

# Economics Program Working Paper Series

## The Old and the New in the U.S. Economic Expansion

Victor Zarnowitz  
The Conference Board

January 2, 2001

EPWP #01 - 01



**THE CONFERENCE BOARD**

Economics Program  
845 Third Avenue  
New York, NY 10022-6679  
Tel. 212-759-0900  
[www.conference-board.org/economics](http://www.conference-board.org/economics)

# The Old and the New in the U.S. Economic Expansion

Victor Zarnowitz<sup>\*</sup>

Economics Program  
The Conference Board  
845 Third Avenue  
New York, NY 10022-6679  
Tel. 212-759-0900  
[www.conference-board.org/economics](http://www.conference-board.org/economics)

---

<sup>\*</sup> Senior Fellow and Economic Counselor, The Conference Board; Research Associate, National Bureau of Economic Research; and Professor of Economics and Finance Emeritus, Graduate School of Business, The University of Chicago. I wish to thank Craig Bowles, Jing Sima, and Greg Dawson for valuable research assistance and help with the charts. Earlier versions of this paper were presented at the Rheinisch-Westfälisches Institut (RWI) in Essen, Germany on February 28, 2000; at the Institutional Investor Institute's Corporate Funds Roundtable 2000 in Washington, D.C. on April 10; and at the Columbine/Instinet Seminar at The Broadmoor, Colorado Springs on August 16. Comments from the participants are gratefully acknowledged, as are comments from Malcolm Harris, Greg Dawson (US Postal Service), and Ataman Ozyildirim (The Conference Board). Help from Saul Hymans and Kathleen Miltzer was particularly valuable when the paper was presented at the 48th Annual Conference on the Economic Outlook of the University of Michigan at Ann Arbor on November 16, 2000. The responsibility for any errors is, of course, exclusively mine.

## Contents

1. Introduction: The Surfeit of Questions and the Task Ahead	3
2. The 1990s vs. 1980s and 1960s: Economic Activity, Inflation, and Demand	4
2.1 A Weak Recovery and Late Upswing of Output and Employment	4
2.2 The Late Downturn and Steady Decline in U.S. Unemployment	6
2.3 The Global Diminution of Inflation	7
2.4 Changes in Stability and Strength of Consumer Demand	10
2.5 Trends and Surges in Private Domestic Investment	12
3. Labor Income and Costs, Productivity and Profits	13
3.1 Modest Gains in Nominal and Real Wage Rates	13
3.2 Productivity Improvements and Labor Cost Reductions	14
3.3 Long and Strong Rises in Profits and Profit Margins	16
4. Changes in Financial Markets and the Economy	18
4.1 Trends vs. Cyclical Movements in Interest Rates	18
4.2 The Declines and Inversions of Yield Spreads	19
4.3 Stock Prices Soar Far Beyond Profits	21
4.4 Leading Indicators Signal Less Growth and More Uncertainty	23
5. Policy Concerns, New Returns and New Risks	25
5.1 Unstable Monetary Growth	25
5.2 The Path from Budget Deficits to Surpluses	26
5.3 The High-Technology Boom and Productivity Measurement Problems	28
5.4 Shifts in Personal and Business Saving Rates	31
5.5 Related Imbalances in Saving and Trade	32
5.6 Government Debt Down, Private Debt Up	33
6. Some Lessons and Outlook	36

## 1. Introduction: The Surfeit of Questions and the Task Ahead

How does the expansion of real economic activity in the United States since 1991 compare with its historical precedents in terms of length, strength, composition, and sources? Was it really unique, marking the onset of a new age of both higher and more stable growth with no significant inflation? How justified are the expectations of strong and lasting productivity-enhancing innovations? These and many related questions are prompted by what is widely viewed as a surprising combination of economic and financial, domestic and foreign events, which occurred recently and are still unfolding, as the millennium draws to its end. The essay is addressed to several of them.

The proponents of the view that the economy is undergoing a huge metamorphosis and entering a new era of indefinite prosperity believe, first, that the current American business expansion is indeed uniquely long, strong, and stable. Many see the main reason for past downturns in rising inflation and the reactions to it of markets and policy makers; they argue, second, that for various reasons inflation is no longer such a threat. The third and apparently most sweeping and important thesis being advanced is that the breakthrough to, and maintenance of, the expected “Golden Age” is due to the new information technology (IT).

By trying to answer the initial questions, I shall be dealing with all three of the above points. But still other related issues must be considered. Why did no other major market economy succeed as well as the United States in the 1990s? Was the latest upswing of the U.S. industry a special achievement and, if so, in what respects? Are there any useful lessons that other countries can draw from the U.S. example or model? Thinking about these matters necessarily involves an assessment of the roles of several major factors such as monetary and fiscal policies, domestic and international financial markets and disturbances, and global business cycle developments.

Yet even the mere recital of these problems raises the threat of an unmanageably large and complex task, which therefore needs to be defined more precisely and more narrowly. The questions concern not only the unfolding and hence still hard-to-read past but also the unknown future. Hence good answers

will only be reached in time, after much data collection and analysis. But arguments pro and con of the “new economy” are already forcefully presented and debated. So far, much of the popular discussion in the media has been limited to the realm of speculation and assertion, but increasingly the need for a more restrained and balanced analysis based on economic theory and history will be recognized and met.

## **2. The 1990s vs. 1980s and 1960s: Economic Activity, Inflation, and Demand**

### **2.1 A Weak Recovery and Late Upswing of Output and Employment**

A simple but revealing way to evaluate the argument that the decade of the 1990s has produced unprecedented gains in real economic activity is to compare the cyclical patterns of total U.S. output and employment for the three long expansions of recent history. In each case, the value of the series at the initial trough of the expansion is set equal to 100, an arrangement that enables the user to make directly visual assessments of what happened at comparable stages of the successive developments. The recession years preceding the troughs of February (Quarter 1) of 1961, November (Q4) 1982, and March (Q1) 1991 are covered as well as the recoveries and expansions that followed. Chart 1 A shows the three patterns for the U.S. real Gross Domestic Product (GDP); Chart 1 B, for non-farm payroll employment.

The greater the rise of a series so measured, the larger is its cumulative gain during the particular expansion. For example, GDP increased from 6,631.4 in Q1 1991 to 9,373.5 in Q3 2000 (in billions of chained 1996 dollars; see right-hand scale). This amounted to a total output gain of 41.4 percent (see the index numbers on left-hand scale). But the thick line for the 1990s is the lowest of the three curves plotted, reflecting the fact that U.S. GDP increased overall as much as 51.8 percent between Q1 1961 and Q4 1969 and 36.7 percent between Q4 1982 and Q3 1990 (the shortest of the three expansions).

The slope of any of the curves represents the growth rate of the series in the particular period. In the first ten quarters of the recovery that began in Q1 1991, real output rose very sluggishly, at rates at best half of those observed in the recoveries of 1961-63 and 1982-84. It is this initial sluggishness that

accounts for the weak overall performance of the current U.S. expansion in terms of the total output amplitude. Even though since 1994 growth accelerated to match (or occasionally exceed) growth in the 1980s, the two lower curves in Chart 1A remained approximately parallel and the distance between them was never eliminated. But the 1960s achieved the best growth record by far, particularly in the second half of the decade.

Chart 1B reaffirms and further strengthens this conclusion by showing that total non-farm employment in the U.S. first failed altogether to grow and then barely budged during the first eighteen months of the recovery in March 1991 – September 1992. Indeed, the rate of unemployment continued to increase from about seven to nearly eight percent in this period (see Chart 2A), while employment in goods-producing industries actually declined.

All this was indeed very unusual. Typically, in the early recovery stages, employment, like production, grows fast and unemployment falls fast. Yet in 1991-92 the U.S. economy was so sluggish that people were largely unaware that the recession is over. In retrospect, it is clear that this was an important, perhaps decisive factor that contributed to the defeat of President Bush in the 1992 election.

Again, it was the weakness or belatedness of the initial upturn that caused employment in the present expansion to lag well behind their historical counterparts. The overall employment increases were 21.6% in 1991-2000, 23.5% in 1982-90, and 34.7% in 1961-69.

The length of the current business expansion in the U.S., viewed by so many commentators in the media as a unique achievement (whether of the private economy, government policies, or both), looks rather less impressive when the above facts are properly considered. The duration record of surpassing the 106-month long expansion of the 1960s in March 2000 is set in terms of national output but not in terms of employment. Further, the overall gains in activity (measured by the volume of production and, especially, employment) were so far smaller in the period since 1991 than in the shorter expansion of the 1960s. Even the still shorter expansion of the 1980s achieved greater employment growth than that observed in 1991-98.

In short, the claim that the U.S. economy has already attained the pinnacle of longest, highest, and broadest growth is premature. The effects of the sluggishness of the recovery in 1991-93, and of the 1995 slowdown, need to be taken into account. But it is just as important to recognize that the impact of these events was by no means altogether or necessarily adverse. The slack production during the late 1980s and early 1990s can to some extent be ascribed to the reductions in inputs of labor and materials associated with the initial stages of the latest wave of technological innovation and corporate restructuring. The payoff on such “downsizing” tends to come years later, and it indeed did-- in the second half of the 1990s.

## **2.2 The Late Downturn and Steady Decline in U.S. Unemployment**

The unemployment rate (UR) tends to fall throughout business expansions, typically most strongly during their early recovery stages, and the more so the longer the phase. The decline ceases when a long expansion issues in a slowdown. This pattern prevailed in both the 1960s and the 1980s, as displayed in Chart 2 panel A.

In the past decade, the U.S. jobless rate moved differently. After rising from over five to nearly seven percent in 1990 and early 1991 (a period including a short and mild recession), civilian unemployment continued to increase for another year and a half and approached eight percent of the labor force. Only after this unusually long lag did the jobless rate turn down in a rather gradual fashion, but its subsequent decline was also unusually long and persistent, flattening only once in 1995 and ending impressively at below 4 percent late in September 2000. The unemployment rate in the current expansion was consistently lower than during the 1980s but consistently higher than during the 1960s.

The overall decrease in UR in the present expansion was 2.9 percentage points, slightly less than in the 1960s when UR fell from 6.9% to 3.5%, moving throughout at considerably lower levels. In the 1980s, UR declined almost in half, from 10.8% to 5.5%: a huge drop but from a very high level. In both

1960s and 1980s, UR ceased declining in the last year of expansion. In 2000, UR seems to be hovering close to 4% but without any tendency to increase so far.

The falling unemployment rate is usually associated with tightening conditions in labor markets and upward pressures on wages and unit labor costs. But the prominent feature of recent years was that the rates of unemployment and inflation declined simultaneously. This generally unexpected combination of events seems to have perplexed the proponents of the inverse relationship between the two variables as embodied in the analysis of the Phillips curve and the concept and estimates of the “natural” rate of unemployment at which inflation has no tendency to accelerate. However, as discussed below, there are some explanations for the newly observed developments that are rooted in both a long historical record and contemporary international events, including the effects of crises and downturns, overcapacity, and deflation abroad. But special factors such as the effects on prices and productivity of rapid advances in computer hardware and software attracted considerably greater attention.

### **2.3 The Global Diminution of Inflation**

In this paper, inflation and growth rates are six-month (two-quarter) smoothed annualized rates. The value of a series in month (quarter)  $t$  is divided by the average of its values in the preceding twelve months (four quarters), and the ratio is raised to the power of  $12/6.5$  (for monthly series) or  $4/2.5$  (for quarterly series). This method attempts to reduce the volatility of the observed growth rates (short-term percentage changes), while bringing out their cyclical behavior. It is a somewhat stronger smoothing device than the more familiar year-over-year comparisons (for more detail, see Zarnowitz and Moore 1982, p. 62, and Niemira and Klein 1994, pp. 94-95).

Consumer price inflation, so measured, in the United States fell sharply (from about 7% to less than 3%) during the year centered on the March 1991 trough, stabilized in 1992-95 in the 2%-3% interval, declined again but more gently in 1996-97 to less than 2%, and changed little in 1998 and early 1999. It zigzagged and rose from about two to four percent later in 1999-2000. In contrast, as shown by Chart 2-



B, the trend of inflation was irregularly up in the 1960s, from around 1% to over 6%. It varied mostly in the 3%-4% range in 1983-85, dropped sharply but briefly in 1986, and finally rose to 5%-6% in 1987-1990.

After decades of inflation dominating the post-World War II era, the low and stable or declining growth rates of the U.S. Consumer Price Index observed in the 1990s met generally with growing surprise and pleasure. Most people thought the expansion itself would necessarily bring on more inflation. Many economists were hard-pressed to account for the long concurrence of falling inflation and falling unemployment rates. Some found the main explanation in good luck: the coincidence of favorable “supply shocks”. Technological progress hastened the enormous decline in computer hardware and software prices, and increased greatly their importance. The new ways of marketing via the Internet strengthened the bargaining position of consumers/buyers, which led to lower prices, in part because the resulting sales were effectively tax-exempt. The strong dollar and weakness abroad helped by reducing the prices of imports, with large contributions from the declines in prices of industrial materials and commodities at large.

No doubt, all these factors have participated in helping to suppress U.S. inflation in recent years, but the analysis is far from complete and convincing. The decline of inflation in the 1990s was not just an American phenomenon but widely diffused internationally, particularly in Asia and Europe. In some countries actually deflation prevailed, and not just in commodity prices, where it is not uncommon, but in the far more comprehensive indexes of producer and consumer prices. Economic historians have long observed waves of deflation alternating with inflation for periods preceding WWII, but the return of deflationary tendencies, which became increasingly evident in 1997-98, was a great surprise to the general public accustomed to see inflation as an unalterable rule of life.

When the long-run trends in prices were downward, inflation was weak or absent during business cycle expansions and deflation dominated during contractions. This is shown by data on U.S. wholesale prices for most of the second half of the 19<sup>th</sup> century (see Zarnowitz and Moore, 1986, pp.553-560). Expected inflation was then low and stable, since so was the actual inflation in the long run under the gold

standard. The U.K. and U.S. economies may have been operating on the nearly horizontal parts of their nonlinear Phillips curves<sup>1</sup>.

The episodes of deflation during the 1990s are related to major cyclical developments abroad. Thus Japan, after a long era of high growth with few serious setbacks, suffered a collapse of heavily overvalued real estate and stock prices, a sequence of financial crises and business recessions, and, perhaps worst, a protracted economic stagnation with repeated failures of institutions and policies. Along Asia's Pacific Rim, there was first a large wave of foreign capital inflows, then much malinvestment and overinvestment in short-term speculative ventures, weak but protected financial and other companies, and industries with excess capacity. Finally, in 1997-98, debt and currency crises undermined investor confidence and caused massive panic and capital flight. Exports slowed, risks rose, and profits fell. Slowdowns followed by recessions occurred since mid-1990s in Thailand, South Korea, Malaysia, and Indonesia. The devaluations in these countries caused initially rounds of price increases but in the wake of recessions prices dropped. Deflated imports from these countries as well as from China helped reduce prices in Europe and North America.

The inflation-restraining effects of the foreign crises and recessions were enhanced by globalization, a well-advanced process defined broadly as a trend toward increased international integration of output, input, and asset markets. The apparent results included reductions in the powers of U.S. corporations and labor unions to raise prices and wages, respectively. The surge of domestic demand helped the economy to weather the negative influence on exports of the foreign slowdowns and recessions. Expansionist monetary policy countermeasures and resilient optimism of investors helped to overcome challenges to the financial markets from crises abroad- which crested in 1998 when troubles spread to Russia and Brazil. Overall then, the net impact on the United States of the newly virulent business cycle developments abroad was to reduce inflation. Given the predominantly adverse macroeconomic effects of inflation (Zarnowitz, 1999), this effect was clearly positive.

---

<sup>1</sup> The curve is assumed to have a negative slope that diminishes in absolute value to the right. That is, it is steep in the region of highest inflation and lowest unemployment rates, flat in the region of lower inflation and higher unemployment. This implies that inflation can rise indefinitely when excess demand increases sharply, whereas deflation is limited even in severe recessions

However, the Asian recessions ended generally in late 1998 and were followed in some countries by substantial recoveries. Also, oil prices turned around and rose steeply and some industrial materials prices increased significantly as well. So the situation changed in that the deflationary forces weakened, and the inflationary force strengthened. At the time of this writing (mid-November 2000), our six-month smoothed annualized growth rate in CPI shows an irregular but clear upward movement from 1%+ in early 1999 to 3%-4% in March-August 2000 (Chart 2B). This is still relatively moderate and perhaps even reversible if the slowdown lasts and deepens. But in the meantime tight labor markets will continue to exert upward pressures on companies' actual labor costs, total costs and desired prices. And any slowdown in productivity of labor will raise unit labor costs and increase the downward pressures on profits and upward pressures on prices. Because of the adjustment difficulties and lags involved, past slowdowns have often coincided with temporary increases in inflation, and the current and expected slowdown may well follow suit.

#### **2.4 Changes in Stability and Strength of Consumer Demand**

Real personal consumption expenditures (C) remained remarkably steady as a proportion of real GDP during the past decade (Chart 3 A). C/GDP fluctuated narrowly around 67+/- less than one percent; it increased mildly in 1990-93, decreased most of the time in 1994-96, rose in 1997-98, and varied at the top of the range in 1999-2000. The pattern in the 1980s was very similar, except for larger variation in the percentage C/GDP ratio, up in the recession and down in the recovery. In the 1960s, C/GDP also increased a little in the recession and had but mild drifts in the expansion (mostly down for the first six years, mostly up for the last three); but here the ratio was throughout lower, varying in the 62%-64% range.

The smoothed six-month annualized growth rate for consumption (GR-C, see Chart 3B) fell drastically from over 2% to about -2% during the recession in 1990, but then recovered strongly to about

---

characterized by excess supply. See Phillips, 1958, for the example of the relationship for the United Kingdom in the pre-World

4% by Q 4 1992. GR-C then varied in the 2% to 4% interval through mid-1997; drifted upward strongly to reach over six percent in January -March 2000; and finally dropped in April-October back to 4.8 percent.

The strength of consumption in the late 1990s has been attributed by many observers to the "wealth effect", i.e., the encouragement of household spending provided by increases in the value of household assets. Historically, housing has been most important among these assets, and residential construction increased in recent years at a record pace. But the stock market boom of the second half of the nineties, and the spreading stock ownership and high optimism that accompanied it, attracted most of the attention here. The patterns in Chart 3 are broadly consistent with the wealth effect hypothesis as they point to particular strength of consumption in 1997-79, when the market soared, as well as to a swift slowing in 2000, after the market flattened and declined. Further, as shown below, the personal saving rate declined strongly in the past eight years, while growth of personal debt rose greatly.<sup>2</sup>

To be sure, personal consumption may accelerate temporarily for other reasons, e.g., in 1982-83 people restrained and postponed outlays during recession and made up for it by spending more freely during recovery --in a period generally marked by CPI inflation, falling rapidly from extraordinarily high levels. But then the eighties began to witness an irregular downward drift in GR-C, in contrast to the more stable upward drift in the nineties (see Chart 3B). In the sixties the cyclical pattern of consumption growth was similar, waning in the recession and waxing in recovery, but here the last six years of the long expansion saw GR-C fluctuating widely around a high average level. (Thus, in 1965 and 1968, both years when real economic activity strongly accelerated, GR-C ascended into the record 6%-8% interval, only to drop sharply in the following years.)

---

War I age.

<sup>2</sup> The wealth effect may have been considerable weaker and much less studied in the past, but some evidence suggests that it is not exactly a newly-born phenomenon. For example, using two-quarter growth rates to abstract from common trends, we obtain for 1960-99 (156 observations):

$$CD_t = -2.6 + 1.9Y_t + 0.2S_{t-1} \quad R^2 = 0.468$$

(8.9)      (5.8)

Where CD refers to real expenditures on consumer durables, Y to real personal income, and S to the Standard & Poor's 500 stock price index. The t-ratios in parentheses indicate high statistical significance for  $S_{t-1}$  as well as  $Y_t$ .

## **2.5 Trends and Surges in Private Domestic Investment**

While consumption accounts for a relatively steady and high proportion --about two thirds--of GDP, gross private domestic investment (GPDI) has always been much smaller but also much more variable and cyclical. GPDI includes fixed investment -- nonresidential structures, equipment and software, and residential--as well as the relatively small and highly volatile component of change in private inventories.

Chart 4, panel A, compares the behavior during the three recent long cycles of the percentage of GDP represented by GPDI (or I for simplicity). The ratio I/GDP, taken in real terms, declined in each recession and rebounded in each recovery: in the 1960s in the 10% to 12%+ range, in the 1980s and the 1990s one to two percentage points higher. In 1983-84, investment was clearly a major driving force in the recovery as I/GDP rose from about 12 to 16 percent, but this changed when the ratio started trending downward slowly to 13.6% at the business cycle peak in Q3 1990. For the 1960s, the pattern shows a gradual rise in the first five years of the expansion followed by more variation and some net decline in the next four years.

In contrast, there was a much stronger and more persistent upward trend in real fixed and inventory investment during the U.S. business expansion of the 1990s. The I/GDP ratio increased from 12.3 percent at the Q1 1991 trough to about 20 percent over the same period, and it becomes clear that capital formation attained a huge size and played a huge role in this expansion. The main perceived source of this lies in the spread of the new technology of information, which accounts for the dominant demand for related equipment, including hardware and software whose capacity was rising as prices were falling rapidly. On the side of financing, large increases in credit, stock prices, and profits expected of the new ventures all helped greatly through most of the second half of the past decade.

The growth rate of GPDI (GR-I) dropped sharply in each recession and bounced back still more strongly in each recovery, but less so in this cycle than in the previous ones (Chart 4, panel B). After the

extraordinary rise and fall in the recovery of 1983-84, GR-I varied at mostly fairly low levels before a long decline in 1988-90 that ended well below zero. Large variations around a substantially higher average level characterized the corresponding pattern for the 1960s. By contrast, growth of private domestic investment in the 1990s was considerably more stable as well as higher.

### **3. Labor Income and Costs, Productivity and Profits**

#### **3.1 Modest Gains in Nominal and Real Wage Rates**

Between Q1 1961 and Q4 1969 (35 quarters), the rates of nominal wages as represented by the index of average hourly compensation in the U.S. non-farm business sector (1992=100) increased by a total of 57.2 percent; between Q4 1982 and Q3 1990 (31 quarters), by 38.9 percent; and between Q1 1991 and Q2 2000 (37 quarters), by 39.1 percent. Here wages are gross –before taxes- and include fringe benefits.

As shown in Chart 5, panel A, the relative gains in wages were about equal in all three cycles after the first nine quarters of recovery, but in 1993-96 growth of wages slowed greatly and the pattern for the current expansion fell below the patterns for the sixties and eighties. The gap remained sizable despite the acceleration of the rise in labor compensation during the period 1997-99. Average hourly compensation rate rose about as much during the present expansion as during the much shorter expansion of the 1980s, and much less than during the somewhat shorter expansion of the 1960s.

The six-month smoothed annualized growth rates of the same series plotted in Chart 5, panel B, provide confirming evidence. Growth of wages so measured had a downward drift in 1990-94, an upward drift and much smaller short-term variations in 1995-98, finally a fairly smooth decline from 6% to 2% in 1998-2000. It was most of the time lower than the corresponding figures for the 1960s and 1980s.

When expressed in real terms to adjust for inflation, hourly wages rose strongly in the first six quarters of the recovery, Q2 1991 - Q3 1992, but in the next three years they actually declined slightly

(Chart 6, panel A). After increasing very slowly in 1995-96, the hourly compensation started rising much faster in 1997 before slowing down again considerably (from 4%-5% to 0-2%) in 1998-2000. The corresponding patterns for the growth rates (Chart 6, panel B) demonstrate more directly that real hourly wages were relatively stable and moderate in this expansion. They scored far greater gains in the 1960s, somewhat lesser gains in the 1980s. It is only in the last three years that wages really picked up. However, it is also important to note that total labor income increased much more in the nineties than did the wage rate because people worked longer hours. In the past eight years, the average workweek in manufacturing regularly exceeded 41 and occasionally even 42 hours, whereas the workweek varied mostly between 40 and 41 hours during the corresponding phases of the previous long expansions.

### **3.2 Productivity Improvements and Labor Cost Reductions**

The Employment Cost Index (ECI) rose 39.6 percent between Q4 1982 and Q3 1990 (31 quarters) and 36.7 percent between Q1 1991 and Q2 2000 (38 quarters), as shown in chart 7A. ECI includes total costs of employment in dollars, including fringe benefits covered by employers. The annual growth rate of these costs fell in the first half of the 1990s from about 5 percent to 2.5 percent, but it then drifted up most of the time in the second half to end up at 4.7 percent. In the 1980s, growth of the Employment Cost Index (ECI) was throughout higher, on the average by about one percentage point (see Chart 7B). The sharp rise in the ECI in 1999-2000 is unusual in having been maintained for four consecutive quarters before flattening in Q2 2000. Further increases in ECI would support the fears (which at times seem to be shared by the Fed) that the labor market may yet tighten so as to fuel wage raises, which lead to more price inflation or a squeeze on profits.

However, to the extent that rising labor productivity, i.e. growth of output per hour of work, matches the increases in average costs of employment, i.e., growth of wages and supplements per unit of output, business can absorb these cost hikes without having either to raise prices or suffer lower profits. The new information and communication technologies, by requiring more human and physical capital per

worker (higher skills and equipment), raise labor costs and productivity simultaneously. The question, then, is how do the productivity and the cost trends compare?

The six-month smoothed growth rate of output per hour in the nonfarm business sector (LP -GR) fell from 2% a.r. to near zero during the 1990-91 recession, then rose to over 4% and declined back again to zero during the weak "downsizing" recovery of 1991-92, when production crept up while employment stagnated (Chart 8A). From Q1 1993 through Q2 2000, the trend in LP-GR was upward, ending as high as 4.9 percent. This movement was much more steady and moderate than the large up-and-down fluctuations of LP-GR in the 1960s and 1980s.

Historically, growth of nonfarm labor productivity can clearly be classified as procyclical but leading, that is, as a rule declining in a late phase of expansion when output slows more than employment (also turning up slightly before the trough of the cycle). The early downturns of LP-GR show up in the patterns for the 1960s and 1980s, but so far the productivity trend in the present expansion remains favorable.

Growth of unit labor costs (ULC-GR) usually first increases and then decreases during recessions, and this happened in 1960-61, 1981-82, and 1990-91. Its decline tends to deepen during the early recovery stages, and this too can be observed in each of our three patterns in Chart 8, panel B. ULC-GR fell from a peak of about 5% a.r. to near zero in 1991-93, rose temporarily by over 2% in 1993, fluctuated narrowly below 2% in 1994-96 and below 3% in 1997-98, and finally declined to -1% in Q2 2000. By contrast, in the 1960s and 1980s ULC-GR fluctuated much more and tended to rise in the later expansion stages, in conformity with its historical lagging pattern.

Chart 8 is consistent with the interpretation of much of the recent technological development as a substitution of computer inputs for labor inputs. Such a substitution represents movements along and around the production functions rather than the large upward shifts of these functions that would be expected of a general technological revolution (the subject will receive more attention below). The process reduced greatly the variability of growth of unit labor costs in the U.S. non-farm business sector



and, at least so far, prevented the rise of ULC-GR that occurred in late stages of the previous long expansions. It also stabilized LP-GR and, again at least so far, prevented its decline in this cycle.

The recent developments depicted in Chart 8 are distinctly favorable: rising productivity keeps reducing and holding down unit labor costs. But the data refer to the past (the growth rates are not centered), and the process is unlikely to be sustainable. Maintaining the high rates of technological innovation becomes increasingly difficult and costly because of adverse developments in both product and financial markets. As companies report lower than expected sales and earnings, their market values fall and their access to equity and corporate bond markets for funding new investment projects shrinks. At the same time, the upward pressures on employment costs could well intensify as labor gradually recognizes the lag of gains in wages behind gains in productivity and profits.

### **3.3 Long and Strong Rises in Profits and Profit Margins**

Measures of corporate profits after taxes in constant dollars and of the ratio of domestic profits (adjusted for inventory valuation and capital consumption) to corporate domestic income display remarkably consistent and persistent increases during the present business cycle (Chart 9). These movements extended from the early years of the decade of the 1990s, which were sluggish but marked by extensive cost cutting ("downsizing"), through most of 1997, a year of strong growth. Total real profits then declined mildly in late 1997 and 1998 but rebounded strongly in 1999 and the first half of 2000. The profit margin moved narrowly in the high 10%-12% range since 1994, mostly up but down mildly in late 1997 and 1998. These comprehensive data are quarterly, subject to substantial lags and difficulties of measurement. The related monthly ratio of the producer price to estimated unit labor cost in the U.S. manufacturing sector had strong and persistent upward trend in 1994-96, less growth in the next two years, a brief upswing in 1999, and another slowing and destabilization more recently.

As shown further in the first two panels of Chart 9, corporate profit totals and margins in the 1960s were higher than in the 1990s during the first six years of expansion but later declined strongly,

conforming to the usual pattern of lengthy leads at peaks. In the 1980s, the patterns for both series were considerably lower than their counterparts after the first three years of the expansion. The third panel shows the price-labor cost ratio much higher in the 1990s than in either of the two previous long expansions.

The rise in effective profits and profitability would be expected from the accompanying developments. Profit margins are associated positively with changes in real GDP and in productivity (output per worker hour), negatively with inflation, interest rates, and a measure of risk aversion - yield on new high-grade corporate bonds minus yield on long-term Treasury bonds. The corporate domestic profit to income ratio shows high positive correlation with the price to unit labor cost ratio, which can be viewed as a proxy margin measure.<sup>3</sup>

Now the recent evolution of these determinants of profits and margins has been until recently very favorable. Economic growth measured by change in real GDP was extraordinarily high in recent years. Output per hour of work increased significantly, though perhaps less than some would infer from the rapid progress in the digital sector of the economy. Unit labor costs moved up but stayed moderate, behind the rise in labor productivity. Inflation and interest rates declined much of the time. Finally, risk varied in a way that did not seriously threaten the generally high business and investor confidence bolstered by optimism about the new technology. This was best evidenced by the boom in related segments of the stock market.

However, lately conditions have started to deteriorate in ways that are likely to affect profits adversely in the near future. High oil prices and rising medical and health insurance costs reduce consumer confidence and eagerness to spend. The downturn in stock prices of high-tech companies collected in the Nasdaq index (which lost almost half of its value between March 10 and December 2 of the year 2000) has similar implications via the "wealth effect". Moreover, the turmoil in the financial markets, about which much more will be said later, may signal that an economic slowdown which is developing carries a rising risk of recession. Along with great many excellent projects that pay off

---

<sup>3</sup> For evidence and analysis, see Zarnowitz 1999.

handsomely, booms typically generate numbers of poor investments and disappointing profits as well, which tend to be discovered when growth cools. Thus sufficiently long, large and diffused slowdowns are associated with lower profits and further depressant effects on employment, output, and spending. Such developments have probably occurred in many earlier business expansions that ended in extended slowdowns marked by early downturns in profits (see, e.g., the patterns for the 1960s and 1980s in Chart 9).

#### **4. Changes in Financial Markets and the Economy**

##### **4.1 Trends vs. Cyclical Movements in Interest Rates**

Procyclical movements in interest rates suggest that in the market for credit demand rises (falls) more than supply in expansions (contractions). But the rates depend on a number of interacting factors whose relative importance varies over time: actual and expected inflation; changes in monetary policy; changes in fiscal policy affecting government debt; the financial markets climate or changes in confidence of traders, investors and savers; and the relevant international variables, notably the interest rates abroad. When inflation is procyclical, its expectations, which influence nominal interest rates strongly, should tend to be procyclical, too.

Real interest rates, which are adjusted for expected changes in the price level to show true costs of borrowing, may have only a weak or inconsistent relationship with business cycles.<sup>4</sup> But the ex ante real interest rates, like expected inflation, are not observable and can only be estimated with varying and often low reliability.

The ex post observable real interest rates, which have been quite low in the 1960s and at times even negative in the 1970s, became unusually high in the early 1980s. Since then, the real short and long rates, though predominantly decreasing, remained rather substantial. Thus, in 1999-2000, TBR moved up

---

<sup>4</sup> See, e.g., Mishkin 1981.

in the 4%+ to 6% range, CBY in the 6%-8% range, and CPI in the 2% to 3% range, which implies real interest of around 3 to 5 percent, a.r.

In addition to cyclical movements, interest rates show longer trends. These were upward in the 1960s and 1970s, downward in the 1980s and 1990s, reflecting similar trends in inflation rates. The trend reversal in the early 1980s corresponded to a sharp shift from a relatively permissive to a decidedly counterinflationary monetary policy. The drifts in interest rates were very large and approximately symmetric, spanning rises from about two or four to 14-16 percent and declines back to low single digits. At times, the trends overwhelmed the cyclical movements in the rates, producing declines during expansions.

Thus, as shown in Chart 10, panels A and B, the 91-day Treasury Bill rate (TBR) rose from 2.4% to 7.7% during the expansion of the 1960s, while the new high-grade corporate bond yield (CBY) rose from 4.4% to 9.2%. In the 1980s, both the short and the long rates had much larger swings at much higher levels, with declines prevailing despite upturns in recovery and one later year. (TBR fell from 14% in the 1981 recession to 8% at the trough and 6% in 1987, then increased and flattened again, ending up at 7.7%. CBY declined to 12% at the beginning and 9.7% at the end of the expansion.) During the recession and recovery in 1990-93, both TBR and CBY drifted downward then sideward. After moving upward in 1994, the two series drifted down again, but in 1999-2000 the short rate rebounded from about 4% to 6%, the long rate from 6% to 8%.

#### **4.2 The Declines and Inversions of Yield Spreads**

The spread calculated as the difference, 10-year minus 1-year Treasury bond yields, predominantly declined during each of the three long expansions compared: in the 1980s and 1990s when interest rates had downward trends as well as in the 1960s when they had an upward trend (see Chart 10C). For the spread to decrease when the interest rates generally are falling, the long-term rate must decline more than the short-term rate.

Chart 10C shows that the yield spread increased strongly from near zero to over 3 percent during the recession-recovery period 1990-92, then drifted down slowly back to near zero in 1998. It picked up a little in the first half of 1999, then declined again, and into negatives (-0.4 to -0.8), first in April 2000 and then consistently from June through November. Its pattern for the 1980s runs mostly lower and shows much more volatility, falling steeply to below zero in the sixth and seventh year of the expansion. In the 1960s, the yield spread was generally much lower and declining gradually; it fell below zero twice, first in the sixth year of the expansion and again right before the peak.

Typically, long-term interest rates are higher than short-term interest rates, and also less variable generally and less cyclical. The spread, long minus short rates or yields, narrows at top levels of aggregate economic activity and widens at bottom levels. It tends to turn up (down) early in a business contraction (expansion), which means that it leads by very long intervals, particularly at peaks. Its movements, then, look countercyclical much of the time. The spread may eventually turn negative, with the short rate exceeding the long one, contrary to the normally observed condition. Such inversions of the term structure of interest rates, showing up in the relation between yields of default-free bonds with different maturities, when observed before and near business cycle peaks and associated with concurrent increases in short rates, have often been viewed as relatively reliable signals of recession. Several studies have found the term-structure spread to be a useful long leading indicator of business cycle turning points.<sup>5</sup>

In an environment of low inflation persistent for some time, short-term interest rates may be more sensitive to the real-rate component, while long-term interest rates may still be dominated by the inflation component so long as the expectations of price stability do not extend far into the future. Now suppose credit tightens, which may be the result of restrictive monetary policy or of greater caution of banks and capital markets; then short rates respond promptly and significantly by rising but long rates increase much less and, indeed, may decrease if expectations of future inflation do. This would result in a flattened or

---

<sup>5</sup> See, e.g. Estrella and Hardouvelis 1991 and Estrella and Mishkin 1998.

even inverted yield curve, i.e., yields on long-term securities fall relative to yields on short-term securities for financial instruments with otherwise similar characteristics.<sup>6</sup>

However, the recent fiscal policy of reducing the supply of long-term Treasury bonds resulted in increased demand driving their prices up and their yields down. This blurs somewhat the meaning of the recent U.S. yield inversions. But the combination of high short and low long yields, whatever its cause, means reduced profit margins for the banks. Also, it is disturbing to contemplate conflicting and uncoordinated effects on the direction of interest rates of monetary and fiscal policies.

### **4.3 Stock Prices Soar Far Beyond Profits**

The Standard and Poor's index (1941-43=10), which covers common stock prices of 500 large and medium-size companies using their capitalization numbers as weights, provides a fair, though certainly incomplete, picture of the U.S. equity market. (This index accounted for about two-thirds of the market value of over 5000 publicly traded stocks in 1991.) Chart 11A shows that the S&P 500 index rose quite slowly (just about 25 percent) in the four initial years of this expansion through 1994, but then just about doubled in 1995-96 and doubled again in 1997-99. This unprecedented bull market suffered only one setback, a result of the financial crises abroad in 1998, which was sharp but brief. However, S & P 500 started growing more slowly and irregularly in the second half of 1999 and declined by over 7 percent in September-November, 2000.

In the expansion of the eighties, the index made a bigger cumulative percentage gain before the October 1987 crash, then fell to the 1990s pattern and moved close to it for the remaining two and a half years. In the sixties, S&P 500 increased very gradually, and far less in the last five years of the expansion (1965-69) than in the corresponding stages of the two later cycles.

---

<sup>6</sup> Note that this argument is consistent with the *preferred habitat theory* of the term structure of interest rates, which makes the long-term yield equal to an average of short-term yields expected to occur during the life of the bond *plus* a term premium that varies with the supply and demand conditions for that bond (the less general expectations theory uses only the first of the above two components). Usually, the yield curves are upward sloping as people prefer holding short-term bonds, which makes the term premium positive.

While the stock price index quadrupled in the 1990s for the S & P 500 companies, their earnings less than doubled so that the price to earnings (P/E) ratio increased from 14 to 33 in 1994-99 (after fluctuating in the lower half of the same range in the previous five years; see Chart 11B). In 1999-2000, P/E slid to 27, still high enough historically for the fears of an overheated market to persist.

The P/E ratio was far higher in this expansion than in the previous long U.S. cycles. In the eighties, P/E was generally the lowest and most variable, swinging its way up from 7 to 20 in 1982-87, then dropping to 12 in 1998 and rebounding to 16 in 1988-90. In the sixties, P/E was stable, varying most of the time in the narrow interval from 15 to 20 (Chart 11B).

While the comprehensive stock market indexes (S & P 500, Dow Jones) grew and fluctuated much more moderately, the Nasdaq index, heavily weighted by the new technology companies, soared from 469 in March 1991 to a high of 4803 in March 2000 (in terms of monthly averages, Feb.1971=100). This astounding upswing was simultaneously (1) the source of huge returns and rising optimism to investors and proponents of the "new economy" paradigm and (2) the reason for skeptical observers to fear that many companies are overvalued so the index will turn down. Nasdaq finally tumbled from its March 10 peak of approximately 5049 to a low of 2598 on the last of November, a decline of almost 49 percent, followed in early December by large variations in the 2600-2900 range.

The high levels of stock prices imply very high future profit margins and profit shares in GDP, which may well be unrealistic (see, e.g., Fair 2000). Even many basically optimistic forecasters have grown cautious lately, conceding that the recent stock market boom produced many excessive valuations that are presently subject to downward corrections. Certainly, it is no longer the case that new companies in the most popular high-tech areas enjoy generous market pricing even without showing much, if any, near-term profitability.

#### **4.4 Leading Indicators Signal Less Growth and More Uncertainty**

Of the ten components of The Conference Board's U.S. Leading Index (LI), six have reached early highs and drifted irregularly downward this year: average weekly hours in manufacturing, average weekly initial claims for unemployment insurance (inverted), percent of companies reporting slower deliveries (the vendor performance diffusion index), building permits for new private housing units, interest rate spread (10-year Treasury bonds less federal funds), and the consumer expectations index. The local peaks occurred in January 2000 for the last three of the above indicators, in March for the inverted unemployment insurance claims, and in April for the average workweek. The vendor performance index started declining in December 1999, with a secondary peak in April 2000. By October 2000, the last month covered, the declines ranged from about 14 percent (housing permits) to two percent (manufacturing workweek). Unemployment claims rose almost 18 percent; vendor performance fell 13 percent to a low in September before improving slightly in October; the interest spread turned increasingly negative (-0.43 to -0.77) in June-October; and consumer expectations slid from 108.6 to 103.4 (1996:1=100).

In contrast to these declines of considerable size, duration, and diffusion, the other four components of LI present a more mixed picture. The S & P 500 stock index hit a high at 1,485.5 (1941-43=10) in August and declined in September and October by 6.4 percent to 1390.1. Manufacturers' new orders for consumer goods and materials dropped 6.7 percent between May and July but made up for it partly by rising 3.1 percent between July and September. Manufacturers' new orders for nondefense capital goods fell sharply in July but resumed rising moderately in August and September. Money supply M2 continued on a fairly steady and mild upward trend, gaining about 3.6 percent in the year ending in September 2000. (The new orders and money series are all in 1996 dollars, adjusted for inflation).

Chart 12 shows that the U.S. Leading Index increased but very gradually in the first five years of the present expansion, much faster and steadier in the next four years (see panels A and B for levels and



six-month smoothed and annualized growth rates, respectively). The gains of the leading index in the early 1990s were quite modest compared with the 1960s and even with the 1980s, but they increased and steadied in 1996-98. However, the index weakened in 1999 and its decline deepened significantly in 2000.

Series that represent costs of doing business such as the inventory-sales ratio, change in unit labor cost, average prime rate charged by banks, and commercial and industrial loans outstanding are components of the U.S. Index of Lagging Indicators. So are such measures of consumer and social costs as ratio of installment credit to personal income, change in the consumer price index for services, and average duration of unemployment. Thus, an accelerated rise in the lagging index, which often occurs late in an expansion, provides a warning that an imbalance due to rising costs may be developing. When their scales are inverted (put upside down) some of the laggards turn into long leaders. The ratio of the Coincident to the Lagging Index, which had leads of 8-11 months at most recent U.S. business cycle peaks, has reached a high of 110.3 in March and stayed narrowly lower since.

## **5. Policy Concerns, New Returns and New Risks**

### **5.1 Unstable Monetary Growth**

Judging from official announcements, monetary policy in the 1990s was dominated by recurrent fears that the economy will overheat and reignite inflation. But the actual behavior of the variables under Fed control suggests that keeping the economic expansion going was also important, at times even more so. Thus, growth of the monetary base (MB), which includes currency and bank reserves, was kept very high during the sluggish early 1990s but then allowed to drop sharply in 1994-95, when a counterinflationary slowdown was the policy's target. In the second half of the expansion, MB growth picked up strongly and reached an explosive rate of 15 percent briefly last year (presumably to counter the Y2K problem). After a quick downward correction this year, MB growth slid to a more reasonable 6 percent (Chart 13A).

Comprehensive monetary aggregates are very difficult to control, as the money demand function is unstable in the short run (as indicated by recent experience in many countries, including the United States). Growth of M3 (which includes all savings and time deposits, money market mutual funds, and overnight and term Eurodollars and repurchase agreements), low in 1990-94, increased strongly, from about 2 percent to 11 percent in 1995-98. It then declined to below 8 percent late in 1999 but is now back up near 10 percent (Chart 13B).

Some of the statements of the Fed's top officials expressed recurrent worries about the bull market's momentum and its concomitants--the wealth effect driving up personal consumption, including imports, and severely depressing personal saving. Yet the Fed evidently could or would do little to influence the huge flow of money and credit feeding the demand for stocks.

The now favored strategy of inflation targeting by means of influencing interest rates faces difficult tasks: measuring and forecasting inflation, selecting its optimal rates, and assessing the effects of monetary policy actions. How inflation reacts to interest rate changes has proved difficult to estimate (see

Sims 1992, Cecchetti 1996, and Cecchetti and Groshen 2000, for evidence and discussion). Yet, for better or (more likely) for worse, monetary targeting for price level stabilization is no longer accepted as a promising strategy.

When expressed in constant dollars (deflated with the Consumer Price Index), the broad money supply is clearly an endogenous variable, which tends to be a leading indicator. M2/CPI, for example, reaches an early peak when nominal money supply slows while prices rise. Chart 14A shows that growth of real M2 declined from about 7 percent to less than 2 percent in 1999-2000. M2 covers mainly currency, time and savings deposits; when mutual bond and stock funds are added, the growth rate of the resulting M2+ aggregate starts earlier and extends from 9 percent to less than 1 percent (Chart 14B). M3 growth declined from 9% to 5%-6%(Chart 14C). If maintained, such low growth of real money supply could well contribute to slowing down the pace of economic activity. (Note the low and negative growth rates of deflated money supply in the late stages of the expansions of the 1960s and 1980s).

## **5.2 The Path from Budget Deficits to Surpluses**

The recovery through 1994 saw federal receipts rise by about 26 percent only, but the boom that followed caused a surge in taxes raising the total to almost 90 percent. Recent changes in the levels and progressivity of the tax rates, and shifts of people into higher brackets, resulted in more of the federal income tax having been paid by well-to-do (an estimated 30 percent in 1993, 40 percent in 1998, for those with over \$200,000 of adjusted gross income).

Nonetheless, the federal receipts pattern for the 1990s shows no exceptional strength when compared with its recent counterparts. In 1961 - 69, tax revenues of Washington more than doubled, with the last four years of the expansions accounting for the lions' share of the gain. The pattern for the 1980s lies above and parallels that for the 1990s, but the two are not very far apart (on all of the above, see Chart 15A).

The big difference in the federal budget shows up on the side of expenditures rather than receipts. In 1990 – 95, the current-cycle pattern either exceeded slightly or practically coincided with the earlier patterns, but thereafter the situation changed drastically. Since 1996 federal expenditures rose less than 12 percent, whereas the corresponding figures for the late sixties and late eighties were about 52 and 26 percent, respectively (Chart 15B).

A major factor behind the observed contrast in the expenditure patterns was the drastic reduction of defense spending after the Cold War ended (recall also the role of expanding military spending on the Vietnam War during the 1960s). In 1990, 2.1 million people served in U.S. armed forces, but in 1999 that number dropped to 1.4 million. Military spending fell from about 5 percent of GDP to 3 percent. There was a steady decline of national defense expenditures in constant (1996) dollars from the high plateau around \$450 billion reached in 1987-91 to about \$340-\$360 in 1997-2000, or by a bit more than 20 percent (see Chart 16, Panel A). The 1980s saw the opposite upward movement for over five years. In the 1960s, the real defense outlays were modest in the first half of the decade, expanding strongly in the second half on the road to Vietnam.<sup>7</sup>

The federal budget deficit exceeded 200 billion dollars in Q2 1991 and 300 billion dollars in Q3 1992 before turning down and getting ever smaller as a result largely of the rise in tax receipts and the slashing of military spending. The deficits declined steadily to less than 100 billion dollars in 1997 and were replaced since by surpluses that rose consistently in Q1 1998 – Q3 1999 from 25 to 134 billion dollars.

Chart 16, panel B compares the federal government's budget surpluses or deficits in the three cycles using their ratios to GDP. In the sixties, the deviations from the zero line (balanced budget) were quite small on both the positive and the negative sides. In the first halves of the eighties and nineties, the patterns largely overlap, except in 1991-93 around the Q3 1992 nadir (deepest deficit ratio). Since 1996, the ratio rose strongly and steadily, from -2 to +1.5 percent, that is, from still large deficits to surpluses not seen for a long time.

---

<sup>7</sup> Indexing to the business cycle troughs is not done here; it would only emphasize the already strong contrasts shown.

The split between the Democratic administration and the Republican majorities in Congress may help explain why federal expenditures grew but slowly in the last several years. Still, the fact remains remarkable, and the government's claim to credit for a policy of "fiscal discipline" deserves to be treated with a reasonable degree of sympathy.

### **5.3 The High-Technology Boom and Productivity Measurement Problems**

The recent boom in technology-driven stock prices implies a widespread expectation that the breakthroughs in high technology will bring enormous advances in productivity. It is indeed true that great gains have been achieved on this front and that many more are to come. But it is also true that the currently available data for the last several years show mostly moderate growth rates of U.S. output per hour, stable and improving but often smaller than the corresponding measures in the 1960s, for example (see above, Chart 8A).

The proponents of the "new economy" vision assume that the growth rates of productivity (and hence of output) are substantially underestimated in the currently available U.S. statistics. Unfortunately, there is no clear evidence that this is in fact so. One can readily think of sources of bias in either direction. Just to illustrate, employment hours may be understated to the extent that some people spend much extra time on productive but unpaid and unrecorded work with computers—which, other things equal, would result in underestimation of output and productivity. But there is also much concern about "cyber-slack", that is, shirking or neglect of duties by employees who use computers for private pursuits, e.g., games or shopping—which would produce overestimation of hours and output.

It is well known that the measured growth in U.S. labor productivity slowed greatly between 1949-73 and 1973-90: from 3.3% to 1.2% per year, according to the Bureau of Labor Statistics, for example. A slight improvement to 1.3% in 1990-96 was followed by a large one to 2.0% in 1997-98. However, a well-received study estimated that the average annual productivity growth in the early 1990s

was 1.4% for the total business sector and as high as 3.7% for manufacturing<sup>8</sup>. This would imply very low or even negative labor productivity growth for non-manufacturing, an outcome judged unlikely by many analysts, particularly for those industries which use computers intensively (i.e., finance, insurance, and real estate or the FIRE sector; wholesale and retail trade; airlines; legal, health, and business services, entertainment, and security investments).<sup>9</sup>

Studies of U.S. manufacturing show that before 1979 those industries that used computers intensively had somewhat *lower* growth rates of labor productivity than those industries that used computers much less. The learning process took some time but in 1979-90 this situation was reversed, with the computer-using sector's output per labor hour rising over 3 percent, more than twice the number for the "non-using" sector. In 1990-96, the gap apparently widened much more yet, but outside of manufacturing the measured productivity gains were still very much smaller. For the U.S. economy overall, the sectors not using computers had gains of about 3.5% in 1947-73, 1.25% in 1973-79, and 0.4% in 1979-91; the corresponding numbers for the computer-using sectors were 2.5%, 1.2%, and 1.1% (McGuckin et al. 1997).

These numbers, if correct, imply that manufacturers utilize computers much more efficiently than companies in the services sectors do. The alternative is that output and productivity in services are *strongly and increasingly underestimated*. The latter explanation is favored by several students of the problem who believe that unmeasured quality improvements result in understatement of output and/or overstatement of prices of services. It is an undeniable and long recognized fact that output of services is much harder to measure than output of goods. But, even under the assumption that computers have the same impact in services as in manufacturing, the implied increasing measurement errors explain only a part of the puzzle, though a significant one.<sup>10</sup>

---

<sup>8</sup> See Dean 1999. See also McGuckin, Stiroh, and van Ark 1997.

<sup>9</sup> These service industries have been estimated to account for about 55 percent of value added but 77 percent of computer capital in the U.S. economy of 1991. In contrast, only a minority of manufacturing industries (including machinery, printing and publishing, instruments, and stone, clay, and glass) use computers intensively.

<sup>10</sup> The estimate by McGuckin et al. is that the measurement error in 13 computer-intensive, non-manufacturing industries accounts for underestimation of aggregate labor productivity growth in the 1990s by about 0.3-0.5 percentage points per year.

The long, huge decline in quality-adjusted computer prices resulted predictably in a large-scale substitution of cheap computer inputs for the more expensive labor inputs. The process undoubtedly benefited business by reducing the costs of production, distribution, storage and dissemination of all kinds of information. The productivity – enhancing effects of computers could very well be substantially weaker than these cost-reducing effects. The benefits to consumers are likely to be more mixed.<sup>11</sup>

In sum, the productivity of labor could be underestimated either because the economy's output is larger than measured or because employment in hours is smaller than measured or both. Perhaps production of financial and other services grew faster than the official numbers indicate; but we really do not know that since our estimates of these aggregates are sadly deficient. As for hours of work, they are perhaps more likely to be under- than over-counted, which would be a source of bias in the direction of overestimating productivity.

The latest efforts in this difficult area suggest an emerging consensus that the new information technology has indeed produced a significant rise in labor productivity in 1995-99 (to almost 2.6 from about 1.4 in 1973-90 and 1990-95, in percent per year). Capital deepening contributed most (particularly in IT itself), but technological progress (multifactor productivity) and labor quality improvement helped as well. There is considerably less confidence that the productivity resurgence will prove permanent rather than temporary. The numbers are still below those estimated for the era before the productivity slowdown in the early 1970s, and not strongly supportive of the widespread perception that the rapid progress of IT has brought a fundamental shift to permanently higher growth rates of overall output and productivity (the "new economy" paradigm). Still, much further, though perhaps less continuous, progress is expected by many analysts in the extended IT context.<sup>12</sup>

---

<sup>11</sup> For example, the ATMs in banking offer generally high benefits, while telephone calls to businesses that run into complicated and slow computerized answering services are of questionable value. (Note that here both the positive and the negative effects are apt to end up unmeasured.)

<sup>12</sup> See Jorgenson and Stiroh 2000, with comments by Gordon and Sichel.

#### **5.4 Shifts in Personal and Business Saving Rates**

The personal saving rate fluctuated with no clear trend in the range of approximately 7 to 9+ percent of personal disposable income in the 1960s; around a downward trend in the 12 to 6 percent range in the 1980s; and along a much more regular and persistent downward trend in the 9 to 0 percent range in 1992-2000 (Chart 17A).<sup>13</sup> The accelerated drop in that rate in the last few years caused much concern and comment, but its sources are not difficult to discern.

First, higher taxes often result in lower savings, and federal tax receipts rose strongly and steadily in the second half of the past decade (see Chart 15A). Second, capital gains from appreciation of assets such as housing and stocks are not included in personal income but are probably treated as savings by many recipients. Third, the more assets a person or a family has, the less they need to save for further wealth accumulation and use: an old story but with increasing applications in an environment of spreading ownership of assets that tend to increase in value.

Whereas the personal saving rate declined, gross business saving, which is the sum of undistributed corporate profits and business depreciation allowances, increased from 12 percent to more than 16 percent of GDP in the 1990s. In the 1980s, business saving was lower, rising from 9 to 12 percent of GDP, while in the 1960s it only crept up from near three to less than four percent (see Chart 17B). Not surprisingly, the relative strength of business saving reflects that of profits (cf. Chart 9).

Along with the rise in the volume and weight of business saving, federal surpluses began to replace deficits in 1998-99, that is, government *dissaving* was being eliminated in favor of increasing government saving (Chart 16B and text above). Both tendencies counteracted the depressing influence on gross national saving of the decline in the personal saving rate.

Still, it is clear that the great expansion of fixed investment in the past decade outpaced by far the growth of private domestic saving. (Recall that GPDI soared from about 12 percent of GDP to 20

---

<sup>13</sup> Personal saving rate is defined as the percentage of disposable income left after all personal outlays on goods and services, interest on loans (excluding mortgage interest), and net payments to foreigners (the last two items are relatively quite small). Disposable income is personal income after income, estate, gift, and penalty taxes and miscellaneous fines (Social Security taxes are excluded from personal income).



percent, while households saved an ever smaller proportion of personal income and gross business saving increased relative to GDP at half the rate of investment.) This will be shown next to intensify the long-standing problem of foreign borrowing being necessary to finance the excess of U.S. private domestic investment and imports.

### **5.5 Related Imbalances in Saving and Trade**

GDP is the sum of consumption, domestic investment, government purchases, and net exports (C, I, G, NX); it is also the sum of consumption, private saving, and net tax revenue (C, S, and T). The first breakdown is by sources, the second by uses of income (NX is exports X minus imports M; T is taxes minus government transfer payments). Subtracting C from both sides of this well-known accounting equation reminds us that total saving must equal total investment for the economy as a whole:  $S+T-G=I+NX$ . But the composition of national saving (private vs. government) matters, and so does the composition of investment (domestic vs. net foreign). Rearranging terms shows that  $S - I = G - T + NX$ , that is, any difference between private saving and domestic investment must equal the government budget balance (G-T) plus net exports.

If  $S < I$ , then  $(G-T+NX)$  must be negative; most likely, either the U.S. government budget or the trade balance or both would be in deficits in some combination. The federal budget was indeed in the red in each year since 1979 until very recently. Net exports were negative each year since 1960, except only for 1979-81. The excess of M over X in real terms was particularly large in 1983-89 and after 1992.

Thus, since American households were not saving enough, private investment in and imports to the U.S. were financed in large measure by borrowing abroad. The "twin deficits" debate is over: it is clear that NX can continue to be negative even when the government budget balance turns positive. The main burden of matching the deficits ( $S < I$ ,  $T < G$ ) fell on rising foreign indebtedness, not on upward adjustments of private domestic saving.

The curves in Chart 18 refer to the ratio of real net exports (exports deflated with export prices minus imports deflated with import prices) to real GDP. NX/GDP has been moderately but increasingly negative in the 1960s; much more negative and V-shaped in the 1980s; and declining sharply from the range of 0 to -1 1/2 percent in 1990-97 to -4 1/2 percent in Q3 2000. Imports, recently enlarged by bills for high-priced foreign oil, continued to show a much faster and steadier upward trend than exports.

The main reason for the swelling in the last few years of foreign trade deficits is that the U.S. economy grew much more quickly than its trade partners. Confidence of foreigners in high U.S. returns, growth, technological progress, and continued prosperity was such that they continued to invest money here. The dollar stayed strong despite the growing risk of U.S. overdependence on foreign capital.

Yet foreign borrowing ( $NX < 0$ ) cannot pile up indefinitely without adverse effects. Lower expected returns in the U.S. would cause foreigners to reduce their investments here, which would weaken the dollar and work to lower the levels of economic and financial activity. The current slowdown of the U.S. economy, which seems to be deepening as this is written (December 20, 2000) may provide a test. But for the trade and current account deficits to fade, a reversal of long-observed relationships would be needed. Some adjustments would be much more desirable than others. Thus one would wish for an increase in  $S$  rather than a decrease in  $I$ ; for an increase in  $X$  rather than a decrease in  $M$ ; and for reasonable stability of real exchange rates and real interest rates.<sup>14</sup>

## **5.6 Government Debt Down, Private Debt Up**

National debt is in each period either augmented by a deficit or reduced by a surplus in the federal budget. The debt is an alternative to taxes in financing government expenditures. Using debt defers tax payments to the future and results in more *dissaving* by the government. Historically, the effects of government deficits and growing national debt have in fact tended to be mixed and modest. But in the 1980s, after taxes were cut and debt was increased strongly, real long-term interest rates rose sharply and

the ratio of investment to GNP declined mildly. In the 1990s, all this was reversed, with generally positive results.<sup>15</sup>

Chart 19 shows the evolution of the federal debt in terms of its ratio to GDP (panel A) and its six-month smoothed growth rate (panel B). In the 1960s, Washington borrowed steadily but moderately most of the time, and the ratio of national debt to GDP declined from 10 to 8 percent (see the right scale in Chart 19A). In the 1980s, growth of the debt first climbed from about 10 to 25 percent during the recession and early recovery, then dropped, stabilized, and declined gradually back into the 5 to 10 percent range; the ratio of federal debt to GDP increased from 19 to 36 percent. In the 1990s, federal debt grew at mildly rising rates during the recession and initial recovery but then at steadily decreasing rates, from about 12 percent in 1992 to -2.5 percent at the end of 1999 and -6.4 percent in September 2000. The federal debt/GDP ratio, in percent, increased from 35 to 49 between Q1 1990 and Q3 1995, then flattened and decreased back to 37 in Q3 2000.

Less than a decade ago, scary long-term projections of rising deficits and the national debt were almost routinely made and a heated debate prevailed about who or what was to blame. Now the controversy is already under way about who or what gets the credits for the elimination of the deficits and what to do with the surpluses which are forecast to increase strongly in the long run. But the long projections are bound to fail because they ignore the unknowable changes in business cycles and trends. The discussions generated much more heat than light and will probably continue to do so.

Chart 20 shows the changes in the nonfederal (private and state and local) debt, using the same format as Chart 19. In the 1960s, that debt grew at fairly steady rates from around 19 to 29 percent of the concurrent levels of GDP (see the right scale in Chart 20 A). In the 1980s, growth of nonfederal debt was much higher and more variable, and the ratio of that debt to GDP increased from about 77 to 122 percent. In the 1990s, like in the previous cycles, this growth pattern declined in recession; it then fell to a record

---

<sup>14</sup> There is a broad positive correlation between these rates but they have fluctuated in the past decade with no clear trends. The preferred adjustments, of course, are those that do not favor foreign over domestic prosperity or vice versa.

<sup>15</sup> This evidence agrees better with the theory asserting that deficits and debt have some significant influence upon interest rates and investment than with Barro's neo-Ricardian "equivalence theorem", according to which the net effect of a substitution of debt for taxes would be nil if people reacted to it by saving correspondingly more in anticipation of higher taxes in the future. See Rock, ed., 1991, especially chapter 6 by Barro and chapter 10 by Blinder.

low of 2.1 percent by mid-1992, but then started a long climb to 6 percent in mid-1995 to mid-1997 and 9 to 10 percent in 1998-2000. The percentage nonfederal debt/GDP ratio stayed high and remarkably stable but rising from 126 in 1990 to 155 in Q3 2000.

The bulk of the nonfederal debt is private domestic debt, which is huge, exceeding greatly the current value of the nation's output and creeping slowly upward. This is in contrast to the federal debt, which is less than half the current-dollar GDP and has been gradually declining.

Given the shifts in its structure- more private, less public debt- the quality of the overall debt in the United States may have worsened. In addition, the quality of the private debt has probably deteriorated, as it usually does in prolonged economic expansions and stock market booms.

Chart 21 shows the spread between the yield on new high-grade corporate bonds (CBY) and the yield on long-term Treasury bonds (TBY), a measure of risk aversion which acts negatively as a determinant of profit margins and real capital investment (Zarnowitz 1999). Even high-quality bonds must pay a premium relative to the Treasury debt which is free of default risk. This yield differential ( $YD=TBY-CBY$ ) has been relatively low and stable during the long expansion of 1991-99, varying mostly between 50 and 100 basis points, but it rose irregularly from a low of 50 in September 1997 to a high of 150 in June 2000. In the second half of the expansion of the 1960s, YD increased much more, from about 30 to 240 basis points. In the 1980s, however, YD dropped strongly, from about 270 in the recession to less than 100, after the first three years of recovery, and remained rather stable thereafter, fluctuating around 100.

## 6. Some Lessons and Outlook

This paper has considered many aspects of the economy in a comparative analysis of the current and two recent business cycles in the United States. I shall not repeat its results here but concentrate on some of its main messages and the outlook.

1. The vigorous economic boom in the U.S. developed only in the second half of the 1990s, the early recovery in this cycle having been unusually sluggish. The expansions of the 1960s and 1980s were actually stronger over the same durations. Abroad, the past decade witnessed numerous financial crises and major recessions. The lesson is that, contrary to the exaggerated hopes of yesteryear, the *business cycle is far from dead* and must be considered in any serious analyses and forecasts. Historically, long expansions often ended in slowdowns that risk recessions by reducing profits and investment. The U.S. entered this phase of the current cycle in the middle and late months of the year 2000.<sup>16</sup>
2. A mild slowdown in 1995 followed a string of increases, and preceded a string of decreases, in the Federal Reserve benchmark interest rate. The boom of 1996-99 developed in an environment of restrained inflation; high optimism about the new technology, productivity, and profitability; and favorable cost conditions for starting and doing business. Profits indeed rose strongly, propelled by high growth of national output, improved and stabilized growth of labor productivity, and relatively moderate costs of finance and employment. The strong profits help explain the soaring rates and shares of real investment. *The low inflation, increased productivity, and high rates of business and household capital formation are the most positive aspects of the U.S. economic expansion in the late 1990s.*
3. The expansion was driven by high consumption demand as well as very high investment demand, both financed in large measure by intensified borrowing (personal and corporate). The long bull market accelerated, with stock prices rising much more than profits (the P/E ratio for the S&P

companies more than doubled). In particular, the IT and Internet related stock prices (mainly the NASDAQ index) soared to unprecedented high P/E multiples. Many new “dot-com” ventures were amply funded in the market itself via amazing increases in initial prices (IPOs) despite the lack of current and dubious future earnings. Much of the boom in volatile and illiquid securities involved buying on margin, a particularly risky type of credit.<sup>17</sup> *The danger of an overvalued and crash-prone market was magnified as stock ownership spread and many enthusiastic analysts and eager advertisers sold the wonders of the “new economy” to great many naive new investors.*

4. The wealth effect of the bull market is widely believed to have made a substantial contribution to the high consumer demand and the low personal saving rate of recent years; now the declines in the market are likely to have the reverse consequence. It is quite likely, too that many poor or misdirected business investment projects found support in financial markets that temporarily valued euphoric growth forecasts more than solid records of managerial performance. In the near future, business capital spending may well suffer from overcapacity in the new telecommunications and technology areas, and lack of fresh cash from disappointed venture capitalists and investors. *Private overborrowing, undersaving, and overinvestment in this sense should probably be counted as the most negative aspects of the recent boom.*<sup>18</sup>
5. The federal funds rate was raised six times between June 1999 and May 2000 in an effort to bring down what the Fed considered an unsustainably high and potentially inflationary pace of the expansion. The high real interest rates slowed economic activity. Not surprisingly, the first slowing effects appeared in the typically leading financial markets and the cyclically sensitive manufacturing sector. The long climb of the broad stock price indexes continued more slowly and irregularly in 1999 and early 2000 despite the interest rate hikes and warnings from the Fed, but it ended in a steep

---

<sup>16</sup> The early version of this paper, written in February-March and published as NBER Working Paper 7721 in May 2000, contained the substance of these warnings. The later versions recognized the increasing risks and likelihood of a slowdown.

<sup>17</sup> If stocks fall in value, the buyer must put up more money to make up for the shortfall. Margin debt as percent of market value at online brokers has by some estimates more than quadrupled since 1995. However, the Fed kept the margin requirement (i.e., the proportion of a stock’s purchase price to be paid down) unchanged at 50 percent.

<sup>18</sup> Although some may prefer to stress domestic income and wealth inequities or trade and current account deficits. Despite the latter, the dollar remained strong against the euro and the yen as the U.S. economy and the U.S. stocks grew much faster than their counterparts in Europe and Japan. As a result, U.S. exports weakened.

fall after the mid-year. The overvalued new technology part of the market turned down earlier, at the end of the winter 2000, and it would appear that there the bubble did indeed burst with inherently unpredictable force and consequences. The corporate bond market, often helpful to the Fed by moving in desired directions, suffered some bad hits as well lately as risk aversion rose and the investors' flight to safety intensified. In addition, rising of prices of oil, natural gas, and local energy (electricity in California) began to hurt U.S. consumers and business. *By mid-2000, it was clear that economic activity was slowing and overall uncertainty was increasing.*

6. The Conference Board's composite index of U.S. leading indicators flattened and eased by almost one percent in the January-November 2000 period, in sharp contrast to the past three years when it gained 1.5 to 2 percent annually. Its financial subindex showed considerably stronger signs of coming sluggishness. Early downturns occurred in monetary growth rates and deflated money aggregates. The interest rate spread turned negative or flat lately. Among the most recent adverse signs was the deterioration of consumer confidence and expectations. Of the coincident indicators, industrial production reflects the seemingly worsening weakness of manufacturing. After consumption growth declined substantially in Q2 2000, real GDP growth fell sharply (from 5.7 to 2.2 percent) in Q3. Retail sales before Christmas were rather disappointing. *Thus the year is ending on a note of rising apprehension that the slowdown may deepen and end in a recession.*
7. To conclude in a more cheerful mode, it is well to recall that the U.S. economy enjoyed unusually great benefits in the last several years: not only major technical innovations, higher productivity, profitability, and investment but also rising employment, wealth, and consumption. Moreover, all of this occurred without a serious rise in inflation – unlike in previous vigorous business cycle expansions. The process had its costs, however, in the increasing imbalances that tend to accompany all booms. The rise of these imbalances and risks accelerated greatly in 1999-2000. The widespread expectation that this expansion will be different because of the Internet, IT etc., was simply wrong: great technological innovations typically precede, accompany, and amplify major economic expansions but they never perpetuate them. Indeed, these innovations are the force behind much of

the “creative destruction” that goes on in a dynamic market economy. *Technical progress is by no means limited to economic expansions; it goes on in slowdowns and contractions without negating the business cycle, and should continue unimpeded in the long run.*

8. Because of changes in its structure such as the shift from goods to services production, the U.S. economy has become less recession-prone. Better business management, especially improved computerized inventory control, has probably helped as well. Countercyclical stabilization policies made modest contributions: they continue to be hampered by long and variable lags in effect and by limitations of macroeconomic forecasting. Nevertheless, they have an important role to play, especially monetary policy by influencing interest rates, liquidity, and related expectations. (Fiscal policy has less flexibility and longer effects, the role of automatic stabilizers having been reduced by inflation and the long rise in budget deficits.) *Business expansions have become longer, contractions shorter, and there are no apparent reasons why this should be reversed, regardless of short-term problems.*

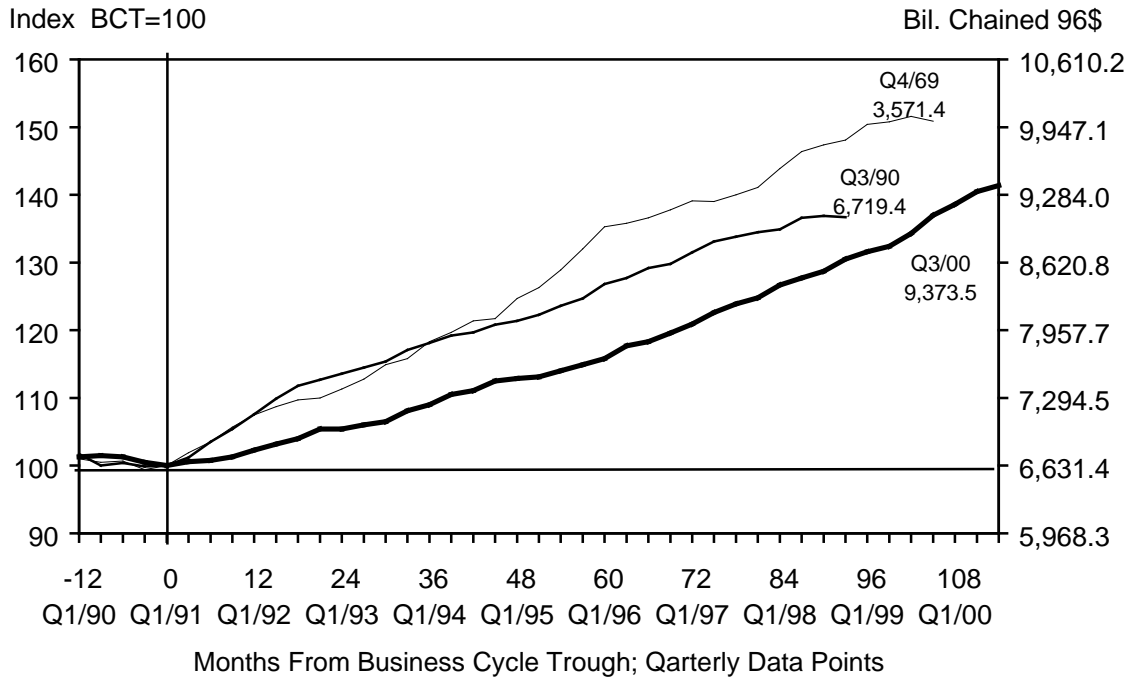


## References

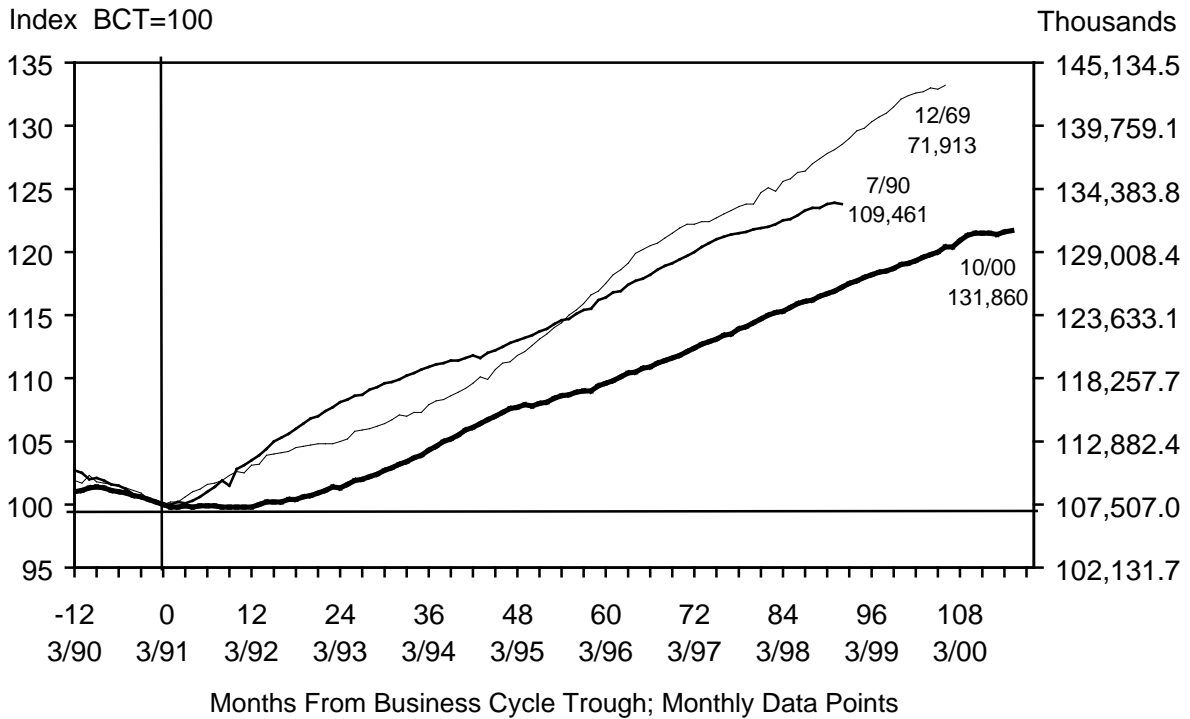
- Barro, R.J. 1991. "The Ricardian Model of Budget Deficits," in Debt and the Twin Deficits Debate, ed., Rock, J.M. Mayfield Publishing Company, Mountain View, CA. pp. 133-148.
- Blinder, A.S. 1991. "Is the National Debt Really – I Mean Really – A Burden?" in Debt and the Twin Deficits Debate, ed., Rock, J.M. Mayfield Publishing Company, Mountain View, CA. pp. 209-225.
- Cecchetti, S.G. 1996. "Inflation Indicators and Inflation Policy," NBER WP 5161 (February).
- Cecchetti, S.G. and Groshen, E.L. 2000. "Understanding Inflation: Implications for Monetary Policy," NBER WP 7482 (January).
- Dean, E.R. 1999. "The Accuracy of the BLS Productivity Measures," *Monthly Labor Review* pp. 24-34 (February).
- Estrella, A. and Mishkin, I.S. 1998. "The Term Structure of Interest Rates and Its Role on Monetary Policy for the European Central Bank," NBER WP 5279 (March).
- Estrella, A. and Hasdouvelis, G.A. 1991. "The Term Structure as a Predictor of Real Economic Activity," *Journal of Finance*, 46: 555-572.
- Fair, R.C. 2000. "Fed Policy and the Effects of a Stock Market Crash on the Economy," *Business Economics*, 35,2: 7-14.
- Jorgenson, D.W. and Stiroh, K.J. 2000. "Raising the Speed Limit: U.S. Economic Growth in the Information Age," Brookings Papers on Economic Activity 1: 125-235 (with comments by R.J. Gordon and D.E. Sichel).
- McGuckin, R.H.; Stiroh, K.J.; and van Ark, B. 1997. "Technology, Productivity, and Growth: U.S. and German Issues," The Conference Board, *Perspectives on a Global Economy*, Report no. 1206-97-RR (Winter).
- Mishkin, I.S. 1981. "The Real Interest Rate: An Impirical Investigation," in Brunner, K and Meltzer, A.M. The Costs and Consequences of Inflation. Carnegie-Rochester Conference on Public Policy, vol 12. Amsterdam, North Holland.
- Niemira, M.P. and Klein, P.A. 1994. Forecasting Financial and Economic Cycles. J. Wiley & Sons, Inc., New York.
- Phillips, A.W.H. 1958. "The Relation Between Unemployment and the Rate of Change of Money Wage Rate in the United Kingdom, 1861-1957." *Economica*, U.S. 25: 283:299.
- Rock, J.M. 1991. Debt and the Twin Deficits Debate. Mayfield Publishing Company, Mountain View, CA.
- Sims, C.A. 1992. "Interpreting Macroeconomic Time Series Facts: The Effects of Monetary Policy," *European Economic Review*, vol. 36, no. 2, pp. 69-90.
- Zarnowitz, V. and Moore, G.H. 1986. "Major Changes in Cyclical Behavior," in Gordon, R.J., ed. The American Business Cycle: Conformity and Change, Ch. 9, pp. 519-582.
- Zarnowitz, V. and Moore, G.H. 1982. "Sequential Signals of Recession and Recovery," *Journal of Business* 55: 57-85.

# Chart 1 U.S. Output and Employment

## A. Real Gross Domestic Product

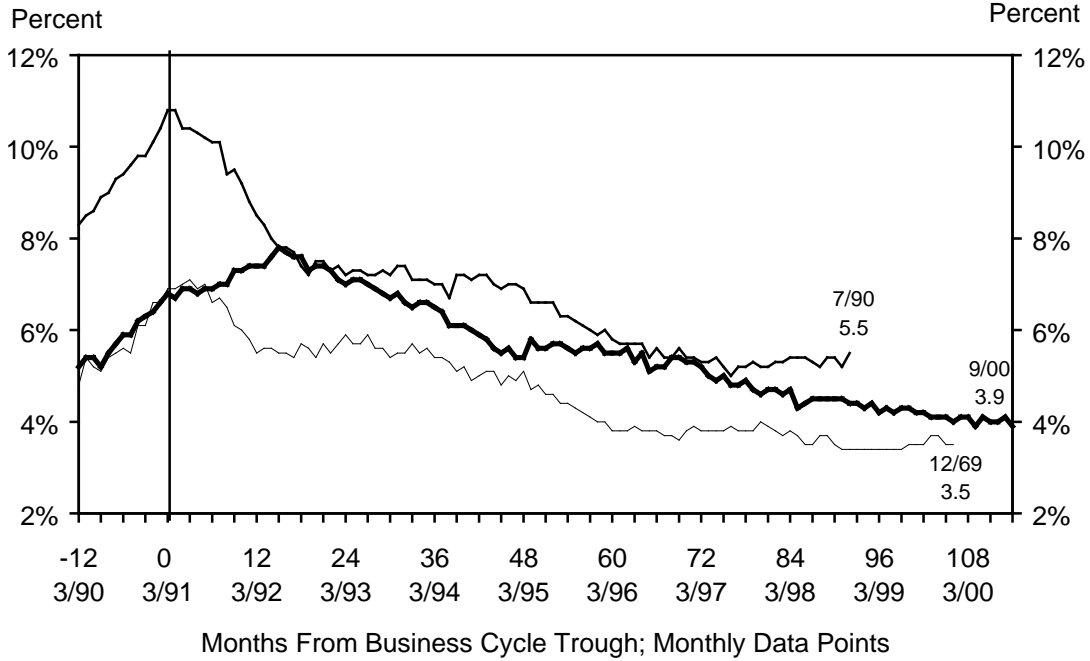


## B. Employees on Nonfarm Payrolls

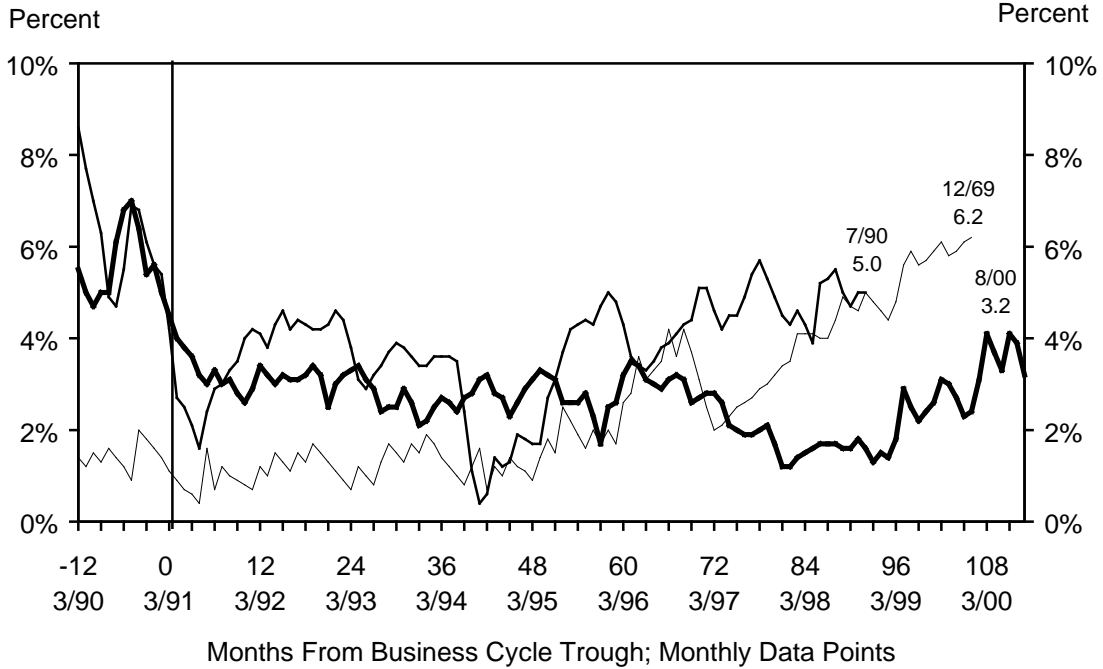


## Chart 2 Unemployment and Inflation

### A. Unemployment Rate

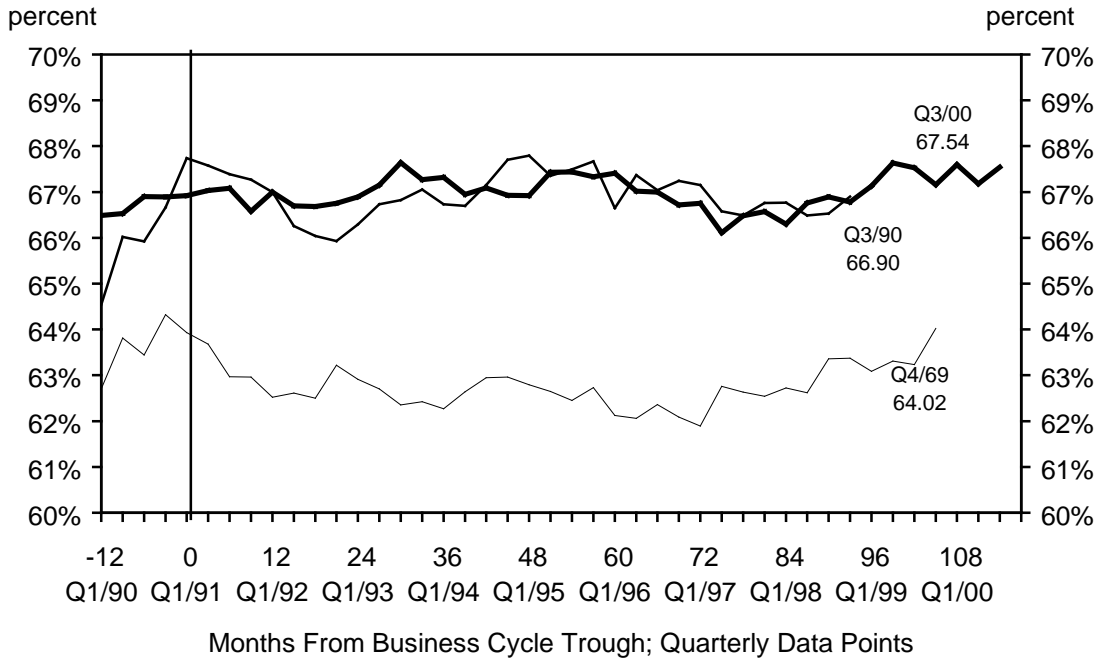


### B. Consumer Price Index Growth Rate

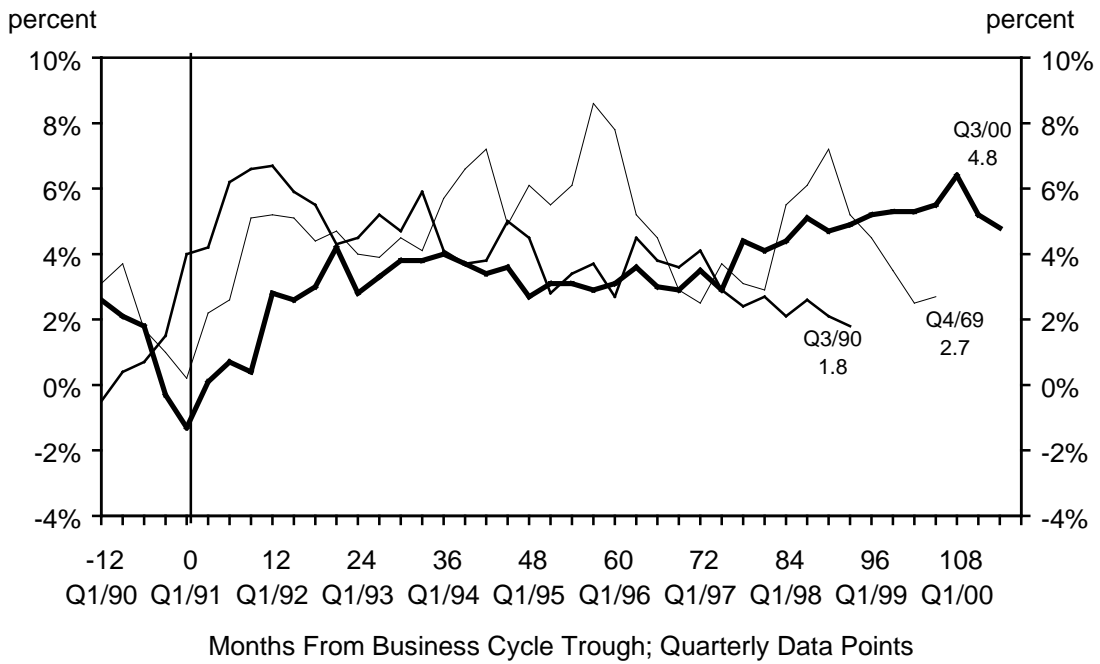


### Chart 3 Personal Consumption Expenditures

#### A. Ratio to GDP

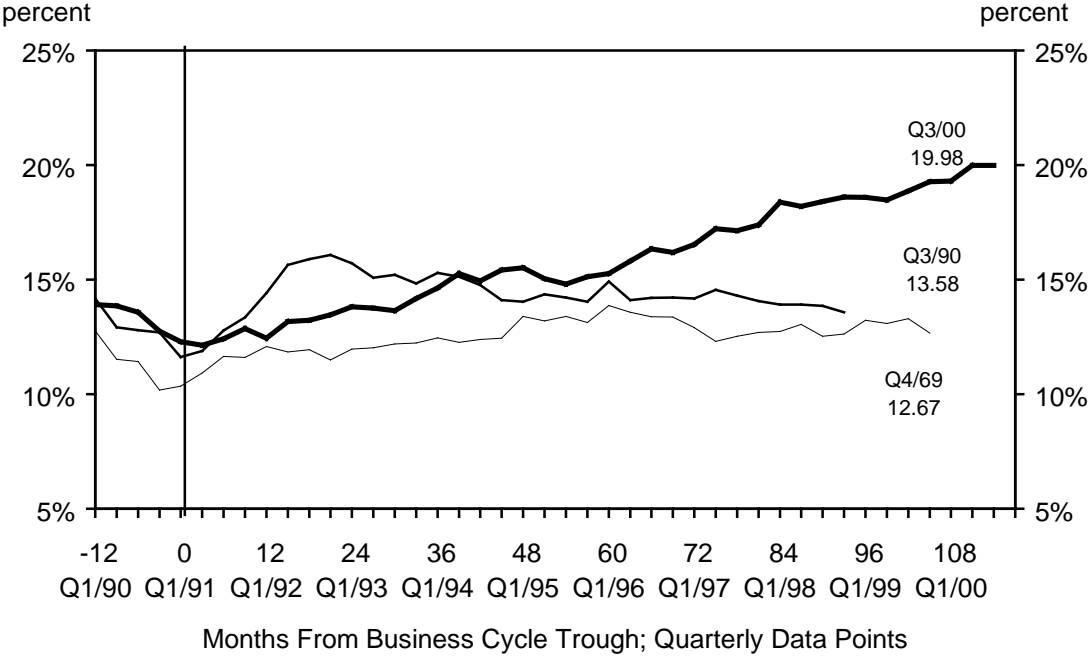


#### B. Growth Rate

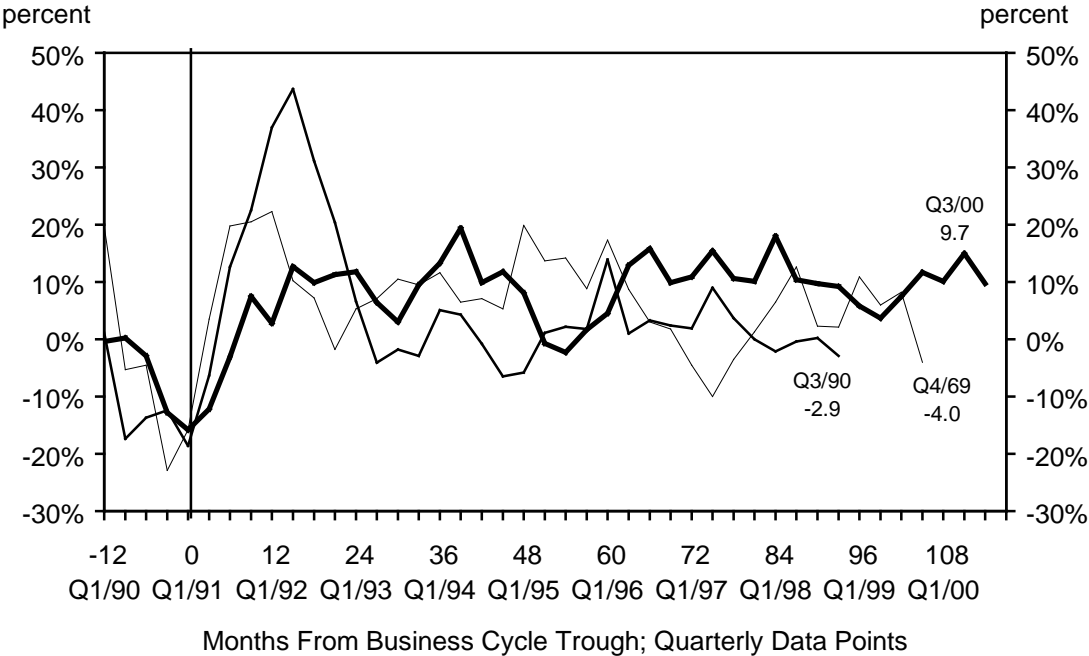


# Chart 4 Gross Private Domestic Investment

## A. Ratio to GDP

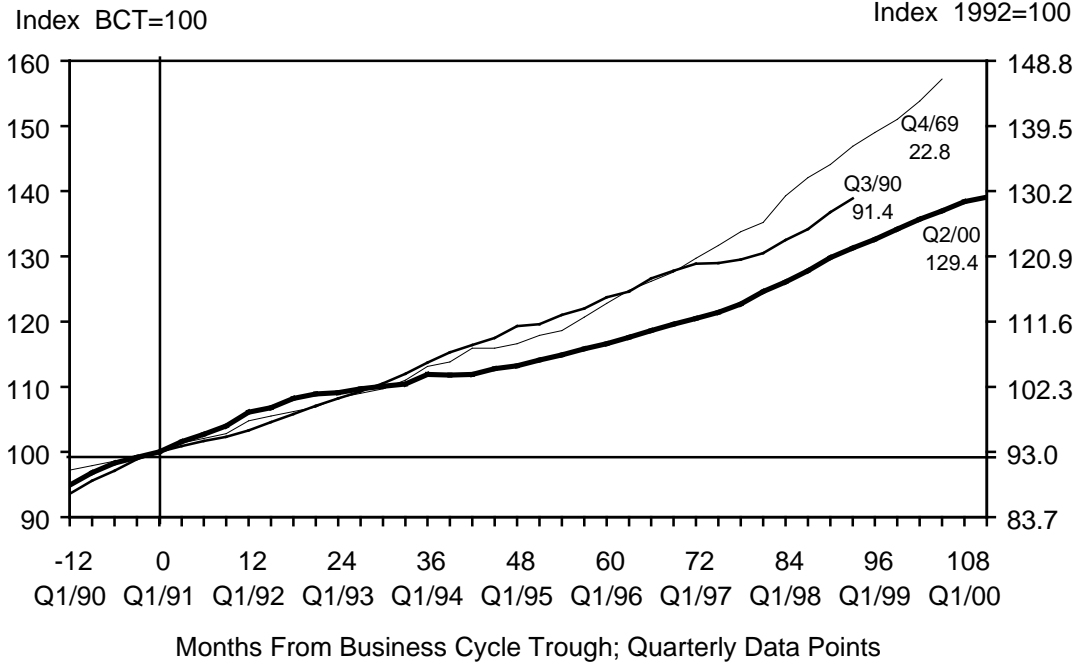


## B. Growth Rate

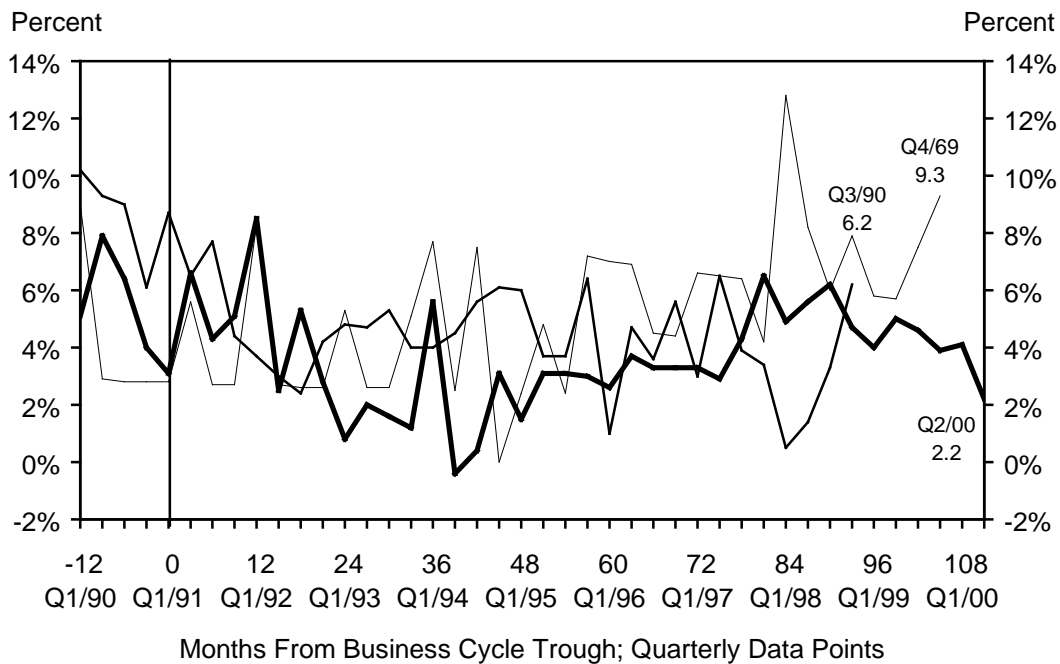


## Chart 5 Nominal Wages, Nonfarm Business Sector

A. Index of Average Hourly Compensation

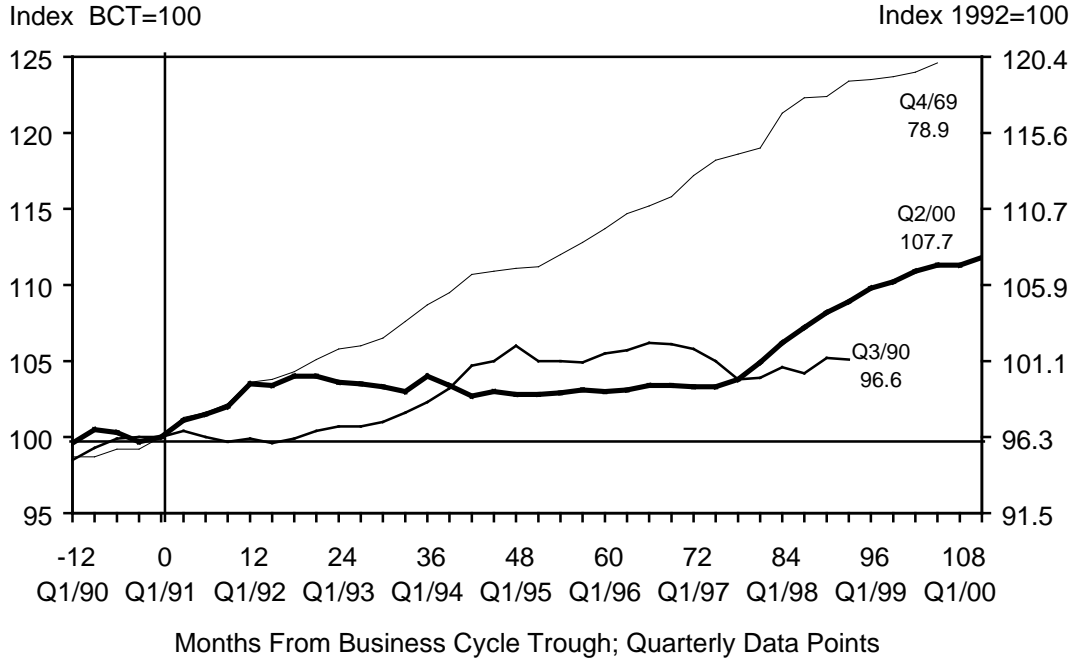


B. Index of Average Hourly Compensation, Growth Rate

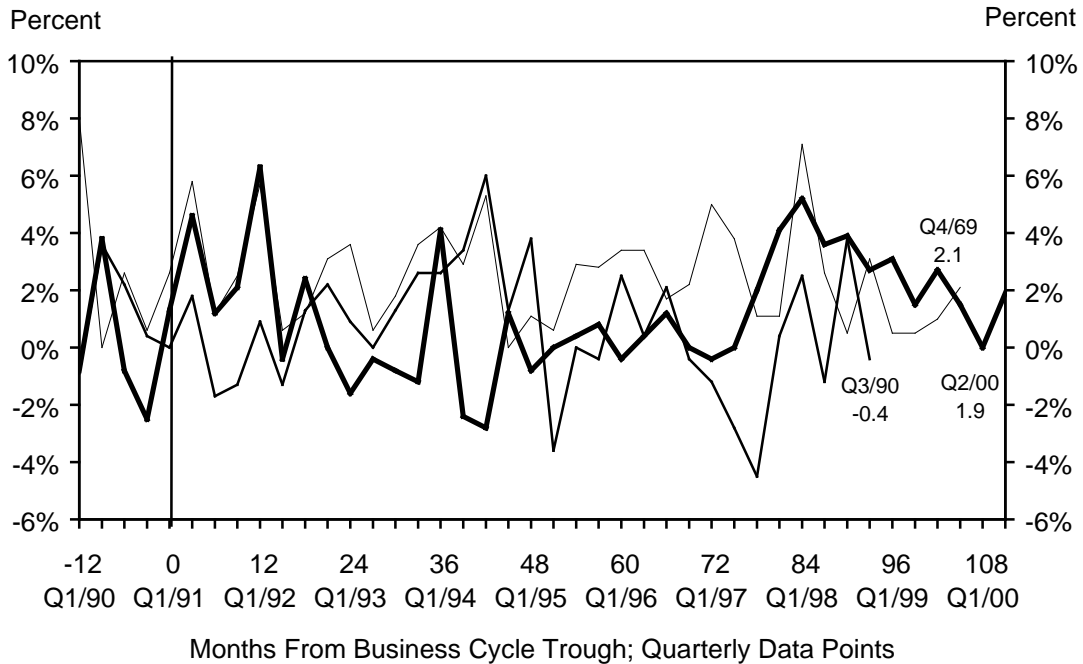


## Chart 6 Real Wages, Nonfarm Business Sector

A. Index of Real Hourly Compensation

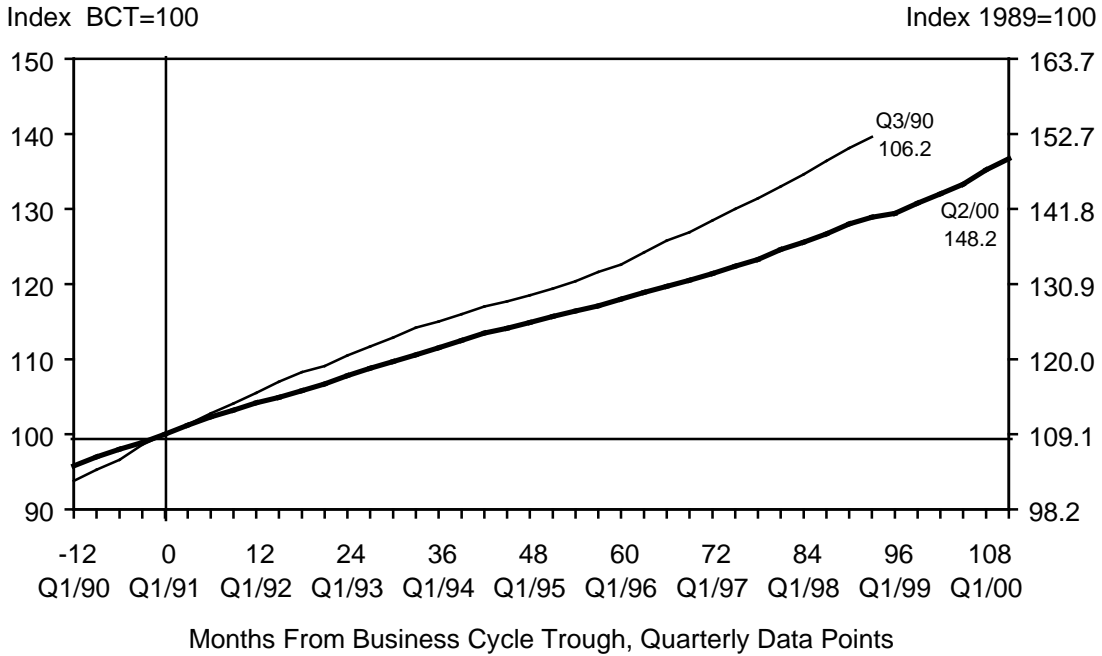


B. Index of Real Hourly Compensation, Growth Rate

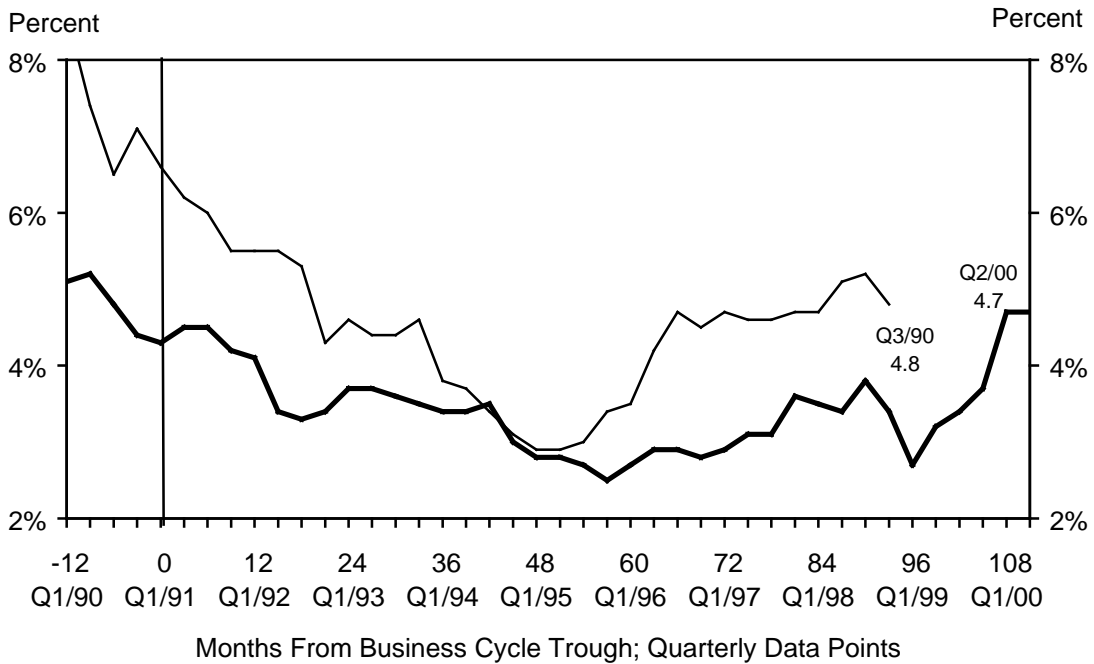


## Chart 7 The U.S. Employment Cost Index

A. Employment Cost Index



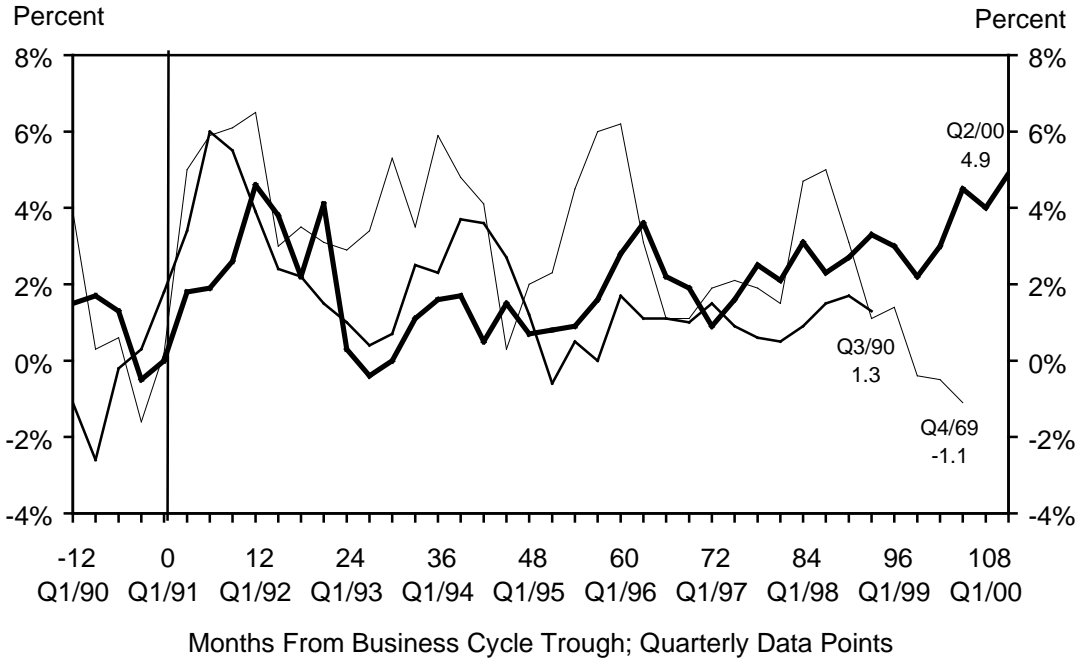
B. Employment Cost Index Growth Rate



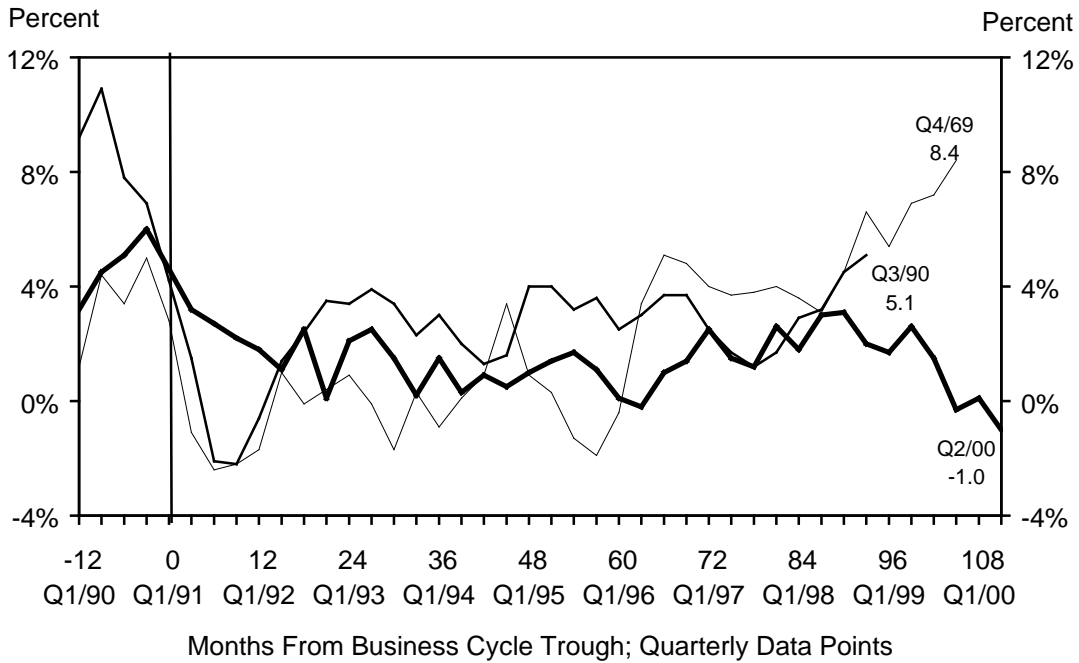


## Chart 8 Cost and Productivity

A. Output per Hour, Nonfarm Business Sector, Growth Rate

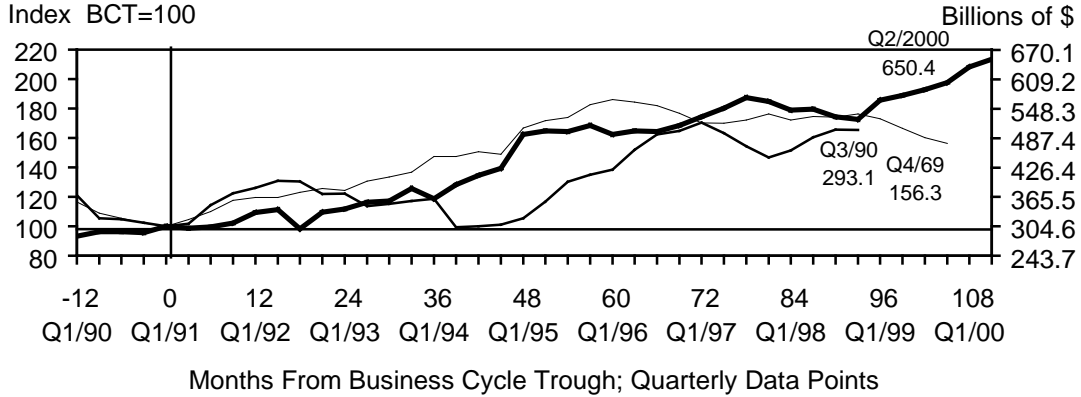


B. Unit Labor Cost, Nonfarm Business Sector, Growth Rate

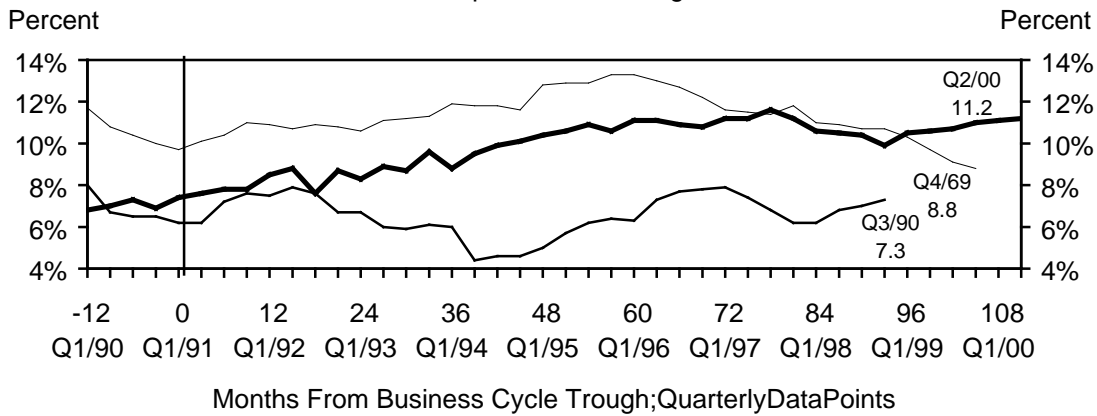


## Chart 9 Three Measures of Profitability

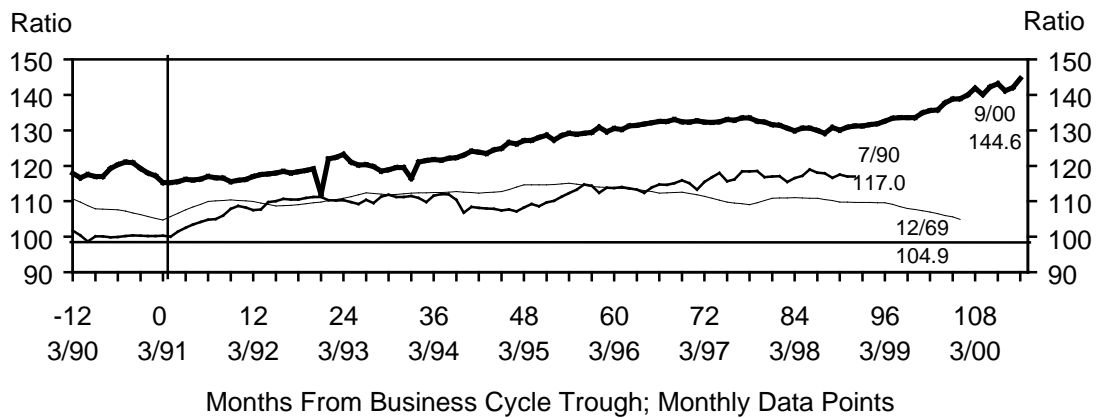
### A. Corporate Profits, Total



### B. Corporate Profit Margin

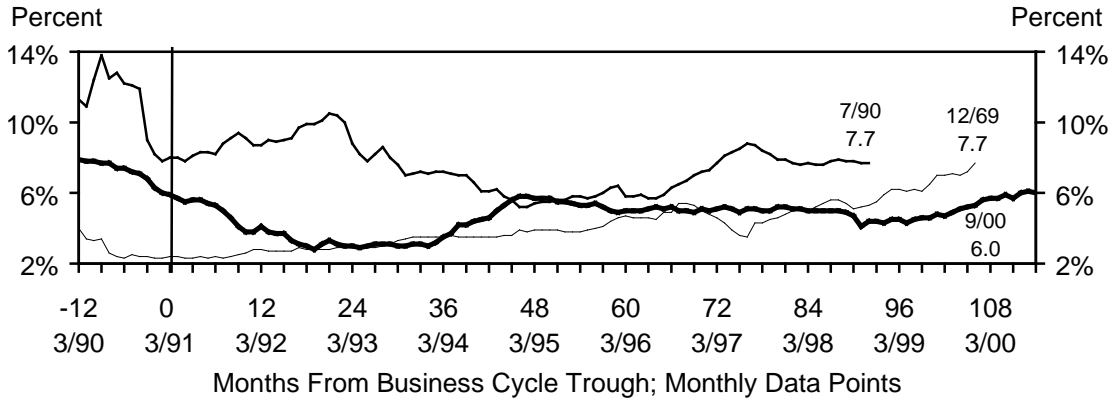


### C. Price/Labor Cost Ratio

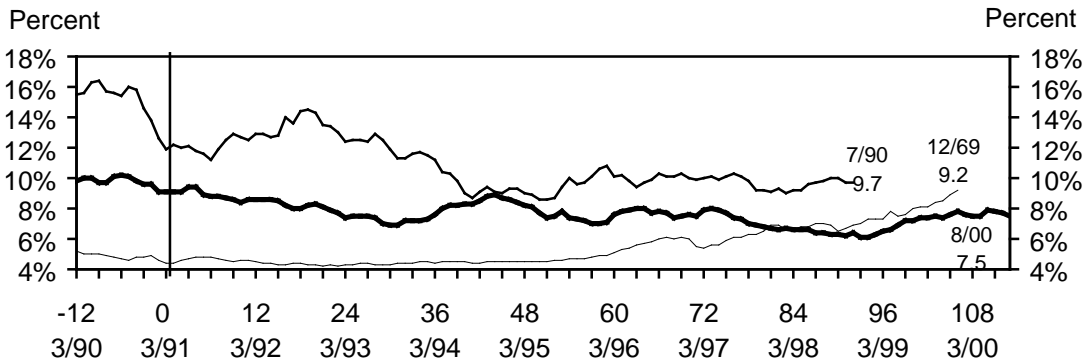


## Chart 10 Short and Long Interest Rates

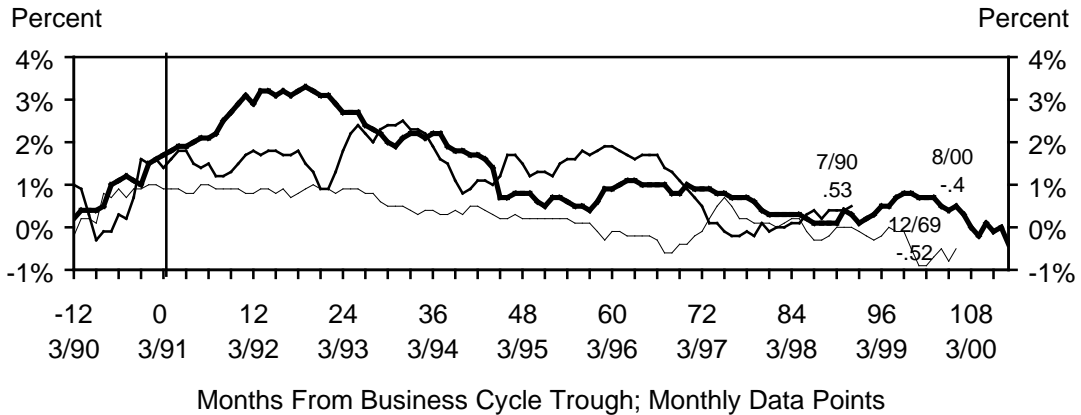
A. Treasury Bill Rate



B. New High-Grade Corporate Bond Yield

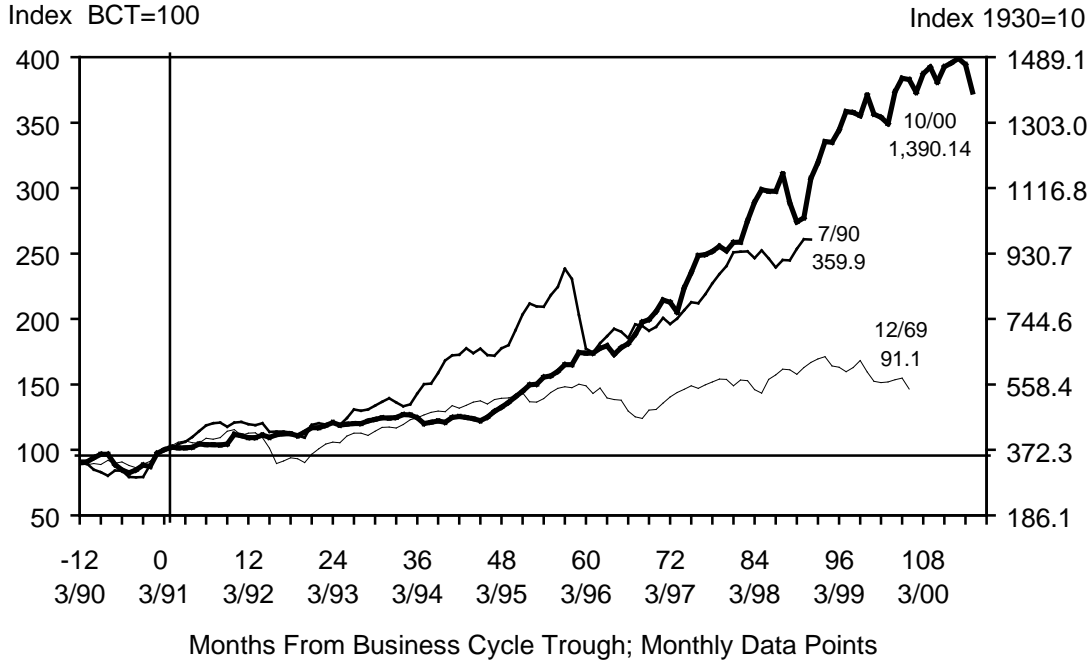


C. Yield Spread (10-year minus 1-year Treasury Bond yields)

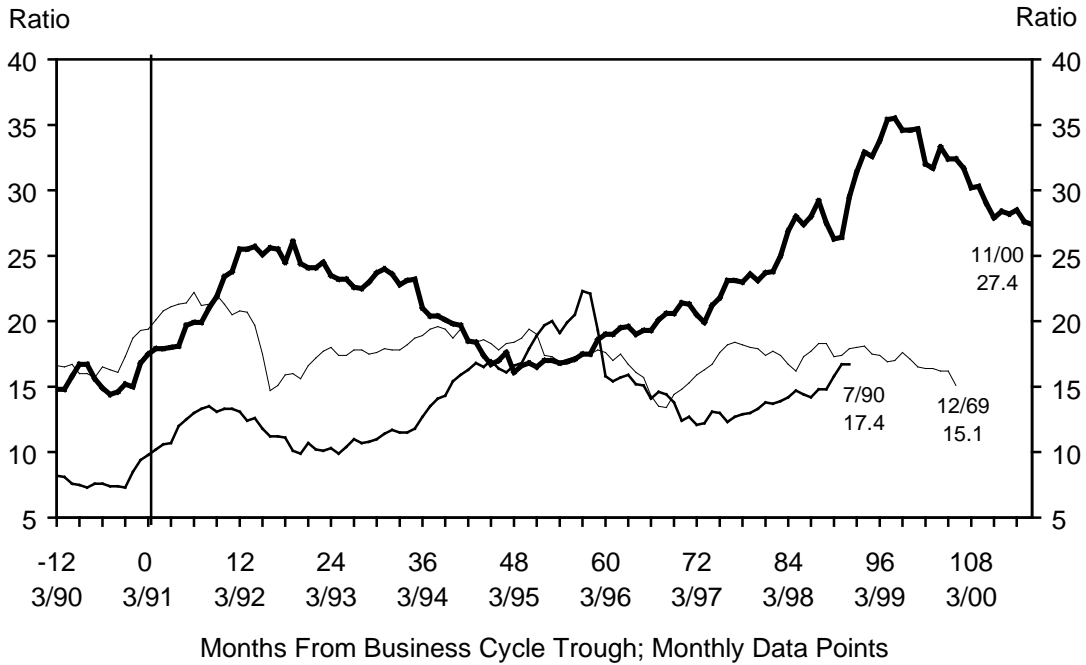


## Chart 11 Stock Prices and Price to Earnings Ratio

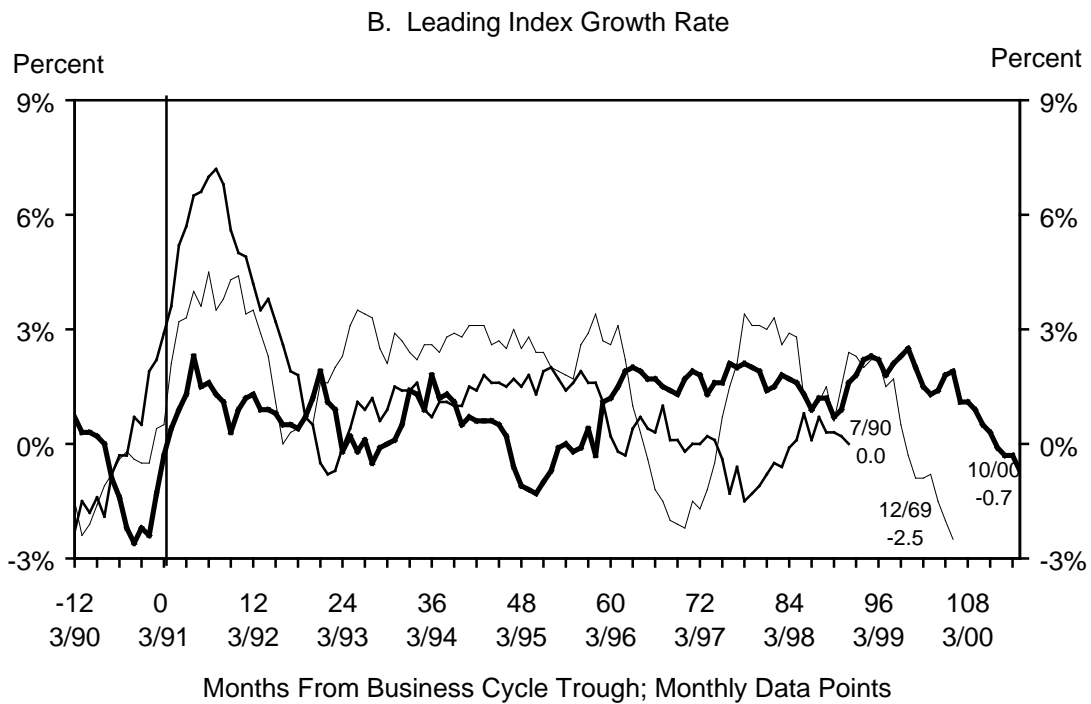
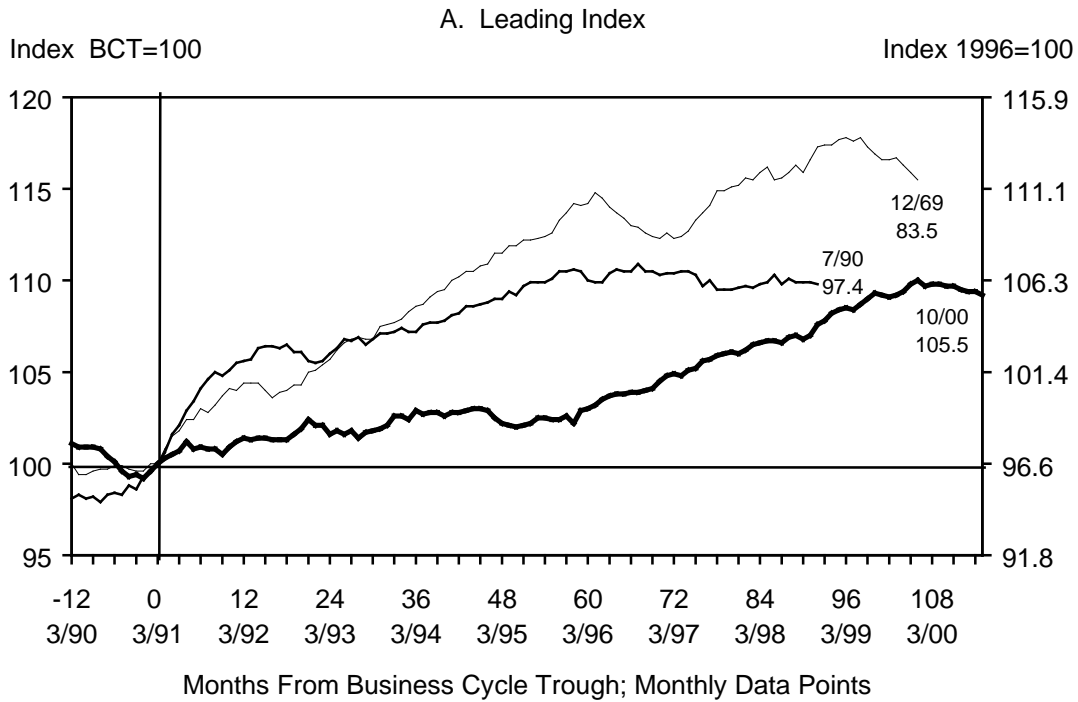
A. S&P 500 Stock Price Index



B. Price to Earnings Ratio (for S&P 500 Companies)

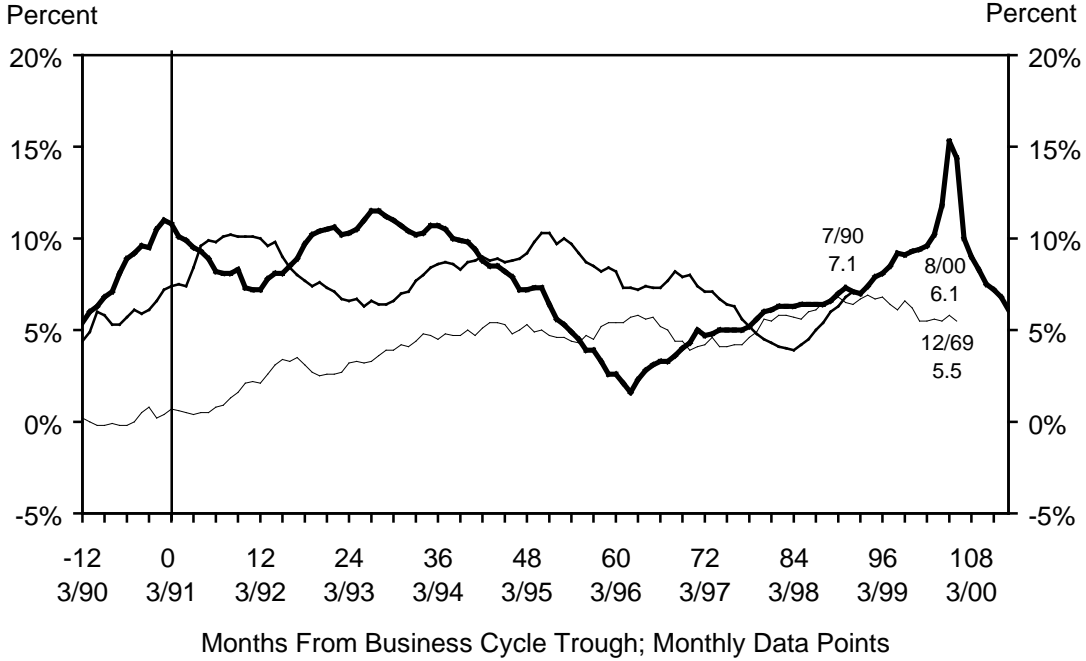


## Chart 12 U.S. Composite Index of Leading Indicators

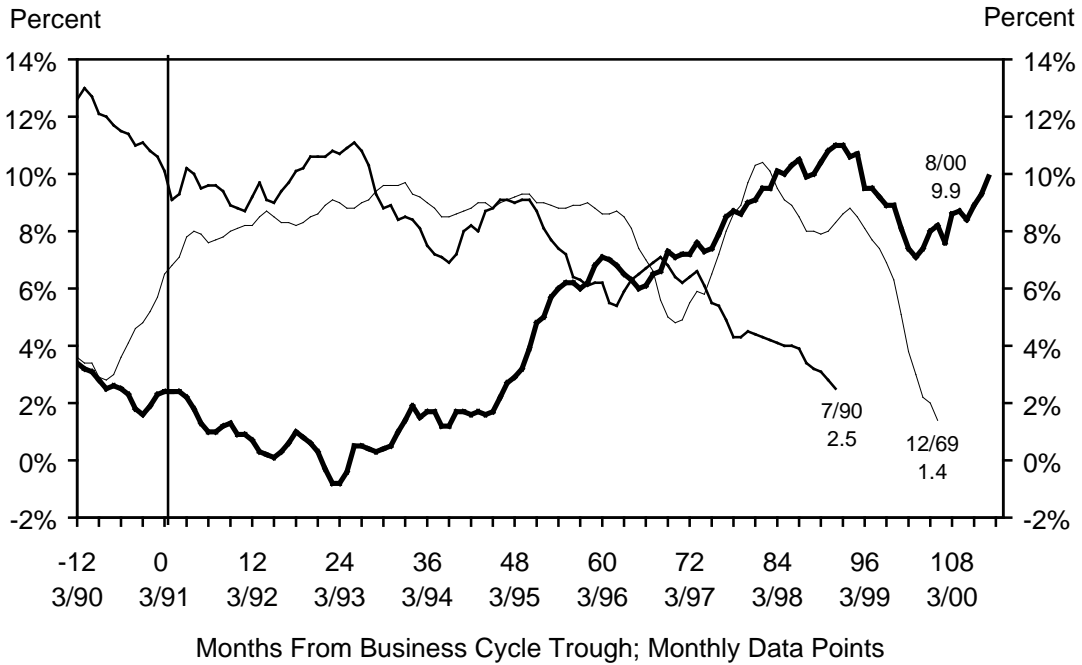


### Chart 13 Monetary Base and Money Supply

A. Monetary Base Growth Rate

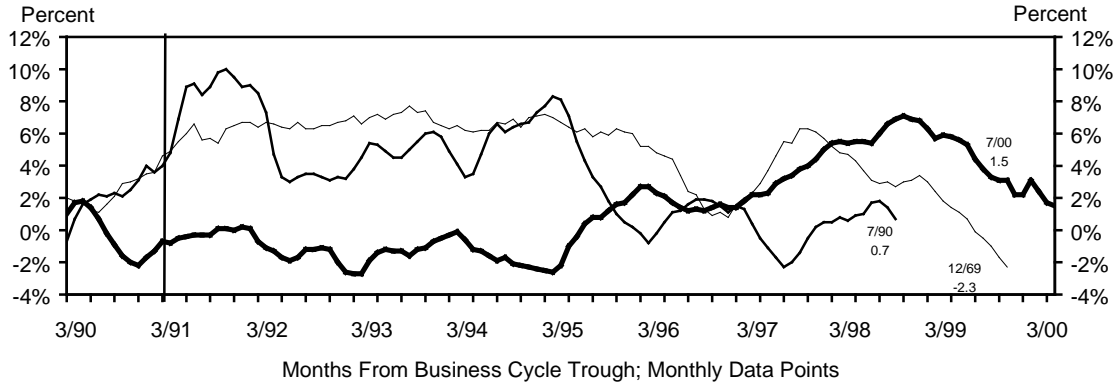


B. Money Supply (M3) Growth Rate

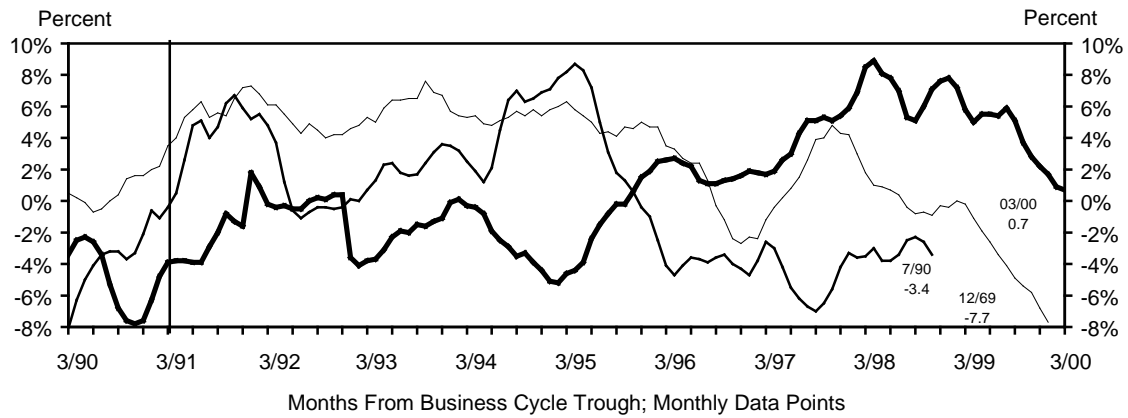


# Chart 14 Real Money Supply

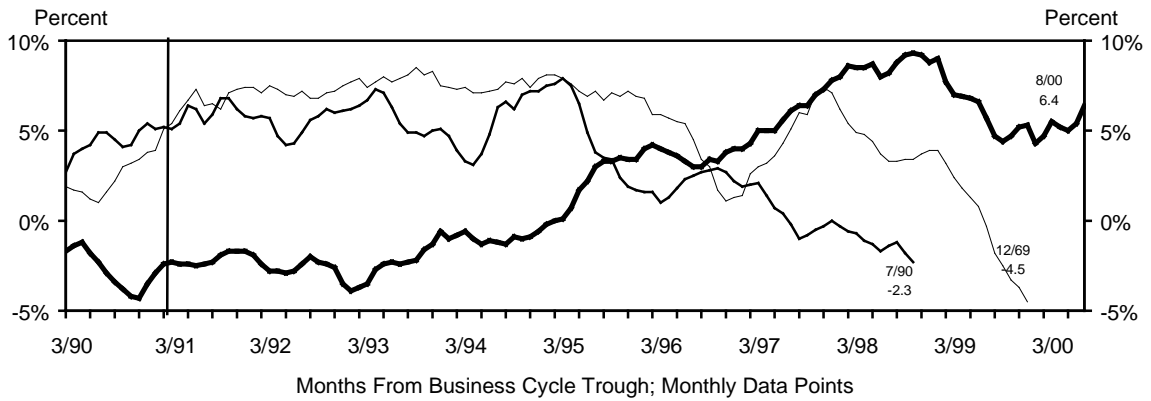
A. Deflated M2 Growth Rate



B. Deflated M2+ Growth Rate

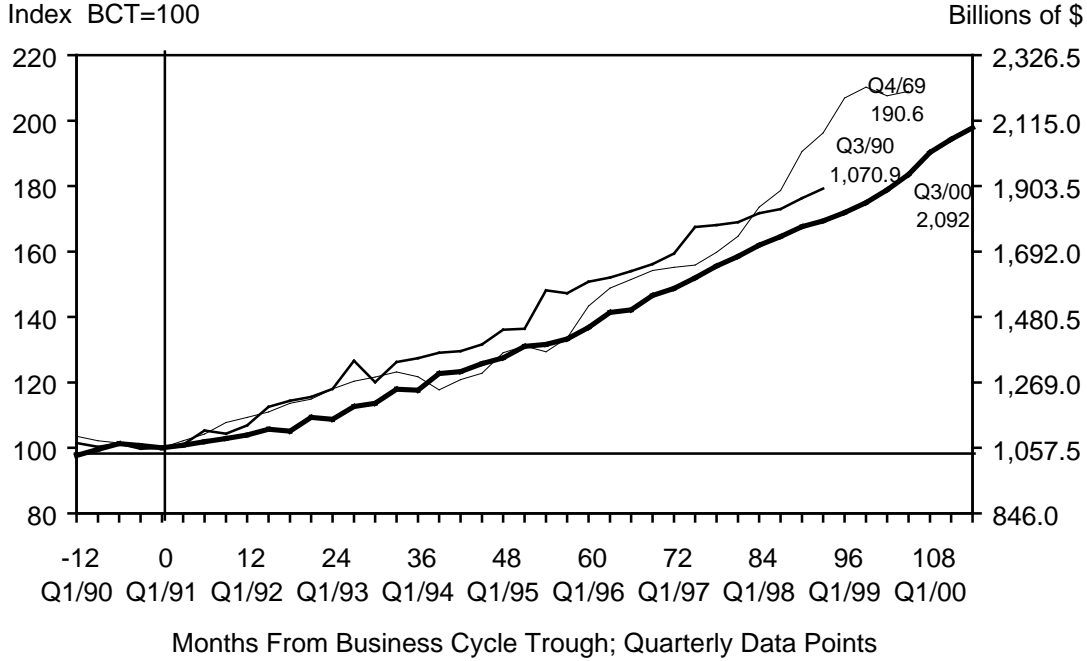


C. Deflated M3 Growth Rate

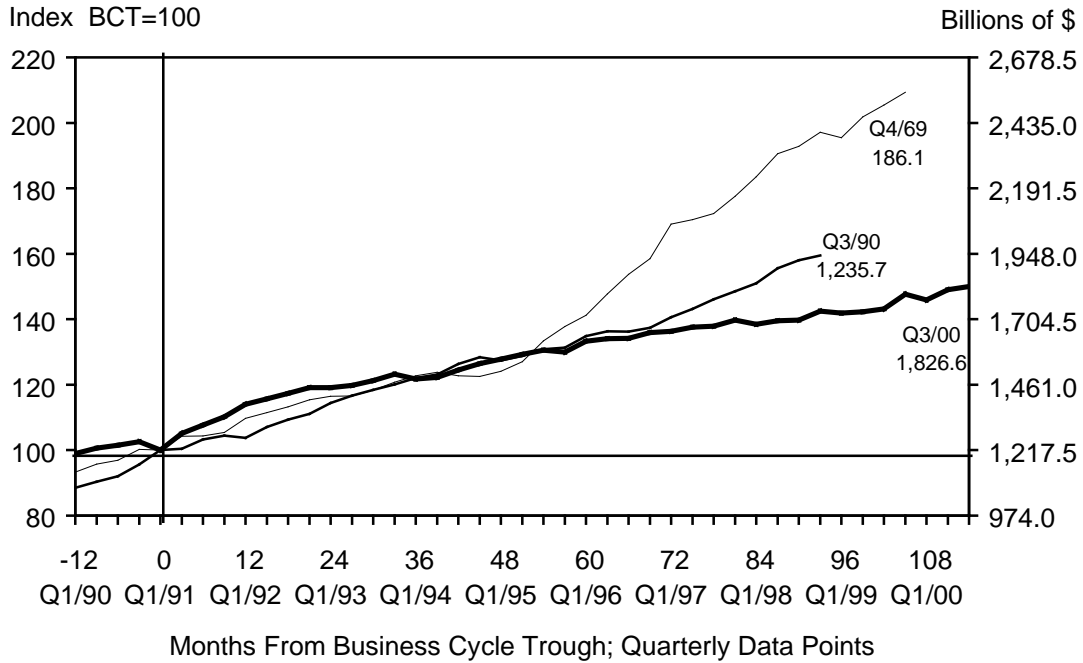


# Chart 15 Federal Receipts and Expenditures

## A. Federal Receipts



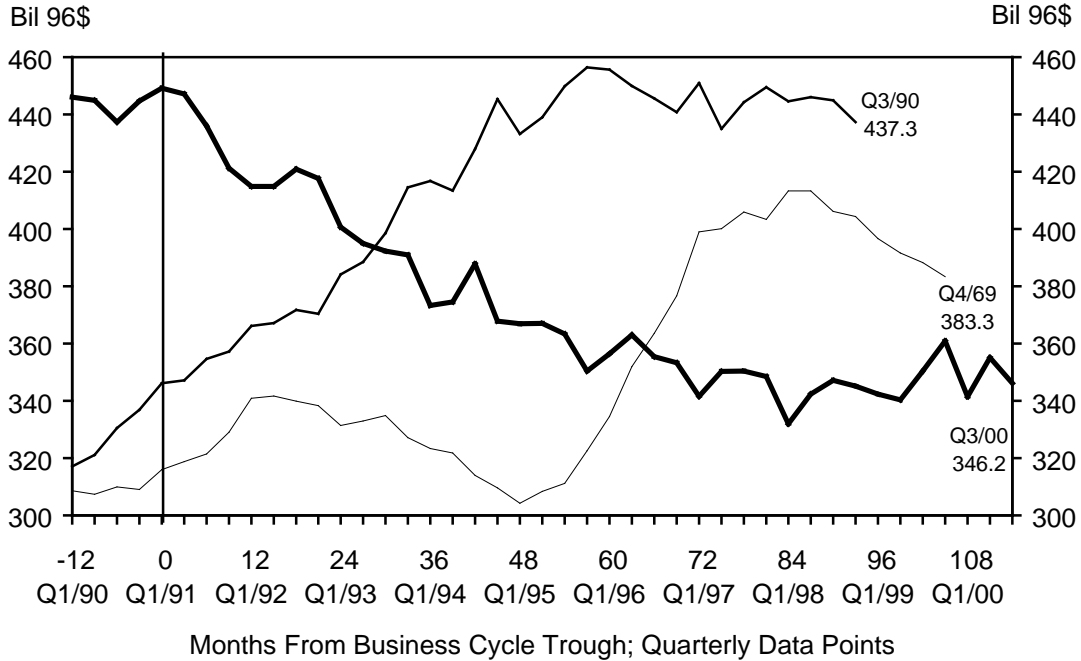
## B. Federal Expenditures



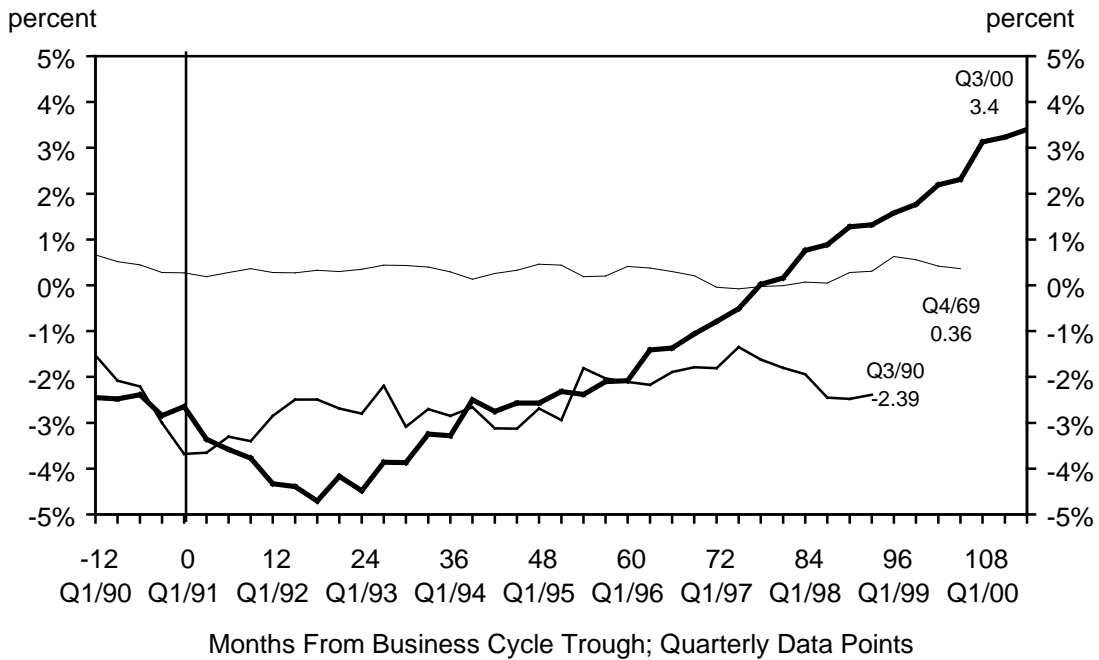


**Chart 16**  
**National Defense and Federal Budget Balance**

A. Purchases for National Defense

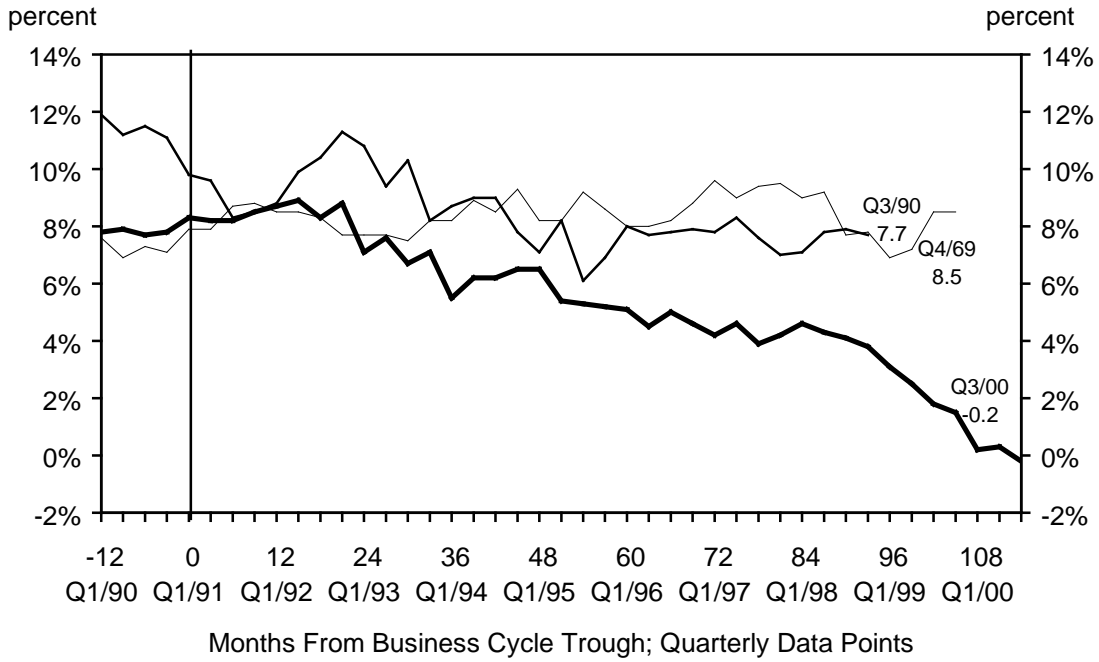


B. Government Surplus or Deficit Relative to GDP



# Chart 17 Personal and Business Saving

## A. Personal Saving Rate



## B. Business Saving / GDP

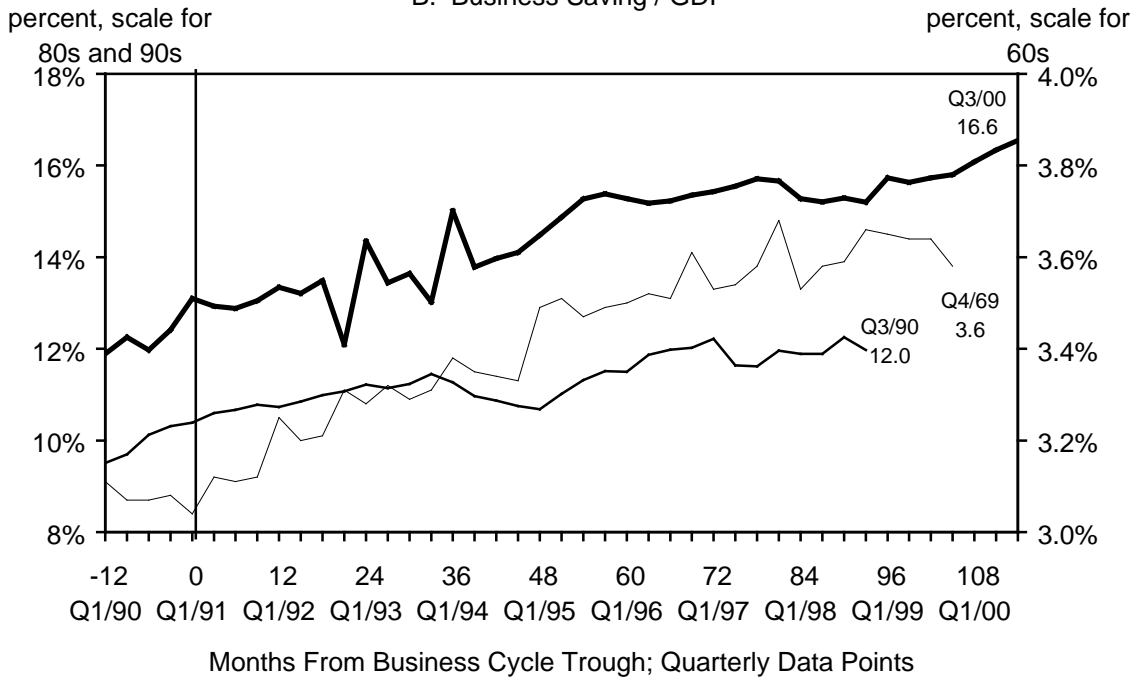
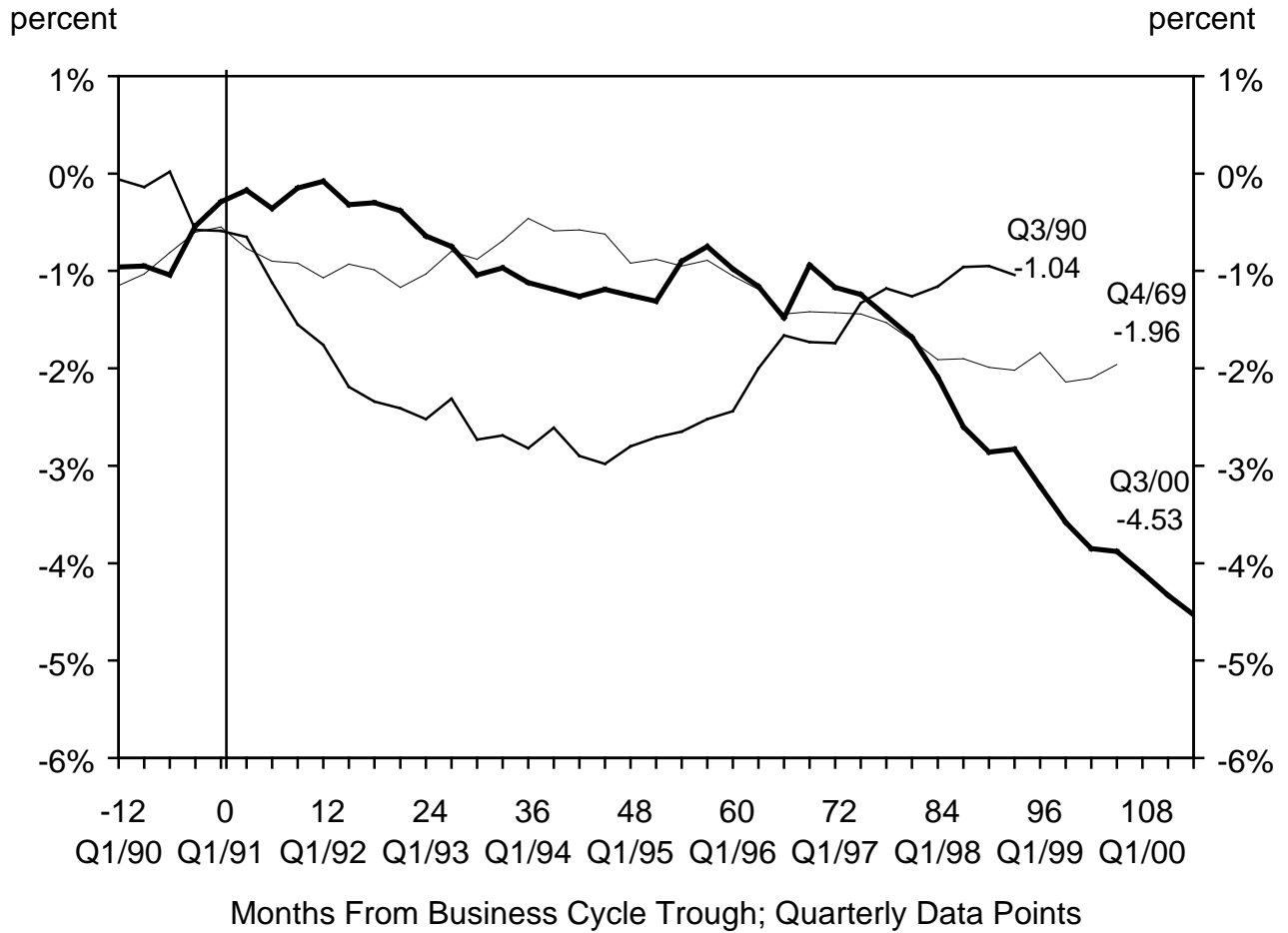


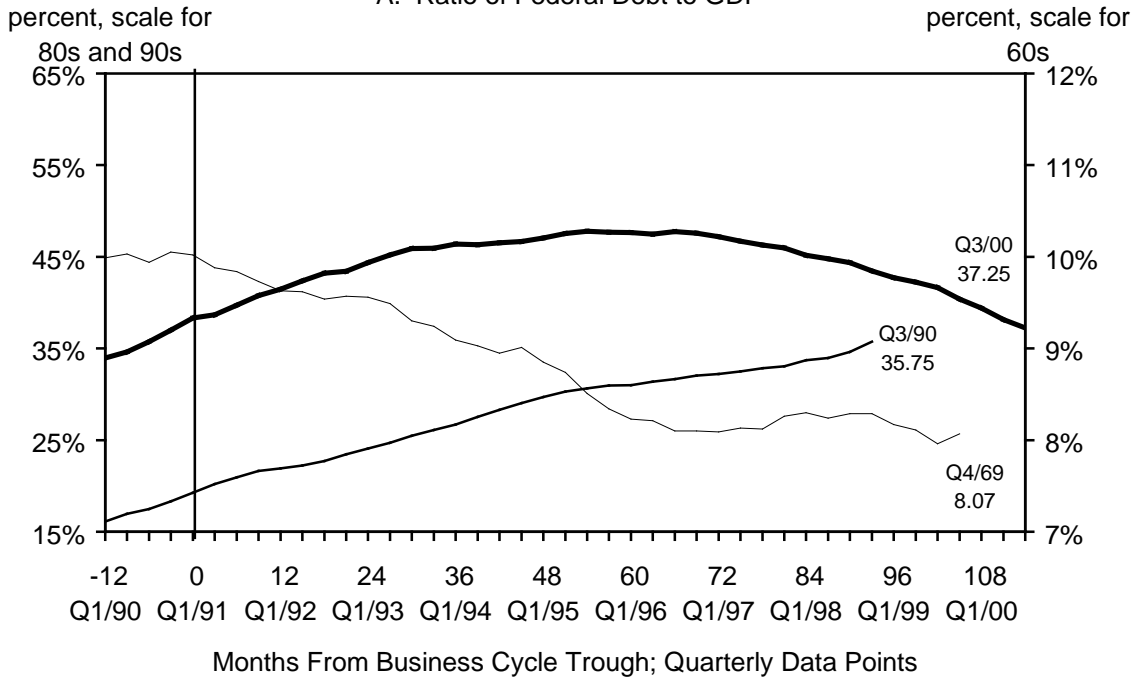
Chart 18

Ratio of Real Net Exports / GDP

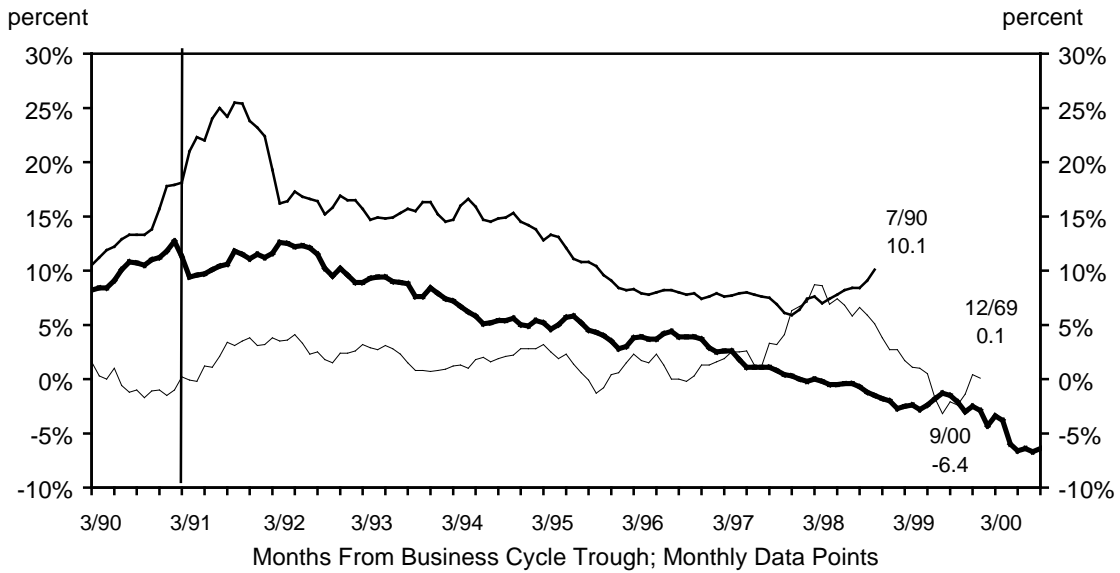


# Chart 19 Federal Debt

A. Ratio of Federal Debt to GDP



B. Federal Debt, Growth Rate



## Chart 20 Nonfederal Debt

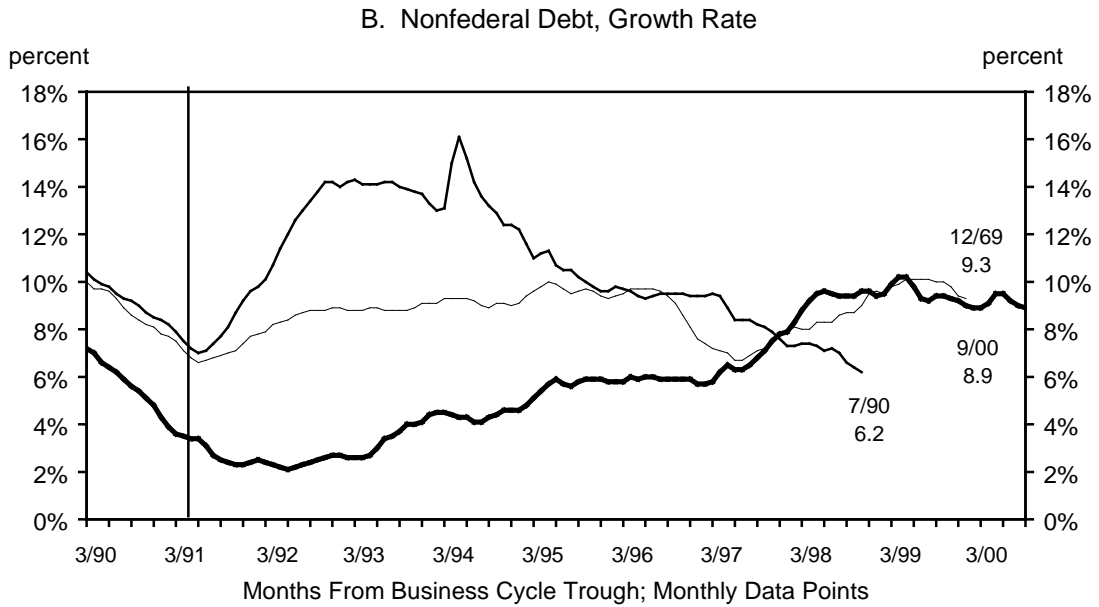
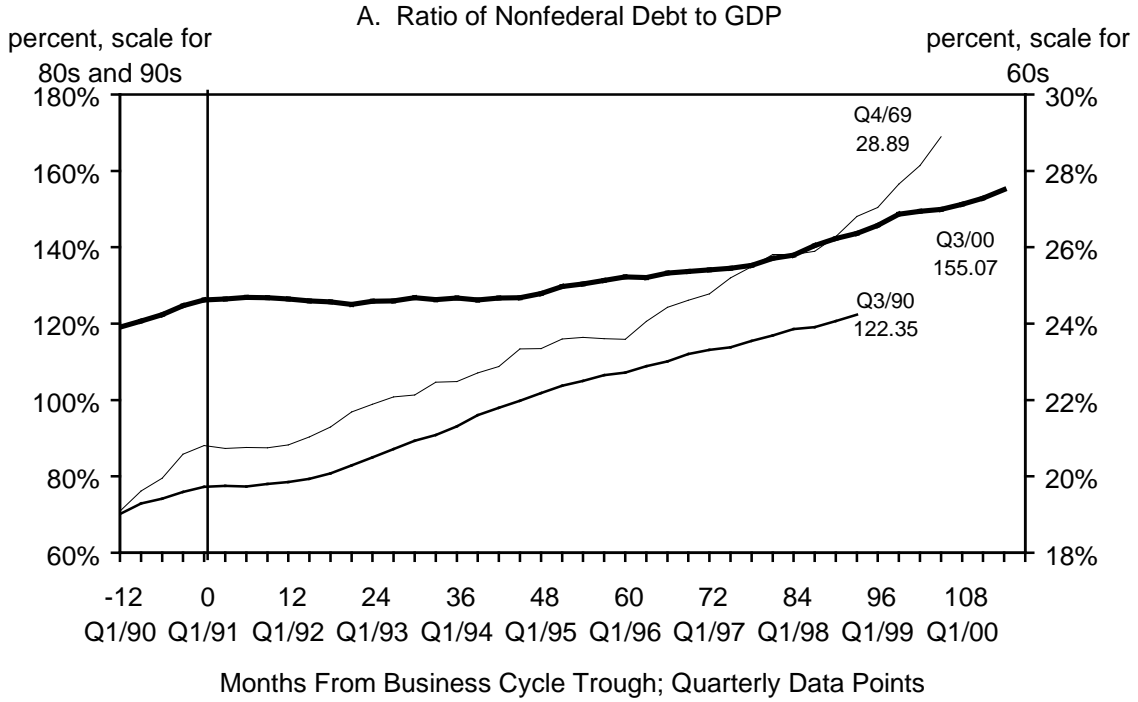


Chart 21

**Risk Aversion: Yield on New High-grade Corporate Bonds  
Minus Yield on Long-term Treasury Bonds**

