

CHAPTER 1

Inflation and Growth in the 1980s

IN THE 1980s THE UNITED STATES will confront a variety of stubborn problems that have developed during the past 15 years. Chief among these problems is one that is shared by most other industrial countries—the persistence of large wage and price increases, even in the face of high unemployment and slack production. This problem poses the single most important challenge to U.S. economic policy—reducing inflation while maintaining a reasonably prosperous and growing economy.

Many other problems are themselves closely related to inflation, either as cause or as consequence. Our Nation's productivity growth has virtually halted in recent years. The era of cheap energy has ended, the world has grown vulnerable to supply disruptions, and the course of domestic inflation and unemployment has become closely dependent on economic and political developments in the oil-rich but politically unstable Middle East. Meanwhile, the struggle to find a proper balance between a clean, healthy, and safe environment, on the one hand, and satisfactory economic growth with lower inflation, on the other, will continue. All of these developments, together with the growing interdependence of the world economy, have set in motion major changes in economic structure, occupational skill requirements, and industrial location that will continue to pose sizable adjustment problems to many industries, communities, and workers.

While the magnitude of these economic challenges is cause for serious concern, it does not warrant pessimism. During the 1970s the U.S. economy performed quite well in many important respects. Over that decade our country outperformed most other major countries in providing jobs for its people (Table 1). Employment grew almost 25 percent as the American economy created jobs not only for millions of youths entering the labor market for the first time but also for millions of women, who found job opportunities in growing numbers. This performance continued through the last years of the decade at an increased pace. While the growth in the number of employed persons was temporarily interrupted by the recession of 1980, the basic performance was virtually unparalleled.

TABLE 1.—Changes in employment in major industrial countries, 1970–80

[Percent change]

Country	To 1980 first quarter from	
	1970	1976
Germany.....	-3	3
France.....	4	2
United Kingdom.....	0	0
Japan.....	8	5
United States.....	24	11

Note.—Data are for civilian employment.

Sources: Department of Labor (Bureau of Labor Statistics) and Organization for Economic Cooperation and Development.

Some of the rapid job creation was associated with the low rate of productivity growth, but production also increased rapidly. As shown in Table 2, the growth of industrial production in the United States, both during the decade as a whole and in the last years of the decade, compared favorably with that of other large industrial countries.

TABLE 2.—Changes in industrial production in major industrial countries, 1970–80

[Percent change]

Country	To 1980 first quarter from	
	1970	1976
Germany.....	29	15
France.....	36	10
United Kingdom.....	15	9
Japan.....	56	29
United States.....	41	16

Sources: Board of Governors of the Federal Reserve System and Organization for Economic Cooperation and Development.

Whatever the problems of the American economy, they do not arise from an inability to generate large increases in jobs and production. But if the challenges raised by chronic high inflation, energy and environmental problems, ebbing productivity growth, and structural readjustment are not faced, the potential for further growth will not be realized.

In recent years the United States has successfully begun to tackle some of its most difficult problems. After years of inaction followed by several years of vigorous debate, and with some painful sacrifices, we have put into place the major elements of an energy program which is already paying dividends in the form of greater energy conservation and improved supply prospects. After decades in which the documented evidence about the greater productivity and efficiency to be gained from economic deregulation had been ignored, this Nation finally acted during the past 4 years to deregulate its airline, trucking, and railroad industries, and major elements of its financial industry. And during the 1980 recession the executive branch and the Congress showed their willingness to maintain the restraint and discipline

needed to control inflation by resisting strong pressures for a hasty and potentially inflationary fiscal stimulus.

As this *Report* will have several occasions to point out, there are no simple and clear-cut answers to the complex economic problems confronting our country. Many of them will yield only gradually to persistent efforts pursued on many fronts. In some cases where our knowledge is particularly uncertain, we may have to try several approaches before finding an effective solution. Nevertheless, the willingness to tackle difficult problems which this country has shown in the last several years provides a reason to temper concern about the seriousness of our economic problems with a belief that they can be met successfully.

The first two chapters of this *Report* examine the major economic challenges identified above and discuss appropriate policies to deal with them. In most instances the Administration has already made specific policy recommendations, and these are reflected here. But in some cases the chapters identify and evaluate additional policy options on which decisions would have been made had this Administration continued in office. The third chapter of this *Report* examines the Nation's general economic performance in 1980 and the outlook for 1981 and 1982, while the fourth chapter turns to issues pertaining to the international economy.

Chapter 1 addresses the broad problem of reducing inflation while achieving satisfactory growth in employment, output, and productivity. It considers selected aspects of both demand-side and supply-side measures. After discussing the history and causes of inflation, the chapter outlines the role and the limitations of demand management policies, examines the special problems of setting and carrying out anti-inflationary monetary policies in a world of high inflation and frequent economic disturbances, and evaluates the potential usefulness of a tax-based incomes policy as a method for reducing inflation. The remainder of the chapter is devoted to supply-side policies and pays particular attention to two subjects: *first*, the importance of increasing the share of the Nation's output devoted to capital formation and the macroeconomic policies necessary to achieve that goal; and *second*, the integration of supply-oriented tax reductions with overall policies of demand restraint.

Chapter 2 deals with major problems in particular sectors or markets. Specifically, it covers six major topics: energy, regulation, banking, agriculture, the labor market, and the generic problems of structural adjustment among industries confronting economic change. Broadly speaking, the policy measures discussed in Chapter 2 are aimed at increasing supply and productivity by improving the efficiency with which particular markets work and adjust to change. Like

the macroeconomic policies examined in Chapter 1, these too are a means of reducing inflation and speeding economic growth.

INFLATION

The Nation has for some time now experienced inflation that would have been unimaginable in earlier days. Although people's lives and the course of business may not, at first glance, appear radically different from what they were in 1960 before the recent inflation began, inflation has taken a very real toll. The uncertainty it has brought with it cannot be measured, but the consequent anxiety has torn at the fabric of our society. People feel less able to mark their progress and fear that the next round of inflation will leave them poorer. In a number of ways—such as introducing cost-of-living adjustments into wage contracts and indexing the benefits of social welfare programs—institutions have evolved to compensate for some of the uncertainty. But these institutions may sometimes only heighten the arbitrary redistribution of income brought on by inflation—redistribution that society often finds undesirable and unfair. In addition to these painful effects, moreover, inflation reduces the Nation's prospects for growth. The reduction may not appear dramatic, but it impairs the efficiency of the free-enterprise system and discourages capital investment, innovation, and risk-taking.

Rising prices, it should be remembered, are not in the aggregate synonymous with a reduction in real income. When prices rise, someone receives the additional revenues. And for the economy as a whole, rising prices have gone together with rising money incomes. But a wage or salary increase comes infrequently and in a large lump, while prices tend to increase all the time. Furthermore, a pay increase may be viewed as uncertain and as a reward for effort, but price increases seem entirely beyond a consumer's control. As a result, a recent wage increase may be forgotten when the grocery bill rises. Thus rising prices are often treated as something that directly lower real incomes, even when in fact for the Nation as a whole they do not. Of course, the resulting anxiety is no less real.

But when the country pays sharply higher prices to foreign oil producers, that does indeed lower its real income. We are poorer because we receive less oil than we did previously for the same amount of money. That would be true whether or not general inflation followed increases in the price of oil. The induced inflation, in the form of generally higher wages, salaries, and prices, is not the cause of the real income decline—the Nation's higher oil bill is.

A similar phenomenon occurs when growth in productivity slows. Slower productivity growth leads to a slower rise in real incomes. A

decline in productivity growth may be accompanied by an unchanged pace of wage and salary increases, in which case inflation will rise. But a slackening of productivity growth may also result in lower wage increases and an unchanged inflation rate. In either case the same slowdown in the growth of real income would have occurred. It was not caused by inflation.

Although some of the simpler notions that associate inflation with real income loss are wrong, high and rising rates of inflation do indeed weaken the Nation's macroeconomic performance. Inflation can contribute to slower growth in productivity by discouraging investment in two ways. First, some evidence suggests that when inflation increases, not only do people's expectations of future inflation rise, but their expectations tend to become much more uncertain. In this climate, expectations depend less on fact and more on opinion, rumor, and subjective perceptions. Innovative investments and other higher-risk economic activities, the seedbeds of future productivity growth, seem even riskier and are less likely to be undertaken. Meanwhile, businesses and households devote increasing effort to shielding themselves from the effects of inflation, often by speculating in nonproductive assets. Second, as discussed later in this chapter, the interaction between inflation and the tax system can indirectly discourage business investment and also affect the types of assets chosen, thereby distorting investment decisions and resulting in a less productive capital stock.

In a market economy the structure of relative prices and costs, and the yardstick of business profits, provide signals to businesses about what to produce, what inputs to buy, and when to buy them. The system responds to changes in those signals—changes in the price of aluminum relative to copper, of glass relative to tin, and in wages relative to prices. But in a period of high inflation, with a consequent increase in uncertainty, it is much more difficult to distinguish signals from random events. It is hard to know to what extent particular wage and price increases simply represent general inflation or are conveying a "real" message. As a consequence, it is easier to make wrong decisions. Inefficiencies grow, and productivity falls.

The uncertainty created by inflation also obstructs the conduct of economic policy. To the extent that high and rising inflation unhinges expectations from reality, the connection between economic policies and their results is attenuated, and the difficulties of policy-making are increased. Inflation itself is then more difficult to control. There is a temptation for macroeconomic policy to make announcements and take measures to impress the markets, but the intangible gains so purchased tend to evaporate rapidly.

Uncertainty is in large part to blame for the damage done by inflation. In addition to causing serious worry among individuals planning their economic futures, uncertainty interferes with the efficient operation of markets and thereby lowers the productive potential of the economy. Although measures to cure inflation may themselves be painful, over the longer term a reduction in inflation will yield rewards in terms of increased productivity growth and real income.

UNDERSTANDING INFLATION

To understand our persistent inflation, it is necessary to look beyond the commonly cited price statistics. Such statistics as the consumer price index (CPI), the various producer price indexes, and the national income account deflators are specialized measures of inflation, each with its own idiosyncrasies. They may be sharply influenced by fluctuations in food and energy prices or in mortgage interest rates and therefore sometimes exaggerate and sometimes understate the fundamental trend of inflation. As an example, in July 1980 the consumer price index showed inflation at zero while the producer price index (PPI) for finished goods showed inflation at an annual rate of almost 20 percent. It is therefore useful to construct measures which better reveal the true course of inflation.

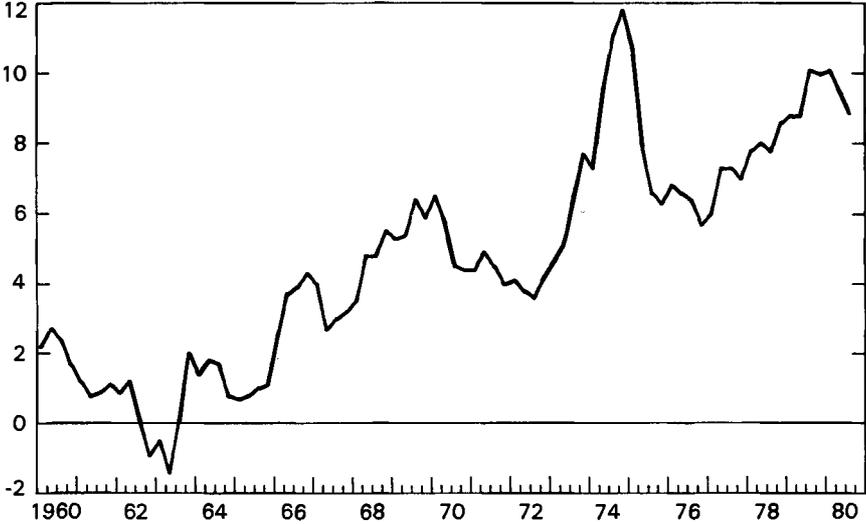
Charts 1 and 2 present two different statistical series which together approximate the basic trend, or "underlying rate," of inflation. The underlying rate is the rate of inflation which today's economy would tend to perpetuate if supply and demand remained roughly in balance and no special factors came into play, such as a large rise in oil or food prices.

Since payments to labor are estimated to account for almost two-thirds of total production costs, prices over the longer term tend to move in conjunction with changes in unit labor costs. Chart 1 shows a special measure of that change—the rate at which wages and fringe benefits are increasing *minus* the trend of growth in productivity. Chart 2 is a version of the price index for personal consumption expenditures calculated by the Department of Commerce. It excludes the volatile components of food and energy. Each series tells basically the same story.

Chart 1

Standard Unit Labor Costs

PERCENT CHANGE FROM 4 QUARTERS EARLIER^{1/2}



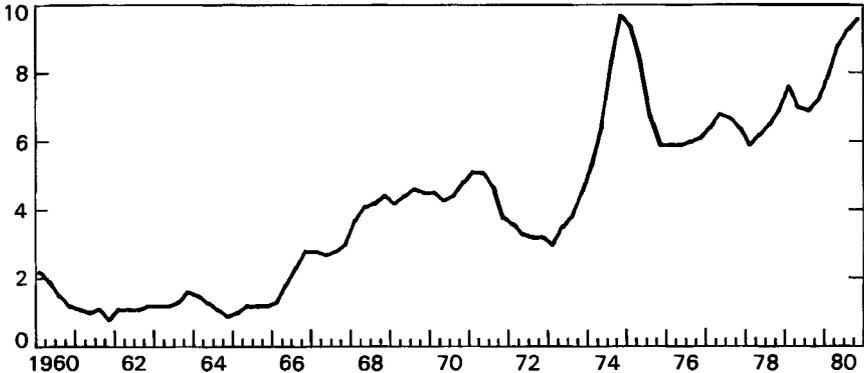
^{1/2}PERCENT CHANGE IN RATIO OF COMPENSATION PER HOUR TO CYCLICALLY ADJUSTED PRODUCTIVITY, PRIVATE NONFARM BUSINESS, ALL PERSONS, UNREVISED.

SOURCES: DEPARTMENT OF LABOR AND COUNCIL OF ECONOMIC ADVISERS.

Chart 2

Price Index for Personal Consumption Expenditures Excluding Food and Energy

PERCENT CHANGE FROM 4 QUARTERS EARLIER^{1/2}



^{1/2}PERCENT CHANGE IN FIXED-WEIGHT PRICE INDEX. DATA ARE PRELIMINARY AND SUBJECT TO REVISION.

SOURCE: DEPARTMENT OF COMMERCE.

Over the past 15 years the underlying rate of inflation has risen from about 1 percent in the first half of the 1960s to 9 or 10 percent now. The increase has not been steady. Instead, there have been three major episodes. Each period began with a sharp increase in the underlying rate and ended with the rate falling only part way to its original level. Thus, each new inflationary period has started from a higher underlying level than its predecessor.

The first jump in the underlying inflation rate came during the Vietnam war, when a large rise in both military expenditures and outlays for Great Society programs was financed for several years without a tax increase. This led to a very large Federal budget deficit superimposed on an economy already operating at a high level. The result was a classic example of an excess of demand over supply. The underlying inflation rate rose from about 1 percent in the 1961-65 period to 4 or 5 percent by 1969. By the end of the decade the forces pushing up the inflation rate receded as taxes were belatedly raised and Vietnam war outlays declined. Although the economy entered a recession in 1970, the underlying rate of inflation continued at about 4 to 5 percent until wage and price controls were introduced in August 1971. For a short period the controls held down inflation in prices but did not reduce the growth in costs.

Another inflationary episode began in late 1973 as the result of two major developments. A poor crop year worldwide caused a sharp surge in food prices, and the Arab oil embargo at the end of 1973 was followed by a threefold increase in world oil prices. Although the full impact of the increase in world oil prices was muted in the United States by price controls on domestically produced oil, energy prices and the prices of energy-using products increased sharply. Aggregate demand grew sharply in 1972 and early in 1973. A worldwide boom led to a major inventory buildup and a widely based acceleration of raw materials prices in 1973-74. Finally, the distortions and inequities brought on by wage and price controls created irresistible pressures for easing the controls in 1973 and eliminating them in 1974. When this occurred, there was a burst of price and wage increases.

When this burst receded, the U.S. economy entered its worst recession in 40 years. While the underlying rate of inflation fell back from its late 1974 peak, it did not fall to its starting point. Aside from brief fluctuations, it settled down in the 6 to 7 percent range from 1976 through 1978.

The most recent inflationary episode was triggered when the Organization of Petroleum Exporting Countries (OPEC) raised oil prices in 1979 and early 1980. Relative to the size of the U.S. economy, the recent price increase was larger than the 1973-74 increase. By the

end of 1974 the world price of oil had tripled from about \$4 to about \$12 per barrel, thereby adding about \$18 billion to our bill for imported oil, or roughly 1.4 percent of gross national product (GNP). Since the price of domestically produced petroleum (which at that time accounted for about two-thirds of the petroleum used in the United States) was restrained by controls, the average U.S. price remained lower than prices throughout the rest of the world. Still, domestic oil prices almost doubled, so that the total increase in consumer costs was almost 3 percent of GNP.

During the most recent shock the price of imported oil rose from about \$15 per barrel at the end of 1978 to \$35 at the close of 1980. This added about \$50 billion to the cost of the oil we now import into the United States, or about 2 percent of GNP. Since domestic crude oil prices were in the process of being decontrolled during this period, the price of domestic oil increased by about \$15 per barrel, adding another \$60 billion to the oil costs paid by consumers.

The forces of inflation during this period were also strengthened to some extent by the behavior of aggregate demand. There was some acceleration of wages in 1978 as unemployment fell sharply. And for a time in late 1978 and early 1979, there appeared to be some excess demand in product markets.

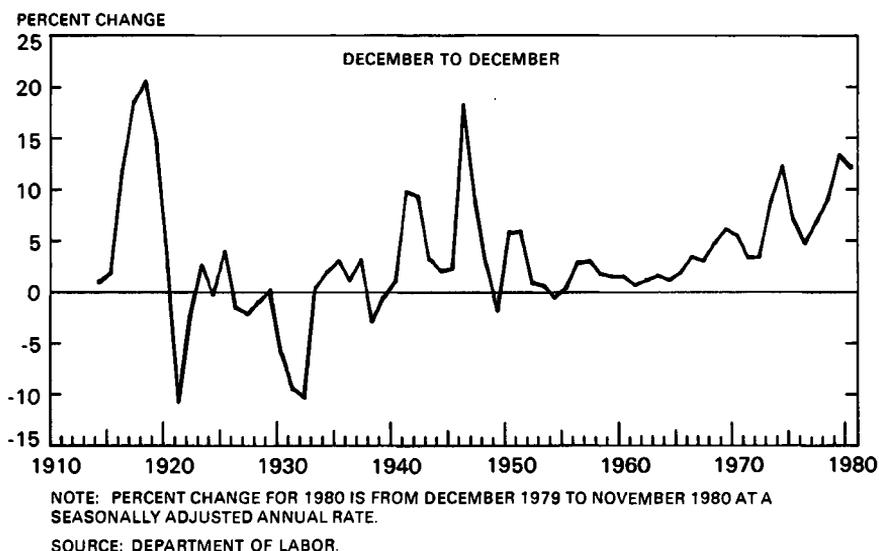
Spurred by these developments, inflation surged in 1979 and early 1980. As measured by the CPI—which was also heavily influenced by sharp increases in mortgage interest rates—inflation reached annual rates of 15 to 20 percent in the first quarter of 1980. By the spring of 1980 the forces that had given rise to this inflationary episode subsided, and the economy entered a brief recession. The measured inflation rate receded from its peak, but the underlying rate appears to have leveled off in the 9 to 10 percent range, up several notches from the 6 to 7 percent level at which the period had started.

THE SOURCES OF INFLATION

The chief problem with respect to inflation is not the sporadic developments that generate inflationary impulses. Instead, it is the ratchet-like nature of the inflationary process which makes it resistant to downward pressures. Chart 3, which shows year-to-year changes in the consumer price index since 1913, captures the essence of the inflation problem of the past two decades. The size of the inflationary bursts of recent years has not been out of line with those which occurred earlier in the century, but recent inflation has had an upward bias and has fluctuated around a rising trend line. An understanding of the “causes” of inflation must therefore encompass not only the various factors that give rise to particular inflationary episodes but also the reasons why inflation has developed a ratchet-like character.

Chart 3

Changes in Consumer Prices Since 1913



The Role of Aggregate Demand in Creating Inflation

The inflation rate which occurs in any given year is a composite of the individual wage and price decisions made by millions of businesses, unions, and workers. Those decisions are influenced by the strength of demand relative to supply. As demand (or spending)—on the part of consumers, business, and government—declines relative to supply, there is pressure on workers to moderate their wage demands lest employment fall, and on producers to restrain prices for fear of losing sales. The converse also holds true: the smaller the number of unemployed people and the lower the amount of unused industrial capacity, the greater the upward pressure on wages and prices. Some evidence also suggests that a rapid rise in demand can generate upward pressure on both wages and prices, even if the level of demand is not excessive. In general, if demand is in rough balance with supply, the underlying rate of inflation for the economy as a whole will remain basically unchanged, even though prices and wages in individual sectors may fluctuate in response to conditions in particular markets. If excess demand exists, or if the rate of increase in demand is very large, the underlying rate of inflation will tend to rise. If aggregate demand falls below supply, some downward pressure will be exerted on inflation.

Expectations about the future state of aggregate demand are also an important determinant of inflation. Wage decisions and many

price decisions cannot easily be reversed. Wages are often set for at least a year, and under most major union contracts they are set for 3 years. There are also many advantages to both buyers and sellers in avoiding frequent product price changes. As a consequence, decision-makers have to think not only about market conditions at present but also about what they are likely to be in the future. Thus, both current and *expected* aggregate demand influence the rate of inflation. Moreover, a firm's decisions today about what wages to offer or what prices to set for any future period will be conditioned by its expectations about the wages its competitors will pay and the prices its competitors will charge, and by the incomes that will be earned by its customers. In short, today's inflation rate is strongly influenced by what people expect it to be tomorrow.

It was excess aggregate demand during the Vietnam war that drove up the underlying rate of inflation from 1 percent to 4 or 5 percent by the end of the 1960s. Although increases in oil and food prices were the principal causes of the next two inflationary surges, pressures from aggregate demand again played an identifiable role. The most troublesome feature of the inflation of the past 15 years, however, has been the fact that after each of the three inflationary episodes the underlying rate of inflation did not fall back to its earlier level. To what extent was this outcome a demand-related phenomenon?

TABLE 3.—Selected indicators of declining demand pressures

[Percent, except as noted]

Item	1969 peak vs 1970 recession		1973 peak vs 1975 recession		1980 peak vs 1980 recession	
	1968 I to 1969 IV	1970 I to 1971 IV	1973 I to 1974 II	1974 III to 1976 IV	1979 I to 1980 I	1980 II to 1980 IV ¹
Average level:						
Manufacturing weekly overtime (hours)	3.6	2.9	3.7	2.9	3.3	2.7
Unemployment rate: Total	3.5	5.5	4.9	7.7	5.9	7.5
Males 20 years and over	2.1	3.9	3.3	5.9	4.2	6.4
Vendors reporting slower delivery	59	49	86	43	60	*38
Manufacturing capacity utilization:						
Primary processing industries	88.1	82.6	91.9	79.3	87.5	*76.1
Advanced processing industries	85.9	76.9	84.2	76.3	83.9	*78.3
Change during period: ³						
Producer prices for crude materials excluding food and fuel ⁴	4.3	1.6	37.0	2.7	26.1	11.8
Unemployment rate (percentage points)	-.3	2.4	-.2	2.6	.3	1.3

¹ Preliminary.

² Fourth quarter 1980 not available; November used as fourth quarter average.

³ Change from quarter preceding start of period shown.

⁴ Annual rates. Data prior to 1973 from series seasonally adjusted by Council of Economic Advisers.

Note.—Based on seasonally adjusted data, except vendor performance.

Sources: Department of Labor (Bureau of Labor Statistics), Board of Governors of the Federal Reserve System, Purchasing Management Association of Chicago, and Council of Economic Advisers.

At the end of each inflationary episode the economy entered a recession—in 1970–71, in 1974–75, and in 1980. Unemployment rose steeply, and substantial amounts of idle capacity appeared (Table 3). The failure of inflation to fall back to earlier levels is therefore not attributable to excess demand. On the other hand, there clearly would have been some level of demand low enough to have caused business and labor to moderate the increase in wages and prices substantially so as to return to the earlier level of inflation. But for reasons discussed later, the rate of wage and price increase has become relatively insensitive to a moderate degree of economic slack. As a consequence, the cost of the necessary restraint—in terms of additional unemployment, idle capacity, and lost income, production, and investment—would have been extremely high.

Federal Budget Deficits as a Cause of Inflation

The Federal budget balance at any given time is an important factor in determining the level of current aggregate demand in the economy. If the Federal budget is in deficit, total spending—private and public—will be higher than it would be if taxes had been raised or spending had been cut to produce a balanced Federal budget. Any tax or spending measure that turned a budget deficit into a balanced budget would tend to reduce demand relative to supply and put downward pressure on the inflation rate. Furthermore, since businesses make wage and price decisions at least partly in the light of what they expect market conditions to be, announcements of future budget policies have a strong effect on current economic conditions and on the rate of inflation. Thus budget deficits can contribute to inflation both by being a part of current aggregate demand and by contributing to expectations about future aggregate demand.

The existence of important relationships between Federal budget policy and aggregate demand that in turn affect inflation does not, however, support the simple view that budget deficits cause inflation and that inflation could be eliminated if Federal deficits were eliminated. Federal deficits are not the sole—or even the primary—determinant of aggregate demand. The Federal deficit is likely to be largest when private demand is weak, incomes are low, and inflationary pressures from the private demand side are absent. That is the situation in a recession. In the second column in Table 4, which shows the Federal budget deficit as a percentage of GNP, the effects of recession in 1958, 1970–71, 1974–75, and 1980 show up as large increases in the deficit in the fiscal years during and immediately after the recession. Conversely, a truly inflationary budget may exhibit a small deficit, or even a surplus, as a result of an inflation-caused increase in Federal revenues. In 1969, as inflation was surging, the

Federal budget achieved a surplus. In 1974, when another inflationary surge occurred, the deficit was quite small.

TABLE 4.—Governmental surplus or deficit and gross national product, 1958–80

[Amounts in billions of dollars]

Year	Fiscal years—unified budget		Calendar years—government sector, national income and product accounts			
	Federal surplus or deficit (—) ¹		Federal surplus or deficit (—)		Federal and State and local surplus or deficit (—)	
	Amount	As percent of GNP	Amount	As percent of GNP	Amount	As percent of GNP
1958.....	-2.9	-0.7	-10.3	-2.3	-12.6	-2.8
1959.....	-12.9	-2.7	-1.1	-2	-1.6	-3
1960.....	.3	.1	3.0	.6	3.1	.6
1961.....	-3.4	-.7	-3.9	-.7	-4.3	-.8
1962.....	-7.1	-1.3	-4.2	-.7	-3.8	-.7
1963.....	-4.8	-.8	.3	.1	.7	.1
1964.....	-5.9	-1.0	-3.3	-.5	-2.3	-.4
1965.....	-1.6	-.2	.5	.1	.5	.1
1966.....	-3.8	-.5	-1.8	-.2	-1.3	-.2
1967.....	-8.7	-1.1	-13.2	-1.7	-14.2	-1.8
1968 ²	-25.2	-3.0	-6.0	-.7	-6.0	-.7
1969 ²	3.2	.4	8.4	.9	9.9	1.0
1970.....	-2.8	-.3	-12.4	-1.2	-10.6	-1.1
1971.....	-23.0	-2.2	-22.0	-2.0	-19.4	-1.8
1972.....	-23.4	-2.1	-16.8	-1.4	-3.3	-.3
1973.....	-14.9	-1.2	-5.6	-.4	7.8	.6
1974.....	-6.1	-.4	-11.5	-.8	-4.7	-.3
1975.....	-53.2	-3.6	-69.3	-4.5	-63.8	-4.1
1976.....	-73.7	-4.5	-53.1	-3.1	-36.5	-2.1
1977.....	-53.6	-2.9	-46.4	-2.4	-18.3	-1.0
1978.....	-59.2	-2.8	-29.2	-1.4	-.2	.0
1979.....	-40.2	-1.7	-14.8	-.6	-11.9	.5
1980 ³	-73.8	-2.9	-62.3	-2.4	-34.8	-1.3

¹ Includes off-budget outlays.

² A 10-percent income tax surcharge was introduced in July 1968—thus entering calendar year 1968 but fiscal year 1969.

³ Preliminary.

Sources: Department of Commerce (Bureau of Economic Analysis), Department of the Treasury, and Office of Management and Budget.

If government budget deficits are the cause of inflation, it should make no difference whether the deficit occurs at the Federal, State, or local level. For example, the Federal revenue-sharing program, which grants Federal tax revenues to State and local governments, has the effect of reducing State and local deficits (or increasing their surpluses) by increasing the Federal deficit. If the program were eliminated, but both levels of government continued to tax the same amount and maintain the same level of services, the Federal deficit would be reduced—but the total deficit, and its inflationary consequences, would be unchanged. In fact, principally because the State and local governments accumulate funds to pay employee pension costs, their budgets usually show a surplus. As the figures in the final column in Table 4 show, the combined budgets of Federal, State, and local governments have either showed a surplus or a very small deficit during the past two decades, except during recessions and for 2 years when Federal spending on the Vietnam war was at its peak.

The notion that budget deficits are the chief cause of inflation also founders on a comparison of budget deficits and inflation among different countries. Japan and Germany in recent years have had much better success in combating inflation than the United States. Yet their budget deficits, especially those of Japan, have been much higher relative to the size of their economies than has been the case in the United States (Table 5).

TABLE 5.—*International comparison of deficits and inflation, 1977–79*

Country and item	1977–79 annual average
United States:	
Public sector surplus or deficit (–) as percent of GNP ¹	–0.1
Inflation rate ²	8.4
Germany:	
Public sector surplus or deficit (–) as percent of GNP ¹	–2.7
Inflation rate ²	3.5
Japan:	
Public sector surplus or deficit (–) as percent of GNP ¹	–4.8
Inflation rate ²	5.1

¹ Standardized national accounts basis.

² Percent change in consumer price index.

Sources: Department of Labor (Bureau of Labor Statistics) and Organization for Economic Cooperation and Development.

Stating that deficits are not the sole cause of inflation does not, of course, imply the opposite proposition—that the size of the budget deficit is unimportant to the control of inflation. Subsequent sections of this chapter emphasize the importance of fiscal restraint in a long-term program to reduce inflation.

Supply Shocks as a Source of Inflation

Sharply higher prices in one sector of the economy can lead to surges in inflation even when excess aggregate demand is absent. These sudden and massive changes generally spring from conditions that cannot be controlled. The most important of these have been increases in food prices resulting from shortages and increases in oil prices mandated by OPEC. These events are no different from such common supply disruptions as strikes, accidents, and natural disasters, but they are much larger, and it is their size which makes their effects exceptional.

Price shocks have both direct and indirect effects. Consumers feel the price increases directly, and these direct effects may be magnified by the brevity of the time in which they occur, resulting in extraordinary jumps in reported inflation rates. In addition, price increases in agricultural or energy raw materials translate indirectly into price increases in the final products that utilize those materials, although the degree and timing of the pass-through depend on market conditions. This secondary impact is quite important in the case of petroleum, half of which is used by businesses in production and transportation.

As an abrupt increase in the price of an important commodity translates into an increase in the cost of living, pressure builds for wage gains to match the new inflation. Some gains take place automatically where wages are linked to prices through cost-of-living clauses in union contracts. Additional acceleration occurs as new contracts are negotiated. As businesses observe the rising wage-price spiral, they are likely to expect a higher future level of inflation. They are then somewhat more likely to grant larger wage increases, both in the belief that rising inflation will make it possible to pass through increases in higher prices and in order to avoid losing workers. Through this process, a sharp increase in food or oil prices can lead to a rise in the underlying inflation rate.

The magnitude of the inflationary process set in motion by an oil-price increase or some other supply shock depends on the state of the economy. The more prosperous the economy and the lower the unemployment level, the more likely it is that the initial increase in prices will lead to higher wage increases and a higher underlying inflation rate.

In addition to their inflationary consequences, supply shocks also create recessionary forces. The very large increases in oil prices in 1974 and 1979 not only spurred inflation but simultaneously depressed aggregate demand. They were therefore largely responsible for the recessions of 1974-75 and 1980. After paying sharply higher prices for petroleum products, consumers had less to spend on other goods and services. But those who received the revenues from higher oil prices—foreign and domestic oil producers—increased their demands for U.S. exports and investment goods only gradually. On balance, therefore, aggregate demand and spending fell, leading to lower output and reduced employment.

Such a simultaneous increase in inflation and unemployment brought on by supply shocks creates a dilemma for economic policy. If monetary and fiscal policies produce additional aggregate demand to “compensate” for the recessionary forces set in motion by a supply shock, there is likely to be a large induced rise in inflation. If, on the other hand, no effort is made to compensate, aggregate demand will fall. But given the relative insensitivity of wage and price decisions to moderate slack in the economy, some increase in the underlying inflation rate is nonetheless likely. Only sharply restrictive monetary and fiscal policies, which strengthen the forces leading to recession, can prevent an increase in the underlying inflation rate. While recessionary forces came into play in 1974 and 1980, the slackening of aggregate demand was not sufficient to avoid another upward ratcheting of the inflation rate.

The Role of Declining Productivity Growth

Over the past decade—and perhaps since the mid-1960s—the rate of productivity growth in the United States has slackened. (A later section of this chapter examines this trend in more detail.) This slackening has been an unwelcome development, since productivity growth can offset the effects of rising wages on business costs and prices. When productivity growth slows but increases in wages continue, the rate of increase in costs and prices rises. While short-term variations in productivity growth may not be recognized in setting prices, a longer-lasting slowdown in productivity will be reflected in higher prices. Once prices begin to rise in response to this pressure, another round of wage demands is stimulated as workers try to offset the increased cost of living. This raises the underlying inflation rate yet again.

The Downward Insensitivity of Wages and Prices

If wages and prices were sensitive to a moderate degree of slack in the economy, careful control of aggregate demand through monetary and fiscal policy could bring rising inflation to a halt quickly and at a modest cost. True, mistakes in policy might occur from time to time, and supply shocks over which the government has no control would still take place. But inflation could be brought down relatively quickly and easily if it did not have—as it has now—a large degree of inertia.

Before World War II, and perhaps in the immediate postwar years, wages and prices were more sensitive in a downward direction. (See Chart 3, for example.) Several careful economic studies show that in that earlier period a moderate or short-lived slackening of aggregate demand tended to reduce the rate of inflation significantly. Those who have compared that earlier era with more recent times differ in their views as to precisely why things have changed, but the basic causes are clear.

During the past several decades the vast majority of firms, labor unions, and workers have come to expect that expansionary government policies will be applied sooner or later to reverse recessionary tendencies in the economy. Since current wage and price decisions are strongly influenced by what workers and firms think the future will hold, the expectation of stimulus removes much of the motivation for moderating wage and price behavior. Businesses and unions have also developed a growing tendency to turn to government for relief, often with some success, when their high prices and wages lead them into competitive difficulties. All of these factors have weakened the incentive for businesses and workers to restrain their wage and price demands, even in the face of softening markets. These actions do not depend on specific knowledge about future government

policies but are based on the widespread view that "the government won't allow things to get too bad."

Prior to World War II, however, popular expectations were different. The Federal Government had historically played little role in smoothing the economic cycles, and substantial depressions as well as mild recessions occurred periodically. Up until the 1930s there was no unemployment insurance, social security, or deposit insurance to ameliorate the consequences of economic downturns. When markets started to weaken, there was no reason to believe that any support—in the aggregate or for individuals—would be forthcoming from the government. As a consequence, wages and prices quickly subsided as businesses and workers scrambled to survive. The cycle, furthermore, was self-reinforcing. Because inflation often led to a slump, followed by a speedy reduction in inflation, businessmen and others came to expect that inflation would not last long; this expectation itself moderated their behavior with respect to wages and prices.

After World War II, however, the United States and other industrial countries decided that the costs of this kind of painful adjustment were too high. Thus, countercyclical policy was founded. The success of that policy, and the existence of various programs of income support to protect individuals in case of unemployment, have changed the character of expectations. In the new environment the appearance of slack markets, idle capacity, and higher unemployment leads to far less moderation in wage and price increases. Downward flexibility has not disappeared, but it has diminished.

Current wage and price behavior has deep-seated structural origins and is not based solely on current expectations about governmental behavior. Since most large wage contracts run for 2 or 3 years, the rate of wage increase in any particular year will have been determined in part by negotiations in earlier years under different conditions. In addition, the expiration dates of multiyear wage contracts for different industries are staggered, and the wage increases negotiated in any industry will be influenced to some extent by the size of earlier increases won by unions in other industries. Moreover, the prospect of further inflation over the life of these contracts has led to the inclusion of cost-of-living clauses, which provide wage increases even when markets are slack. Although union contracts cover less than one-quarter of the civilian labor force, the partial insulation of these contracts from current economic events has some effect on the wages that nonunion firms must pay.

Quite apart from the existence of written contracts, there are mutual advantages to both firms and workers from wage-setting practices that are relatively insensitive to economic slack. In complicated modern societies the costs of acquiring information about alternative

job opportunities are very high for workers, and the costs of training a skilled work force are very large for businesses. Both workers and firms see benefits in establishing long-term relationships. One way for a firm to attract and hold a skilled work force is an implicit agreement not to engage in extensive wage-cutting during periods of weak markets. As a consequence, many firms are unwilling to take a chance of losing out in the labor market by being among the first to reduce wage increases.

Other institutions besides those of wage-contracting contribute to the downward insensitivities of prices and wages. In the case of prices, the downward pressure that would normally be exerted by competitive forces in slack markets is significantly muted in large oligopolistic industries by market strategy considerations and various forms of administered prices. Finally, government intervention in individual markets through regulation, which may fix wages, the price or quality of the product, or the conditions under which production takes place, adds further rigidity.

Some of the economic institutions and practices that contribute to wage and price rigidity themselves evolved in response to expectations that government economic policy would continue to be supportive. Although the persistent application of demand restraint is likely to reduce them, they should not be expected to disappear easily or quickly.

Downward wage and price rigidity makes the costs of reducing inflation through monetary and fiscal restraint quite large. It is difficult to estimate the costs with precision, but representative econometric studies suggest that reducing inflation by 1 percentage point would require a sacrifice of \$100 billion in lost output (in 1980 prices) and a one-half percentage point rise in the unemployment rate over a period of about 3 years. Most of the costs would be incurred in the first half of the period. These statistical estimates, however, are based on historical relationships. There has never been a period of sustained economic restraint in recent times from which direct evidence of the costs could be drawn. The possibility that they would grow significantly smaller if restraint persisted is discussed later in this chapter.

In sum, it is the costs imposed on society when demand restraint clashes with the downward insensitivity of wages and prices that makes it so difficult to reduce inflation by applying monetary and fiscal restraint. Viewed in this perspective, the central problem of economic policy is not how to reduce inflation. If that were the only objective, a sufficiently draconian level of demand restraint could be found to do the job. The real issue is twofold: How large are the costs society is willing to bear to realize the benefits of lower infla-

tion, and can policies be designed to lower those costs so that inflation can be reduced faster with smaller losses in output and employment?

MANAGING AGGREGATE DEMAND

Monetary and fiscal policy must be designed to prevent aggregate spending that is so high or growing so fast relative to the Nation's productive capacity that it encourages a speedup in the rate at which wages and prices are rising—i.e., an increase in inflation. To play a role in lowering the underlying inflation rate, growth in aggregate demand must be further restrained to a point where firms and workers reduce the rate at which they raise wages and prices.

This section starts by specifying a policy of demand management that aims at a gradual reduction of inflation in a world where the inflation rate is highly resistant to downward pressures. Particular attention is paid to the problem of establishing the credibility of anti-inflation policies so as to influence popular expectations in a favorable way. The section then considers some of the special problems of managing monetary policy in a period of high inflation and frequent economic disturbances.

BROAD PRINCIPLES

Three broad principles, discussed at length in last year's *Report*, can guide monetary and fiscal policy as it seeks to reduce inflation while providing for reasonable growth:

First, monetary and fiscal policy should aim for a long-term reduction in the growth of nominal GNP (aggregate spending). That reduction should not be abrupt, or it will produce large decreases in employment and production while reducing inflation only modestly. But the restraint must be maintained, since wages and prices tend to resist the downward pressure.

Second, the pace of nominal GNP growth will undoubtedly need to fluctuate along a declining trend. Realistically, even if there is a decrease in the inflation rate in 1981, for example, some rise in nominal GNP growth will be required to accommodate a modest recovery from the 1980 recession. A policy of fiscal and monetary restraint to produce a long-term reduction in the growth rate of nominal GNP may thus need to be adjusted from time to time to take account of short-term changes in economic conditions. But several cautions are required. Unless clearly warranted and carefully explained, shorter-term adjustments to economic policy can threaten the credibility of longer-term restraint. Moreover, because an increase in inflation once underway is so very hard to eliminate, an inflationary mistake takes much longer to reverse than its opposite. The risks that policy-

makers face are not symmetrical and, as a consequence, uncertainty must be resolved in favor of caution.

Third, no matter how well designed, monetary and fiscal policies cannot prevent large outside shocks to the economy from imposing some damage on employment, price stability, or growth. A practical approach would be to "accommodate" the direct inflationary effect of external price shocks but restrain aggregate demand sufficiently to minimize the indirect inflationary effects that would result if individuals attempted to raise wages and other incomes to "catch up" with higher prices. Without huge costs in terms of lost production, however, it would probably be impossible to restrain demand sufficiently to eliminate all induced increases in inflation. In these circumstances a voluntary incomes policy may be able to make a significant contribution. This seems to have occurred in 1979, when the response of wages to the large rise in inflation was substantially muted.

Because the rate of increase in wages and prices tends to resist downward pressures, a policy of continued restraint on the growth of aggregate demand sufficient to induce a decline in inflation will mean sustained slack in the economy and will result in a period of relatively slow growth in production and employment. This outlook could be improved if it were possible to change the behavior of wages and prices so that they responded to demand restraint more rapidly and by larger amounts.

THE ROLE OF EXPECTATIONS AND THE CREDIBILITY OF DEMAND RESTRAINT

Earlier in this chapter the downward resistance of wage and price inflation was attributed in part to a widespread expectation that expansionary government policies will rather quickly be applied to reverse recessionary tendencies. If firms and workers became convinced that the government meant business, that the markets for their products would not be supported by easier money or fiscal stimulus, and that they could continue raising wages and prices only at their own peril, their decisions about wage demands and pricing policies would undoubtedly be affected. The downward "stickiness" of wage and price inflation would be eased.

Does the government need to put the economy through one or more prolonged periods of economic slack in order to demonstrate the firmness of its anti-inflation commitment? Or can it avoid that necessity by somehow convincing the Nation in advance of its determination? Some observers have suggested, for example, that the government could show its resolve by announcing a target path for nominal GNP or for money supply growth (or both) and by committing itself to pursuing those targets whatever the consequences for unemployment and production. The target path would permit pro-

duction and employment to grow only if they were accompanied by significant reductions in wage and price inflation. But simply announcing a set of targets does not guarantee that they will steadfastly be pursued in the face of mounting losses in employment, profits, and sales. Indeed, the tougher the targets and the greater the demand restraint they seem to require, the less likely they are to be credible, for their success will rely on an uncharacteristic willingness on the part of the Administration, the Congress, and the public to accept large reductions in employment and production rather than abandon the targets.

The mere announcement of government intentions is, therefore, unlikely to produce a significant change in wage and price behavior. The actual experience of persistent demand restraint, followed by a substantial number of individual firms and unions pricing themselves out of the market, would almost certainly be necessary before the credibility of the policy was established. In addition, the government would have to refuse pleas for trade restrictions, subsidies, or other relief for those who failed to moderate their wage and price increases.

Even if firms and workers became convinced that the government was determined to persist in its demand restraint regardless of the consequences, to what extent would they respond with a greater willingness to cut wage and price increases, especially if the demand restraint were moderate instead of very severe? The answer would depend in part on whether they expected inflation or production to fall first. If individual firms believed that demand restraint was synonymous with lower inflation, they would undoubtedly restrain their own wage and price increases, since they would be reluctant to get far out of line with the wages and prices of other firms and industries. But given the downward insensitivity of wages and prices experienced over the past several decades, demand restraint might at the present time lead instead to expectations of lower output. It is not at all clear, therefore, how sharply wages and prices would respond to a moderate decline in demand even if it was expected to last for a long while.

Equally important, strong structural components of wage and price stickiness discussed earlier in this chapter would remain. These structural factors are, in the near term, independent of expectations. As a consequence, other measures would also have to be pursued as a means of speeding a reduction in inflation and raising the growth of production and employment in the face of continued demand restraint.

The foregoing discussion suggests that one of the most critical questions in designing anti-inflation policies is determining the

extent to which the downward stickiness of wage and price inflation has been due to popular expectations rather than to structural factors. While there is no clear-cut answer to this question at the moment, it is surely true that expectations about the persistence of government policies of demand restraint affect the responsiveness of wages and prices. To the extent that the credibility of government policies can be strengthened, the reduction in inflation will come more quickly and the social costs will be reduced. The fact of persistence in an anti-inflation policy—as happened in 1980, when no fiscal stimulus was offered and a restrictive monetary policy was maintained in the face of a weakening economy—should gradually help to modify business and worker behavior. But it would be imprudent to expect entrenched expectations to be changed quickly.

MONETARY POLICY

The Federal Reserve bears a substantial share of the responsibility for carrying out aggregate demand management. As discussed above, the monetary authorities must first confront the question of the appropriate degree of economic restraint. The problem is to achieve the proper balance in order to reduce inflationary pressures at a minimum cost in lost jobs and production. Formulating and implementing policies to achieve this balance in a period characterized by wide fluctuations in economic and financial conditions confronts the monetary authorities with a number of serious additional challenges. While these problems are generally technical in nature, the manner in which they are resolved can have a significant impact on the degree of monetary restraint.

Monetary policy can exert no direct control over aggregate demand. It must exert its influence indirectly, that is, by affecting actual and expected conditions in the money and credit markets. The linkages between what it can control (the cost and availability of bank reserves), its intermediate indicators of conditions in the money and credit markets (the monetary aggregates and interest rates), and its ultimate goals (the impact on real growth and prices) are imperfect and often are not directly observable, even after the fact. In evaluating these linkages, the monetary authorities must rely on predicted relationships based on economic theory and historical experience, and there is plenty of room for slippage. These technical problems create considerable uncertainty for the makers of monetary policy.

A related issue is that the effectiveness of the monetary authorities in bringing down inflation depends on how firms and individuals perceive monetary policy. Private sector expectations of the likely success of monetary policy influence its actual success. Consequently, it is important that the monetary authorities demonstrate that they have chosen a strategy that will achieve their anti-inflation objectives.

Moreover, their actions must indicate that they have the technical capability to meet these objectives while responding forcefully to new situations and to any divergence between desired and actual developments.

In recent years the debate on these issues has focused on the Federal Reserve's target growth ranges for monetary aggregates and on the process of setting and implementing these targets. The targets are defined in terms of the narrow measures of the money stock (formerly M-1 and now M-1A and M-1B, which include currency and various types of checkable deposits), the broader measures of the money stock (M2 and M3, which include currency and checkable deposits as well as time and savings deposits and other deposit-like instruments), and bank credit. The Federal Reserve has used monetary growth targets internally since the early 1970s, and since 1975 it has announced them publicly in testimony before the Congress.

In October 1979 the Federal Reserve modified its procedures for implementing monetary policy in order to give greater emphasis to keeping the growth of the aggregates within the target ranges, even if that meant more variation in interest rates. By this change, the Federal Reserve was widely perceived as having established the realization of its targets as a benchmark for measuring the performance of monetary policy.

While the notion of monetary targeting may appear quite straightforward, in practice there are a number of questions that must be resolved in carrying out a targeting strategy. Among these, three in particular deserve attention here:

- How should the Federal Reserve set its monetary growth targets, both in terms of choosing particular measures of money and choosing numerical targets?
- What is the appropriate monetary policy response when the relationships among economic variables, on which the initial targets were set, appear to shift?
- How rigidly should the Federal Reserve adhere to its longer-run growth ranges over the short run?

Choosing the Appropriate Measure of Money

Debate over selection of the appropriate measure by which to guide monetary policy must take into account the tradeoff between the ability of the Federal Reserve to control any monetary aggregate and the influence of that aggregate on overall demand. For example, the monetary base, composed of currency held by the public plus bank reserves, is probably the easiest for the Federal Reserve to control. But studies have shown that the relationship between the monetary base and aggregate demand is not very close. The narrow meas-

ures of the money stock (M-1A and M-1B) are somewhat harder to control but in general have been more closely tied to aggregate demand. Some economists argue that a broader measure of the money stock, such as M-2, has the most stable relationship with aggregate demand, but the very breadth of this measure—including as it does a mixture of the liabilities of several types of financial institutions—makes it rather difficult to control.

A related issue is how the various measures of the money stock should be defined. The rapid evolution of the financial markets in recent years (see the discussion in Chapter 2) has blurred the historical distinctions between the types of financial instruments and rendered somewhat ambiguous what should be treated as “money.” These developments have been partly responsible for the recent instabilities in the relationship among the narrow monetary measures, economic activity, and interest rates—instabilities commonly referred to as shifts in money demand.

In light of these considerations, the Federal Reserve has chosen to consider a family of monetary aggregates to impart a needed degree of flexibility. Thus, while a narrow aggregate like M-1B has been accorded primary emphasis, there may be periods when it provides an uncertain guide for monetary policy. At such times the Federal Reserve may put more emphasis on the broader measures of the money stock, such as M-2.

Setting Numerical Targets

Once the Federal Reserve determines which monetary aggregates to target, numerical target ranges must be set to achieve the appropriate degree of aggregate demand restraint. The targeting procedure could, for example, begin by determining the appropriate path for nominal GNP that would be consistent with a gradual decline in inflation. Abstracting from cyclical variations in real economic expansion, a steady reduction of inflation would imply a gradual decline in nominal GNP growth.

Given this objective, the monetary authorities would need to estimate growth rates for the monetary aggregates that would satisfy the needs of an economy moving along the presumed declining path of nominal GNP. These would then become the basis for choosing the target growth ranges. Over the past two decades a given growth rate of the narrow measures of money has, on average, financed a 2 to 3 percentage point faster rate of expansion of nominal GNP, although the pattern has varied from year to year. This relationship suggests that the goal of a gradual decline in the growth of nominal GNP would be consistent with a gradual lowering in the target ranges, although not necessarily every year.

Starting with its 1975 targets as a base, the Federal Reserve has, in fact, adhered to a policy of lowering the target ranges by a small amount in each year (Table 6). What has been the result? In some years (1977, 1978, and 1980) the targets were exceeded. In the others there were apparent shifts in money demand such that actual money growth was much lower than would be predicted on the basis of historical relationships.

Predicted M-1 growth for the last 5 years is shown in the third column of Table 6, and the difference between predicted and actual money growth is in the last column. As the figures indicate, those years when actual money growth was in the target ranges (1976 and 1979) were periods in which there were the largest downward shifts in money demand. In effect, actual money growth during these periods supported a greater-than-expected growth of nominal GNP. In the remaining years money growth was nearer the rate expected from historical money-demand relationships, but that growth was above the target range. These two factors—money demand shifts and missing the targets—help to explain how such low values for the monetary growth targets could have persisted in a period of high nominal GNP growth. Over the entire period more nominal growth was accommodated than is implied by the monetary targets and the historical relationships.

TABLE 6.—*Monetary growth rates, 1975–80*

Period	Money growth (percent change from fourth quarter a year earlier)			Predicted minus actual money growth (percentage points)
	Target	Actual	Predicted ¹	
Fourth quarter:				
1976 (M-1)	4½–7½	5.8	10.0	4.2
1977 (M-1)	4½–6½	27.9	9.9	2.0
1978 (M-1)	4 –6½	27.2	8.8	1.6
1979 (M-1)	3 –6	5.5	7.8	2.4
1980 (M-1B)	2 4 –6½	2 4 7.1	7.3	4.1

¹ Predicted money growth based on Council of Economic Advisers money demand equation using actual historical data for GNP, interest rates, and prices.

² Above target range.

³ The target range for 1980 based on the newly defined aggregate M-1B was chosen to be consistent with a slowing in monetary growth as compared to 1979.

⁴ Preliminary.

Sources: Board of Governors of the Federal Reserve System (target ranges and actual money growth) and Council of Economic Advisers (predicted money growth).

Although the continuing application of monetary restraint could call for reductions of the monetary growth ranges over time, there are a number of problems which have to be faced. In particular, the question arises about the extent to which adjustments in monetary targets ought to be made when structural changes occur in the economy.

In the last decade there have been several abrupt shifts in the relationships among important economic factors—disruptions related to

jumps in oil and food prices as well as to shifts in money demand. The problem for the Federal Reserve is how, if at all, to adjust monetary growth targets in response to these changes. This requires an evaluation of the likely direct impact of monetary and credit conditions on economic activity, as well as an assessment of how altering the monetary targets would affect wages and prices.

Response to Supply-Side Shocks

When the economy experiences a supply shock such as the recent surge in oil prices, the initial results are likely to be a reduction in aggregate demand and a rise in unemployment and inflation. As discussed earlier, the Federal Reserve can respond in several ways. At one extreme, the response would aim at accommodating the shock completely, thus restoring real aggregate demand to its level before the shock and avoiding any rise in unemployment. At the other extreme, the response would attempt to offset fully both the direct and indirect inflationary effects. The intermediate position suggested earlier would be to accommodate the direct effects of the price shock but seek to minimize indirect effects.

If the latter strategy were adopted, the monetary targets necessary to pursue it would be identical to those prevailing before the shock only by pure chance. Some adjustment would almost invariably be required, but whether the appropriate response entailed greater or less monetary growth than the original target ranges would depend on conditions prevailing in the economy at the time as well as on the complex dynamic responses of wages and prices after the shock. Moreover, the monetary authorities must remember that their credibility may be damaged if this strategy were to entail an upward adjustment in targets. Such a consideration may lead to a less accommodative position than analysis based strictly on aggregate demand conditions would warrant.

Changes in Money Demand

Shifts in money demand confront the monetary authorities with a different set of problems. Here the appropriate policy response is clear in theory. For example, money-demand shifts have at times in recent years resulted in sudden reductions in the amount of money necessary to support a given amount of economic activity. Holding to predetermined monetary targets in the face of such shifts would mean a more accommodative policy than previously intended. Alternatively, by reducing monetary growth targets commensurate with the demand shift, an unchanged degree of monetary restraint would be maintained.

Although the response is clear in theory, in practice there are many problems. It is difficult for the Federal Reserve to know until

well after the fact whether the money-demand relationship has changed permanently. If one could observe money, interest rates, and nominal GNP contemporaneously, one could judge whether these developments were roughly in line with historical patterns. If they appeared to be out of line, a shift in demand might be suspected. Two problems in ascertaining a shift are the long delay before data on GNP are available, and the frequent revisions subsequently undergone by both GNP and money data. Another problem is that the "normal" demand for money cannot be estimated precisely, so that even with timely data it may take several quarters before the shift becomes evident.

Suppose that a money-demand shift is suspected of having occurred, but its magnitude is uncertain. How should the monetary authorities adjust the targets in a way that maintains a steady degree of monetary restraint? First, the targets for the narrow aggregates might be adjusted by shifting the midpoints of the longer-run target ranges according to the "best guess" of how the structural shift will affect the growth rate. Second, if the impact of the structural change is uncertain, the upper and lower bounds of the growth range may have to be widened to reflect that uncertainty. Third, if—as in the past—the broader money measures do not appear to be affected as much by the structural changes, more emphasis could then be put on the broader aggregates in guiding monetary actions. At such times the relatively greater stability of the relationship of the broader aggregates to income and interest rates may give the monetary authorities a somewhat better measure of monetary stringency. The risk in making these adjustments is that the public may lose sight of why such changes are being made—interpreting them as mere tinkering or as devices aimed at loosening monetary restraint. Thus, the monetary authorities stand to lose credibility unless they can convince the public of the need for such adjustments when they are appropriate.

Problems of Short-Run Variability

Once the annual numerical targets have been set, and adjusted for major supply shocks or shifts in money demand if necessary, the next question is how rigidly the targets should be followed during the year. It is important to recognize that random and temporary fluctuations will inevitably occur, affecting both the demand and supply sides of the financial markets. Empirical evidence suggests, however, that deviations from a desired money growth path lasting as long as a quarter do not destabilize aggregate demand if they are subsequently corrected. Hence, rigid adherence to a longer-run target over periods as short as a month or a quarter would require wide fluctuations in interest rates, which could disrupt the economy unnecessarily. In view of the importance of preserving Federal Reserve credibility, it is

essential for the public to understand that such short-run deviations are not nearly as consequential as they are sometimes made out to be.

The problem for the Federal Reserve is to distinguish these temporary disturbances from more permanent shifts in economic relationships for which some response may be necessary. Since the monetary authorities cannot determine until well after the fact whether a divergence in money growth is permanent or self-correcting, they must establish short-run procedures that partially accommodate temporary disturbances but respond with increasing intensity to systematic trends. The current procedures for implementing the longer-run growth target ranges include setting short-run money targets periodically during the year and managing reserves on a day-to-day basis to meet those targets. These procedures are designed to achieve a proper balance between avoiding unnecessary disturbances in the money markets and responding in a timely fashion to sustained movements of actual money growth away from the desired path.

In practice, this process is subject to a number of slippages, both in the relationship between reserves and money and in the actual control of reserves. Because different components of the money stock are subject to different reserve requirement ratios—and some are subject to no reserve requirements—the ratio of reserves to money can vary unpredictably when funds are shifted among types of deposits and among institutions. This hinders short-run monetary control. Changes in reserve requirements and reserve coverage associated with the Depository Institutions Deregulation and Monetary Control Act of 1980, discussed in Chapter 2, should reduce the variation in the money-reserve ratio, but only gradually. Until this transition period is completed, the variation in this crucial ratio will continue.

Even if the linkage between money and reserves were perfectly stable and predictable, the Federal Reserve would still need to be able to control total reserves. Current problems in forecasting the various uncontrollable factors affecting reserves, in reserve accounting procedures, and in the management of the discount window make it difficult to achieve the target for total reserves. The Federal Reserve is working to improve its forecasting techniques and is considering other reforms that would increase its control over reserves.

Thus, one should not expect the Federal Reserve to adhere rigidly to its annual monetary targets in every period during the year. Temporary and largely self-correcting disturbances will inevitably lead to short-run deviations, but these deviations should have few permanent economic consequences. The current targeting process of the Federal

Reserve provides some flexibility in the face of such temporary disturbances, even with unchanged annual monetary targets.

Conclusions

One of the major lessons that emerges repeatedly in the preceding discussion is the need for understanding, by the public generally and the financial community in particular, of the complexities of monetary policy. Monetary targeting provides an invaluable tool to increase monetary discipline, to communicate Federal Reserve intentions, and to evaluate performance. But the advantages of a semi-automatic rule to guide the monetary authorities are not absolute. In a world where economic and financial markets are subject to major and unpredictable changes, deviations from the Federal Reserve's announced intention to reduce steadily the annual target ranges may sometimes be necessary. Targets, once set, may occasionally have to be modified. And allowing short-run deviations of actual from targeted money growth may be called for if care is taken not to let them persist. But if the public interprets occasional necessary changes in the longer-run monetary target ranges, or short-run deviations of actual money growth from those targets, as evidence that the Federal Reserve has lessened its determination to fight inflation, the monetary authorities will be put in an untenable position. If they fail to make the adjustment in the monetary targets that is called for by a major change in economic circumstances, or if they attempt to avoid all short-run deviations of actual from targeted money growth, monetary policy may produce unwanted results. If, on the other hand, they do change the targets or allow temporary deviations, their actions may be misunderstood by the public and their credibility consequently impaired. The monetary authorities will face this problem once again in 1981, as is discussed in Chapter 3.

INCOMES POLICIES

Even if they are followed with persistence and acquire a credibility that favorably affects expectations, monetary and fiscal restraints are likely to reduce inflation only slowly and at significant cost in lost output and employment. Incomes policies attempt to lower these costs. By directly influencing the setting of wages and prices, incomes policies seek to decrease the inflation and increase the growth of output and employment that result from any given degree of demand restraint. A tight monetary target, for example, is compatible either with a small reduction in inflation and zero economic growth or a larger reduction in inflation and positive economic growth. By persuading workers and employers to accept lower pay and price in-

creases, an incomes policy tries to make the second combination possible.

Incomes policies range from the informal pressure on a few large corporations and unions exerted by the Kennedy Administration to the formal review of price and wage increases by the Council on Wage and Price Stability (CWPS) to even more formal schemes based on the tax system, examined in detail below. While mandatory wage and price controls are the extreme form of an incomes policy, the discussion in this chapter is confined to voluntary forms, that is, forms which do not involve legal prohibition of excessive wage and price increases.

An effective incomes policy encourages various groups in society to accept lower wages and prices for the goods and services they supply in the expectation that the wages and prices they pay will also be lower. An incomes policy that gains widespread support can meet these expectations. Workers agree to lower their wage demands, and thus unit labor costs rise more slowly. Firms moderate their price increases, and therefore workers' costs of living rise more slowly. The implicit agreement made among government, workers, and firms to take simultaneous actions to slow the wage-price spiral through the mechanism of the incomes policy is thus successful principally to the extent that people believe it will be successful.

To have a lasting influence on inflation, an incomes policy must do more than lower the current rate of increase in wages and prices. It must also lower expectations about the *future* rate of inflation. Workers must believe that they can achieve their real wage demands with lower nominal wage gains, and firms must believe that large nominal wage gains or other cost increases will be hard to pass on into prices. While our knowledge about the formation of expectations leaves much to be desired, it does suggest that a short-lived reduction in inflation may be insufficient to change expectations sharply. To be successful in lowering inflationary expectations, therefore, an incomes policy probably has to be in effect for more than a single year.

Even more important, an incomes policy will have no hope of a lasting effect unless it is accompanied by monetary and fiscal restraint. If there is excess demand in labor and product markets, or if monetary and fiscal policies create expectations of excess demand, the basic tenet of an incomes policy is destroyed. Individual employers or groups of workers cannot then assume that their own moderation will be matched by moderation from others.

Although incomes policies can help to reduce inflation, they also tend to create losses of economic efficiency. Ideally, economic policy seeks to lower the *average* rate of wage and price increase while leaving individual wages and prices to adjust freely around that average

in response to circumstances in particular markets. In reality, of course, an incomes policy cannot operate on a statistical average but must deal with the wages and prices of individual firms. Therefore, incomes policies inevitably discourage to some extent movements in prices and wages relative to each other. Over time, the failure of relative prices to adjust in response to changing conditions leads to mounting losses of economic efficiency. The more rigid and mandatory in character the incomes policy, and the longer it is kept in place, the greater will be the efficiency costs.

This Administration has judged the benefits of a relatively flexible and voluntary incomes policy to be significantly greater than its costs. In late 1978 the Administration set forth voluntary standards for pay and price increases as the centerpiece of an incomes policy. This section of Chapter 1 briefly reviews that program, and then evaluates a wide range of measures known as tax-based incomes policies (TIPs) under which tax penalties or rewards are employed as a means of inducing moderation in wage and price increases.

THE PAY AND PRICE STANDARDS

For the past 2 years the Administration's incomes policy has centered on the voluntary pay and price standards. Administered by CWPS, this program applied to firms of all sizes, but only large firms were asked to submit data on pay and either prices or margins. The standards set by CWPS were designed to reflect the structures of different industries. Compliance was encouraged by appealing to firms and workers to restrain price and pay increases in the public interest. CWPS also used public opinion and the threatened loss of government contracts to encourage compliance.

Although the standards were voluntary and were in place during the difficult period of the 1979 OPEC oil price explosion, they appear to have played a role in moderating inflation. Studies by CWPS and the Council of Economic Advisers have estimated that annual wage increases were 1 to 1½ percentage points lower during 1979 than they would have been without the standards. The consequent reductions in labor costs also appear to have been passed on to consumers through lower price increases. A more recent evaluation of the pay and price standards by CWPS suggests that the program continued to have a moderating effect in the second year.

After 2 years of operation there seems to be general agreement that the current pay and price standards could not continue to be effective if simply extended in their present form. Workers and firms no longer appear to be willing to moderate wage and price rises in the expectation that the standards will restrain inflation.

One way of strengthening a voluntary standards program would be to supplement it with a tax-based incomes policy, or a TIP. Such a policy would use the tax system to provide tangible incentives to firms and workers to slow the rate of inflation.

As the discussion in this section later concludes, the most effective kind of TIP would be one that rewarded employees of firms whose rate of wage increase was below the standard. Such a program would significantly reinforce the spirit of cooperation used in other voluntary forms of incomes policies without creating as many distortions as a mandatory program. Firms and workers that agreed to moderate their price and wage increases would be making less of a sacrifice under a TIP than under other voluntary programs. And in sectors of the economy in which relative prices and wages were too low, a TIP would allow adjustments. The most serious distortions in relative prices and wages that develop under mandatory controls would be avoided under a TIP.

Several years ago the Carter Administration proposed to the Congress one particular version of a TIP—the “real wage insurance” program—but the proposal was not acted upon by the Congress, and in fact was not subjected to widespread public discussion and debate. TIPs continue to represent an important untried innovation in the area of anti-inflation policy. While TIPs may impose administrative and efficiency costs, those costs appear to be far less than would be incurred by reducing inflation solely through restraining aggregate demand.

Various kinds of TIPs have been suggested. Under a pay TIP, for example, the government would set a standard for pay increases over the coming year. Groups of workers whose average pay increase did not exceed the standard would be in compliance. In one version of the pay TIP, firms whose wage increases exceeded the standard would be assessed a tax penalty. In another version, all workers in a complying group would receive a tax credit, including individuals within the group whose pay raises were above the standard. Similarly, a price TIP would provide penalties or rewards to firms on the basis of their average price increases relative to a set of standards.

In virtually all versions of the TIP it is the *average* rate of wage or price increase within the firm that is compared with the standard for purposes of determining tax penalties or rewards. With this approach, firms are able to change the relative pay and prices of sub-groups of workers and products. Merit pay plans and promotions that give individual pay raises in excess of the standard can still be used to encourage productivity.

Although the flexibility of TIPs makes them attractive, using the tax system to reduce inflation poses serious administrative problems. These problems present the major obstacles to designing an effective TIP program. The following sections discuss issues of design in some detail, and a Technical Appendix to this chapter examines other problems in measuring average pay increases.

Several choices must be made in designing a TIP. First, should it dispense rewards or levy penalties? Second, should receiving the penalty or reward depend only on being above or below the standard (a "hurdle" TIP), or should the size of the penalty or reward be graduated in accordance with the difference between the standard and the actual pay or price increase (a "continuous" TIP)? Third, should the TIP be a permanent or a temporary program? Finally, should the TIP apply to pay, to prices, or to both? These choices require striking a balance among equity, efficiency, administrative ease, and effectiveness in reducing inflation. The next section discusses the first three choices in the context of a pay TIP, and presents estimates of the cost and effect of a specific pay TIP. Another section discusses price TIPs.

Varieties of Pay TIPs

For several reasons, a reward pay TIP is probably preferable to a penalty pay TIP. A reward TIP encourages workers to cooperate with a voluntary incomes policy by compensating them for accepting lower nominal pay increases than they would otherwise receive. A penalty TIP, whether levied on firms or on individuals, will tend to undercut the spirit of cooperation necessary for a successful incomes policy. This is especially true because incomes policies are often thought to be more effective in restraining pay increases than in limiting price or profit increases. In addition, although lower rates of increase in wage rates and unit labor costs eventually result in lower price increases, the effect is not immediate. In the short run, wages may increase more slowly but prices might not. Workers would therefore be more willing to cooperate with an incomes policy that partially compensated them for accepting, at least in the short run, lower real incomes than they would have earned in the absence of a TIP. Since a reward TIP provides such compensation, at least in part if not in full, it would be both more equitable and more acceptable to workers than a penalty TIP.

Furthermore, a penalty TIP has other drawbacks. If levied against firms, it might increase the rate of inflation. Some of these firms would be able to pass on the cost of the TIP penalty to consumers, especially if the above-standard increase were industry-wide. Some prices therefore would rise as a result of the TIP. Levying the penalty on individuals rather than firms raises different objections. Such a

penalty TIP would occasionally penalize employees who received little or no pay increase but who worked for firms with large average pay raises. For such individuals, a penalty TIP would add injury to insult and would be perceived as very unfair.

A penalty TIP would raise government revenues, which could be returned to the private sector through offsetting tax cuts. By contrast, a reward TIP would cost the Federal Government a substantial amount in forgone tax revenues. In practice, this means that a reward TIP would only be feasible when tax cuts were being considered. Since inflation and economic growth tend to drive up average effective tax rates, however, periodic tax reductions will be feasible if the share of Federal spending in GNP is kept from rising. Therefore, the key budgeting issue posed by a reward TIP is its effectiveness, compared to other forms of tax reduction, in meeting economic goals.

One difficult problem that must be addressed in designing a TIP is the administrative burden it would impose on private firms and on the government. A TIP limited to a few thousand large firms with computerized personnel records would have much smaller public and private administrative costs than a TIP that included millions of small firms.

But limiting a pay TIP to large firms seems very unlikely to secure the kind of support needed to enact and operate a successful incomes policy. A limited reward TIP would be vigorously opposed by workers in small firms, who would argue, rightly, that they were being deprived of a potential tax cut. But a limited penalty TIP would tend to reduce the real income of workers in large firms and would be vigorously opposed by large firms and large unions.

A second issue in the design of a pay TIP is whether the penalty or reward should be a single amount based only on the wage increase being above or below the standard (hurdle TIP), or whether it should be graduated according to the difference between the standard and the actual increase (continuous TIP). A hurdle TIP only encourages firms and workers to have pay raises below the standard. It provides no direct incentive to lower pay raises that were already below the standard or, realistically, to reduce pay raises that were far above the standard. In contrast, a continuous TIP whose penalty or reward depended on the difference between the standard and the actual pay raise would provide an incentive to lower all pay increases. Lowering a pay raise that was above the standard would result in a smaller penalty. Lowering a pay raise that was already below the standard would mean a larger reward.

The main advantage of a hurdle TIP is administrative. Under a hurdle TIP, firms that expected to grant pay raises above the stand-

ard or that thought the administrative costs of compliance were too high would not be required to keep records. In contrast, under a continuous TIP that penalized firms or workers above the standard as well as rewarded those below, all firms would have to keep detailed records and would have to file additional schedules with their tax returns.

A reward-only continuous TIP would eliminate record-keeping requirements for noncomplying firms, and, as emphasized above, it would also be more equitable than a continuous TIP that included penalties. Such a TIP could offer tax credits, for instance, of 3, 2, or 1 percent of earnings, to employees of firms with average pay raises that did not exceed 50 percent, 75 percent, or 100 percent of the standard. However, even this simple continuous TIP would probably generate more disputes than a hurdle TIP, since firms would have incentives to understate their pay increases to appear to be in a lower bracket. Under a hurdle TIP, only firms near the standard would face such incentives.

The final major issue in designing a TIP is whether it should be permanent or temporary. The answer seems to be that a permanent TIP would not be feasible because of the distortions it would create by discouraging changes in relative wages. A TIP might introduce further distortions as people changed their behavior to circumvent the intent of the policy while remaining technically in compliance with the standard. For a while the distortions created by a carefully designed TIP would probably be small. But as relative prices and wages wandered farther from equilibrium levels, the distortions would become larger and the effects on inflation smaller. The economic costs from the distortions of an effective temporary TIP would be acceptable when balanced against the larger costs of relying solely on demand restraint to lower inflation. Because the distortions would build up over time, however, the costs of a permanent TIP would eventually exceed benefits.

On balance, given all the foregoing economic and administrative considerations, a temporary hurdle TIP—a tax credit to groups of workers whose average pay increase does not exceed a specified standard—seems superior to the other variants. Because keeping records and complying with the standard would be voluntary in this type of TIP, firms that found the administrative costs too high could choose not to participate. As with all forms of TIPs, relative wage changes could still occur in response to economic and other developments, although increases in excess of the standard would “cost” workers the TIP tax credit. The efficiency costs would be small at first, but over time the distortions of the TIP would rise and its effectiveness would fall.

Together with a “jawboning” campaign aimed at producing widespread compliance with the standard by lowering expectations of inflation, such a TIP could lower the rate of inflation. Without jawboning, the cost of inducing compliance among workers with anticipated pay raises far above the standard would be prohibitive. Even workers who expected pay raises near the standard might be reluctant to sacrifice part of a pay raise that might be built into future wages in exchange for a small tax credit that only lasted for 1 or 2 years. The major appeal of wage moderation is that if everyone cooperates by accepting a smaller wage increase, the lower nominal wage gains will be matched by lower price increases. Real wages will not fall, but inflation will. A TIP alone cannot provide sufficient economic incentives to make a low wage increase more attractive than a large one. However, with public appeals to moderation and clear evidence of fiscal and monetary restraint, a TIP can contribute to slowing the inflationary spiral.

Costs and Effects of a Reward Pay TIP

The preceding discussion concluded that the most desirable type of pay TIP would be a temporary hurdle type that provided a reward for keeping pay raises below the standard. To examine the possible usefulness of such a TIP in dampening inflation, the Council of Economic Advisers attempted to estimate the costs and effects of a reward TIP open to all employees, public and private. The reward was assumed to be a fixed percentage of wage income, up to the maximum social security wage base of \$29,700. It was also assumed to be taxable and to be refundable to workers whose income tax liability was less than the reward. The average rate of wage increase in the absence of a TIP was assumed to be 9.7 percent.

The probability that a group of workers would accept a wage increase at or below the standard was assumed to depend upon the size of the reward and the relationship of the group’s potential wage increase to the standard. The smaller the potential wage increase relative to the standard and the greater the reward, the higher the probability of compliance. The results of this estimating procedure obviously depend very heavily on the specific relationships used to calculate the probabilities of compliance for various groups of workers. Since there is no historical experience on which to base these relationships, the estimates presented below are simply examples based upon a considered judgment of the issues.

The costs, effects, and compliance rates that would result from various combinations of standards and rewards were estimated under the assumptions mentioned above. Illustrative combinations of standards and rewards at two levels of cost to the Federal budget are presented in Table 7. These estimates suggest three things. First, for a

given standard, as the reward and the cost rise, so does the reduction of wage inflation. Second, there is some tradeoff between standard and reward. That is, a program with a high standard and a low reward may cost the same as a program with a lower standard and higher reward. Third, for a given budgetary cost, a low-standard, high-reward combination tends to be more effective in reducing wage inflation than a high-standard, low-reward combination. The selection of that combination may create a problem of credibility. A TIP that is relatively effective in restraining pay increases for a given cost will tend to have lower compliance rates than a program with a higher standard and lower reward but which has less of the desired effect on compensation. This happens because higher standards put more people in compliance who do not have to modify their wage behavior.

TABLE 7.—*Estimated effects and compliance rates of various pay TIPs*

Standard — Reward (percent)	Compliance rate (percent) ¹	Effect on wage inflation (percentage points)
\$12 billion budgetary cost:²		
7 — 2½	50.2	-0.93
7½ — 2¼	55.9	-.87
8 — 2	61.8	-.79
\$16 billion budgetary cost:²		
7 — 3	54.6	-1.09
7½ — 2¾	59.8	-1.01
8 — 2½	65.3	-.91

¹ Percent of workers in establishments that have an average pay raise less than or equal to standard.

² Net tax expenditure less reduction in Federal compensation. Federal Government pay increase assumed to comply with standard—reduced from assumed economy-wide wage increase in absence of pay TIP.

Source: Council of Economic Advisers.

A TIP should be judged not only on its initial impact, but on its full effect over a 2- or 3-year period. A TIP continued for 2 years with a reduced pay standard in the second year could make a significant contribution to lowering inflation.

PRICE TIPS

Experience with incomes policies here and abroad, including the pay and price standards, suggests that a pay TIP is easier to administer and likely to cause fewer distortions than a price TIP. Nevertheless, a price TIP may be a necessary complement to a pay TIP because restraints on pay alone, even with a reward TIP, might appear inequitable. Furthermore, a price TIP could speed up the effect of a pay TIP by shortening the lag between the lowering of pay increases and their effect on price increases.

It would be unrealistic to set a single price standard for all firms. Productivity growth among industries varies substantially, as do changes in the prices of raw materials and other costs of production.

Recognizing this, CWPS in 1978 established a price deceleration standard which called for all firms to reduce the rate of their average price increases in the program year by one-half percentage point below their increases in a base period. Systematically different movements in productivity and other cost elements among firms and industries should be at least roughly reflected in their base year experience. CWPS found, however, that it had to permit firms to devise various ways of adjusting for uncontrollable cost increases and had to provide separate standards for certain industries, like retailing and food processing.

For several reasons, prices are more difficult to measure than pay. In some industries, such as wholesale and retail trade, prices for the same item vary from week to week. Some firms also give quantity discounts, so that prices for the same item vary from customer to customer. Even if the price of each item did not fluctuate, a small store with only a few employees may sell thousands of different products. Such a firm might have little trouble with the paperwork necessary for a pay TIP, but a price TIP would probably be beyond its administrative capabilities.

Furthermore, a price TIP would face problems posed by new products and quality change in old products. Since new products do not have old prices, no price increase can be calculated for them. Instead, a price standard might have to be based on the firm's average markup over input costs or on the prices of similar products sold by the same firm or other firms. A related issue is the treatment of quality changes. Disregarding these changes might be the best solution for a temporary price TIP, even though doing so would tend to discourage innovation. Alternatively, a program that exempted goods whose quality had changed, and therefore allowed price increases above the standard, would encourage minor product changes that did not really increase quality. Finally, products whose quality improved could be treated like new products, with price increases based on average markup or on the price changes of similar goods.

A price TIP would have to allow firms to pass through to consumers certain increases in the cost of their inputs. For instance, a utility company could not be expected to keep price increases below a TIP standard for long if the price of the oil it used to generate electricity suddenly doubled. To treat the utility fairly, a price TIP would have to allow the firm to raise electricity prices to cover the increased cost of oil. The problem in designing a price TIP is to decide which costs should be granted exemptions, while still encouraging firms to substitute cheaper inputs for more expensive ones.

Given the greater complexity of devising a workable price standard, a price TIP should probably levy penalties and be confined to

large firms. Even among large firms it may be desirable to exempt industries like retailing, in which competition is likely to keep average prices in reasonable relationship to costs. Market forces also make it unlikely that exempting small firms and competitive industries would lead to substantial inequities or to a failure to pass on to consumers the benefits of wage moderation.

CONCLUSIONS

There are no costless ways to reduce inflation. Using demand restraint alone imposes very large costs of forgone output and unemployment for modest reductions in inflation. A successful TIP can shift more of the effect of demand restraint from output to prices and thus can cut substantially the costs of reducing inflation. Although a TIP would itself impose administrative and efficiency costs on the economy, the costs for a short period of time would be small. They would surely be outweighed by the benefits in reduced inflation and lower unemployment that a TIP would bring.

It is useful to distinguish between two broad types of TIP, each of which would have quite different economic objectives. The *first* would be a continuous TIP that would be made a permanent part of the tax code and that would set graduated rewards and penalties according to the size of a firm's wage (and possibly price) increases. Such a TIP would be an attempt to make a major and permanent change in the market system so as to encourage less inflationary wage and price behavior on the part of individual firms. This chapter has suggested that the administrative problems and the distortions introduced into the wage structure would tend to grow over time, while the effect on inflation would decline. Thus, the costs of a permanent wage TIP would soon exceed its anti-inflationary benefits.

A *second* form would be a temporary hurdle TIP based on rewards for wage moderation and would be part of a broad public campaign for voluntary restraint in wage and price increases. The objective of such a TIP, perhaps applied for 2 successive years, would be to provide several downward shocks to the inflationary process, in effect reversing some of the upward shocks which contributed to today's inflation rate. Although such a TIP would also involve administrative costs and distortions in labor-market behavior, these costs would initially be far less than the benefits of the TIP in shortening the period of restraint and slow growth needed to reduce inflation.

As emphasized earlier, a TIP cannot substitute for demand restraint. The latter must also be present; otherwise, any gains produced by a TIP are likely to vanish quickly under the pressure of excess demand. Since a reward TIP would reduce budget revenues like any other tax cut, it must fit into a budget plan that makes tax cuts possible. But if the growth of Federal spending is restrained, pe-

ridic tax reductions will be both feasible and necessary in the years ahead as inflation and economic growth push taxpayers into higher brackets and raise average effective tax rates.

TIPs are novel, and most people are unfamiliar with either the opportunities they present or the difficulties they pose. It is therefore highly unlikely that a TIP could take effect in 1981. But it would be useful for the public in general, and the Congress in particular, to begin evaluating the pros and cons of TIPs so that when the time comes for the next round of Federal tax cuts a TIP program will be seriously considered.

INCREASING INVESTMENT, SUPPLY, AND PRODUCTIVITY

Economic policy must place greater emphasis on supply-oriented measures during the decade of the 1980s for a number of reasons. First, an increase in the growth of aggregate supply, and especially in the growth of productivity, can raise the growth of output and employment that is consistent with a steady reduction in inflation. Second, reducing this country's vulnerability to higher oil import bills will require a substantially increased investment in alternative energy sources over the next 10 years. Finally, even if inflation were not a problem, a speedup in the lagging rate of productivity growth would be essential to maintain the historic advance in our standard of living.

The remainder of the chapter summarizes what has been happening to productivity in the United States and briefly examines some of the reasons why the rate of productivity growth has declined. It also examines the need to increase the share of national resources allocated to capital formation and the Administration's response to that need. Finally, it discusses the relationship between demand- and supply-side policies, and suggests how they must be integrated.

PRODUCTIVITY

Advances in productivity are the foundation of advances in our standard of living. Increases in output per worker lead to increases in real income. Healthy increases in productivity can free the funds needed to improve the conditions of disadvantaged groups while lessening the need for sacrifice elsewhere. Thus, when productivity growth declines, these other advances also are delayed. But expectations of a rising living standard persist. They perpetuate demands for real income gains which can no longer be met and which lead to inflationary increases in wages and to growth in government spending.

Since the mid-1960s, the growth rate of labor productivity has been declining from its postwar highs. In recent years the decline has been so marked as to pose a major challenge to public policy. Be-

cause declining productivity growth brings with it prospects for slower improvement in our standard of living and contributes to inflation, a program to stimulate productivity growth must be a keystone of economic policy.

Table 8 summarizes the postwar history of growth in productivity. The data show a gradual worsening of the productivity decline as time has passed, with the last few years showing sharp declines. While just completed revisions of the data may change the magnitude and timing of the slowdown, its existence and its costliness are unarguable.

TABLE 8.—*Labor productivity growth, 1948-80*

[Percent change per year]

Sector	1948 to 1965	1965 to 1973	1973 to 1979	1978 IV to 1979 IV	1979 III to 1980 III
Private business sector	3.2	2.4	0.8	-0.9	-0.1
Nonfarm.....	2.6	2.2	.6	-1.1	.1

Note.—Data relate to output per hour for all persons.

Source: Department of Labor, Bureau of Labor Statistics.

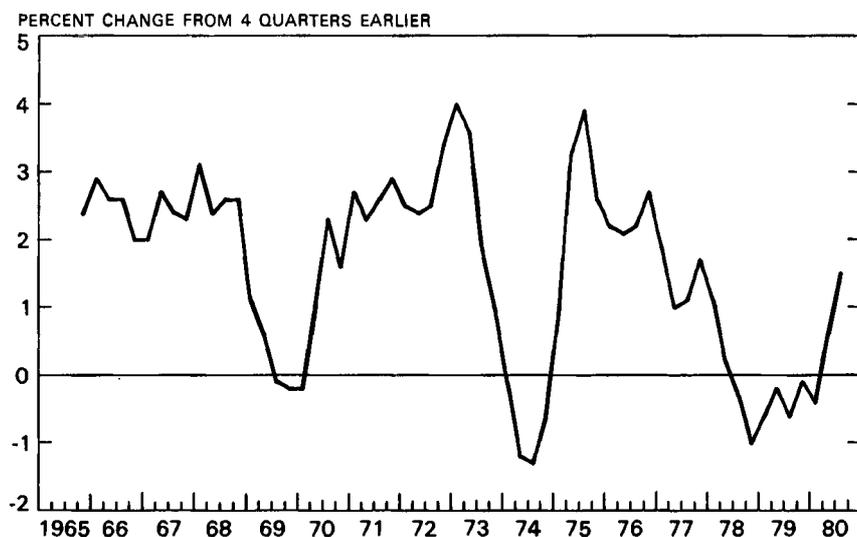
Some of the decline in productivity results from the way we measure it. In particular, productivity measurement counts as an input the costs of governmental and private actions to ensure a cleaner environment, a healthier workplace, and safer consumer products, but it does not count the benefits of these actions as forms of output.

It is difficult to interpret measures of productivity such as those in Table 8 without first distinguishing between changes caused by the business cycle and changes caused by longer-term factors. Because it is costly to hire or to fire, businesses typically do not reduce their work force proportionally when demand slackens or increase it proportionally when demand is expanding. Chart 4 presents the recent history of productivity growth after correction for these cyclical influences. As the chart vividly shows, productivity grew very slowly during most of the years since 1973, and on several occasions actually declined.

It would not be surprising to discover that the slowdown has many causes. Measured productivity growth is a distillation of a number of changes and influences. Many researchers have been in agreement that a number of factors have contributed in roughly equal magnitude to the slowdown. These factors have been discussed in past *Reports*. In addition to increased governmental regulation, particular attention has focused on increases in energy prices, declines in the rate of growth of capital relative to labor, and decreases in spending on

Chart 4

Productivity Adjusted for Cyclical Variation



NOTE.— DATA ARE FOR PRIVATE NONFARM BUSINESS, ALL PERSONS.

SOURCE: COUNCIL OF ECONOMIC ADVISERS.

research and development. But there has also been widespread agreement that a large portion of the slowdown has not yet been explained.

INVESTMENT NEEDS

One of the causes of the decline in productivity growth has been the decline in growth of the capital stock relative to the labor force. Because a rising share of capital formation has been devoted to adjustments to cope with higher energy prices and to complying with environmental and safety regulations, a diminishing fraction of investment has been available to effect gains in productivity. Although these developments may not have been the primary causes of the productivity slowdown, increasing capital formation would nevertheless be an effective way of reversing the slowdown. Many of the factors affecting productivity cannot be directly or immediately influenced by the government, but economic policy—especially tax policy—can influence the pace of capital formation.

As a general rule, an increase in the amount of capital invested per worker is associated with an increase in output per worker—i.e., in increased productivity. There are two reasons for this. First, processes that generate more output per worker usually require more capital per worker, and second, increasing the ratio involves putting newer capital into place. The newer capital is likely to embody more ad-

vanced technology and will therefore increase the efficiency of the capital stock.

During the decade of the 1960s the capital-labor ratio grew at an average rate of about 3 percent per year; over the last 5 years, however, the ratio has remained roughly constant. This development has been due to both the slower growth in the capital stock and to the more rapid growth in employment and hours worked (Table 9). The 1974-79 deceleration in the growth of capital is somewhat at odds with the rough stability in the investment share of GNP over the same period and requires some explanation. A greater share of investment is now being spent on relatively short-lived assets. The ratio of investment in equipment to investment in nonresidential structures has increased in recent years. The result is that each dollar of *gross* investment now yields less *net* investment because the capital stock is depreciating more rapidly.

TABLE 9.—*The investment share, and growth in the capital-labor ratio, 1949-79*

Period	Real business fixed investment as percent of real GNP ¹	Percent change, average annual rate (end of year to end of year)				
		Net capital stock (nonresidential) ²	Employment ³	Hours ³	Capital-employment ratio	Capital-hours ratio
1949-59.....	9.1	4.0	1.1	0.7	2.9	3.2
1959-69.....	9.8	4.6	1.6	1.2	3.0	3.3
1969-74.....	10.5	4.2	1.2	.5	2.9	3.7
1974-79.....	10.3	3.0	3.1	2.8	-.1	.2

¹ Average annual investment-GNP ratio, in percent.

² Net fixed nonresidential business capital, 1972 dollars, end of year.

³ For private business, all persons. End of year calculated as average of year's fourth quarter and following year's first quarter.

Sources: Department of Commerce (Bureau of Economic Analysis) and Department of Labor (Bureau of Labor Statistics).

To restore the growth of the capital stock per worker to that of the 1960s would require that the share of investment in GNP rise by at least 1 percentage point from its recent average of about 10½ percent. Such a development should, at a minimum, restore the productivity growth lost from this source. Further improvement would require yet more investment.

Apart from the necessity of improving the productivity growth rate, there are other reasons why future economic policy should encourage increased investment. Last year's *Report* discussed these needs in detail. The average age of the capital stock at the end of 1979 was 7.1 years. This suggests that much of our plant and equipment was put in place when oil prices were much lower than they are now. Higher energy prices have shortened the service life of older and less energy-efficient capital and made it in the national interest to speed up its replacement. The magnitude of these investments is difficult to

estimate, but it could represent perhaps another 1 percent of GNP per year.

Additional investment requirements arise from the need to continue domestic production of oil, coal, and natural gas at sharply higher investment costs per unit of energy produced, and to expand the investment devoted to alternative energy sources. Conservatively estimated, they amount to about another one-half percent of GNP.

During the late 1960s and early 1970s, before the first surge in oil prices, real business fixed investment averaged about 10½ percent of GNP. In 1978-79, the investment share averaged slightly higher, around 10¾ percent, probably reflecting additional investment in the energy industries. On the basis of a rough judgment, continuation of investment in the neighborhood of 10½ percent of GNP would meet the "normal" requirements of a moderately growing economy and hold the capital stock per worker approximately constant, as it has been in the past 5 years. But it would not provide for an expansion of capital per worker or for the Nation's increased needs for energy investment.

Meeting these objectives will require substantial additional investment. Since the growth of aggregate demand and total GNP will be constrained in the years immediately ahead by the need to reduce inflation, the extra investment cannot come from additional GNP growth but will have to displace consumption or government spending, the other major components of GNP. According to the estimates presented earlier, the share that investment takes in total output will have to rise substantially from a normally expected 10½ percent or so to 12½ to 13 percent, and the combined share of consumption and government spending will have to fall by a corresponding amount.

It is virtually certain that such a large increase in the investment share will not be forthcoming without deliberate government policies. The major elements of such a policy lie in a combination of Federal tax measures and expenditure control. In the future, Federal personal tax receipts will take a steadily increasing share of personal income as inflation pushes taxpayers into higher brackets. As oil prices are decontrolled, revenues will be transferred from purchasers—who will pay the higher prices—to the Federal Government through the windfall profits tax. For both of these reasons the ratio of taxes to GNP will tend to rise and the growth of consumption will be depressed. If Federal expenditures are controlled so that their share of GNP does not rise, periodic tax reductions will be possible. Indeed, they will be necessary to prevent even moderate economic growth from being choked off. If a sizable fraction of those tax reductions are of a kind which concentrate on encouraging investment

rather than restoring the growth of consumption, the share of investment in GNP can be raised. Of course, if the share of Federal expenditures in GNP is not merely stabilized but reduced, the room for increasing the investment share of GNP through investment-oriented tax cuts will be even larger.

Within this framework, tax reductions designed to increase the share of investment in GNP must meet two requirements: They must increase the demand for investment goods, and simultaneously they must increase saving—i.e., they should not increase consumption. These two requirements are closely related, but they are not the same. There are a number of measures that might seek to increase saving but have little if any effect on the volume of business investment. Forgoing tax cuts, letting effective tax rates increase, and creating a large Federal budget surplus, for example, would appear to be one way of increasing national saving. Although such a policy would make possible a decline in interest rates, it would also create a substantial fiscal drag, reduce economic growth and private saving, and probably yield no increase in business investment spending. Conversely, measures that increase investment demand without making room for it with an increase in saving will yield an excessive growth in total demand and renewed inflationary pressure. Both aspects of the problem are important. Given the determinants of investment, what tax policies can best increase the demand for investment goods? What form of tax reductions are most likely to be channeled into saving rather than consumption?

INVESTMENT DETERMINANTS AND INFLATION

Expectations about future growth are critical in determining the volume of investment demand for the economy as a whole. But the essence of the earlier discussion was that investment needs to increase by more than the amount that would be associated simply with a normal expansion of output. A number of factors influence the amount of capital that firms want to use to produce a given amount of output. Chief among them are the attractiveness of the return on capital investment as compared with other uses of investors' funds, the perceived riskiness of corporate investment, and the cost and availability of capital.

One lesson that has been learned in recent years is the deleterious effect of inflation on investment. High inflation rates increase the perceived riskiness of investment, and this increased uncertainty makes planning for future capital needs more difficult. The information about relative demand that is contained in price changes becomes clouded when inflation is high. In addition, increasing rates of inflation are ordinarily accompanied by the expectation of sharply

higher interest rates and monetary stringency. The expected slowing of growth in demand reduces the incentive to add capacity.

But by far the most important effect of inflation on investment is its impact on tax accounting provisions and depreciation allowances. Depreciation is a cost of earning income from fixed capital assets. This cost is the reduced value of the asset due to use, aging, and obsolescence. The depreciation allowed for tax purposes is based on the historical cost of an asset. When inflation occurs, allowable depreciation is reduced relative to the cost of replacing the asset at today's price. Inflation therefore raises the tax on capital and reduces the rate of return on investment, and this problem worsens as the rate of inflation increases.

The inflation-induced increase in the tax on income from business plant and equipment is partly offset by the inflation-induced reduction in the tax burden of borrowers. Firms are allowed to charge the full value of their interest payments against income, even though a portion of these higher interest payments amounts to the repayment of real capital to lenders. The effect on the return to investment of this "excess" deduction varies with the proportion of investment that is debt-financed. It also varies with the extent to which inflation is reflected in interest rates. Since an important part of investment is not debt-financed, it is clear that inflation's tax-increasing impact on the value of depreciation allowances outweighs the tax-decreasing impact of excess deductions on the return to business investment.

Some have suggested that the inflation-induced distortion of tax depreciation could be corrected by indexing the value of existing business assets to allow replacement—rather than historical—cost depreciation. But indexing the value of assets would ignore the interest rate offset described in the prior paragraph. Moreover, as with all indexing schemes its administrative and accounting problems would be quite severe, and almost any simple index imaginable would introduce distortions of its own. For these and other reasons, indexing is not an attractive means of correcting the inflation-induced distortion in depreciation allowances.

TAX MEASURES TO INCREASE INVESTMENT

Policymakers have three principal measures to influence investment through the tax system: changes in depreciation allowances, changes in the investment tax credit, and changes in the corporate income tax rate.

Since the effect of inflation in depressing the value of depreciation is such an obvious factor in the recent decline in after-tax rates of return on capital assets, the liberalization of depreciation allowances is an attractive way to enhance investment. It not only provides an overall incentive for investment but, if carefully designed, it can also

correct some of the distortions in investment that accompany inflation. Under proposals for accelerated depreciation, the allowable depreciation on capital assets would be increased. This would permit firms to write off their capital purchases faster. The changes would affect two determinants of business investment. First, they would increase the after-tax yield of capital investment, and thus its attractiveness. Second, they would increase business cash flow and thereby supply a portion of the funds needed to finance additional investment.

Increases in the investment tax credit would have a similar impact on investment incentives. The investment tax credit reduces the purchase price of eligible equipment. It thus provides a direct incentive by raising net return and by increasing after-tax cash flow.

A reduction in corporate income tax rates, on the other hand, influences investment by increasing after-tax profits. This tends to be a less effective stimulus to investment than either accelerated depreciation or increases in the investment tax credit because it has a smaller impact on the net return from new purchases of capital assets. In addition, depreciation liberalization or an increased investment tax credit are only available to a firm to the extent it invests, but a corporate tax reduction would be available whether investment is undertaken or not.

The President's Economic Revitalization Program contains several elements that would significantly improve the outlook for business investment by offering direct incentives to invest in new plant and equipment as well as support for business cash flow. The two major investment incentives in the program are expansion in the coverage of the investment tax credit and a simplified and liberalized form of depreciation allowances.

The proposed changes in the investment tax credit would allow firms to claim full credit for all equipment purchases, even short-lived assets that currently are allowed only a portion of the tax credit. In addition, the investment tax credit would be made partially refundable. Under the current law, the credit can be used to offset the first \$25,000 of tax liabilities plus up to 70 percent (rising to 90 percent by 1982) of liabilities in excess of \$25,000. But the proposed change would allow firms to claim 30 percent of the value of the credit even if they had no tax liabilities for the year. In this way, firms with substantial investment needs but with little or no current earnings would be supported in their efforts to rejuvenate and expand their capital assets. Among these are both younger and smaller firms that are just beginning to grow and larger industries undergoing transition, such as autos and steel.

The proposal for tax depreciation—the Constant Rate Depreciation (CRD) proposal—would allow firms to accelerate depreciation on new equipment and new structures. Under this proposal, the rate of depreciation allowable over the life of the typical capital asset would be roughly 40 percent larger. In addition, the CRD proposal would greatly simplify depreciation accounting.

The President's proposed depreciation reforms share certain common features with two recent tax proposals: the bill reported by the Senate Finance Committee last fall, and the so-called "10-5-3" proposal. Both proposals would liberalize depreciation allowances by shortening the tax life of capital investments. Both would also simplify business accounting by significantly reducing the number of asset categories that firms would have to keep track of. There are important differences, however. In the President's proposal the reductions in tax life have been designed so that there would be, on average, a similar increase in depreciation allowances across all kinds of assets. The "10-5-3" proposal provides very large increases in the allowed depreciation for longer-lived assets but little or no change in the depreciation allowed for many shorter-lived assets. The tax life for structures would be reduced from an average 30-35 years to just 10 years, but, for example, automobile purchases would be allowed a lifetime of 3 years, exactly the same as under current tax laws. Because the "10-5-3" proposal would grant uneven benefits across asset types, the demand for investment goods would be significantly skewed from what would be dictated by economic considerations alone. In addition, the "10-5-3" proposal includes a complex phase-in schedule that may have the perverse effect of delaying capital investment.

Late in the last session of the Congress, the Senate Finance Committee reported a tax bill which also included a depreciation proposal. The Committee's bill would have established a limited number of asset classes with shorter tax lives than under current law. While the Committee's proposal differed from the open-end accounting of depreciation embodied in the President's proposal, its impact on the value of depreciation and on investment incentives would have been closer to that of the President's approach than is the "10-5-3" proposal.

THE IMPACT OF THE ADMINISTRATION'S INVESTMENT INCENTIVES

The investment tax credit and depreciation proposals in the Economic Revitalization Program would reduce the cost of capital to firms by roughly 5 percent and increase corporate cash flow by \$9 billion during 1981 through reduced tax liabilities. By 1985 the increases in cash flow would total nearly \$30 billion annually. It is anticipated that business fixed investment will be 5 to 10 percent

higher than it would otherwise be by the end of 1982, with smaller additional gains thereafter.

These estimates are derived from statistical relationships which link business investment demand not only with investment incentives, such as accelerated depreciation or increases in the investment tax credit, but also with expected capacity needs and demands for output. According to the historical experience which underlies these estimates, increases in investment demand can be affected by accelerated depreciation even when capacity utilization is relatively low—as it is forecast to be over the near term (Chapter 3). Indeed, the recent historical evidence offers additional support for the view that investment spending could proceed at a rapid pace without extraordinary tightness in industrial capacity. During 1976, the first full year of growth following the 1974–75 recession, real business fixed investment grew 5.3 percent despite the relatively low (79.5 percent) rate of manufacturing capacity utilization during that year. In the following year, growth in real business fixed investment was 11.9 percent, while the utilization rate rose to only 81.9 percent.

SAVING

Any increase in the investment share of GNP must be accompanied by a corresponding increase in the saving share of GNP. Total national saving comes from three sources: individuals save out of their personal income; businesses retain, and thereby save, some of their profit income; and governments save when they run a budget surplus, or dissave when they run a budget deficit. It is total national saving that supports total investment. A portion of saving flows into residential investment, investment in inventories, and net foreign investment. The remainder is available to finance business purchases of plant and equipment.

The Federal Government has numerous policy options for changing the level of national saving and thereby supporting a higher level of aggregate investment. But it is important to realize that no one sector works in isolation. A given sector's increase in saving may be partially or fully offset by another sector's dissaving.

Personal tax cuts designed to increase specific types of saving, such as an increase in the amount of tax-free interest from passbook savings accounts, are likely to be the least effective ways to increase total saving. They will increase the flow of saving into those instruments whose after-tax returns have been raised, but they will do so primarily at the expense of those forms of household saving whose after-tax returns have not been raised. They will reshuffle personal saving but increase its amount very little.

General reductions in personal tax rates would increase personal income, which would itself lead to higher saving. In addition, the

higher after-tax return on saving may induce still further increases in saving. This is more likely to occur if the personal tax cuts are directed at higher-income individuals who tend to save relatively more of their additional after-tax income. But there is substantial evidence that, in any case, the personal saving rate responds very little to changes in rates of return or in the tax structure. A large part of the personal tax reduction would therefore go toward increasing consumption.

The most effective avenue at the disposal of the Federal Government to increase the volume of saving is to reduce taxes on business income. Cuts in business taxes would lower government saving, but a large part of the tax cut would flow into business saving. Business after-tax cash flow would be increased. In time, part of the increased cash flow would lead to higher corporate dividends. A very large part, however, would be allocated to an increase in retained earnings—i.e., saving. Evidence suggests, for example, that corporations save more than 50 cents from every additional dollar of after-tax income. Furthermore, some portion of any dividend increase would find its way into personal saving. By contrast, giving the tax cut directly to households would have a smaller effect on saving because households are likely to save a much smaller fraction of every dollar of additional disposable income.

It seems wise, then, to focus government efforts on the sector most likely to allocate a large part of any tax relief to saving—business. A business tax cut would result in relatively large saving, and incentives to expand investment demand would simultaneously be improved. It is this approach that lies at the heart of the President's Economic Revitalization Program.

THE INTEGRATION OF DEMAND-SIDE AND SUPPLY-SIDE POLICIES

Tax reductions which induce additional saving and investment will contribute to faster productivity growth, and this in turn will help reduce inflation. A number of critical questions arise, however, in determining the appropriate type, magnitude, and timing of any tax reductions. First, what kind of an increase in productivity might reasonably be expected from investment-oriented tax cuts of various sizes, and what would be the associated reduction in inflation? Second, to what extent would the improvements in productivity and other supply-creating aspects of a tax reduction offset the increase in aggregate demand they would cause? More generally, how would tax cuts aimed at increasing supply fit into the framework of fiscal restraint that is required to reduce inflation?

EXPECTED PRODUCTIVITY GAINS

Although the effect on investment from a given loss of tax revenues would vary with the form of the reduction (accelerated depreciation, larger investment tax credit, or lower corporate income tax rates), the evidence suggests that each dollar of reduction in annual business taxes might, at the outside and after several years, generate slightly more than a dollar in business fixed investment. To increase investment by 10 percent, a business tax reduction of at least \$30 billion—or about 1 percent of GNP—would be necessary. This larger volume of investment, maintained from 1981 through 1985, would increase the capital stock by about 5 percent after allowing for depreciation. On the basis of the historical relationships between output and capital, such an addition to the capital stock might generate a total increase in the level of productivity of at most 1.5 percent by 1985, or about 0.3 percent per year. In view of the declining rate of productivity growth which the Nation has experienced in recent years, however, this small improvement would be significant.

Such a rise in the productivity growth rate would not be likely to induce a faster rise in money wage demands. Therefore, since the growth of unit labor costs is equal to the increase in compensation per hour minus the rate of growth in productivity, the faster productivity growth rate should lead to a slower rise in costs and prices. In turn, a slower rise in prices would help to reduce the growth of wages, leading to a still further slowdown of inflation. All told, an investment-oriented tax cut amounting to about 1 percent of GNP might produce a 0.3 percentage point rise in productivity growth that would translate, after several years, to just over one-half percentage point reduction in the inflation rate.

DEMAND VERSUS SUPPLY RESPONSES TO TAX CUTS

Tax reductions have two principal effects. On the one hand, individuals and firms will buy more goods and services. As a tax cut is spent and respent throughout the economy, the resulting increase in nominal GNP will exceed the original tax cut. As a result of this multiplier process, aggregate demand will rise by more than the tax cut. But tax cuts also increase the supply of goods and services. Since lower tax rates allow individuals and firms to keep a larger fraction of their income after taxes, the lower rates affect incentives to work, to save, and to invest the savings, increasing potential GNP.

Although the magnitude of the multiplier varies according to the nature of the tax cut, aggregate demand typically rises by about twice the size of a reduction in taxes. Thus, a tax cut equal to 1 percent of GNP will increase aggregate demand by about 2 percent. To match the increase in demand, a 2 percent increase in supply would also be

required. To the extent that its supply response is less than the additional demand it creates, any tax reduction adds to the pressures of demand on the rate of inflation.

But there are two ways in which such tax cuts can be made while still restraining demand. First, tax reductions may offset increases in other taxes. As discussed earlier, inflation pushes taxpayers into higher tax brackets, so that the average effective tax rate—the ratio of tax revenues to GNP—rises. Consumption is depressed and economic growth reduced. In the years ahead, periodic tax reductions will therefore be both possible and necessary to keep aggregate demand from falling. Second, a tax reduction accompanied by Federal spending reductions of roughly the same magnitude will not change aggregate demand; hence, even if the supply response to a tax cut is smaller than the demand response, inflationary pressures will not be generated.

Thus, it is clear that the design and timing of supply-oriented tax cuts depend importantly on the specific relationship between the demand-side and supply-side responses. If such tax reductions fail to generate enough supply to offset the additional demand they create—and the evidence discussed below suggests this to be the case, particularly for personal tax reductions—they must then be integrated like any tax cut into policies of demand management.

THE SUPPLY-SIDE RESPONSE TO PERSONAL TAX CUTS

A 10 percent reduction in marginal tax rates on individuals (approximately a \$30-billion personal tax cut in 1981) would increase the total demand for goods and services by \$60 billion, or 2 percent of GNP. It could also lead to increases in individual work and saving in response to the lower tax rates and thereby increase potential GNP. How much of the increase in demand would be matched by such increases in supply?

The Supply of Labor

The additional production that results from lowering taxes on labor income depends both on changes in the quantity of labor supplied (i.e., the total number of hours worked) and on changes in the average productivity of labor.

Higher after-tax wages make work more attractive. This encourages new entrants to join the labor force and those already employed to work longer hours. Since after-tax incomes have risen, however, people can also afford to work less—to take longer vacations or to shorten their workweeks. Whether the former effect would or would not exceed the latter effect is hard to predict. A preponderance of the evidence suggests that for adult men the two effects approximately offset each other; that is, a cut in income taxes increases the

supply of adult men in the work force only slightly, if at all. Women, on the other hand, and particularly married women, respond much more strongly to higher wages. In the past, the number of adult women in the work force may have increased by as much as 1 percent for every 1 percent increase in take-home pay. Although women are more responsive to changes in their wages than are men, men still outnumber women in the labor force and on average earn substantially more. Therefore, a reduction in personal income tax rates would increase the *total* supply of labor only slightly.

Whether an increase in the labor supply would be accompanied by an increase in productivity is uncertain. While most business investment enhances productivity, an increase in the labor supply would not improve productivity unless it increased the average quality of work performed or the intensity of effort. Productivity might actually fall as the supply of labor increased if the additional labor supply consisted, on balance, of less skilled or less experienced workers.

Alternatively, some have argued that the increased supply of labor from high-income, high-productivity workers would outweigh the increased supply from other workers, so that the average productivity of the labor force would rise. This could happen if high-productivity workers were more sensitive to a given percentage change in after-tax earnings, or if the tax reduction represented a larger percentage change in their take-home pay. Since high-income workers are a small fraction of the labor force, these influences would have to be large to alter total productivity significantly. Studies of high-income workers generally do not find them much more responsive to equal percentage increases in after-tax income. However, a 10 percent across-the-board reduction in tax rates would also mean a larger percentage increase in the after-tax earnings for these workers because their households are in high marginal tax brackets. A 10 percent tax cut is, therefore, likely to produce a somewhat larger change in the supply of high-income workers. Still, even in high-income households it is in fact second-income earners—generally those who have lower productivity—who are apt to be the most responsive to lower tax rates.

Balancing the two opposing forces—the lack of experience of new workers and the possibility of a greater-than-average influx of higher-income workers—it seems unwise to assume that the average productivity of the labor force will be improved by a personal tax cut.

Taking all the relevant factors into account, the limited response of the supply of labor and of productivity to a 10 percent reduction in personal income tax rates is likely to produce an increase in potential GNP of perhaps 0.2 percent to at most 0.6 percent. This result follows in part from evidence suggesting that such a tax cut would

induce an increase in labor supply between 0.3 and 1.0 percent. According to past relationships between labor and production, such an increase in labor supply would lead to the modest increase in potential GNP mentioned above.

The Supply of Saving

A reduction in personal income tax rates increases both the income out of which an individual worker can save and the after-tax return to saving. It would also tend to discourage borrowing by reducing the value of the income tax deduction for interest payments. If the increases in personal saving find their way into additional business investment, productivity will rise.

Most empirical studies have concluded that changes in personal income tax rates would have only a small effect on personal saving. At best, a 10 percent reduction in tax rates would increase personal saving less than 3 percent. This means that the saving rate—the average share of personal saving in disposable income, which over the last 5 years has averaged 5.7 percent—would rise by no more than 0.2 percentage point. The additional saving would at most be equivalent to only about 0.2 percent of GNP.

Even if every dollar of personal saving that resulted from a 10 percent tax cut were invested in business plant and equipment—and some, in fact, would flow into housing—the effects on output and on productivity would be small. If the tax cut and the higher saving continued for 5 years, the additional saving and investment would increase potential GNP by less than 0.3 percent and lead to a negligible increase in the annual rate of productivity growth.

This examination of likely responses thus suggests that even under the most optimistic circumstances, a 10 percent reduction in tax rates would not induce enough additional work, saving, or investment to offset more than a fraction of the 2 percent increase in aggregate demand that would accompany the tax cut.

BUSINESS TAX CUTS

It was pointed out earlier that a tax cut that liberalized the business depreciation allowance or increased the investment tax credit could, after a time, have a fairly substantial effect on the Nation's productive potential. Such a tax cut, amounting to 1 percent of GNP, could raise potential output by perhaps 1½ percent over a 5-year period.

This would still be less than the 2 percent rise in aggregate demand that would also be generated, however. More important, the increase in demand would come relatively quickly, most of it within 1½ to 2 years. The increase in supply, on the other hand, would occur very gradually. As a consequence, the tax cut would tend to

increase demand pressures, especially in the years immediately following it. While tax reductions that are effective in raising investment are essential in a long-term strategy to promote economic growth, business tax cuts, like personal tax cuts, must be designed to fit into an overall framework of fiscal restraint.

CONCLUSIONS

This analysis of the macroeconomic effects of Federal tax reductions suggests several conclusions for the development of fiscal policy:

First, specific investment-oriented tax reductions for business are likely to increase saving, investment, and productivity by a much more significant degree than cuts in personal income taxes.

Second, productivity-oriented tax reductions will yield improvements in the inflation rate that are helpful and significant, but still relatively modest in the context of a 10 percent underlying inflation rate.

Third, the supply response, while a critically important feature of any tax reduction, will be substantially less than the demand response, particularly in the short run.

Fourth, since reductions in both business and personal taxes will increase demand faster than supply, they must be designed and carried out in ways that are consistent with the demand restraint needed to reduce inflation.

It is sometimes alleged that the potentially inflationary effects of a large tax cut can be avoided if the Federal Reserve steadfastly pursues its goal of keeping the growth of the monetary aggregates within tight targets. But if taxes are reduced while the Federal Reserve pursues an unchanged monetary policy, aggregate demand will nevertheless increase, especially in the short run. The increase in demand would lead to a rise in interest rates that would dampen the increase in aggregate demand but not eliminate it. Additional inflationary pressure would then result.

A very large tax cut unaccompanied by the necessary spending cuts would lead to both an increase in inflation and a sharp rise in interest rates. Some, and perhaps all, of the stimulus to investment from tax reductions would be undone by the higher interest rates and the greater uncertainty engendered by a new round of inflation.

Monetary restraint is an absolutely essential element of inflation control and reduction. Tax measures focused on increasing supply can make a significant contribution. But there will be a continuing need for careful and prudent fiscal policies to restrain demand. In recent years the Nation has come to appreciate the potential value of supply-oriented tax policies. In the process of learning some needed lessons about supply-side economics, however, the Nation cannot

afford to forget its hard-learned lessons about the need for demand-side restraint.

The three central elements of a macroeconomic policy to reduce inflation and advance the Nation's prospects for healthy economic growth have been set forth in this chapter: maintaining a persistent and prudent course of demand restraint; putting in place an improved incomes policy using tax incentives to induce wage moderation; and increasing the share of the Nation's output going to investment. The next chapter deals with the challenge of inflation and growth at the level of individual markets and sectors. It concentrates on measures to increase the economy's flexibility and capacity for adjusting to change.

Carrying out these policies will require patience and, in the interim, some sacrifice. But if they are followed with persistence they promise a substantial payoff in improved economic performance.

TECHNICAL APPENDIX TO CHAPTER 1

MEASURING PAY INCREASES UNDER A TIP

Once the basic features of a pay TIP have been chosen, several problems in the measurement of average pay increases must be solved. These problems arise from changes in the composition of a firm's work force, from fringe benefits, and from multiyear union contracts with cost-of-living adjustments. Resolving these problems requires striking a balance among administrative convenience, equity, efficiency, and the effect on inflation.

COMPOSITION OF THE WORK FORCE

Like any well-designed tax, a successful TIP must use a measure of average pay increase that is unambiguous, that alters behavior in undesirable ways as little as possible, and that is fair in its treatment of different types of firms and workers. The simplest indicator of average pay—total wages received by a group of workers divided by the total number of hours they work—is a poor measure because it changes both with hourly wage rates and with the number of overtime hours. Even if wage rates increased by less than the TIP standard, an increase in the average amount of overtime, paid at a premium, could put the group out of compliance. Using this measure would therefore discourage overtime work, an undesirable distortion. A better measure would use straight-time wages divided by straight-time hours, with adjustments to reflect changes in the length of the standard workweek or the size of the overtime premium.

Because of possible changes in the composition of the group, however, a simple measure of straight-time wages divided by straight-

time hours also has drawbacks. For example, during a recession a firm may grant a pay raise far below the TIP standard and also lay off large numbers of low-seniority workers. Because low-seniority workers tend to have below-average wages, the remaining workers will have higher wages than the original group. Consequently, this measure of wage change may well show that the increase in average pay exceeded the standard even if no individual worker received such a large raise. Conversely, when firms hire additional low-seniority, low-wage workers during expansion, the group may appear to be in compliance even if all continuing workers receive pay raises above the standard.

This measure is also affected by changes in the skill-mix of the work force. If a firm increases the proportion of low-wage, less skilled workers in its work force, the measure will show a calculated wage increase less than the "true" wage increase. A decrease in the proportion of less skilled workers will show just the opposite. Because of these features, the measure also discriminates in favor of growing firms and against declining firms, since new workers are, on average, likely to be paid less than those already on the payroll.

More important, this measure introduces an element of uncertainty. A firm could agree with its workers to grant pay increases that met the standard—citing the TIP reward as an offsetting factor—and then unexpectedly discover at the end of the year that small changes in the composition of the work force had put the group out of compliance. Firms and workers who had negotiated small pay raises in anticipation of receiving a TIP reward or avoiding a penalty might find themselves above the standard, while others who had ignored the standards could be surprised to find themselves in compliance. An unpredictable measure is not only unfair; it also will have less effect, since firms and workers will tend to ignore the standard if they cannot be sure that small pay raises will result in compliance.

Data collected by the Bureau of Labor Statistics from a large sample of establishments suggest that significant changes in the composition of a firm's work force are common. As Table 10 shows, 22 percent of the workers in the motor vehicle industry were in establishments that experienced an increase in their calculated straight-time hourly earnings of more than 13 percent between December 1978 and December 1979. During this period the United Auto Workers' contract, which covered a majority of the workers in these establishments, provided for an increase of about 11 percent, including cost-of-living adjustments (COLAs). Therefore, most of the establishments with increases in calculated average hourly earnings larger than this must have experienced a change in the composition of their work force.

TABLE 10.—*Distribution of workers by percentage change in average establishment wage, selected manufacturing industries, December 1978 to December 1979*

Percentage change in average establishment wage	All manufacturing	Motor vehicles	Food processing
	Percent distribution		
Less than 0	5.1	5.9	8.5
0 to 6.9	18.6	7.8	24.8
7.0 to 9.9	27.4	19.3	28.6
10.0 to 12.9	25.4	44.8	17.8
13.0 to 19.9	17.2	13.7	13.2
20 and over	6.3	8.5	7.1

Source: Department of Labor, Bureau of Labor Statistics.

Additional evidence suggesting large shifts in the composition of the work force is provided by the percentage of workers in establishments who experienced actual declines in their average nominal wage. For all manufacturing, 5.1 percent of workers were in establishments that reported declining money wage rates, and 8.5 percent of those in food processing were in establishments that reported nominal wage declines. It is hard to believe that such a large percentage of workers were in establishments that actually cut the average nominal wage for their entire work force during a period in which the CPI rose by 13.3 percent.

Clearly, a satisfactory measure of wage changes will be one that is not affected by systematic changes in work force composition. The problem can be solved either by a wage index or by a measure that counts only the hours and payroll for those workers who were with the firm throughout the year. A wage index, like a price index, combines the wage rates for specific types of jobs into one measure. The weights used reflect the percentage of a firm's workers in each skill or seniority level. A wage index reflects the "true" average pay increase for all employees and is not affected by changes in composition or seniority. Such an index would be relatively easy to construct for many firms. Union contracts already set wage rates for specific jobs. Some large nonunion firms and many States and local governments also have pay scales that list the salary levels of workers in each job category and seniority step.

These union and nonunion pay scales could be used with the base period percentages of workers in each job category to calculate a firm's average pay raise, just as a price index is used along with a base period market basket of goods to measure price increases. To ensure that the firms did not give raises above the standard by promoting workers, rates of promotion above past experience would be included in the calculation of pay raises. Doing so, of course, may

reintroduce the problem of changing skill mix if the additional promotions reflect an upgrading of skills.

Nonunion firms that do not have pay scales could calculate their average pay raise from the wages and hours of those workers who continued to work for the firm throughout the year. Such a measure would not be affected by changes in the composition of the work force, since the wage rates of former or new employees would not enter into the calculation. Because firms generally hire new workers at the bottom and retire or lose workers from the top, the average pay raise for continuing workers will exceed the average pay raise for all workers in a firm with stable composition but high turnover. Therefore, measures for continuing workers must be adjusted to allow for promotions.

MEASURING FRINGE BENEFITS

A critical element in the measurement of pay increases is the treatment of fringe benefits. The cost of a given package of fringe benefits can increase for either of two reasons: because the package has become more generous (the employer is buying more services for the employees) or because the price of a given set of services has risen. For example, an employer who adds dental benefits onto the health insurance provided for employees would increase the cost of health insurance by improving the package of benefits. Health insurance premiums might also rise for a given set of benefits simply because medical care in general becomes more expensive.

Which increases in the costs of fringe benefits should the TIP include as increases in compensation? One approach is to include all increases in the cost of fringe benefits, both those that reflect higher prices for a fixed package as well as those that reflect improvements in the package. This would treat each dollar paid in fringe benefits exactly like a dollar paid in cash wages. Such an approach, however, would require extensive work to evaluate the cost of all benefits. Although determining the cost of fringe benefits purchased from other organizations, such as medical insurance, would be simple, determining the cost of other fringes, like unfunded pension benefits, would be more difficult. Another drawback is that firms and workers might object to being ruled out of compliance for cost changes they could not control, such as the cost of employer health plans.

An alternative treatment would be to exclude fringe benefits completely from the calculation of a group's average pay raise. This would involve the fewest administrative problems. It would, however, provide a strong incentive for firms to give all increases above the standard in the form of fringes rather than cash, since the group would be in compliance as long as cash remuneration did not increase by more than the standard. This would defeat the purpose of

the TIP and would also distort the structure of labor compensation for a long period.

A compromise solution would be to include only the cost of improvements in benefit packages. For example, the cost of new medical benefits would be charged against the standard but increases in the cost of existing benefits would not. This would reduce the difficulty of estimating the costs of some types of fringes without creating an incentive to divert all pay increases above the standard into benefit improvements. Although fringes would still be treated more generously than cash wages, this compromise would eliminate a certain amount of paperwork.

MULTIYEAR CONTRACTS

A third problem in measuring wage increases is the evaluation of new multiyear union contracts. A TIP will have its greatest effect on the wage settlement if the firm and union know when they are bargaining whether the contract's provisions are in compliance with the standard. For this reason, and to prevent firms and unions from postponing large wage increases to the later years of a contract in order to be in compliance during the first year, the entire contract would have to be evaluated in advance. Since most major union contracts include COLAs, evaluating wage increases in new multiyear contracts requires predicting future price inflation. (A TIP can have no direct effect on pay increases in existing multiyear union contracts. Therefore, they can be evaluated at year-end like the pay increases of non-union workers.)

Because the number chosen will affect expectations and thus will affect the success of the TIP, there may be a temptation to use an overly optimistic prediction of future price increases. If this occurred, union workers with COLAs would often be judged to be in compliance but then receive wage increases above the standard because the actual price increase exceeded the prediction used to evaluate the COLA. This would seem unfair to firms and workers who do not have COLAs and, if substantial, would set in motion catch up pressures on the part of nonunion workers that could increase inflation in subsequent years. To some extent, these considerations are counterbalanced by the fact that union workers would have to restrain their wage increases for a 2- or 3-year contract period in order to be in compliance with a TIP that may only last 1 year.