Productivity and the Prospects for Outgrowing the Budget Deficit

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INTRODUCTION

The federal government has been running budget deficits of unprecedented proportions, totaling $211 billion in fiscal year 1985 (FY85), and amounting to 5.5 percent of gross national product (GNP). By comparison, in the 1970s the federal government deficit averaged 1.8 percent of GNP, and in the 1960s only 0.3 percent of GNP. Moreover, official forecasts from Congress and the Administration are for continued high deficits for at least the next five years, unless Congress cuts spending programs, raises taxes, or both.

The size of both the current and the projected federal deficits has heightened the pitch of the fiscal policy debate. Many analysts argue that deficits of this magnitude will be detrimental to the U.S. economy because the growing federal demands in the credit markets could keep real interest rates high and "crowd out" private investment. High real interest rates are likely to keep the value of the dollar high. A high dollar makes imports relatively less expensive, and it

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increases the demand for foreign-made goods at the expense of those produced at home. And this means slower growth for industries that rely heavily on export markets and for those that compete with imports.

Because the federal deficit is so large, these analysts argue that the economy would benefit from a deficit reduction.[1] They believe that the needed reductions in the deficit can be accomplished only with both expenditure cuts and tax increases. Indeed, legislators apparently take as given the need for fiscal initiatives, while debating the details of the various plans.

Other analysts, however, deny the need for such fiscal action. They claim instead that the economic climate is now much better for economic growth, and that robust productivity growth will be strong enough to reduce budget deficits automatically to acceptable levels.[2] The argument is that tax revenues rise more quickly than expenditures in response to real growth, and that real growth—particularly productivity growth—will be high enough to make the deficit shrink dramatically; in other words, the economy will outgrow the deficit. Indeed, substantial fiscal action is not only unnecessary, in their minds, it is also detrimental. According to their view, fiscal initiatives, especially tax increases, would actually aggravate the longer-term budgetary problem by dampening economic growth.

The claim that productivity growth will be high enough to reduce deficits to acceptable levels, if true, has obvious and important policy implications. But before policymakers can act on such claims, they need to form clear ideas of exactly what it means to outgrow the deficit, as well as the time frame in which this would occur. Unfortunately, those who deny the need for fiscal action do not always detail these goals. But, to help pin these down, we can propose a scenario that falls within the bounds of historical possibility. Suppose that the deficit goal is the average deficit-to-GNP ratio for the years 1954-1980—which is 1.3 percent—and that the time frame is ten years.[3] How likely is the economy to outgrow the deficit, in this sense, by 1995?

OUTPUT GROWTH AND DEFICIT PROSPECTS

Current consensus economic forecasts do not support the claim that the economy will outgrow the deficit any time soon. A typical forecast is that of Data Resources, Inc. (DRI), which recently published projections of the course of economic activity through 1995 (see Table 1).[4] Based on their assumptions of what fiscal initiatives Congress will probably enact, and on their judgement about other important economic variables, the deficit falls gradually as a fraction of GNP

[1] Some economists have argued that in an economy with a growing level of nominal GNP, deficits do not cause a problem unless the ratio of outstanding debt to GNP rises. Since 1981, the ratio of gross federal debt held by the public to GNP has grown from 27.5 percent to 39.1 percent, its highest level since 1965. For a discussion of alternative views on the appropriate goals for budget policy, see Congressional Budget Office, *The Economic and Budget Outlook: Fiscal Years 1986-1990*, Chapter III, (CBO, February 1985), and B. Horrigan, "Federal Budget Deficits: An Efficient Tax Perspective," this *Business Review* (May/June 1984) pp. 15-25.

[2] For example, Pierre Rinfret and Paul Craig Roberts, prominent supply-side economists, argue that real GNP could grow in excess of the President's Office of Management and Budget's optimistic forecast, and that it would be strong enough to balance the federal budget. (See *Business Week*, January 9, 1984 and *Business Week*, September 24, 1984.)

[3] Of course, this scenario is arbitrary to some degree, and it is open to debate; the assumptions used here are by no means the only reasonable interpretation of what it means to outgrow the deficit. Rather, these assumptions provide *one* reasonable interpretation. In any case, the goal of a 1.3 percent deficit-to-GNP ratio to be achieved in ten years can be regarded as a yardstick with which to evaluate the impact of alternative productivity growth scenarios.

[4] The DRI figures used in this article come from the DRI "U.S. Long-Term Review," Summer 1985. The forecast refers to the so-called "Trendlong" projection. There is no claim here that this forecast is in some sense better than others. Rather, the economic assumptions used broadly represent a consensus, and the econometric model used in the computations is state-of-the-art.

TABLE 1
THE LONG-TERM PROJECTION

	Average Annual Growth Rate for 1985-1995
Real GNP	2.9%
Labor Productivity	1.9%
Employment	1.0%
	Average Annual Level for 1985-1995
Inflation (GNP deflator)	5.0%
Unemployment	7.2%

SOURCE: DRI "U.S. Long-Term Review", Summer 1985.

over the coming decade. At present, the deficit represents about 5.5 percent of GNP. According to DRI, by 1995 that ratio will fall to 2.7 percent, which is more than twice the post-war average ratio of 1.3 percent.

Not surprisingly, those who believe that high deficits will disappear take issue with the consensus predictions. In particular, they argue that the real growth assumptions underlying these projections are unduly pessimistic, and that underestimating prospective real growth overestimates likely future deficits. DRI foresees average real growth of 2.9 percent each year from now until 1995. Does this forecast understate the economy's long-run growth potential, that is, its ability to increase output? And if so, where will faster growth come from? To answer these questions, it is necessary first to understand what determines the economy's long-run growth capability.

One way to analyze the economy's long-run growth potential is to focus on the amount of labor available to produce output and on the productivity of that labor. Total output in an economy can be expressed as the total hours of labor employed times output per man-hour of labor, or labor productivity. Hence, output growth is determined by the growth rate of the labor force and by the growth rate of labor productivity. The DRI forecast of 2.9 percent average annual real GNP growth, for instance, comes from a 1 percent average annual growth in employment and a 1.9 percent average annual growth in productivity.

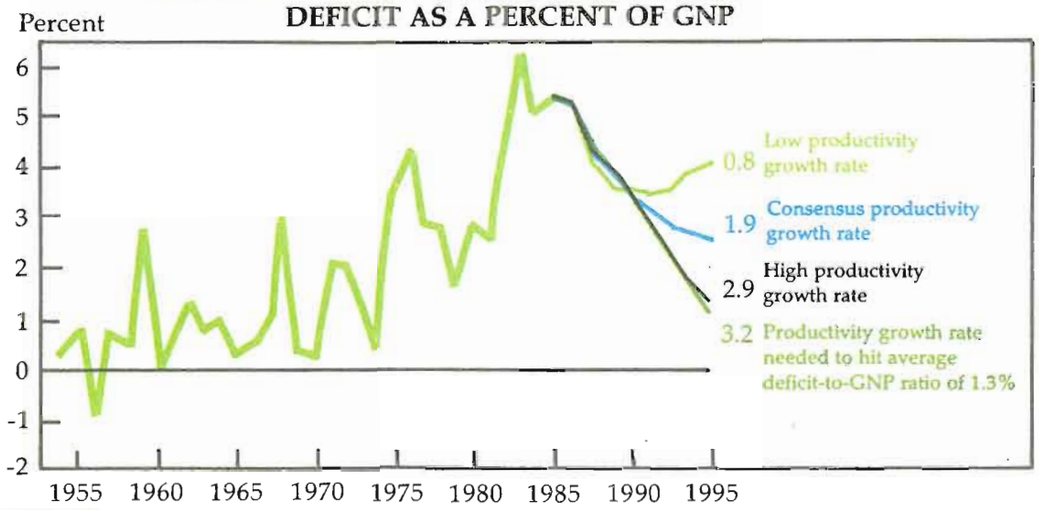
Productivity Growth is the Key. While a surge in employment growth can permit faster real GNP growth, those who look for strong economic growth typically stress labor productivity growth. Basically, they believe that the consensus forecast of 1.9 percent annual growth in productivity is unduly pessimistic. They feel that it is reasonable to expect higher productivity growth and, hence, stronger real GNP growth and lower deficits.[5]

According to the DRI estimates, in order to reach our hypothetical deficit goal, productivity must grow at a 3.2 percent annual average rate over the next 10 years (Figure 1, p. 18). Such productivity growth not only exceeds the consensus forecast by more than a percentage point, but it also appears high by historical comparison. A review of our post-war economic experience reveals no extended period with productivity growth as high as 3.2 percent per year (Table 2, p. 19). During two periods, however, productivity growth did average 2.9 percent per year, quite close to the required rate. Thus, the needed productivity growth, while extreme, may not be out of the question.

[5]Although emphasis here is placed on higher productivity growth, higher employment growth also would raise long-run real GNP growth and lower the deficit. However, employment growth over any long period depends primarily on growth in the labor force, which in turn depends heavily on demographic factors, such as the existing population and its social attitudes. Thus, average employment growth is unlikely to deviate a great deal from the consensus projections.

FIGURE 1

HIGHER PRODUCTIVITY LEADS TO LOWER DEFICIT-TO-GNP RATIOS



NOTE: The deficit-GNP data shown in this figure were obtained by simulating the DRI model of the U.S. economy with the various productivity growth assumptions. For each assumed productivity growth, the simulation is performed so that the annual productivity growth is approximately the same as the average productivity growth.

But is this rate of productivity growth *likely*? This is an especially crucial question in light of the productivity growth the U.S. experienced during the two most recent business cycles. Table 2 reveals that labor productivity growth during the last two business cycles not only was far below the 2.9 percent post-war peak growth, but it also fell short of 1.9 percent annual growth, the consensus prediction for the coming decade. Therefore, the optimistic deficit reduction scenarios for the next ten years rely on a rapid acceleration of trend productivity growth relative to the 1970s and early 1980s.

WERE THE 1970s AN ANOMALY?

Analysts broadly agree on some of the economic forces that determine productivity trend growth, though there are important disagreements on the relative importance of these forces, and on how they interact with each other. Most everyone agrees that improvements in labor quality, that is, general education, skill levels, and so forth, increase productivity. Increases in the quantity or quality of capital equipment and in technological innovation also improve productivity. Finally, lower raw materials prices and less regulation are likely to improve productivity.

The analysts who feel confident that labor productivity growth will accelerate soon believe that the experience of the 1970s is an anomaly. They maintain that temporarily poor performances of the forces that determine productivity growth combined to slow productivity to a level far below its long-run trend growth rate. The forces that depressed labor productivity include a lack of growth in labor quality, large increases in energy prices, lack of technological innovation, and increased business regulation. The productivity optimists contend that the outlook for these forces has improved substantially in the 1980s, and that it will continue to improve in the coming years, making a return to the more rapid productivity growth rates of the 1960s likely.

Some Negative Forces Have Abated . . .

Declines in Labor Quality. In the late 1960s and

TABLE 2
PRODUCTIVITY GROWTH

Peak-to-Peak Period (year:quarter)	Growth Rate in Trend Productivity[a]
1948:4 - 1953:3	2.7%
1953:3 - 1957:3	2.1%
1957:3 - 1960:2	2.9%
1960:2 - 1969:4	2.9%
1969:4 - 1973:4	2.6%
1973:4 - 1980:1	0.8%
1980:1 - 1981:3	1.4%

[a]Measured as the annual rate of change from one business cycle peak to the next and excluding farm productivity. The technique of measuring labor productivity peak-to-peak is commonly used as a way of abstracting from cyclical variations in productivity growth when trying to measure trend productivity growth.

into the 1970s, the labor force contained a relatively large share of new entrants. The post-World War II baby-boom generation had reached working age and there was a large increase in women's participation rate in the labor force. This "double-barreled" influx of new entrants pulled down the average age and the experience level of the labor force. Because they lack experience, new workers generally are less productive than those who have held jobs. As a result, the average "quality" of the labor force stopped growing, and it may have even declined. In a recent study, Michael Darby calculates an index of labor quality growth and estimates that the quality of the labor force increased at a rate of 0.5 percent per year from 1948 to 1965, but remained essentially unchanged from 1965 through 1979.[6]

The outlook for labor quality growth has improved. The baby-boom generation has already made its debut in the workplace, and the disproportionate growth of women in the labor force is not likely to happen again. Over the next few years, as the proportion of the labor force made up of new entrants declines, the average age and experience level of the labor force will increase.[7] Everything else equal, the average growth rate of productivity attributable to this factor should increase.

Energy Price Increases. One of the most dramatic economic events of the past two decades was the extraordinary increase in the relative price of crude oil and other energy prices. From 1973 to the end of the decade, energy prices nearly tripled, while prices for all goods and services rose 85 percent. These huge energy price increases reduced labor productivity through two channels. First, as the relative price of energy increased, firms economized on the use of energy. The attempt to economize on energy pulled down the output produced by existing factories as energy usage declined. And this decline in output reduced labor productivity during that period. Second, the higher relative price of energy induced firms to invest in new plant and equipment that saved energy rather than labor. But this investment substituted energy-efficient capital for existing capital, without increasing the quantity of capital. As a result, this type of investment did not lead to any growth in labor productivity.

The odds of energy price increases in the 1980s even remotely approaching those of the 1970s are slim. In the last few years, the price of oil has fallen, in part as a result of the efforts of business and households to economize on en-

[6]See Michael Darby, "The U.S. Productivity Slowdown: A Case of Statistical Myopia," *American Economic Review* (June 1984) pp. 301-321.

[7]In 1970, the labor force participation rate of women (43.3 percent) was just over half of that for men (79.7 percent). By 1982, the participation rate for women had risen to nearly 70 percent of that for men (52.6 percent to 76.6 percent). The Bureau of Labor Statistics (BLS) sees this ratio of participation rates of women to men rising to 76 percent by 1990—only a small increase. In the same labor force projections, the BLS forecasts that the percentage of the labor force made up of people between the ages of 16 and 24 will fall from 22.3 percent in 1982 to 17.7 percent by 1990. See Howard Fullerton and John Ischetter, "The 1995 Labor Force: A Second Look," *Monthly Labor Review*, (November 1983) pp. 3-10.

ergy use and in part because of the emergence of new suppliers of oil and of other sources of energy. Since it is likely that the adjustments to high energy prices made in the 1970s are mostly complete, and since oil prices have currently been weak, productivity growth is not likely to be as adversely affected by energy costs in the near future as it has been.

Lack of Innovation. Labor productivity can be affected favorably by technological innovations, such as inventions of new production processes, improvements in the operation of existing production processes, or enhancements in the quality (reliability, speed, and flexibility) of capital equipment. Many argue that the pace of pure technological innovation slowed considerably in the 1970s—that Americans simply ran out of ideas.

Ideas and innovations are hard to measure. However, some indication of the rate of change in this intangible "technology" can be gleaned from the Labor Department's measure of Multifactor Productivity (MFP) growth. MFP growth is defined as the growth rate of total output that cannot be accounted for by the growth rate of the inputs.[8] The magnitude of the MFP growth is attributed to the degree of technological innovation. The Labor Department's calculations confirm the view that growth of technological innovation slowed in the 1970s. The MFP grew at an average annual rate of 1.7 percent during the period 1948 to 1973, but fell at a 0.1 percent annual rate from 1973 to 1981.[9] This evidence seems to support the view that the productivity decline may simply reflect a decline in technological innovation.

Causes of a slowdown in technological innovation are hard to identify, but some economists argue that the slowdown in technological innovation was presaged by an earlier slowdown in spending on research and development (R&D). The level of total R&D expenditures as a proportion of GNP fell from 3.0 percent in 1962, to only 2.2 percent of GNP by 1978.

To the extent that R&D spending determines technological innovation, the outlook for growth in technology is much improved. A 25 percent incremental R&D tax credit was authorized under the Economic Recovery Tax Act in 1981. Partly because of this, R&D expenditures have grown to 2.7 percent of GNP in 1984. The National Science Foundation, chief monitor of national R&D activity, anticipates that R&D spending once again will reach 3.0 percent of GNP by 1990.

Confidence that an increase in technological innovation is imminent does not come simply from the belief that if you rub more lanterns, the odds of finding a genie will increase. A genie is already on the loose—the microcomputer and robotics revolution. It is probably this, more than anything else, which accounts for the very favorable productivity outlook held by some analysts. As a wider share of industry adopts these fast, efficient, labor-saving robots and microcomputers, they should increase output per man-hour, which will increase real GNP as long as employment levels are maintained.

Increased Regulation of Business. In the 1960s and 1970s the perception grew that the physical environment had deteriorated and workplace health

[8]The concept and measurement of multifactor productivity (MFP) growth is similar to that of labor productivity growth in that they are both computed as the difference between the growth rate of output and the growth rate of one or more inputs. The general method to compute productivity growth is to find the difference between the growth rates of output and the growth rates of inputs. This difference is attributed to changes in the productivity of the inputs. In the calculation of labor productivity growth, total man-hours of labor is the measure of input. In calculating multifactor productivity growth, the input is measured as a weighted index of the capital and labor inputs, where the weights are set equal to the cost share of each factor in the total cost of production. The difference between output growth and the growth of this input index is attributed to technological innovation.

[9]See U.S. Department of Labor, Bureau of Labor Statistics, *Trends in Multifactor Productivity, 1948-1981*, Bulletin 2178, (September 1983).

hazards had increased in the process of achieving rapid economic growth. Congress enacted legislation, such as the Clean Air Act, the Clean Water Act, and the Occupational Safety and Health Act, which were intended to deal with these issues. The way these laws typically work is by "command and control," with the government specifying acceptable methods of production. This frequently required firms to change their methods of production and to invest in so-called "nonproductive" capital that improved the environment but did not increase the output of marketable goods. Because it diverted investment away from "productive" projects, this social regulation was unfavorable from the vantage point of labor productivity.

No major new pieces of regulatory legislation have been passed in recent years. Moreover, legislative debates over the renewal of the Clean Air Act and Clean Water Act concern mostly relaxation of their requirements versus the status quo, in contrast to the tightening versus status quo battles of the 1970s. It is unlikely that productivity will suffer for the sake of the environment in the next few years, as it may have in the past.

In sum, the case for an imminent productivity upsurge is built upon the belief that the factors causing low productivity growth in the 1970s have abated and are not likely to re-emerge. This observation suggests that productivity growth will return to its normal, higher level, making it more likely that the economy will outgrow the deficit without substantial fiscal policy action.

. . . But the Surge in Productivity Is Not Evident. Despite the likelihood that many negative forces have abated, the case for a resurgence in productivity growth is far from complete. Careful productivity growth studies, which take into consideration all of the forces mentioned and more, still find a disconcerting proportion of the productivity decline a mystery.[10] Because of this, one must approach the qualitative forecasts of a productivity growth reversal from the 1970s with caution. This is especially true of forecasts of record-breaking gains in productivity growth.

The case for a surge in productivity growth based on the factors cited above would be greatly strengthened if there were evidence that productivity is growing rapidly now. Unfortunately, the behavior of labor productivity growth in the current recovery does not support the view that productivity growth is returning to previous highs.

Labor productivity growth behaves cyclically; generally it is high early in a recovery and it falls as the recovery matures. Therefore, it is misleading to look at any single quarterly—or even annual—growth rate, and to compare that number to the long-term average growth, which is itself difficult to measure (see PITFALLS IN MEASURING PRODUCTIVITY GROWTH p. 22). The growth rate of productivity depends not only on its long-term trend but also on the point in the business cycle at which it is being measured. One way of assessing relative productivity growth while controlling for cyclical influences is to compare the current productivity growth to past experience on a "quarter-after-trough" basis.

[10] Two important studies, E. Denison, *Accounting for Slower Growth: The United States in the 1970s*, (Washington, DC: Brookings Institution, 1979), and John W. Kendrick "Long Term Economic Projection: Stronger U.S. Growth Ahead," *Southern Economic Journal*, 50(4) April 1984, pp. 945-964, reach a similar conclusion. Kendrick finds that at least 40 percent of the productivity decline cannot be explained. That the decline has not been explained adequately by the factors mentioned in the text is not surprising to some. To illustrate, energy price increases may have adversely affected labor productivity; but energy costs are too a small a component of the total cost of production to have had a substantial impact on productivity growth, as many have claimed. Denison shows that, as a result, energy price increases explain no more than 5 percent of the productivity decline. Regulatory policy may have diverted investment funds toward "non-productive" capital, but the ratio of pollution abatement capital investment to total capital investment never exceeded 3 percent in any year. Total R&D spending may have fallen during the 1970s, but the bulk of the decline was in military R&D. Private R&D as a percentage of GNP actually rose in the 1970s.

Figure 2 compares the change in nonfarm labor productivity in the current recovery to the change during the average of all previous recoveries and to the best productivity growth episode, which started with the recovery that began in the first quarter of 1960. It is clear from Figure 2 that productivity in the current cycle is growing at below average rates, and certainly below the rates enjoyed during the productivity boom of the 1960s.[11]

The current behavior of productivity provides no indication that we are in the throes of a labor productivity boom. Several studies that look carefully at recent experience also find little support for an ongoing productivity surge. Peter Clark and Robert Gordon examine the behavior of labor productivity in the 1980s and, after accounting for the purely cyclical changes in productivity, find no evidence that trend productivity growth has accelerated at all from the rates experienced in the 1970s.[12] In a longer-term analysis of labor productivity growth trends, Darby finds that, once adequate account is taken of changes in labor quality and of the measurement problems caused by the 1971-1974 price-controls period, there is little evidence of a dramatic downward shift in trend labor productivity during the 1970s.[13] If correct, Darby's analysis suggests that only the improvement in labor quality is likely to boost productivity growth, and that the abatement of all the other negative forces is unlikely to add to growth. The overall conclusion that emerges from careful evaluation of the recent evidence is that the behavior of productivity growth in the current recovery probably represents an improvement over the experience of the 1970s. But it does not warrant the

PITFALLS IN MEASURING PRODUCTIVITY GROWTH

One must be careful when trying to estimate the underlying trend growth of labor productivity based upon measured changes in output per manhour from one period to the next. The reason is that productivity tends to rise and fall with the business cycle. In times of economic slack, employers tend to delay laying off more employees than necessary, and during recoveries they delay hiring new workers. As a result, productivity falls below its trend during the early part of a recession, but once the recovery is underway, productivity rises because existing employees are utilized more fully. Therefore measured labor productivity grows faster—sometimes much faster—than its trend during the early stages of a recovery. As the recovery matures, measured labor productivity slows to its trend growth. To get good estimates of trend growth in labor productivity, it is important to account for its cyclical behavior. One way to measure the historic productivity growth is to measure its trend growth as the annual rate of change from one business cycle peak to the next. Another way is to compare the period-by-period behavior of productivity growth to the typical (and maybe the extreme) behavior of past productivity growth, taking as reference the beginning of the business cycle.

[11] One way to get a rough estimate of the underlying trend growth of productivity in this recovery is to assume that we are at a peak now, and to calculate the peak-to-peak growth rate using the last two peaks (1981:3) and (1980:1). This calculation makes sense only when the recovery is mature, since it is only in that case that the cyclical behavior of productivity will not distort seriously the result of such a calculation. It turns out that the average growth of productivity is 2.3 percent per year for 1981:3-1985:2, and it is 1.8 percent per year for 1980:1-1985:2.

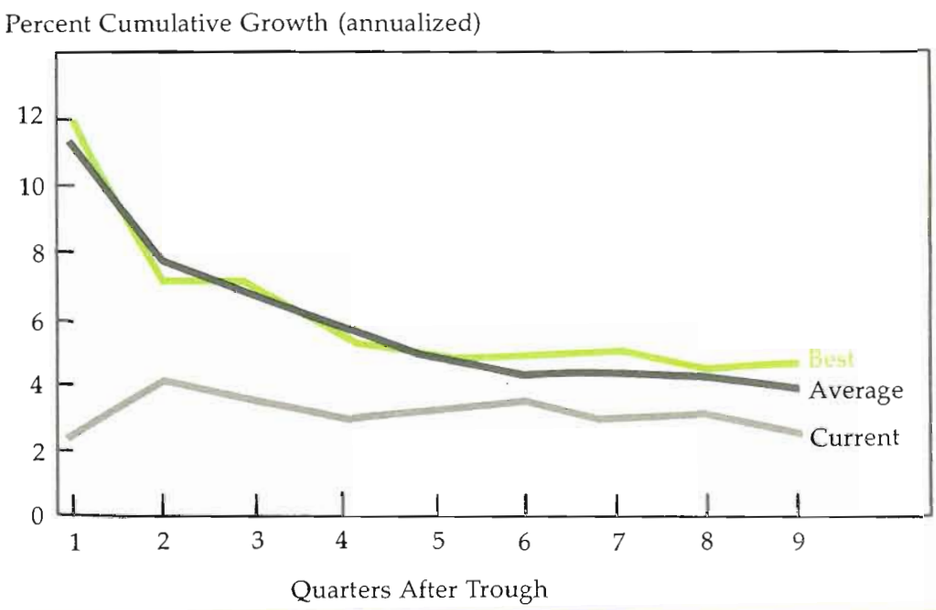
The reason to use 1980:1 as a starting point is that the four-quarter recovery ending in 1981:3 was the shortest since 1919, and the second shortest in recorded American economic history. The rate of capacity utilization remained at only 80 percent during that peak. A measure of trend productivity growth, using as a reference point a quarter before the peak, will be biased upward since some of the purely cyclical productivity gains would be measured as trend productivity. Thus, it may make more sense to use the next-to-the-last peak as a basis for comparison.

[12] Peter Clark, "Productivity and Profits in the 1980s: Are They Really Improving?" *Brookings Papers on Economic Activity* (1), 1984, pp. 136-167; Robert Gordon, "Unemployment and Potential Output in the 1980s," *Brookings Papers on Economic Activity*, (2), 1984, pp. 537-564.

[13] Darby, "The U.S. Productivity Slowdown."

FIGURE 2

NONFARM PRODUCTIVITY GROWTH DURING RECOVERIES



presumption that labor productivity growth will be sufficiently high to allow the economy to outgrow the deficit.

CONCLUSION

In the world of economic policy, where consensus is one of the scarcest of commodities, most analysts argue that the federal government deficits, at their current and prospective levels, pose a risk to the health of the economy. Since 1981, the deficit figures have grown by leaps and bounds. In fiscal year 1985, after three years of economic growth, current tax receipts paid for only 78 percent of federal expenditures. The outlook for the immediate future is not much better.

There are two perspectives on what is to be done. One side views deficits as a chronic problem indicating the need for a shift in fiscal policy, namely, expenditure cuts and tax increases to control the deficit and to ensure future economic growth. The other side sees the deficits as a short-run problem that will be resolved not by government action but by healthy long-run economic growth that will result largely from strong productivity growth.

Whether the deficits will decline substantially as the economy grows depends very much upon whether productivity growth will resurge from its low rates of the 1970s to reach or even surpass its post-war highs. Research on the decline in labor productivity in the 1970s provides some information on future trends in labor productivity; and that literature does lead to expectations that productivity growth will not remain as low as it was during the 1970s. But the case made for a surge in labor productivity growth is speculative; there is little evidence to support it. Not only is the economics profession not satisfied that the experience of the 1970s has been adequately explained, but also the economy's recent productivity performance has been lackluster. So while a strong theoretical case for a snap-back in productivity growth can be made, more empirical meat must be put on that conceptual skeleton before such a scenario appears probable.

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