

TABLE 5.1 Recessions in the United States since World War II

Year and quarter of peak in real GDP	Number of quarters until trough in real GDP	Change in real GDP, peak to trough
1948:4	2	-1.7%
1953:2	3	-2.6
1957:3	2	-3.7
1960:1	3	-1.6
1970:3	1	-1.1
1973:4	5	-3.2
1980:1	2	-2.2
1981:3	2	-2.9
1990:2	3	-1.4
2000:4	1	-0.3
2008:2	4	-3.8

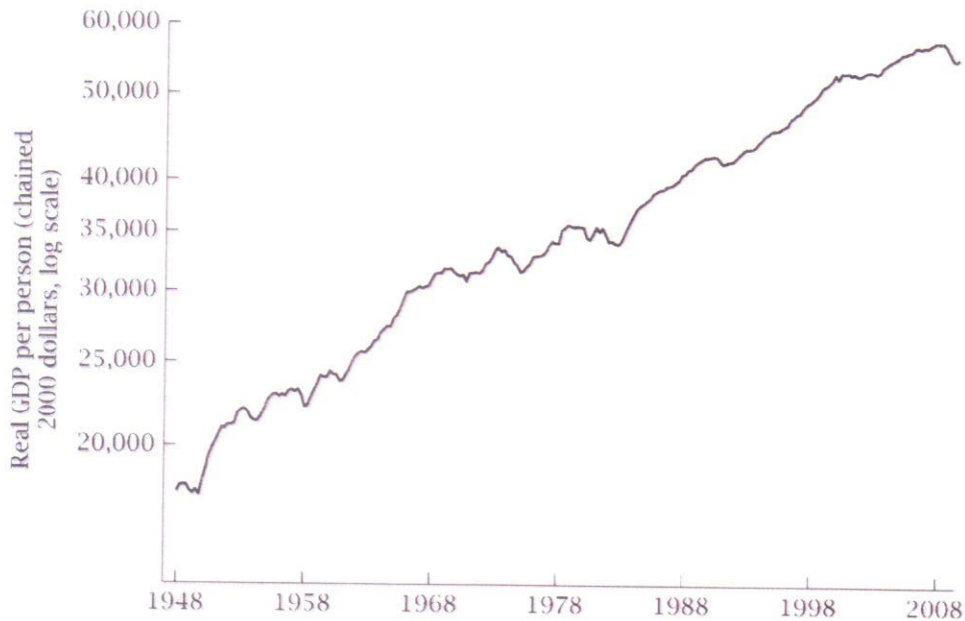


FIGURE 5.1 U.S. real GDP per person, 1947:1-2009:3

The times between the end of one recession and the beginning of the next range from 4 quarters in 1980-1981 to almost 10 years in 1991-2000. The patterns of the output declines also vary greatly. In the 1980 recession, over 90 percent of the overall decline of 2.2 percent took place in a single quarter; in the 1960 recession, output fell for a quarter, then rose slightly, and then fell again; and in the 1957-1958 and 1981-1982 recessions, output fell sharply for two consecutive quarters.

Because output movements are not regular, the prevailing view is that the economy is perturbed by disturbances of various types and sizes at more or less random intervals, and that those disturbances then propagate through

TABLE 5.2 Behavior of the components of output in recessions

Component of GDP	Average share in GDP	Average share in fall in GDP in recessions relative to normal growth
Consumption		
Durables	8.9%	14.6%
Nondurables	20.6	9.7
Services	35.2	10.9
Investment		
Residential	4.7	10.5
Fixed nonresidential	10.7	21.0
Inventories	0.6	44.8
Net exports	-1.0	-12.7
Government purchases	20.2	1.3

the economy. Where the major macroeconomic schools of thought differ is in their hypotheses concerning these shocks and propagation mechanisms.<sup>2</sup>

A second important fact is that fluctuations are distributed very unevenly over the components of output. Table 5.2 shows both the average shares of each of the components in total output and their average shares in the declines in output (relative to its normal growth) in recessions. As the table shows, even though inventory investment on average accounts for only a trivial fraction of GDP, its fluctuations account for close to half of the shortfall in growth relative to normal in recessions: inventory accumulation is on average large and positive at peaks, and large and negative at troughs. Consumer purchases of durable goods, residential investment (that is, housing), and fixed nonresidential investment (that is, business investment other than inventories) also account for disproportionate shares of output fluctuations. Consumer purchases of nondurables and services, government purchases, and net exports are relatively stable.<sup>3</sup> Although there is some variation across recessions, the general pattern shown in Table 5.2 holds in most. And the same components that decline disproportionately when aggregate output is falling also rise disproportionately when output is growing at above-normal rates.

A third set of facts involves asymmetries in output movements. There are no large asymmetries between rises and falls in output; that is, output growth is distributed roughly symmetrically around its mean. There does, however, appear to be asymmetry of a second type: output seems to be

<sup>2</sup> There is an important exception to the claim that fluctuations are irregular: there are large seasonal fluctuations that are similar in many ways to conventional business-cycle fluctuations. See Barsky and Miron (1989) and Miron (1996).

<sup>3</sup> The entries for net exports indicate that they are on average negative over the postwar period, and that they typically grow—that is, become less negative—during recessions.

**TABLE 5.3** Behavior of some important macroeconomic variables in recessions

Variable	Average change in recessions	Number of recessions in which variable falls
Real GDP*	-4.1%	11/11
Employment*	-3.1%	11/11
Unemployment rate (percentage points)	+1.8	0/11
Average weekly hours, production workers, manufacturing	-2.3%	11/11
Output per hour, nonfarm business*	-1.7%	10/11
Inflation (GDP deflator; percentage points)	-0.3	5/11
Real compensation per hour, nonfarm business*	-0.5%	7/11
Nominal interest rate on 3-month Treasury bills (percentage points)	-1.6	10/11
Ex post real interest rate on 3-month Treasury bills (percentage points)	-1.4	9/11
Real money stock (M-2/GDP deflator)* <sup>†</sup>	-0.5%	3/8

\*Change in recessions is computed relative to the variable's average growth over the full postwar period, 1947:1-2009:3.

<sup>†</sup> Available only beginning in 1959.

unemployment rises during recessions. The table shows that, in addition, the length of the average workweek falls. The declines in employment and the declines in hours in the economy as a whole (though not in the manufacturing sector) are generally small relative to the falls in output. Thus productivity—output per worker-hour—almost always declines during recessions. The conjunction of the declines in productivity and hours implies that the movements in the unemployment rate are smaller than the movements in output. The relationship between changes in output and the unemployment rate is known as *Okun's law*. As originally formulated by Okun (1962), the “law” stated that a shortfall in GDP of 3 percent relative to normal growth produces a 1 percentage-point rise in the unemployment rate; a more accurate description of the current relationship is 2 to 1.

The remaining lines of Table 5.3 summarize the behavior of various price and financial variables. Inflation shows no clear pattern. The real wage, at least as measured in aggregate data, tends to fall slightly in recessions. Nominal and real interest rates generally decline, while the real money stock shows no clear pattern.

## 5.2 An Overview of Business-Cycle Research

It is natural to begin our study of aggregate fluctuations by asking whether they can be understood using a Walrasian model—that is, a competitive model without any externalities, asymmetric information, missing markets,