Progress Toward Price Stability: A Report Card for 1994

By George A. Kahn

The Federal Reserve tightened monetary policy six times in 1994. The purpose of these policy moves was to encourage sustainable, noninflationary economic growth. Early actions were taken to move monetary policy toward a less accommodative stance than was followed in 1993. Later actions were taken "against the backdrop of continuing strength in the economic expansion and high levels of resource utilization." These later actions were intended "to keep inflationary pressures contained, and thereby foster sustainable economic growth." All of the actions were in keeping with the Federal Reserve's long-run goal of price stability, which is the key contribution the Federal Reserve can make toward maximizing long-run growth and living standards in the United States.

This article examines the behavior of inflation in 1994 in relation to the Federal Reserve's goal of achieving price stability over time. The article is the second in an annual series assessing the Federal Reserve's progress toward achieving price stability. The first section discusses price stability as a goal of monetary policy and the Federal Reserve's projections for inflation in 1994. The second section describes the behavior of inflation in 1994, showing inflation remained moderate for the year as a whole. The third section shows inflation expectations rose slightly in 1994, indicating the public remains skeptical that the inflation outlook has improved. Together, these findings suggest the Federal Reserve had mixed success in moving further toward price stability in 1994.

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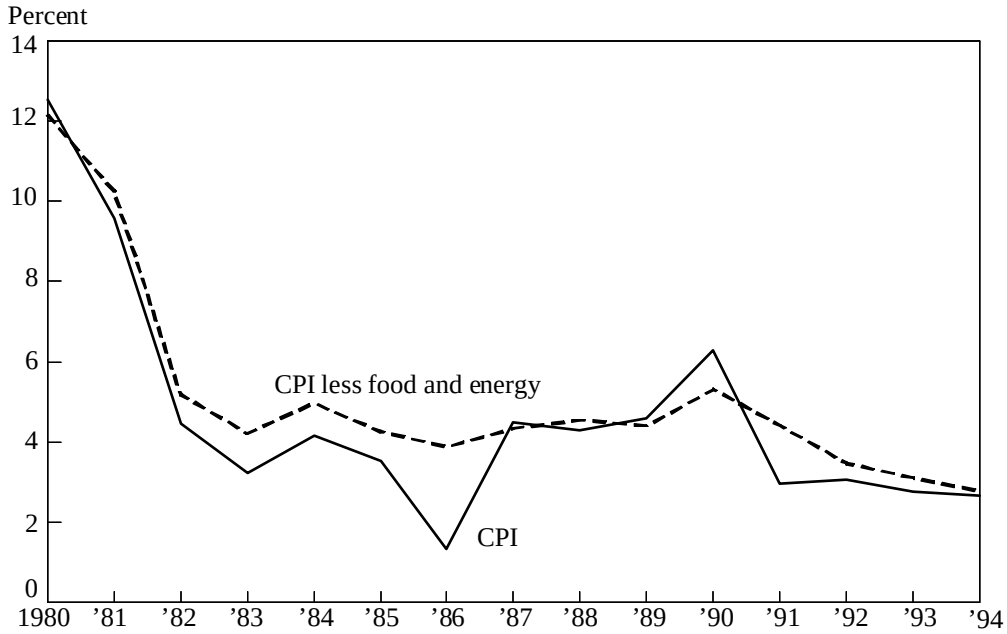
GOALS AND PROJECTIONS FOR INFLATION

Reducing inflation is important because inflation is costly. Inflation discourages saving and investment by creating uncertainty about future prices. It forces businesses and individuals to spend time and money predicting future prices and hedging against unanticipated inflation. And, through its interaction with the tax system, it can increase tax burdens by artificially raising incomes and profits. All of these factors cause the economy to operate less efficiently, hampering economic growth and ultimately reducing standards of living (Fischer).

Because in the long run inflation is a monetary phenomenon, monetary policy is the only tool available for keeping inflation under control. As the nation's central bank, the Federal Reserve holds sole responsibility for maintaining the purchasing power of the dollar. Given the inherent costs of inflation, the Federal Reserve in recent years has adopted a policy of working toward price stability

Chart 1
CPI Inflation Since 1980



Note: Data are Q4/Q4 percent changes.
Source: Bureau of Labor Statistics.

over time. By pursuing this goal, the Federal Reserve minimizes the costs of inflation and, in so doing, helps maximize the economy's long-run growth potential.[1]

Substantial progress has been made in the last 15 years toward price stability. Inflation as measured by the consumer price index (CPI) has fallen from double digits in the late 1970s and early 1980s to under 3 percent last year (Chart 1). Other price measures, described in detail in the accompanying box, have shown similar reductions in inflation. Nevertheless, inflation remains above the level most analysts associate with price stability.[2]

Having achieved a CPI inflation rate of 2.7 percent in 1993, Federal Reserve officials acknowledged that further progress against inflation would be difficult. At the beginning of 1994, the Federal Reserve projected that inflation might run "a shade higher" than in 1993, due in part to developments in the agriculture and energy sectors. In the agriculture sector, poor harvests in 1993 were thought to pose an upside risk to food prices in 1994 and therefore to overall CPI inflation. In the energy sector, price declines that had contributed to low inflation in 1993 were not expected in 1994. More fundamentally, Federal Reserve officials felt "the recent narrowing of the degree of slack in the labor and product markets suggests that competitive pressures damping wage and price increases will be less strong and less pervasive than they have been recently" (Board of Governors, February 1994, pp. 2-3).

Given these developments, the Federal Open

ALTERNATIVE INDICATORS OF INFLATION

Price stability is achieved, according to some definitions, when inflation is not a factor in the decisionmaking processes of households and businesses. Because of difficulties in measuring the aggregate price level, however, price stability does not necessarily imply achieving a constant level for a specific price index. All statistical measures of inflation are flawed.[3] And, there is no consensus on which of many imperfect measures to "stabilize." As a result, policymakers look at a variety of inflation indicators in gauging progress toward price stability. These indexes differ according to how they are calculated and according to the goods and services they cover.

The consumer price index (CPI) measures the average change in the price of a fixed market basket of goods and services purchased by consumers. The market basket is composed of seven major categories of expenditures—food, housing, apparel, transportation, medical care, entertainment, and other goods and services. Goods and services included in the index may be domestically produced or imported.

The *producer price index* (PPI) measures average changes in selling prices received by domestic producers of goods. The index is classified by stage of processing, with separate measures for finished goods, intermediate goods, and crude materials. Of all the PPI indexes, the PPI for finished goods is the most closely watched and the one that is cited in this article. The PPI measures prices at the first level of commercial transaction. Therefore, the PPI can sometimes serve as an indicator of future changes in broader measures of the general price level, such as the CPI. But because the PPI excludes services, its use as an indicator of consumer price inflation is limited.

Removing the food and energy components from the CPI and PPI sometimes gives a better indication of the underlying or *core inflation* rate. Food and energy prices are volatile and not always representative of economywide fundamentals. For example, when a drought raises food prices or OPEC raises oil prices, the effect on inflation is temporary. Looking at the CPI or PPI net of food and energy prices in such a situation can give a better indication of underlying inflationary pressure.

The GDP-based indicators of inflation measure average price changes for all goods and services produced in the United States, including investment goods and exports, but excluding imports. While the *implicit GDP deflator* allows changes in consumer and business spending patterns from one quarter to the next, the *fixed-weight GDP deflator*—like the CPI and PPI—holds spending patterns constant. The GDP-based inflation measures are derived from the same raw data as the CPI and PPI. Therefore, they potentially suffer the same quality-adjustment biases as the CPI and PPI.

Market Committee (FOMC)—the Federal Reserve's principal policymaking body—believed overall CPI inflation might rise slightly in 1994. The projections of CPI inflation for 1994 made in February by the Federal Reserve Board of Governors and Reserve Bank Presidents ranged from 2 1/4 percent to 4 percent. Most of the forecasts, however, were close to 3 percent (Table 1).

Later in 1994, after inflation came in somewhat lower than expected, the FOMC revised downward its projections for inflation (Table 1). In July, the FOMC lowered its range of projections of CPI inflation to 2 1/2 to 3 1/2 percent, with a majority of FOMC members expecting inflation in a narrower range of 2 3/4 to 3 percent.

Table 1

FOMC Inflation Projections for 1994

	February	July
Range	$2\frac{1}{4}$ to 4	$2\frac{1}{2}$ to $3\frac{1}{2}$
Central tendency	About 3	$2\frac{3}{4}$ to 3

Note: Data are Q4/Q4 percent changes for the CPI.
Source: Board of Governors of the Federal Reserve System.

INFLATION IN 1994

Inflation remained moderate in 1994. The CPI for all items in 1994 increased 2.7 percent, the same as in 1993.[4] Core inflation, defined as CPI inflation excluding food and energy prices, declined from 3.1 percent in 1993 to 2.6 percent (December over December) in 1994. Thus, for the year as a whole, overall CPI inflation fell toward the low end of the narrow range of projections made by FOMC members in July.

Other measures of inflation were mixed, with most indicators of final goods prices remaining largely unchanged and indicators of inflation at the earlier stages of production rising somewhat. Despite declining slack in the economy, most price measures remained well contained for the year as a whole. However, due to both fundamental and special factors, inflation in the second half of the year showed signs of rising.

Movements in inflation over the year

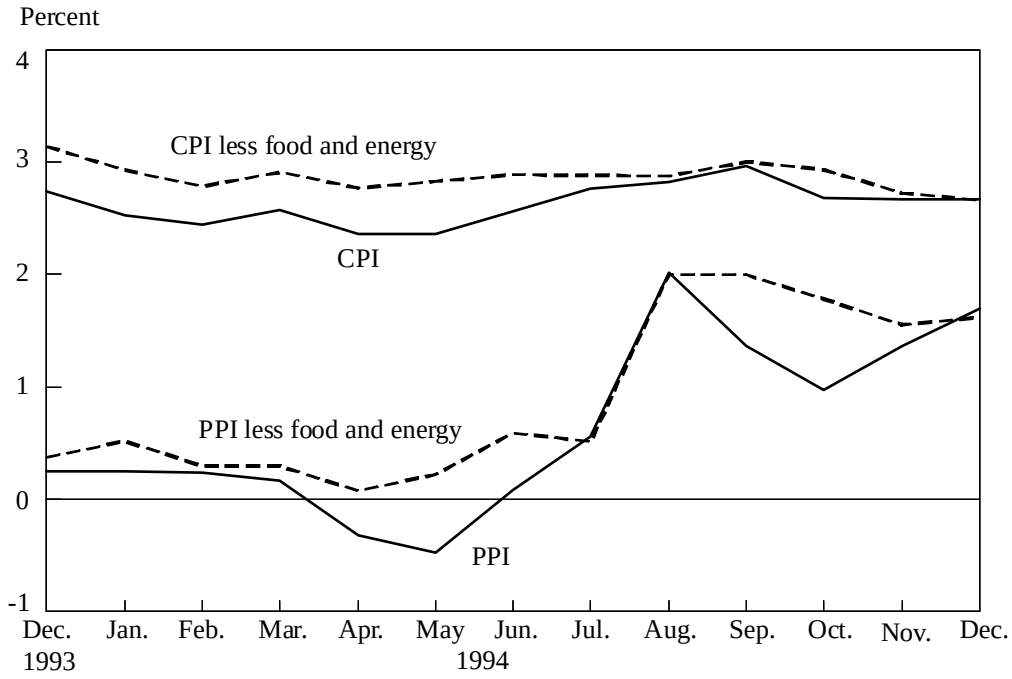
Most measures of inflation fell slightly in the first half of the year and then rose somewhat. Inflation as measured by the 12-month percentage change in the CPI—with and without food and energy—decreased through the first five months of 1994 (Chart 2). After reaching a low of 2.4 percent for all items and 2.8 percent for all items except food and energy, CPI inflation increased through September. Then, both overall and core CPI inflation moderated a bit in the fourth quarter.

Similar to CPI inflation, inflation in the producer price index (PPI) fell slightly in the first part of the year (Chart 2). After reaching a low of -0.5 percent for all items in May and 0.1 percent for all items less food and energy in April, PPI inflation rose sharply through the August. PPI inflation then moderated a little in the fall.

GDP-based measures of inflation rose slightly over the year as a whole (Chart 3). While both the implicit GDP deflator and the fixed-weight GDP deflator showed a slight decline in inflation in the first quarter, they both showed slight increases in the second and third quarters. Through the third quarter—the most recent quarter for which data are available—inflation in the implicit deflator increased from 1.8 percent in 1993:Q4 (Q4/Q4) to 2.3 percent in 1994:Q3 (Q3/Q3), and inflation in the

Chart 2

Monthly Inflation Indicators



Note: Data are 12-month rates of change.
Source: Bureau of Labor Statistics.

fixed-weight deflator increased from 2.8 percent to 2.9 percent.

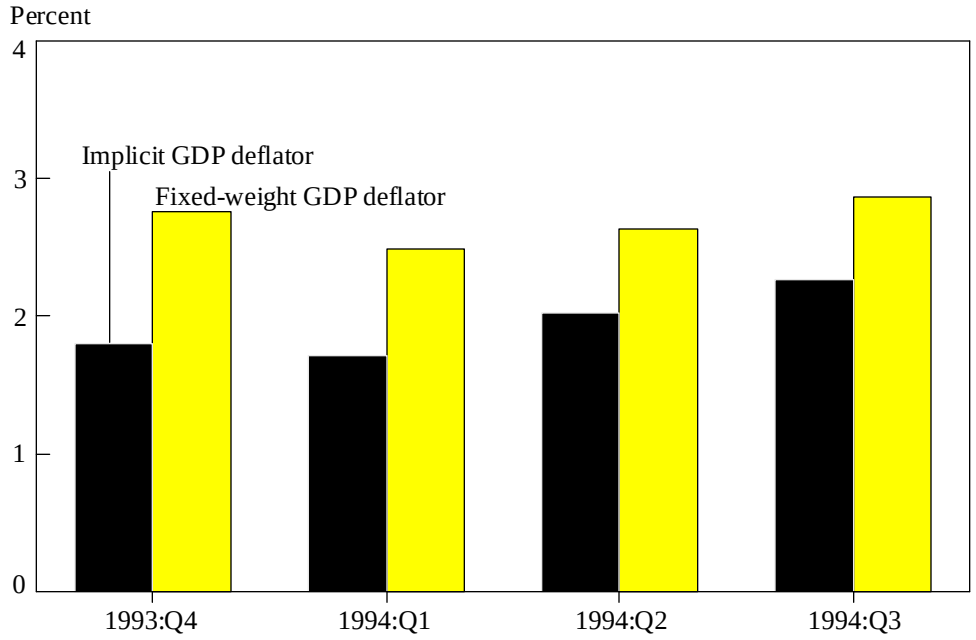
Fundamental factors

Most fundamental determinants of inflation signaled rising inflationary pressures through much of the year, if not rising inflation statistics. The most important fundamental factor was the reduction and elimination of slack in the economy in the form of excess industrial capacity and unemployment. By most measures, the economy is currently operating at or beyond full resource utilization. In such situations, inflation tends to rise, albeit with a lag.

One common measure of resource use is the capacity utilization rate in manufacturing. According to this measure, capacity use rose steadily in 1994 from just under 82 percent in January to over 85 percent in December (Chart 4). Research conducted at this Reserve Bank suggests inflation tends to increase when the capacity utilization rate rises above 82 percent (Garner). Although some analysts have suggested excess foreign capacity is currently acting as a relief valve for building inflationary pressures, this research suggests otherwise. It argues that capacity use remains a reliable indicator of inflationary pressures and that the 82 percent inflation threshold has held fairly steady since the 1960s.[5] Accordingly, rising capacity use put upward pressure on inflation throughout most of 1994.

Chart 3

Quarterly Inflation Indicators



Note: Data are four-quarter rates of change.
Source: U.S. Department of Commerce.

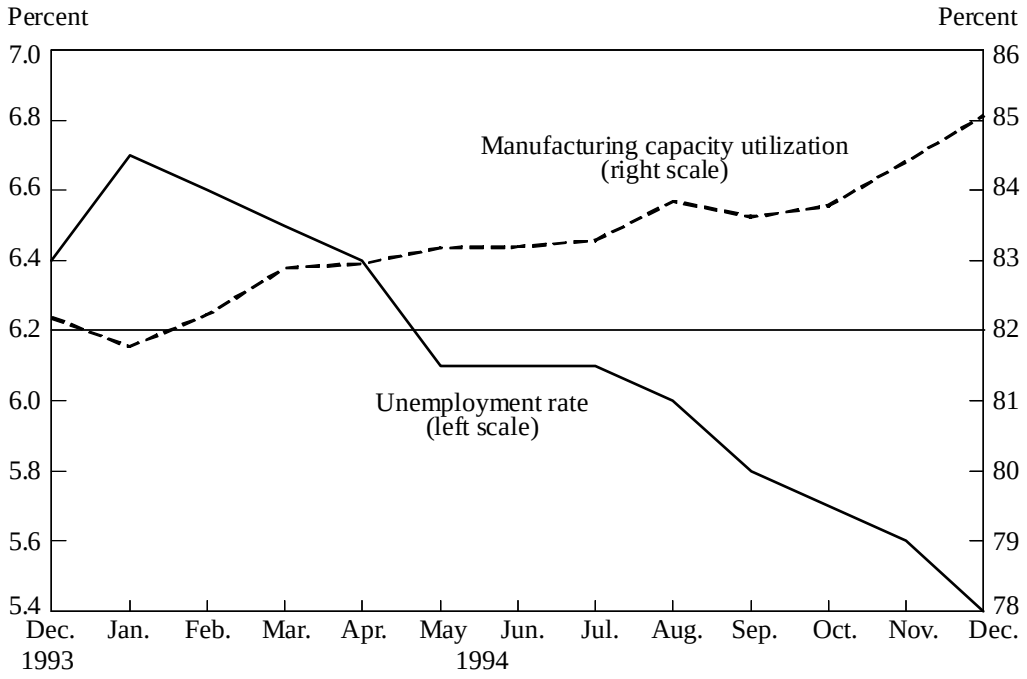
Despite almost a year of capacity use above the 82 percent inflation threshold, measured inflation showed only a few signs of rising, mostly in the second half of the year. This is not unprecedented. In the 1960s and early 1970s, for example, capacity utilization rates rose above the inflation threshold well before inflation accelerated. But inflation did eventually accelerate. Thus, while high rates of capacity use have not yet generated a significant increase in inflation, history suggests inflationary pressures may nevertheless be building.

Another measure of resource use is the unemployment rate. Unemployment fell sharply in 1994, from 6.7 percent in January to 5.4 percent in December (Chart 4).[6] Nevertheless, in the first four months of 1994, unemployment remained above most estimates of the "natural rate" of unemployment—the lowest rate associated with stable inflation. These estimates of the natural rate range from 5 1/2 percent to 6 1/2 percent, with research conducted at this Reserve Bank suggesting a natural rate of about 6 1/4 percent (Weiner). With unemployment above the natural rate early in the year, labor markets exerted downward pressure on inflation. After April, unemployment fell below the natural rate, exerting upward pressure on inflation. On net in 1994, unemployment was essentially a neutral factor affecting inflation.[7] By the end of 1994, however, unemployment was well below most estimates of the natural rate, suggesting higher inflation in the future.

With unemployment above the natural rate in

Chart 4

Resource Utilization



Sources: U.S. Department of Labor and Board of Governors of the Federal Reserve System.

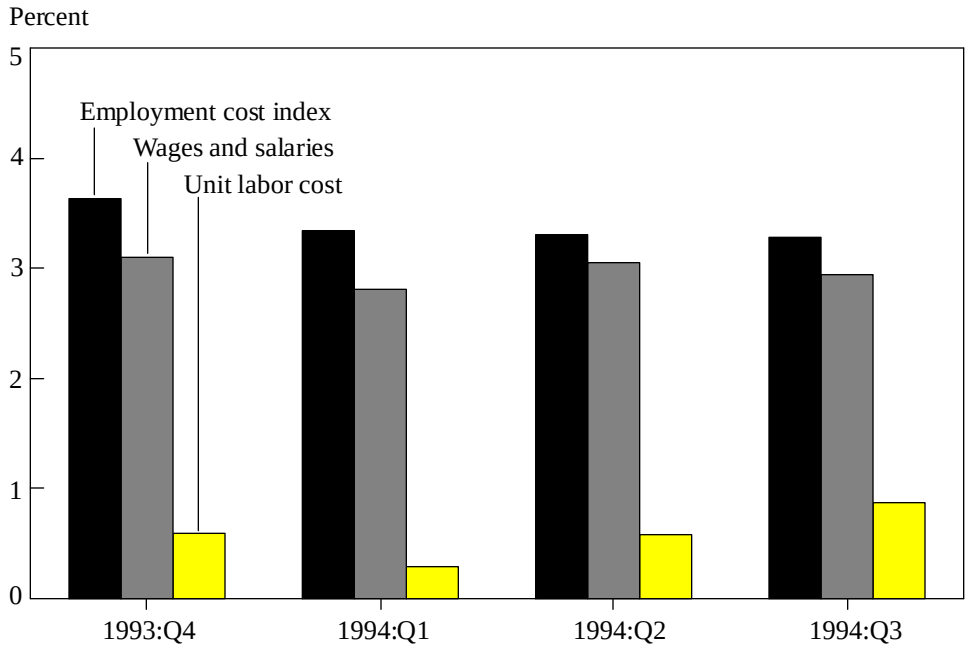
the first part of the year, increases in labor costs remained moderate. Growth in labor costs has important implications for inflation because labor costs are roughly two-thirds of total production costs. While total labor costs rose somewhat faster than prices in 1994, productivity growth continued to be strong. As a result, unit labor costs—those incurred on average in producing one unit of output—increased only modestly.

One of the best measures of labor costs, the employment cost index (ECI), shows these trends clearly (Chart 5). The ECI is a measure of total labor costs including benefits.[8] As measured by the ECI, total labor costs rose less than 3.5 percent in the first three quarters of 1994, down from 3.6 percent in the fourth quarter of 1993 (Q4/Q4). The wage and salary component of the ECI rose 3 percent or less. And, because of rapid productivity growth, growth in unit labor costs remained under 1 percent in the first three quarters of 1994—a rate significantly less than the rate of inflation. Thus, slack in labor markets at the beginning of the year and strong productivity growth combined to keep labor cost increases in check. With labor markets now much tighter, however, and productivity growth likely slowing due to cyclical factors, future labor cost increases may not be as favorable.

Another fundamental factor affecting inflation, prices of materials used at the earliest stages of production, signaled higher inflation throughout 1994. These materials prices, also known as commodity prices, fluctuate minute by minute in auction-

Chart 5

Wage Inflation



Note: Data are four-quarter rates of change.
Source: Bureau of Labor Statistics.

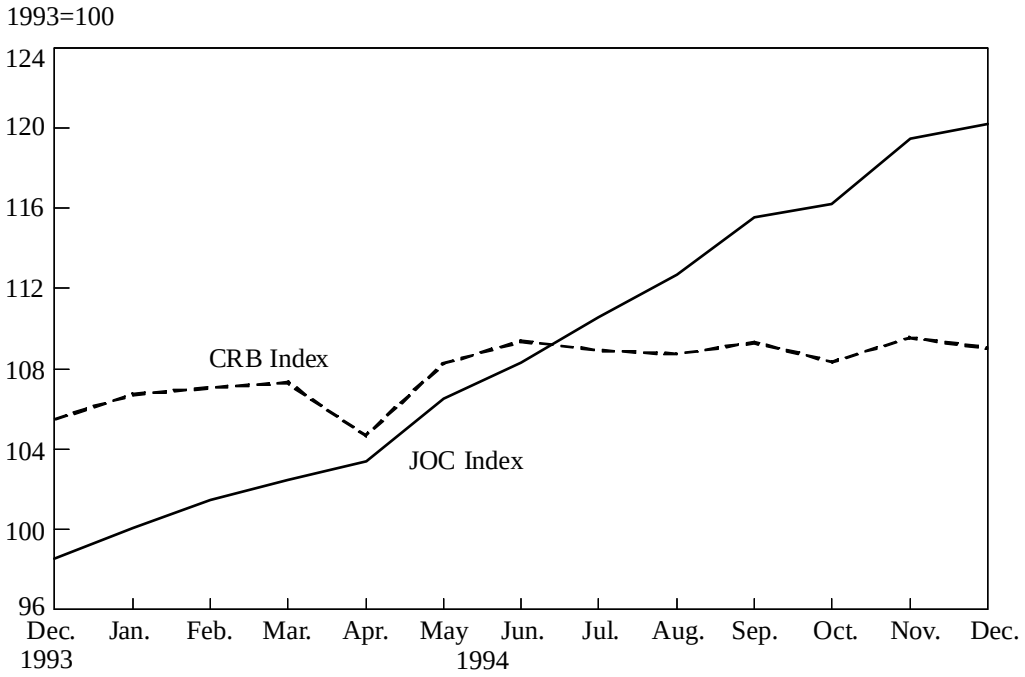
type markets and sometimes signal an early warning of future movements in the prices of finished goods and services. Two closely watched commodity price indexes rose throughout the year. The Journal of Commerce (JOC) index, which is weighted toward industrial materials, rose much faster than the Commodity Research Bureau (CRB) futures index, which is weighted toward agricultural products (Chart 6). The JOC index showed a steady increase from 98.53 in December 1993 to 120.18 in December 1994. The CRB index rose from 105.49 in December 1993 to 109.02 in December 1994. Despite the increases, commodity price increases did not lead to a significant increase in inflation in 1994. Still, the trends suggest a potential for higher inflation in 1995.

Special factors

While fundamental factors explain long-term movements in inflation, a number of special factors help explain fluctuations from month to month. At the consumer level, three key sectors contributed most to the decline in inflation early in the year. First, price inflation in the *medical care* sector moderated from 5.4 percent per year in December 1993 to 4.6 percent in May 1994. The threat of greater regulation of the medical care industry and efforts by businesses to contain rising medical care benefit costs possibly contributed to the moderation in medical care price inflation. Second, price inflation in the *food and beverages* sector declined from 2.7 percent in December 1993 to 1.6 percent

Chart 6

Commodity Price Indexes



Sources: CRB Commodity Index Report, and *Journal of Commerce*.

in May. The primary cause was moderation in the prices of fruits and vegetables. And third, price inflation in the *apparel and upkeep* sector fell from 0.9 percent in December to 0.4 percent in May. Contributing to lower inflation in apparel prices were greater post-holiday discounting than usual and the delayed introduction of new fashion lines.[9] At the wholesale level, inflation also declined in the first five months of 1994, due primarily to declines in *food and energy* prices.

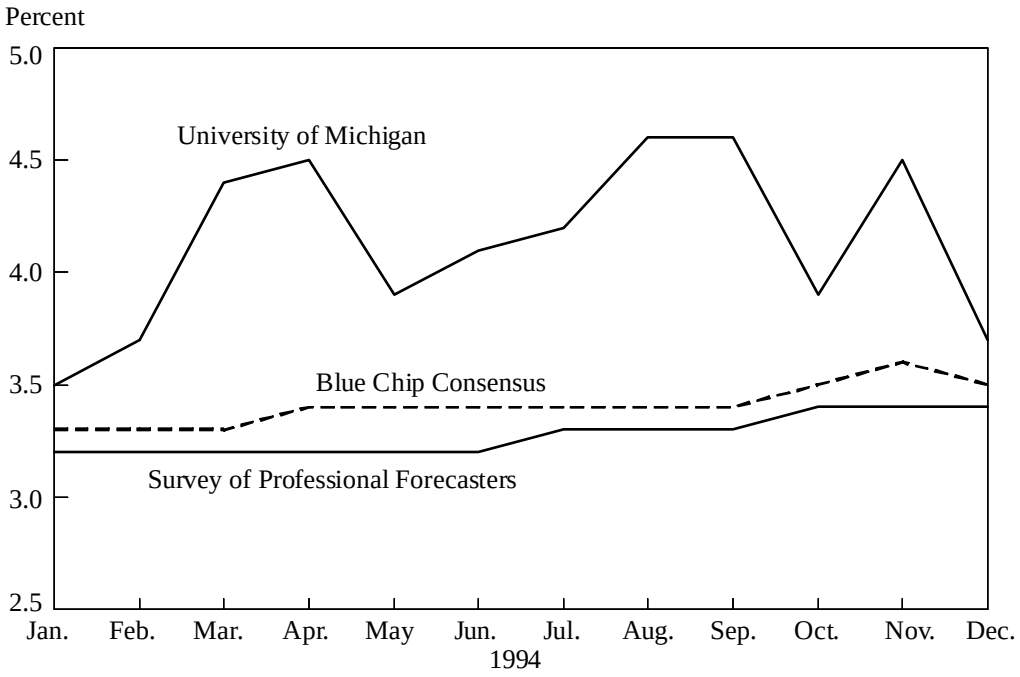
Other special factors contributed to slightly higher inflation in the remainder of the year. At the consumer level, substantial price increases in the food and transportation sectors pushed inflation higher. For example, *coffee prices* jumped over 20 percent in July and August as a result of a freeze in Brazil. *Gasoline prices* also rose, pushing the transportation component of CPI inflation from 2.0 percent in May to 4.5 percent in September. At the wholesale level, the rise in inflation was more alarming. The increase was broad based, with particularly big increases in *crude oil prices* and *wholesale coffee prices*.

INFLATION EXPECTATIONS IN 1994

Another approach to evaluating progress toward price stability is to examine changes in inflation expectations. Inflation expectations are important because a decline in expectations is an essential ingredient in making progress toward

Chart 7

Short-Term Inflation Expectations



Notes: The Blue Chip Consensus data are forecasts of CPI inflation from 1994:Q4 to 1995:Q4. The Survey of Professional Forecasters data are forecasts of average annual CPI inflation for 1995. The University of Michigan data are expected CPI inflation over the next 12 months.

Sources: "Blue Chip Indicators"; Survey Research Center, University of Michigan; and the "Survey of Professional Forecasters," Federal Reserve Bank of Philadelphia.

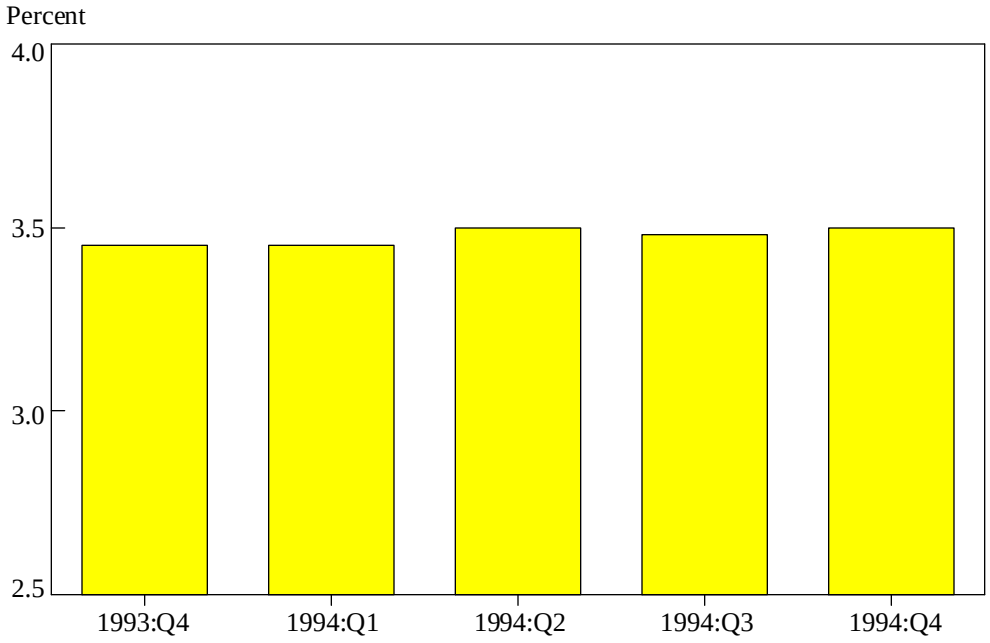
price stability. Unfortunately, most measures of inflation expectations show that inflation is expected to rise in the future. Moreover, expectations of inflation over the short run were revised slightly upward in 1994. Revisions to expected inflation over the long run were mixed and generally quite small. Overall, the public apparently remained skeptical that the Federal Reserve would contain inflation at its current level, and many analysts revised expectations of inflation slightly upward.

Importance of expectations

Inflation expectations are important for two main reasons. First, inflation expectations are a key determinant of inflation. For example, if inflation is expected to fall, businesses will be more willing to reduce the rate of increase of product prices, and workers will be more willing to moderate their wage demands. Both businesses and workers will realize, in an environment of lower inflation, they

Chart 8

Long-Term Inflation Expectations



Note: Long-term expectations are the median forecasts for CPI inflation over the next ten years.
Source: "Survey of Professional Forecasters," Federal Reserve Bank of Philadelphia.

can maintain their real prices and wages with lower nominal price and wage growth. As a result, actual wage and price inflation will fall. Thus, a decline in inflation expectations can lead to a decline in actual inflation.[10]

A second reason inflation expectations are important is that they signal how workers and businesses view future monetary policy. For example, a central bank that plans to reduce inflation over time, but fails to generate falling inflation expectations, may lack credibility. Businesses and workers might continue to plan on an unchanged inflation rate when setting prices and wages and, as a result, inflation might persist. Reducing inflation becomes more difficult and more costly (Kahn and Weiner). It is therefore important for expectations to adjust downward when monetary policy acts to lower inflation. Knowing how expectations are changing gives an indication of how credible monetary policy is and thereby how quickly inflation will fall.

Short-term expectations

Short-term inflation expectations were slightly higher at the end of 1994 than at the beginning of the year. For example, inflation expectations for 1995 rose in 1994. Not only did professional forecasters doubt that inflation would remain at its 1994 level in 1995, but most forecasters raised their

expectations of the likely increase in inflation (Chart 7). One measure of inflation expectations is the Blue Chip consensus forecast of CPI inflation. According to this indicator, expected CPI inflation from 1994:Q4 to 1995:Q4 rose steadily through 1994, reaching a high of 3.6 percent in November 1994. (In December 1994, however, the Blue Chip consensus lowered its forecast of 1995 inflation by a tenth of a percentage point.) Another indicator of short-term inflation expectations is the survey of professional forecasters compiled by the Federal Reserve Bank of Philadelphia. This survey, conducted on a quarterly basis, shows expected CPI inflation for 1995 rising steadily through 1994 and reaching a high of 3.4 percent in the fourth quarter.[11]

Compared with the inflation outlook of professional forecasters, consumers' outlook for inflation was more volatile and pessimistic. The University of Michigan's consumer survey of inflation expectations for 12 months ahead rose sharply early in the year, then fluctuated around an average rate of 4.2 percent for the rest of the year.

Long-term expectations

Survey measures of long-run inflation expectations were fairly stable in 1994, with some deteriorating modestly and others improving modestly. While most forecasters continue to expect inflation to rise over long time horizons, revisions to these expectations have been mixed. For example, long-term inflation expectations, as measured by the Philadelphia Reserve Bank's survey of professional forecasters, rose slightly through the year (Chart 8). Expected CPI inflation over the next ten years rose from 3.45 percent in the fourth quarter of 1993 to 3.50 percent in the fourth quarter of 1994.

In contrast, another survey compiled by the Federal Reserve Bank of Philadelphia showed long-term inflation expectations declined modestly in 1994. This survey—the Livingston Survey—summarizes inflation forecasts of economists from industry, government, banking, and academia twice a year. The survey shows ten-year forecasts of CPI inflation falling steadily from 3.6 percent in December 1993 to 3.5 percent in June 1994 to 3.4 percent in December 1994.

The relative steadiness of, or possible decline in, long-term inflation expectations is reassuring. It suggests the public has not raised its expectations of long-term inflation in response to recent strong economic growth and the elimination of excess capacity in the economy. Although inflation is still expected to rise over both the short and long run, recent economic developments have not led to a fundamental reassessment of the long-run inflation outlook.

CONCLUSIONS

The Federal Reserve had mixed success in 1994 in making progress toward price stability. Acting promptly to contain inflationary pressures, the Federal Reserve raised short-term interest rates as the economy approached full resource utilization. These actions were taken preemptively, before any apparent increase in inflation statistics at the consumer level. Partly because of these actions, inflation remained moderate. Overall CPI inflation was unchanged from 1993, and core CPI inflation declined slightly. In contrast, fundamental inflation indicators throughout the year pointed to higher future inflation.

The outlook for inflation in 1995 is less positive. Most forecasters expect inflation to increase in 1995 and have revised upward their short-term inflation expectations. The December Blue Chip consensus forecast for CPI inflation from the fourth quarter of 1994 to the fourth quarter of 1995 is 3.5 percent, somewhat higher than actual inflation in 1994. This expectation is likely based on a view that the economy is currently operating beyond full resource utilization and that continued rapid growth could lead to a further overheating of the economy in early 1995.

An increase in inflation in 1995 is not inevitable.

The tightening of monetary policy in 1994 may prove sufficient to slow economic growth to a more sustainable pace and bring aggregate economic activity closer in line with capacity constraints. If not, a further tightening of monetary policy may prove necessary. Prompt action by the Federal Reserve in these circumstances will be essential to ensure inflation remains well contained.

ENDNOTES

[1] The Federal Reserve Act, as amended by the Employment Act of 1946 and the Full Employment and Balanced Growth Act of 1978, spells out the goals of monetary policy. They are stability and growth in the economy, a high level of employment, stability in the purchasing power of the dollar, and reasonable balance in transactions with foreign countries.

[2] For more background information on price stability as a goal of monetary policy, see Kahn.

[3] One problem associated with the construction of price indexes is adjusting prices to reflect changes in the quality of goods and services. When innovation allows manufacturers to improve their products, consumers receive more product for their dollars. On a quality-adjusted basis, the price of these products has fallen. Statisticians try to adjust for such quality changes in computing price indexes but, to the extent quality improvements are understated, inflation is exaggerated. Another problem is accounting for changes in the "market basket" of goods and services purchased by consumers. While some price indexes allow spending patterns to change over time, *fixed-weight* price indexes such as the CPI measure changes over time in the price of a fixed market basket. To the extent consumers respond to individual price increases by switching to comparable items that cost less, such fixed-weight indexes may overstate inflation.

While there is considerable uncertainty about the size of the upward bias to the CPI, most estimates suggest it is small. One study, based on a survey of the literature, estimates the bias to fall within a range of zero to two percentage points (Wynne and Sigalla). Another study estimates an upper bound of 1.8 percent and a "more reasonable" bias of about one percentage point (Lebow, Roberts, and Stockton, pp. 32-33).

[4] CPI inflation was 2.7 percent in both 1993 and 1994 whether measured from the fourth quarter to the fourth quarter or from December to December.

[5] For a subsample from 1974 to 1993, Garner finds the stable-inflation capacity use rate to be 81 percent. In all other samples analyzed, the stable-inflation capacity use rate is estimated to be 82 percent.

[6] The rise in the unemployment rate from December 1993 to January 1994 may be partly attributable to a change in the way the U.S. Department of Labor measures unemployment. In particular, the survey used by the department to calculate unemployment (the Current Population Survey) was revised in January. The new survey, which uses a different questionnaire and new collection techniques, has resulted in a slightly higher unemployment rate.

[7] A simple rule of thumb can be used to estimate how much pressure, on net, unemployment has exerted on inflation. The rule of thumb, which has been reliable in the past in relating inflation to unemployment, says that one point-year of unemployment below (above) the natural rate is associated with a 0.5 percentage-point increase (reduction) in inflation. A point-year of unemployment is one year of unemployment one percentage point away from the natural rate (Kahn and Weiner). With an average unemployment rate of 6.1 percent in 1994 and a natural rate of 6.2 percent—as estimated by Weiner—the economy has experienced, on average, a tenth of a point-year of unemployment below the natural rate. Therefore, inflation would be expected to increase only 0.05 percentage point (0.1 x 0.5). With overall CPI inflation remaining unchanged from 1993 to 1994 and core CPI inflation falling 0.3 percentage point (from 1993:Q4 to 1994:Q4), the rule of thumb comes close to "predicting" the actual behavior of inflation. However, taking lagged effects of unemployment on inflation into account or choosing slightly different time frames might lead to somewhat different "predictions."

[8] The employment cost index provides a measure of labor costs for a fixed set of jobs. Thus, it is similar to a fixed-weight price index because it is not influenced by shifts in workers across jobs and industries.

[9] These factors were largely offset in the late spring and early summer as new fashions were introduced. However, apparel prices declined again in the fall.

[10] The decline in inflation will be permanent only if the expectations of lower inflation are realized (Kahn and Weiner).

[11] Another survey conducted by the Federal Reserve Bank of

Philadelphia—the Livingston survey—also shows expected inflation for 1995 increasing. In June 1994, for example, respondents expected CPI inflation of 3.3 percent in the first half of 1995. In December 1994, they had raised their expectation of inflation in the first half to 3.4 percent. For all of 1995, the December report indicates expected CPI inflation of 3.5 percent.

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