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#29 The Baby Boom Chart Book 1996

#30 Backlash: Workers Vs. Bonds

#31 Economic Consequences Of The Internet

#32 The Undefeated Forces Of Deflation

Topical Study #33

PRODUCTIVITY MUST BE BOOMING

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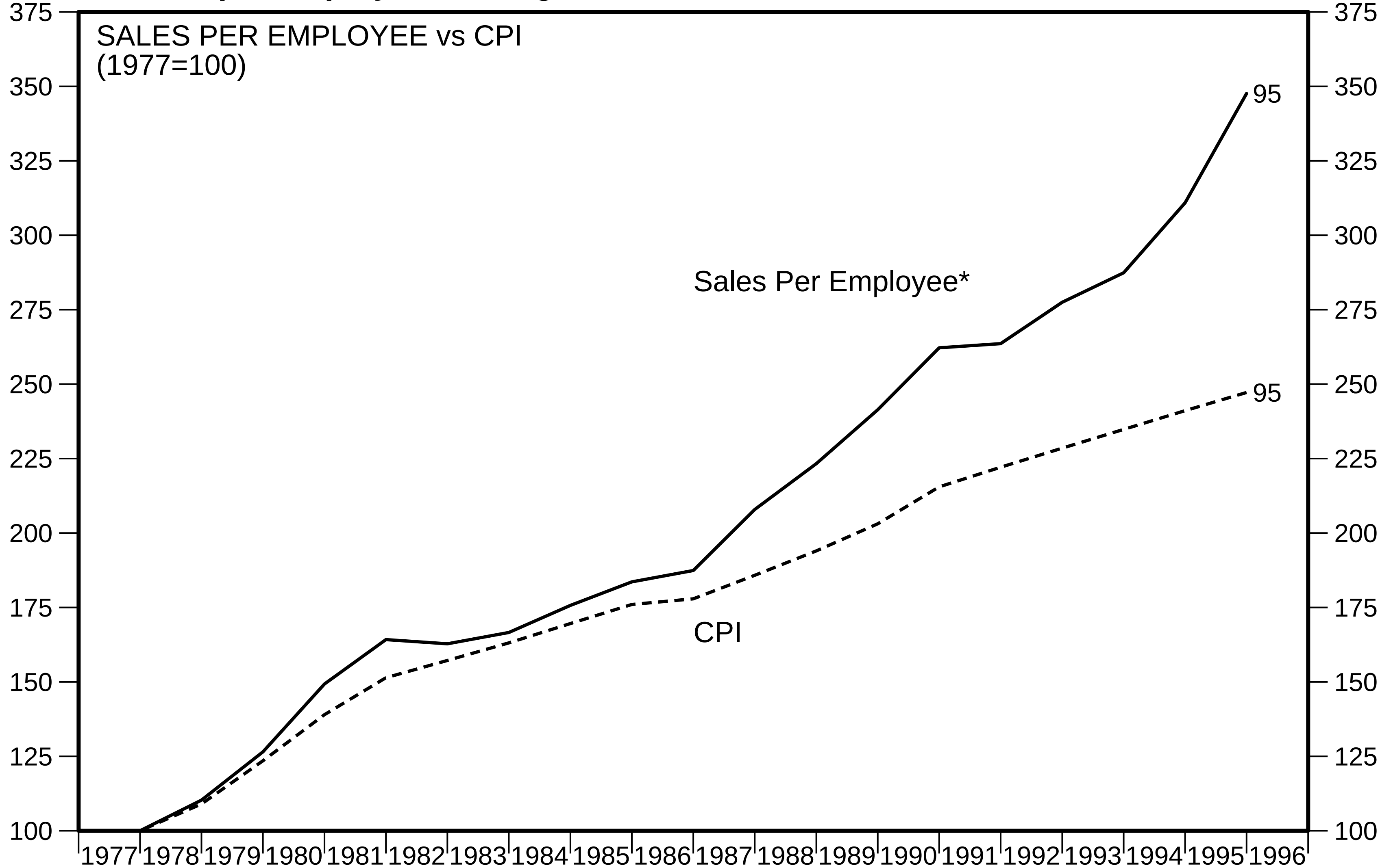
#1 Sales per employee soaring relative to CPI.



* Source: Standard & Poor's Corporation and FactSet Research Systems, Inc.

I. The Official Numbers Must Be Wrong

During the late 1980s, I predicted a secular rebound in productivity growth during the 1990s. It hasn't happened so far, according to the productivity data compiled by the Bureau of Labor Statistics at the Commerce Department. However, I'm convinced that the official statistics woefully understate productivity growth. Sales per employee data suggest that productivity is actually booming.

Both the services and high-tech sectors are accounting for more and more of GDP. It is virtually impossible to get an accurate reading of the output and the productivity of industries in these two sectors. How can we measure the unit output of health care or software, for instance? We can't. The government's efforts to do so are inadequate. This isn't a criticism; it's simply a fact. Of course, we can easily measure total business sales and individual industry revenues, but the macroeconomic problem is in determining the price versus volume mix of revenues.

Given that productivity is hard to measure, perhaps we should look at revenues for some confirmation or contradiction of the productivity trend. Sales per employee should be closely related to productivity, i.e., unit output per man-hour. The numerator of the first ratio, namely sales, is price times unit output. The denominator of the second ratio is employment times the average hours worked per production period.

Jim Moltz and Terry Gardner, Jr., my colleagues at Deutsche Morgan Grenfell, have constructed sales per employee ratios for the S&P 500 companies and all of the S&P industry groups. Exhibit 1, which first appeared in the October 28, 1996 issue of their *Weekly Market Comment*, shows the aggregate ratio versus the CPI. I prefer to compare the ratio to the price index that is more closely related to corporate sales, namely the GDP price deflator for nonfinancial corporate business:

1. Sales per employee is up 250% since 1977, while the price index is up less than 100%. Adjusted for prices, real sales per employee is up 80% since 1977 (Exhibits 2 and 3).

2. Real sales per employee tracked productivity, especially in the nonfinancial corporate sector, reasonably well until 1986. But since then, real sales per employee has soared relative to productivity. While the sales measure is up 80% since 1977, productivity in the nonfarm and nonfinancial corporate sectors is up only 18% and 29%, respectively (Exhibits 4 and 5).

3. The discrepancy between the two measures of business performance has widened recently, with real sales per employee up an amazing 10% in 1995, while productivity in the nonfarm and nonfinancial corporate business sectors edged up 0.2% and 0.4%, respectively (Exhibits 6 and 7).

I believe that the sharp increase in the growth of real sales per employee since the mid-1980s reflects a secular rebound in the growth of productivity, led by the fastest growing and most productive sectors of the economy. From 1987 to 1995, real sales per employee increased 4.7% per year, on average, well above the 1.1%-per-year average for nonfinancial corporate productivity, as officially measured. *Making some adjustments (see below) leads me to conclude that productivity has been growing closer to 3% than 1%.*

II. The Leaders Are High-Tech & Health Care.

The sales data clearly suggest that productivity gains must be much greater than measured by the government's statisticians. The following table shows the gains in sales per employee for the 11 S&P sectors from 1990 to 1995. The biggest gains have been in sectors where unit output is the hardest to measure–technology, communications, and health care. But the encouraging aspect is that every major sector is registering improvement. So generally speaking, it is truly a broad trend.

Sales Per Employee Growth

S&P Sector	1990-1995 % Gain In Sales Per Employee
Technology	83.5
Health Care	48.5
Communication Services	47.4
S&P 500	**43.9**
Basic Materials	43.5
Capital Goods	34.7
Utilities	33.4
Energy	25.6
Consumer Staples	20.8
Transports	19.4
Consumer Cyclicals	14.5
Financials	11.3

Source: Jim Moltz and Terry Gardner, Jr., *Weekly Market Comment*, October 28, 1996

III. What's Wrong With This Picture?

One possible criticism of my critical analysis of the productivity issue is that I am comparing apples and oranges. The sales data include the value of all products sold by the S&P companies, including raw and intermediate goods and services. The sales data are for goods and services produced and sold by these companies anywhere on this planet. The productivity numbers are based on goods and services produced only in the United States and sold to both domestic and foreign end-users, so they more appropriately and accurately reflect value-added.

S&P 500 company sales hit a record of $4.2 trillion in 1995 (Exhibit 8). This is equivalent to 58% of nominal GDP, up from 51% in 1986. However, as just mentioned, those sales include lots of intermediate output, which is excluded from GDP. In fact, all US-based corporations accounted for 60% of GDP (Exhibit 9). Furthermore, there is no way that the S&P 500 companies account for anything close to 58% of GDP when they only account for 16% of payroll employment (Exhibits 10 and 11).

Technically speaking, the apples-versus-oranges issue is a flaw in my analysis of the productivity puzzle. However, in reality, the dramatic rise in sales per employee, especially in the 1990s, must be based on productivity rather than some bizarre increase in the ratio of intermediate to final sales or the ratio of S&P 500 companies' foreign-to-domestic output.

It is possible, I suppose, that the ratio of intermediate to final sales has been increasing since the mid-1980s as a result of outsourcing. The "business services" industry has been booming because it is performing many of the functions that were previously done in-house. On the other hand, the sharp decline in the foreign-exchange value of the dollar from 1985 through 1995 should have made it more profitable to produce more in the United States, not abroad. In addition, the annual hours worked per employee has been on a downtrend for many years, which would cause the output per man-hour measure (productivity) to rise faster, not slower, than sales per employee.

Finally, the rise in S&P 500 sales relative to GDP suggests that some of the strength in sales relative to measured productivity is a mix effect. I estimate that all these effects would produce a "reconciliation adjustment factor" of minus 1.7 percentage points at most for real sales per employee growth*In other words, productivity has been growing at least 3% per year since 1987!*

IV. Wage Gains Based On Productivity Aren't Inflationary.

In addition to the puzzling weakness in productivity–as officially measured–economists have also been puzzled by the fact that the cyclical upturn in wage inflation hasn't boosted price inflation so far. Some continue to predict an imminent rebound in price inflation. Others are just puzzled.

I believe that the rise in real wages–with nominal wage gains outpacing price increases–is another important piece of evidence pointing to a rebound in productivity. (See the January 13 issue of my*Weekly Economic Analysis,* "Are Rising Wages Inflationary?") Furthermore, the dramatic increase in sales per employee certainly justifies paying workers more. So the cyclical upturn in wage gains isn't a confirmation of the so-called "worker backlash" theory promoted by other economists. Rather, workers are more productive and they are getting paid for their achievements. (See my Topical Study #30, *Backlash: Workers Vs. Bonds*,May 8, 1996[1])

In the past, the unemployment rate declined as a business expansion aged. Tighter labor markets put upward pressure on wages that were not offset by productivity. Rising unit labor costs were the main cause of cost-push inflation. To halt rising price inflation, the Fed was forced to raise interest rates until the boom turned to bust.

Today, labor markets are tight, but companies are successfully increasing sales per employee by boosting productivity. The economic sectors that are growing the fastest are also the ones that have demonstrated a remarkable ability to increase their sales faster than their workforce.

V. Profits Without Pricing.

Another surprising puzzle has been the strength of corporate profits in a very weak pricing environment. Again, the puzzle is easy to solve if productivity gains are much better than officially measured, and certainly if productivity gains are anywhere near as good as suggested by the trend in sales per employee.

Corporations have been very successful in boosting their profit margins, i.e., profits divided by sales, not only through productivity, but also through innovation. The product cycle has become much shorter in many industries, especially technology. Business planners realized that global competitive pressures can squeeze profit margins on new products very quickly. So they have to constantly innovate to create new products with high profit margins before the margins on last year's winners collapse. Sales per employee is soaring not just because companies are selling more of their same old products, but also because there are so many different, new products. An increasing number of companies are implementing business strategies with the goal of having 50% or more of their sales attributable to products that didn't exist two-to-five years ago.

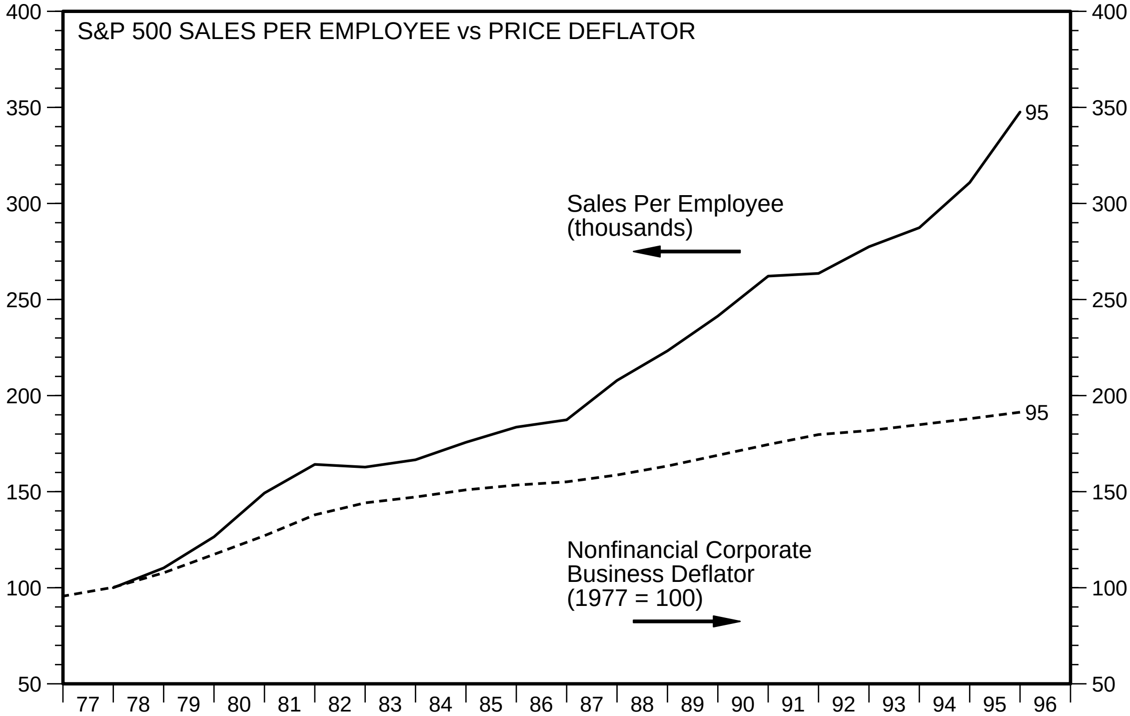
VI. Another Reason For Rational Exuberance.

The bottom line is that the performance of sales per employee is one of many very good reasons to be exuberant about the US economy and US equities. The Dow should hit 10,000 by 2000–or sooner.

[1] http://www.yardeni.com/yardeni/public/t_960508.pdf

- Real Sales -

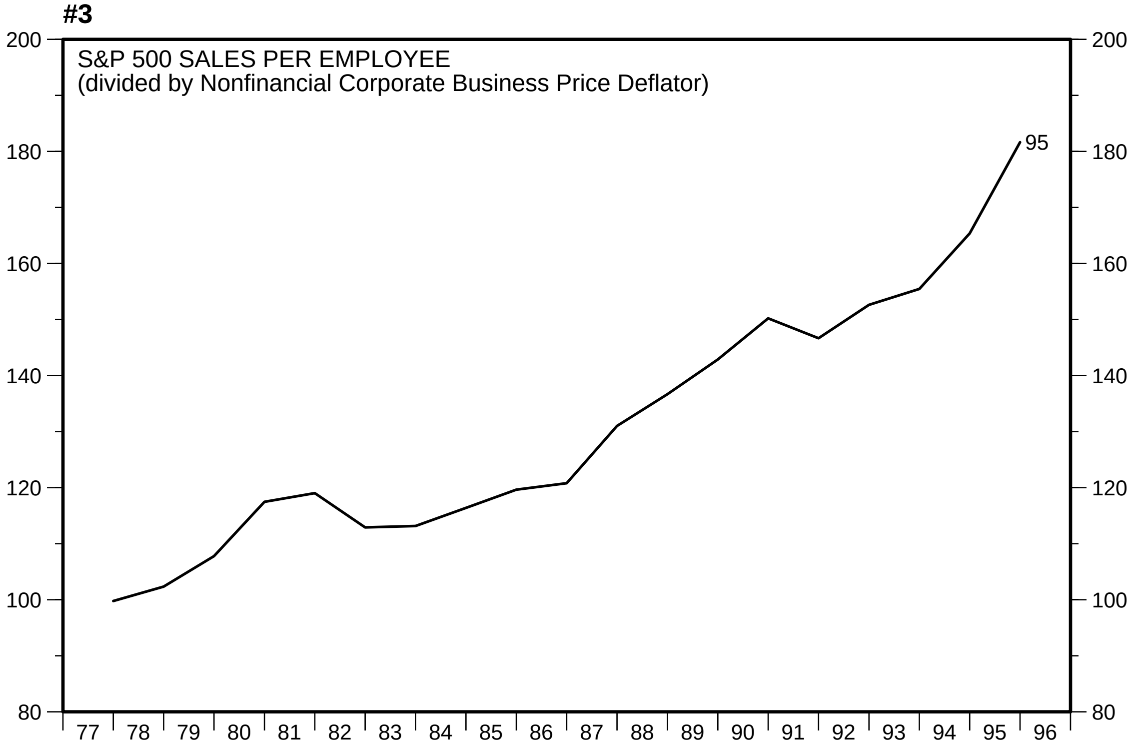
#2



Source: Standard & Poor's Corporation, FactSet Research Systems, Inc, and US Department of Commerce.

Since 1977, business prices have doubled while sales per employee have increased 3 1/2 times. Real sales per employee are up 80% since 1977.

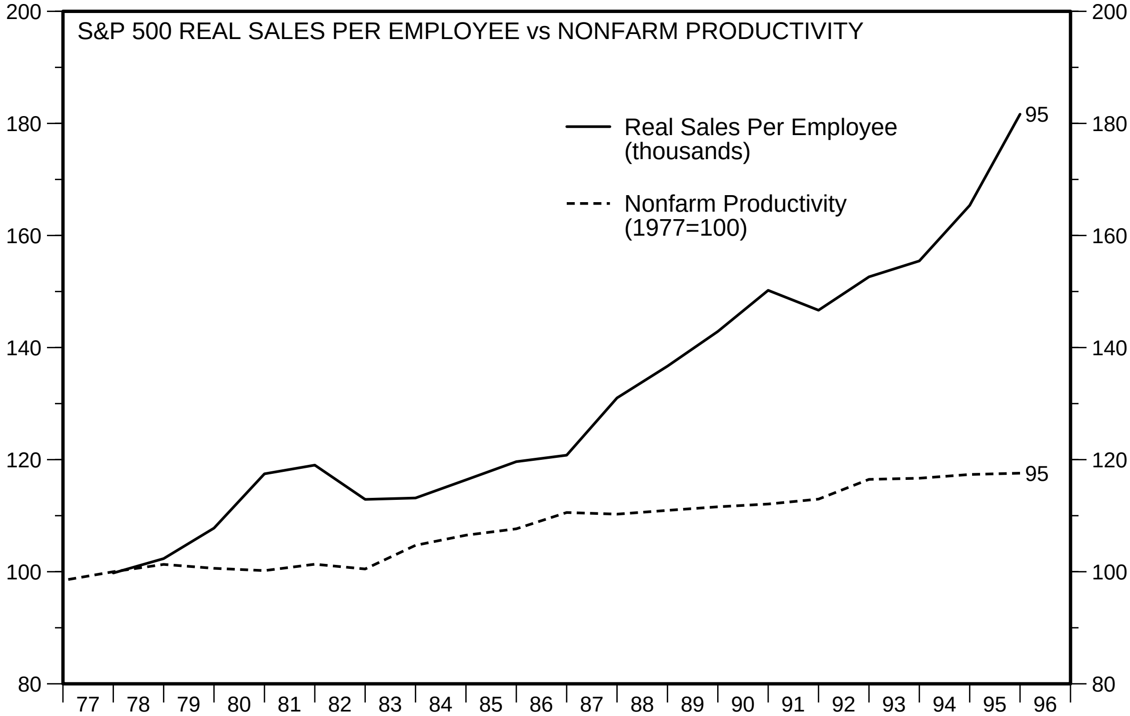
#3



Source: Standard & Poor's Corporation, FactSet Research Systems, Inc, and US Department of Commerce.

- Sales Per Employee -

#4



Source: Standard & Poor's Corporation, FactSet Research Systems, Inc, and US Department of Commerce.

While real sales per employee have increased 80% since 1977 for the S&P 500 companies, productivity in the nonfarm and nonfinancial corporate sectors are up only 18% and 29%, respectively.

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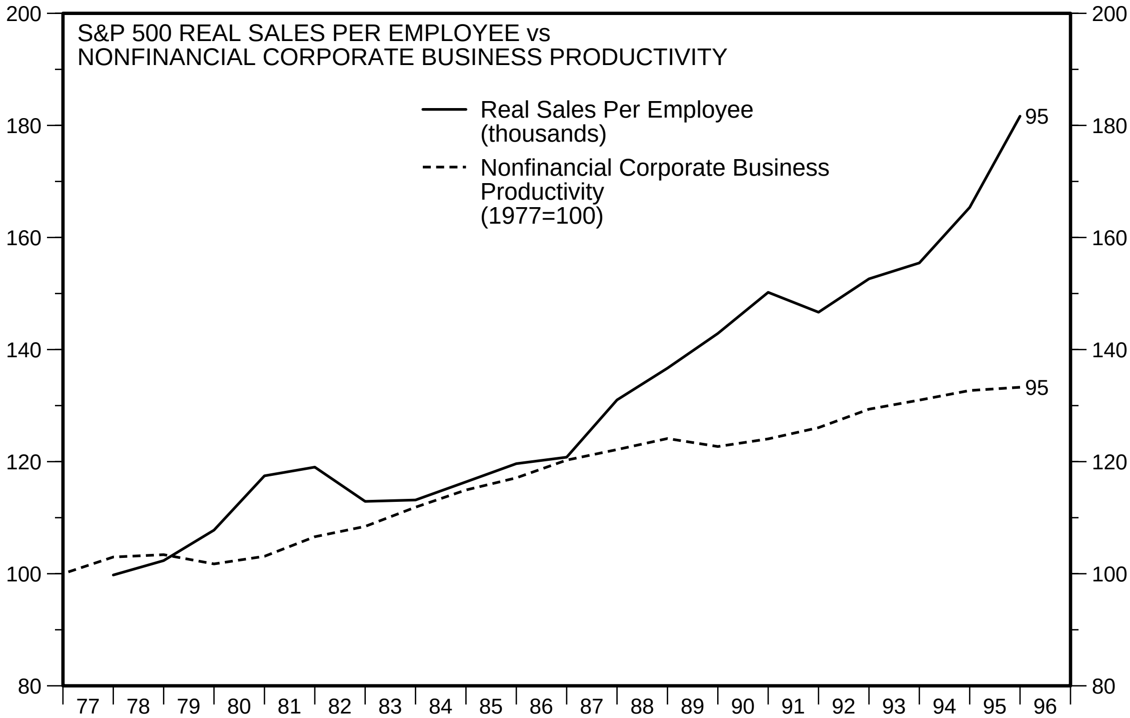
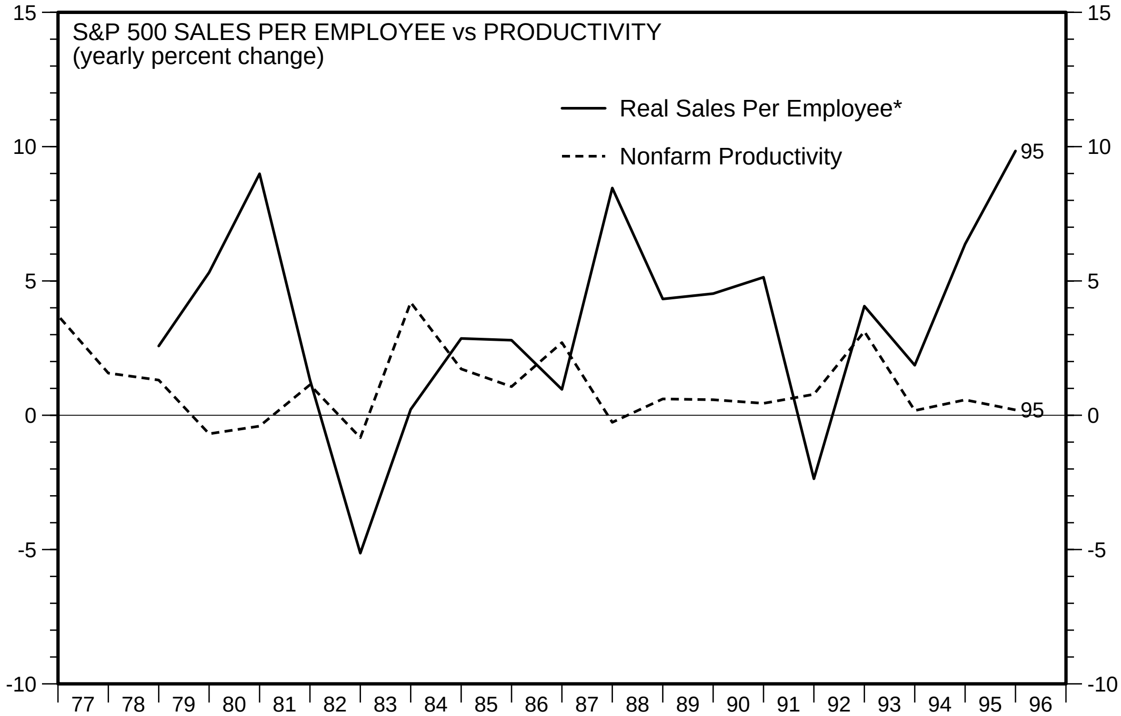


Source: Standard & Poor's Corporation, FactSet Research System, Inc, and US Department of Commerce.

- Productivity -

#6



* Using Nonfinancial Corporate Business GDP Price Deflator.
Source: Standard & Poor's Corporation, FactSet Research Systems, Inc, and US Department of Commerce.

It's hard to believe that productivity growth has been as lackluster as measured by the government given the rapid rise in real sales per employee.

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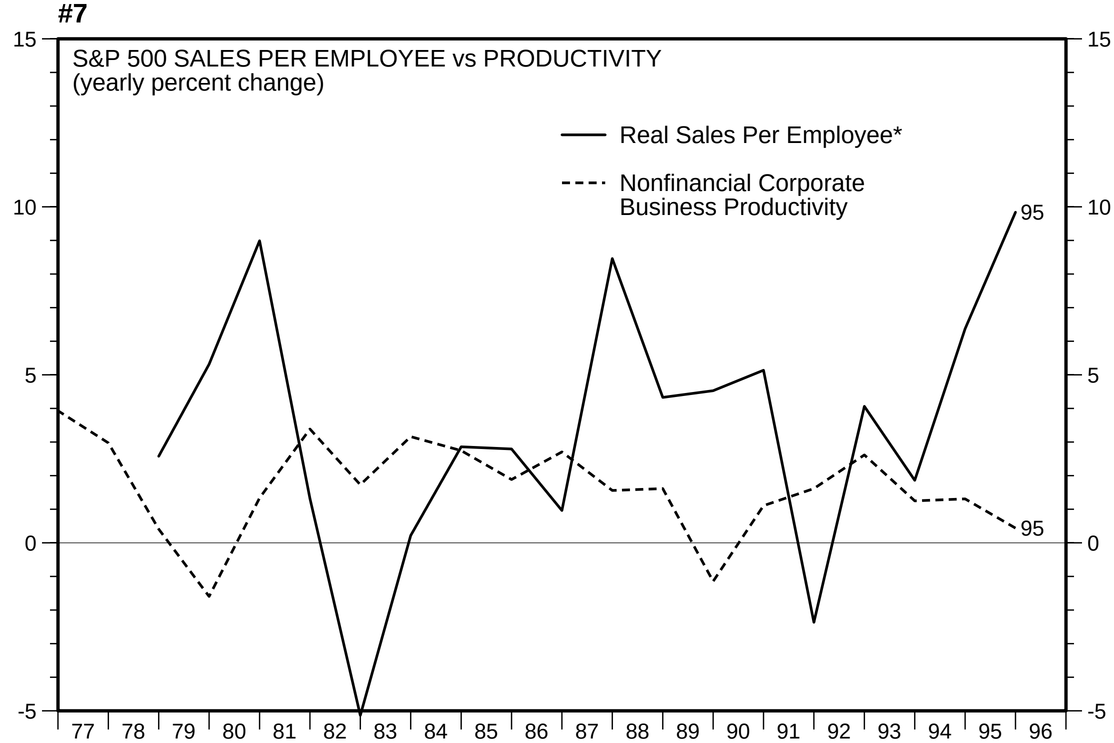
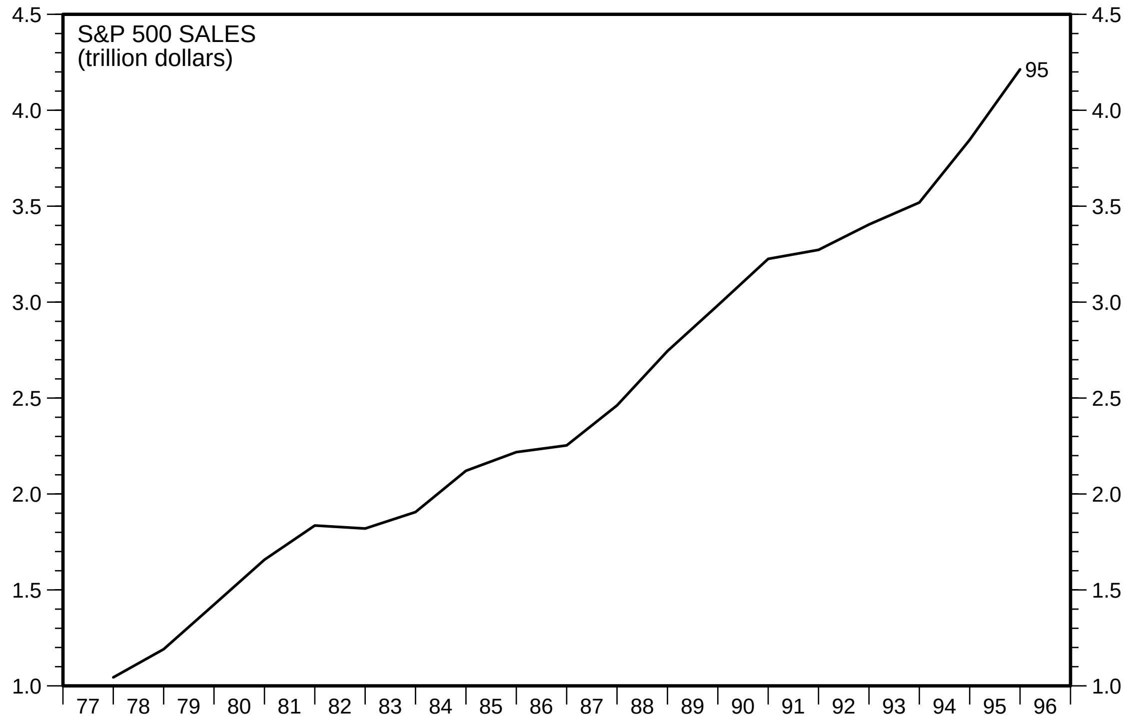


* Using Nonfinancial Corporate Business GDP Price Deflator.
Source: Standard & Poor's Corporation, FactSet Research Systems, Inc, and US Department of Commerce.

- S&P 500 Sales -

S&P 500 companies' sales probably rose over $4.5 trillion in 1996. All corporations now account for over 60% of GDP. Looks like S&P 500 companies have been gaining share of GDP since mid-1980.

#8



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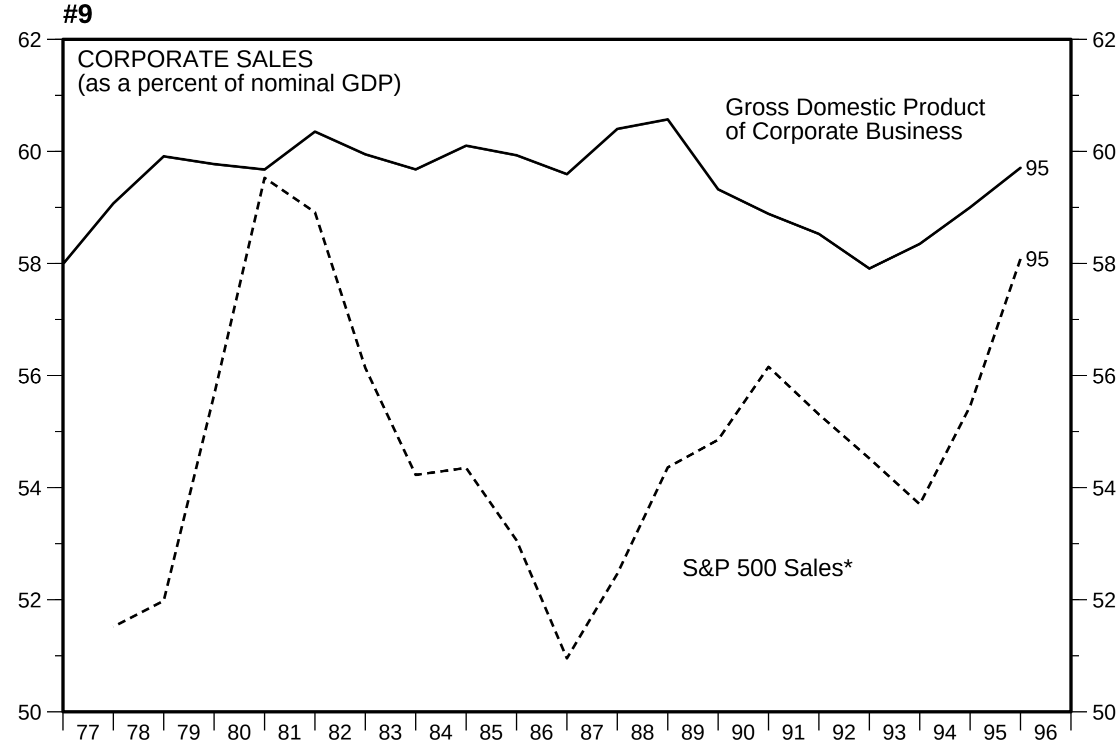


* Warning note: GDP is goods and services produced in the US and sold to domestic and foreign end-users. S&P 500 sales include sales of intermediate and foreign-produced goods and services.

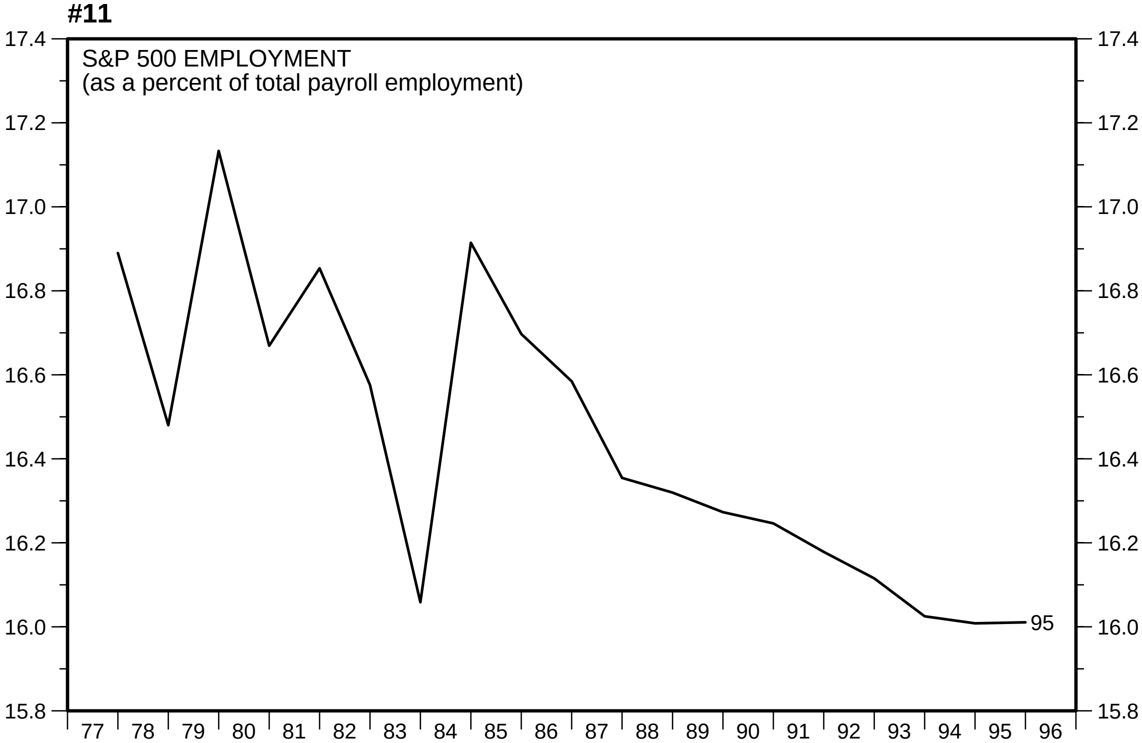
- S&P 500 Employment -

#10

Source: FactSet Research Systems, Inc.

S&P 500 companies' employment is at a record in absolute terms, but low relative to total employment.

#11



Source: FactSet Research Systems, Inc.

TOPICAL STUDIES

Topical Studies #19 and higher are available on http://www.yardeni.com/yardeni/topical.html

#32 Dr. Edward Yardeni, *The Undefeated Forces Of Deflation*, October 28, 1996

#31 Dr. Edward Yardeni, *Economic Consequences Of The Internet*, October 22, 1996

#30 Dr. Edward Yardeni, *Backlash: Workers Vs. Bonds*, May 8, 1996

#29 Dr. Edward Yardeni with Amalia Quintana, *The Baby Boom Chart Book 1996*, March 28, 1996

#28 Dr. Edward Yardeni, *Liquidity Story Is Wildly Bullish*, February 12, 1996

#27 Dr. Edward Yardeni, *10,000 In 2000*, November 6, 1995

#26 Dr. Edward Yardeni, *The US Economy's Mega-Trends*, July 10, 1995

#25 Dr. Edward Yardeni, *The High-Tech Revolution In The US of @*, March 20, 1995

#24 Dr. Edward Yardeni, *Hard Or Soft Landing?*, February 6, 1995

#23 Dr. Edward Yardeni, *The End Of The Cold War Is Bullish*, September 10, 1993

#22 Dr. Edward Yardeni, *Apocalypse Now! (NOT!)*, May 8, 1992

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#19 Dr. Edward Yardeni and David Moss, *The Triumph Of Adam Smith*, July 17, 1990

#18 Dr. Edward Yardeni and Deborah Johnson, *Dow 5000*, May 9, 1990

#17 Dr. Edward Yardeni, *The Triumph Of Capitalism*, August 1, 1989

#16 Dr. Edward Yardeni with Amalia Quintana, *The Baby Boom Chart Book*, January 25, 1989

#15 Dr. Edward Yardeni and David Moss, *The New Wave Manifesto*, October 5, 1988

#14 Dr. Edward Yardeni, *Could Real Estate Prices Fall? And What If They Do?*, August 24, 1988

#13 Dr. Edward Yardeni, *The Coming Shortage Of Bonds*, June 20, 1988

#12 Dr. Edward Yardeni, *How The Baby Boomers Are Changing The Economy*, April 6, 1988

#11 Dr. Edward Yardeni and Deborah Johnson, *The Restructuring Of Corporate America Is Bullish*, December 9, 1987