after the economy started upward because the unemployment rate continued to rise for 15 months, as we have already pointed out. This fact is what obscured the recent upward trend in the deficit ratio, at least until recently.

The observations of the last two paragraphs suggest that the deficit currently is not a problem for the time being, since it is a surplus; in any case the government's fiscal situation usually gets worse during recessions and wars. If we avoid recessions, then, we probably can expect the Federal

budget to stay in surplus, at least if the economy grows at "normal" rates. Of course this statement is made under the assumption that government expenditures do not increase sharply for any other reason, such as the repair to Social Security and/or Medicare or a costly war.

Why, then, did politicians and the media get so excited about the deficit, even when it was clearly on a downward trend? There seem to be many reasons, some of them not very inspiring. For one thing, there seems to be some confusion about our need to pay off the debt: The fact is, we owe most of it to ourselves. That being the case, when we pay off the debt we merely transfer the funds from a taxpayer to a bondholder and no wealth disappears from the system.[8] Another thing is that the large *nominal* deficit is not a *real* deficit. By focusing on the very large nominal numbers (a billion dollars is a lot to most of us) we are apt to be confused about the *real* magnitude of the deficit; that is one reason why we scaled the figures to produce Fig. 1.5. Finally, there seems to be a kind of ritual among politicians of the major political parties (and the media) involving the deficit. As a politician, in particular, you will be crucified by either the opposition or the media if you fail to mention that the deficit must be driven at least to zero and kept there! Most economists disagree and few have any concern with *persistent* deficits as long as the interest payments on the National Debt do not get out of control (they were never close to being so, as we shall see in Chapter 6).

In any case, speaking more generally, our number one priority, speaking of macroeconomics, of course, is either the satisfactory performance of the GDP figures or a satisfactory unemployment rate. The deficit does not affect either of these very much, as we shall see in later chapters in this book. When it might, however, it would be mainly through higher interest rates in capital markets. We will return to this topic, also, in Chapter 6.

The Trade Deficit

There is yet another deficit that is the subject of much discussion: This is the gap between the total value of the goods that we export and the total

[8]Aside from funds that might go overseas because some of the national debt is owned by foreigners (typically, in fact, by foreign central banks).

value of the goods that we import. In particular, the *trade deficit* is often growing, again in absolute numbers, and the reason for concern, at least as given in popular discussions, is that this is the result of either our inability to compete globally (hence lower exports) or because of the effect of cheap labor abroad (hence larger imports).

The trade deficit, to deal with definitional matters first, is usually expressed in the form of the "trade balance". The precise calculation is the following:

$$\text{Trade Balance} = \text{Exports} - \text{Imports}$$

This would treat a trade deficit as a negative number when imports exceed exports, as they usually do these days. Exports, then, are the value of goods produced in the United States and sold abroad, while imports are the value of goods purchased from foreign sources. Of course, if exports exceed imports, there would be a trade surplus. These numbers are frequently mentioned in the media where it is sometimes proposed that if we *protect* U.S. industries by raising tariffs this action will make the trade deficit grow smaller (or even disappear), if we pursue this protection aggressively.

The first thing to do is simply to graph real exports and imports. Again we have quarterly data (in real form) and again it is appropriate to scale the data by expressing them as ratios of real GDP. Figure 1.6 shows the results. In this case, the trends in the two series are the most striking things about these two ratios: They both moved generally upward, and sharply so near the end of the period (when, due mainly to the Asian crisis, the export ratio drifted downward somewhat). We have seen other growing numbers in this chapter, but this set is different. Both of these are growing *as ratios* of real GDP. Thus from numbers around five percent of real GDP in the early 1960s, exports have grown to over 13.2 percent by 1998, and they were again moving upward at the end of 1998 and into 1999 (even though this is not clear in Fig. 1.6). Think about it: What this graph shows is that both exports and imports have outpaced the growth of real GDP in the United States, *by a lot.* If that was not the case, the two graphs would have been horizontal. Increasing exports means more jobs, faster in the export sector than in all of the other sectors of the economy, just as a matter of arithmetic!

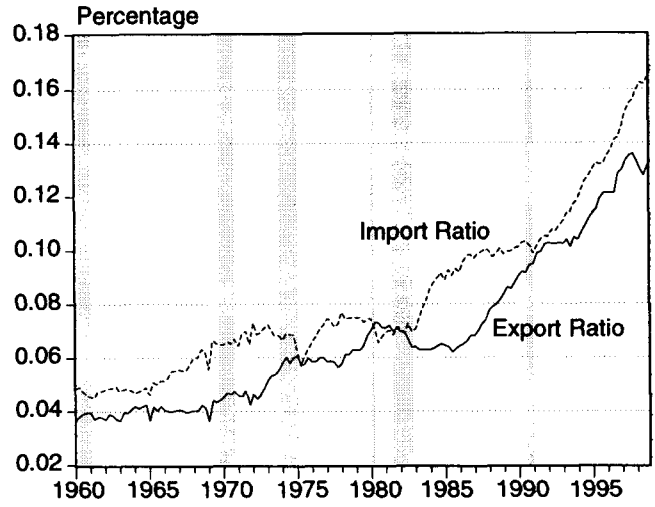

Fig. 1.6. Export and import ratios in the United States ratios of real GDP, 1960–1998.

To dramatize the situation further, we can compare the growth rates for the two variables with that for real GDP using the turning points of the economy. For this table, however, since we do not have monthly figures for GDP, we will have to use the quarter in which GDP peaked to provide the comparison. All of these were identified in Tables 1.1 and 1.2. Note again that all variables in Table 1.4 are in "real" terms so that inflation has been taken out of the figures.

We have taken the real GDP growth figures and the cyclical datings directly from Table 1.2; to these were added the comparable growth rates for real exports and imports. The bottom of the table contains the most interesting result: Both exports and imports have outpaced the growth of real GDP for the U.S. economy since 1948. In fact, the lead is so substantial that it will not be wrong to say that the foreign sector is leading the way for the U.S. economy. Notice, also, that exports have actually grown faster than imports since 1960, even though the publicity about the "huge" gap of around $200 billion (at the end of 1998 and into 1999) tends to dominate the discussion. The media creates the impression that things are getting much worse when, in fact, they are not. These comments do not exactly apply to the results of the "Asian Crisis" of 1998–1999, for then the gap grew relative to real GDP, but that was clearly a temporary situation.

Table 1.4. Export and import growth in the United States.

Peak-to-Peak	Quarters	Exports (%)	Imports (%)	GDP (%)
1948.4–1953.2	18	0.38	8.98	5.62
1953.2–1957.3	17	8.35	4.60	2.07
1957.3–1960.1	10	0.43	6.91	2.63
1960.1–1969.3	38	6.04	7.36	4.20**
1969.3–1973.4	17	9.25	4.48	3.42
1973.4–1980.1	25	6.46	4.10	2.75
1980.1–1981.3	6	0.73	−4.34	1.19
1981.3–1990.2	35	6.14	7.60	2.98
1990.2–1998.4	34	6.80	8.31	3.35
1960–1998	155	6.44	6.28	3.13

**See the notes for Table 1.2.

On the surface, though, there are reasons for concern. *If* we can produce the goods that we import in such large numbers, then *our* workers will be employed in that task; instead, some *foreign* workers benefit from *our* expenditures on their products. Now aside from being a narrow and nationalistic point of view, a problem arises if we try to do something about the situation. What we can do is shut off the imports by raising tariffs; lots of folks have asked the government to do this. The problem, quite simply, is that if we raise tariffs, foreign governments will quickly retaliate by raising their tariffs. It does not take a genius to figure out that our exports will fall as a result. Indeed, and it has happened in the past, round after round of increased tariffs can wring the neck of this particular goose. That is, both exports and imports can decline, and with suitably high tariffs, one can bring the rates of growth of both exports and imports below the rate of growth of GDP. Economies (and jobs) will therefore grow more slowly worldwide than they are now, if aggressive tariff policies are unleashed. This is one major reason why most economists recommend no major policy initiatives in this particular area; even though *if* you can pull it off, your country will be better off.

The important point in any case is that the United States exports rise faster than real GDP so that this particular "sector" is adding to employment faster than the other sectors of the economy. Whatever we do, we do not want to shut off world markets as a source of gain for our firms and our

workers. There appears to be no easy way to decrease our imports without attracting retaliation, but, one suspects politicians will not stop trying to think of ways, if only because the public (and the media) seem especially concerned about this particular deficit. In addition, business firms are always asking for "protection" in one form or another (tariffs or subsidies), because whatever happens to the economy, the *particular* industry and its workers are likely to gain from any protection granted to the products of the particular industry.

1.4 CHAPTER SUMMARY

In this chapter, we have gone over the performance of the U.S. economy with respect to the main variables that we expect the government to be concerned with. In fact, the United States is not unique in this respect, and you will find these same variables considered in any discussion of macroeconomic goals and performances around the world. These variables are the rate of growth of real GDP, the unemployment rate, and the rate of inflation.

What can we say as a summary about the performance of the U.S. economy? First of all, the economy is generally growing in terms of its real output and employment, with both growth and employment currently (2000) at record levels. Business downturns, which in the 1970s and early 1980s were relatively frequent, seem to be getting milder, shorter, and more infrequent, and so there is very good news on that score. Indeed, since the end of 1982, there have been only eight months of recession in the United States, an outstanding performance for any economy, and certainly for the U.S. in peacetime.

We have less reason to be pleased about the performance of unemployment, however, since the figures we have looked at suggest that the best we can do is get down to a point somewhere between four and five percent (as an unemployment rate) when times are as good as they get. Inflation, too, may not be a completely solved problem, although the rate of inflation is currently *much* lower than it was, for example, in the 1970s and early 1980s. Finally, there are the deficits of the Federal government and on the balance of trade. The former seems to have gone away for the time being because GDP has risen so much, raising the tax base. In addition, the budget

cutters have assisted in the process (as we will see in Chapter 6). We have suggested that the trade deficit is not really a problem we are likely to want to tackle in any case, but it alone among the variables we have looked at in this chapter has not improved in the 1990s.

Whether things are currently getting better or worse, each of these areas has provided severe problems in the past, and it is not a stretch to say that each will in the future. This is sufficient motivation to move into the analysis of these variables, with the main focus being both on what determines the variables and what we can do to influence them, in the short and long run. That is where we are headed in this book.

1.5 KEY TERMS

Policy objectives	Unemployment rate	Gross domestic product
Growth rate	Inflation rate	Recession
Business cycle	Cyclical trough	Cyclical peak
Price level	Double digit inflation	Federal deficit
Foreign trade deficit		

1.6 STUDY QUESTIONS

Review Questions

1. What are the principle objective variables for U.S. macroeconomic policy? Can you rank them in order of importance?
2. How are Gross Domestic Product (GDP) and unemployment related? Can you imagine a policy that will help unemployment without changing the growth rate of GDP?
3. Why, do you think, there have been fewer recessions since 1982 than at any other time in our history?
4. Why do the media and politicians concentrate on unemployment figures rather than GDP figures in describing the state of the economy?
5. Why may the unemployment variable lag behind the GDP variable for the economy? Does consideration of this apparent fact affect your answer to Question 4?

6. Can you imagine the price level increasing while the inflation rate is decreasing? Give an example. Why did we ask this question?
7. If the Federal government runs a deficit, where does it get the funds to make the expenditures that are not paid out of taxes. Are there any alternatives?
8. Why, do you think, did the Federal deficits disappear recently in the United States?
9. If the U.S. trade balance is negative, meaning imports exceed exports, what specifically may be the problem with this? What can we do to make this balance positive? Why don't we do it, then?

Discussion Questions

1. If inflation was ten percent and GDP was growing at five percent, would the situation be better or worse than if inflation was zero percent and the rate of growth of GDP was three percent? Explain your answer carefully.
2. Curiously, Federal deficits have gotten better, almost any way you look at them, but the political rhetoric seems unchanged. Explain why the deficit has been getting better and then try to account for the political pressure that still seems to exist.
3. If both real exports and real imports increase at the same rate, and that rate is double the real rate of growth of the economy, then an existing trade deficit will also grow faster than the economy. How will you explain, to someone in the media for example, that the rapidly growing deficit may actually not be a matter of much concern?
4. Inflation rates have currently dropped near zero in the United States (and many other countries). Why, then, do we continue to discuss the topic as if it is important for the economy?

Computer Exercises

1. Using the data from FRED or from your instructor, perform the following calculations:
   a. Print out the data for real GDP from 1960 through the latest numbers available.

b. Print out the data for nominal GDP for the same time period.
c. Put the two in a graph.
d. Put a label on the graph.
e. Print the graph.

2. Using the data supplied to you, perform the following calculations: Calculate the *average* rates of growth of real GDP for the decades of the 60s, 70s, 80s, and 90s and arrange the numbers in a table. In doing so, express the result as a series of percents using the log-change growth rate formula described in the text. You can take the endpoints of the data or you can take the average growth rates of the quarterly figures. Your choice. If you decide to do both, compare them and comment. Note that we are asking you to produce a little table like Table 1.2 but with decades rather than business cycle dates. What do the numbers show about the growth rates of these four arbitrary periods?
3. The data supplied by any official source does not include an inflation variable. Use the log-change formula on the data from FRED to generate a series of inflation rates for the chained GDP deflator for the entire period covered by the data. Be sure to make the corrections that convert the numbers into annual growth rates (in percentage). When you have done this, create a graph of the inflation rate and compare your work with Fig. 1.4. It should be the same. Be sure to save your inflation data when you are done, since you will have a lot more use for this variable in later exercises.