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Topical Study #47

The Technology Lottery



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I. The Lottery Principle

And undoubtedly some of these small companies which are—stock prices are going through the roof will succeed. And they very well may justify even higher prices. The vast majority are almost sure to fail. That's the way the markets tend to work in this regard. There's something else going on here, though, which is a fascinating thing to watch, and it's, for want of a better term, the lottery principle. What lottery managers have known for centuries is that you could get somebody to pay for a one-in-a-million shot more than the value of that chance. In other words, people pay more for a claim on a very big payoff, that's where the profits from lotteries have always come from. And what that means is that when you're dealing with stocks—the possibilities of which are either it's going to be valued at zero or some huge number—you get a premium in that stock price which is exactly the same sort of price evaluation process that goes on in a lottery. So the more volatile the potential outlook—and indeed, in most of these types of issues, that's precisely what is happening—you will get a lottery premium in the stock. But the answer to the question is, is there some hype in this? Of course there's some hype. There's hype in lots of things. But there is at root here something far more fundamental, and indeed it does reflect something good about the way our securities markets work. Namely, that they do endeavor to ferret out the better opportunities and put capital into various different types of endeavors prior to earnings actually materializing. That's good for our system. And that in fact, with all of its hype and craziness, is something that at the end of the day probably is more plus than minus. (Fed Chairman Alan Greenspan, from the Q&A of his Congressional testimony on Social Security before the US Senate's Budget Committee, January 28, 1999.¹)

II. Winning Tickets

Since 1996, Fed Chairman Alan Greenspan has been searching for a way to value stocks. So have I. In his famous December 5, 1996 speech, he first raised this issue when he asked, “But how do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions....”² At first, to do so, he compared the 12-month forward earnings yield of the S&P 500 to the 10-year Treasury bond yield.³ This led Mr. Greenspan to conclude that investors must have very high expectations for earnings growth and very low risk assessments to justify the market's lofty valuation levels. He implied that these assumptions might be irrational.

¹ Professor David Moss of the Harvard Business School brought this quote to my attention. Professor Moss is currently working on a book about government's role in managing risk.

² <http://www.bog.frb.fed.us/boarddocs/speeches/1996/19961205.htm>

³ See www.yardeni.com/stocklab.html for several articles on the Fed's Stock Valuation Model.

His statement above suggests that he now believes that the stock market has become a lottery and that valuations can be justified based on a “lottery principle.” As I’ve shown in my recent commentaries, the bull market in stocks has been narrowing significantly since April 1998. Fewer stocks have been leading the advance. They’ve been mostly big cap technology stocks, which now sport amazingly high valuation multiples. Does it make sense to justify these heady tech valuations using Mr. Greenspan’s lottery principle?

I don’t think so. And in any event, it is disturbing to see the Fed Chairman speculating about why speculation makes sense. Technology is the most innovative industry. It is also the most competitive. To justify current tech valuations using traditional valuation models requires very optimistic predictions for earnings growth. Projecting that the fast earnings growth rates experienced by some technology companies will continue into the future and spread to other tech companies, that are currently losing money, is questionable.

However, while forecasting earnings for individual tech companies may be hazardous work, I think it is reasonable to assume that the overall tech sector will continue to be the fastest growing one in our domestic and global economies for at least another decade. Investors increasingly seem to be valuing tech companies within a portfolio of several tech stocks—as a group rather than individually. They figure the tech lottery will continue to have a huge payout. So they are willing to buy lots of tickets at scalpers’ prices to play the game. “You got to be in it to win it,” is their mantra. Some stocks may disappoint; some tickets will be worthless. But many should meet expectations, and at least some are likely to surpass projections if the tech sector continues to grow so rapidly.

In other words, the lottery principle does help to explain current valuations. I don’t think it justifies them. But I could be wrong. Lotteries are a game of chance. So is the stock market, I suppose. And so is life.

Even more unjustified than the valuations of the high-flying high-tech stocks are the low valuations of the rest of the market. After all, the biggest beneficiaries of the new technologies are the low-tech customers of the tech vendors. Tech-struck investors may be seriously underestimating the future earnings growth of the low-tech companies. Most of these companies are likely to use the new technologies to slash their costs and pump up their productivity.

The November 15 issue of the online version of *The Wall Street Journal* included a fascinating special technology section on the tremendous savings that many companies are likely to experience from “software outsourcing.” Accounting, human resources, procurement, sales, and many other business functions can be performed by third-party vendors over the Internet. Companies no longer must have systems and departments that are very expensive to set up and to maintain in-house.

III. Life In The Fast Lane

I first started to write about the High-Tech Revolution in the January 7, 1993 issue of my *Weekly Economic Analysis*. I wrote that “the US economy is on the threshold of a major Technological Revolution, led by the personal computer. This revolution will continue to boost productivity well above the anemic growth of the 1970s and 1980s.” In my *Topical Study #25*, “The High-Tech Revolution In The US of @,” dated March 20, 1995, I observed:

The standard tools of macroeconomic analysis, particularly business cycle indicators, may no longer accurately reflect the true nature of our economy. Similarly, forecasts based solely on the business cycle model may also miss the mark. The secular trends unleashed by the High-Tech Revolution could overwhelm the cyclical pattern of the low-tech economy. This is not to say that the business cycle is dead. However, it may no longer dominate the course of economic growth as it did in the past.⁴

I was very bullish on the outlook for the stock prices of high-tech companies. During early 1995, they accounted for 11% of the market capitalization of the S&P 500, up from 7% during 1992. I predicted, “As high tech becomes a bigger and bigger share of the economy, this capitalization ratio should at least match, and will probably surpass, the 1984 high of 17% of the S&P 500.”

It certainly has done so. Indeed, the high-tech sector now accounts for 25% of the S&P 500. The technology and communication sectors together now account for 33% of the S&P 500, up from 21% two years ago. The market capitalization of technology is a staggering \$2.9 trillion, or 52.7 times the \$55 billion four-quarter trailing net income of all of the technology stocks included in the S&P 500. Adding the communication sector’s stocks yields a total market cap of \$3.9 trillion, or 48.3 times four-quarter trailing net income of \$80 billion (Exhibits 1 and 2).

These market cap to net income multiples are truly breathtaking. But do they make any sense? Can they go any higher? Can traditional valuation models justify these multiples? Yes, but only if one assumes extraordinarily fast earnings growth rates for the next several years. Of course, the earnings growth rates of many tech companies have been quite impressive in recent years. Indeed, four-quarter trailing net income of the S&P 500 tech stocks is up 90.7% from the prior four quarters. But technology is perhaps the most competitive of all businesses. And recent earnings strength partly reflects easy comparisons from a year ago when the Asia crisis depressed global economic activity. Extrapolating past and current growth rates for individual tech companies into the distant future may be overly optimistic.

⁴ www.yardeni.com/topical.html

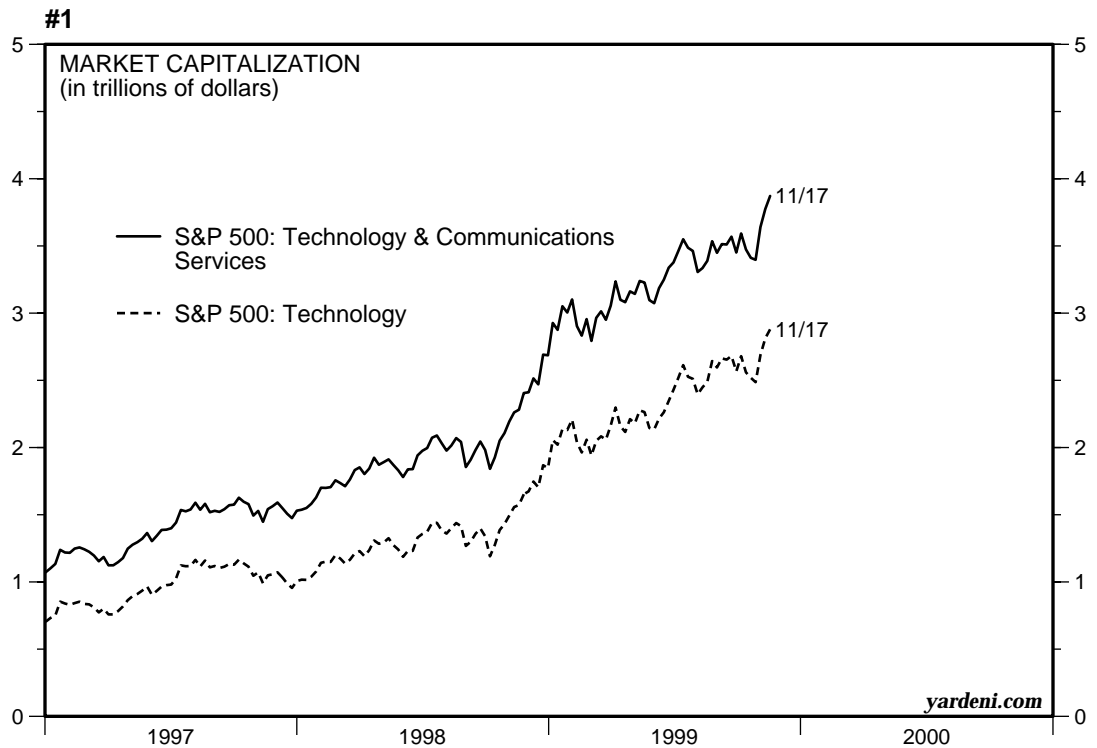
On the other hand, the technology industry as a whole certainly has been growing at an extraordinary pace as shown in Exhibits 3-10, which focus on business spending on high-tech⁵:

- 1) Business high-tech equipment and software expenditures now account for 6% of real GDP, up from only 3% in 1995 (Exhibit 3). Over the past four quarters, real GDP grew 4.1%, with business purchases of high-tech equipment and software accounting for 1.1 percentage points of the growth (Exhibit 4).
- 2) The market is huge: At an annual rate, it is over \$400 billion in current dollars presently. In 1996 dollars, real business high-tech spending is close to \$550 billion, double the amount in early 1995 (Exhibit 5). Computers alone are \$250 billion in 1996 dollars, up tenfold since early 1995 (Exhibit 6).
- 3) Over the past four quarters, the growth of real business high-tech spending hit record highs of 25.6% and 17.6% in real and nominal terms, respectively. Spending on computers is up 53.2% and 19.0% in real and nominal terms, respectively (Exhibits 7, 8, 9, and 10).

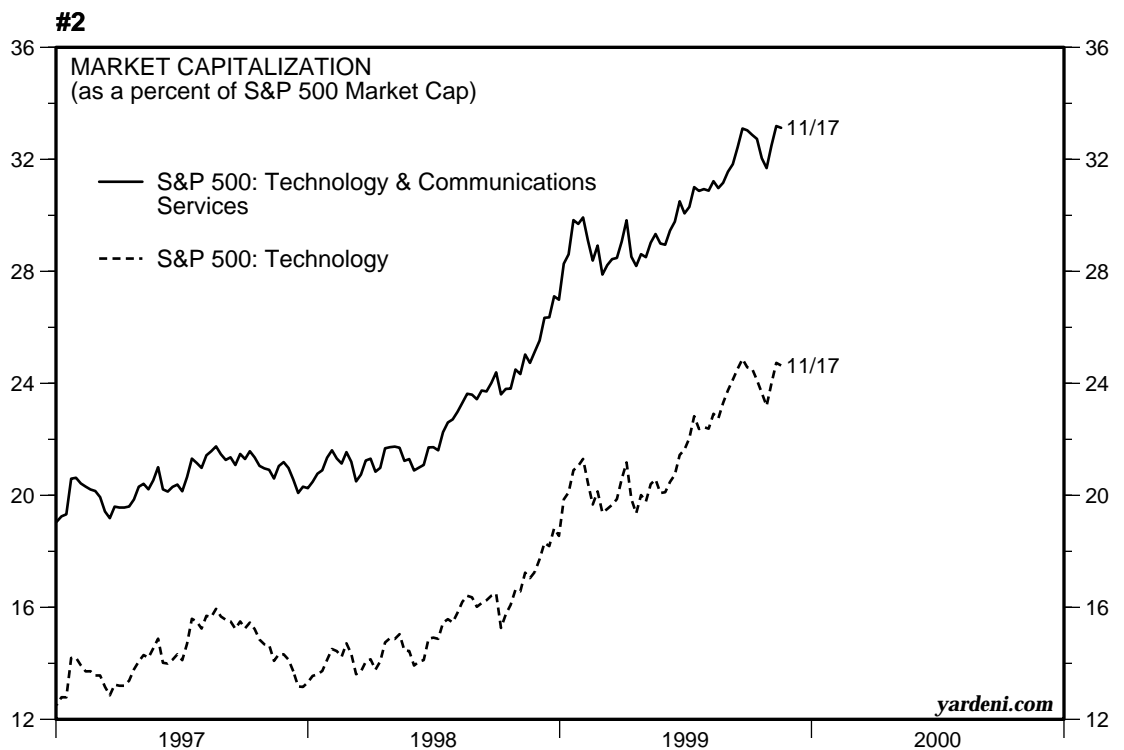


⁵ At the end of October, The Commerce Department included business spending on software in the GDP accounts for the first time. I first advocated adding these outlays to GDP in my 1995 topical study cited above: "None of these figures include spending on software programming, which is expensed rather than capitalized. In my opinion, it should be capitalized." Data on consumer spending for computer hardware and software was not available in time to be included in this study.

- High-Tech -

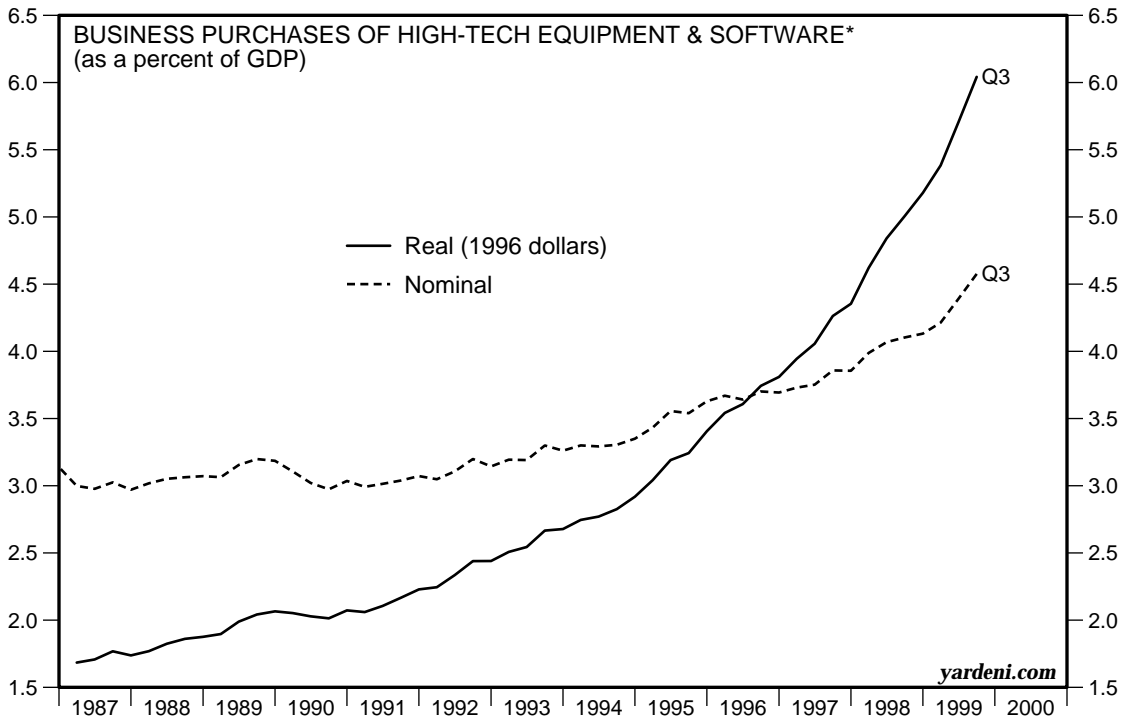


Technology and communications sector has a market cap of nearly \$4 trillion and is one-third of total S&P 500 market cap.



- High-Tech -

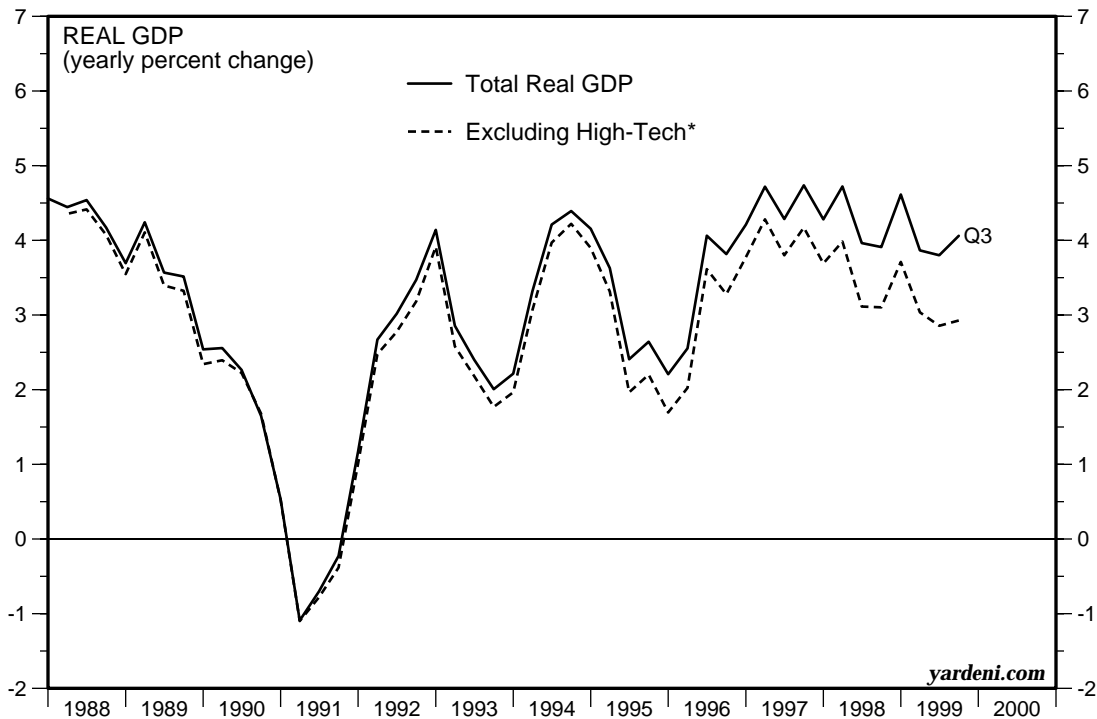
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Business high-tech spending at 6% of real GDP, up from 3% in 1995.

* Information processing equipment & software spending which includes office, computing & accounting machinery, communication equipment, photographic equipment, and scientific and engineering instruments.

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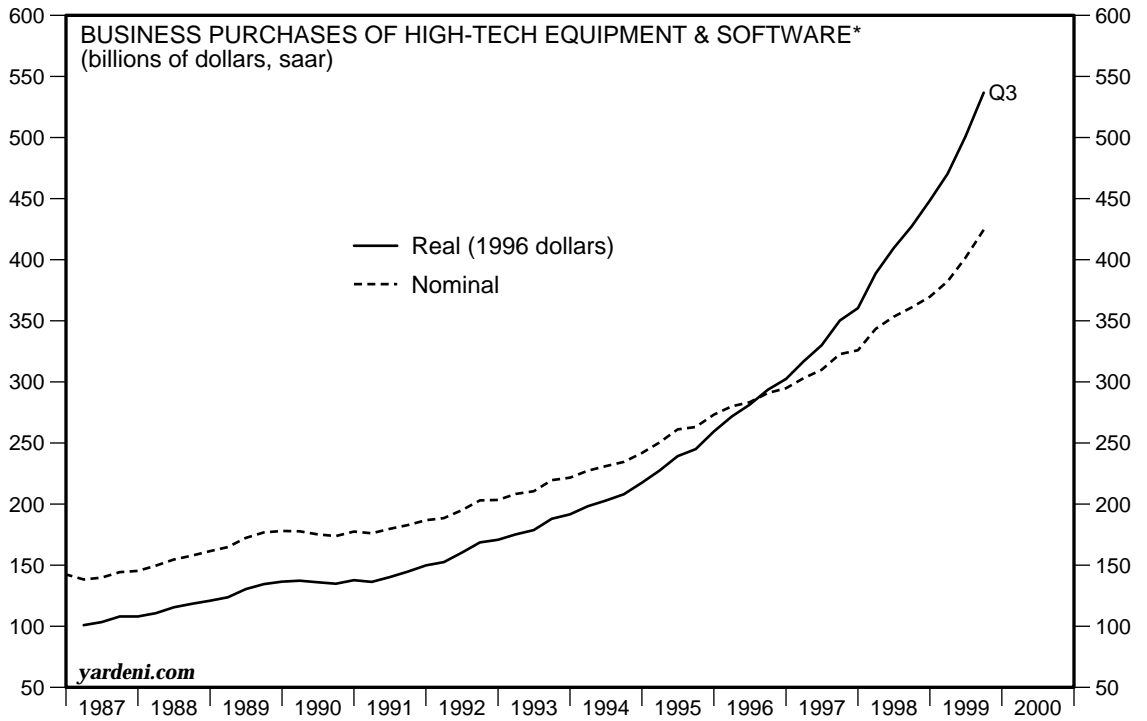


Over the past year, business high-tech spending has added more than a full percentage point to real GDP growth.

* Business purchases of high-tech equipment and software in 1996 dollars.

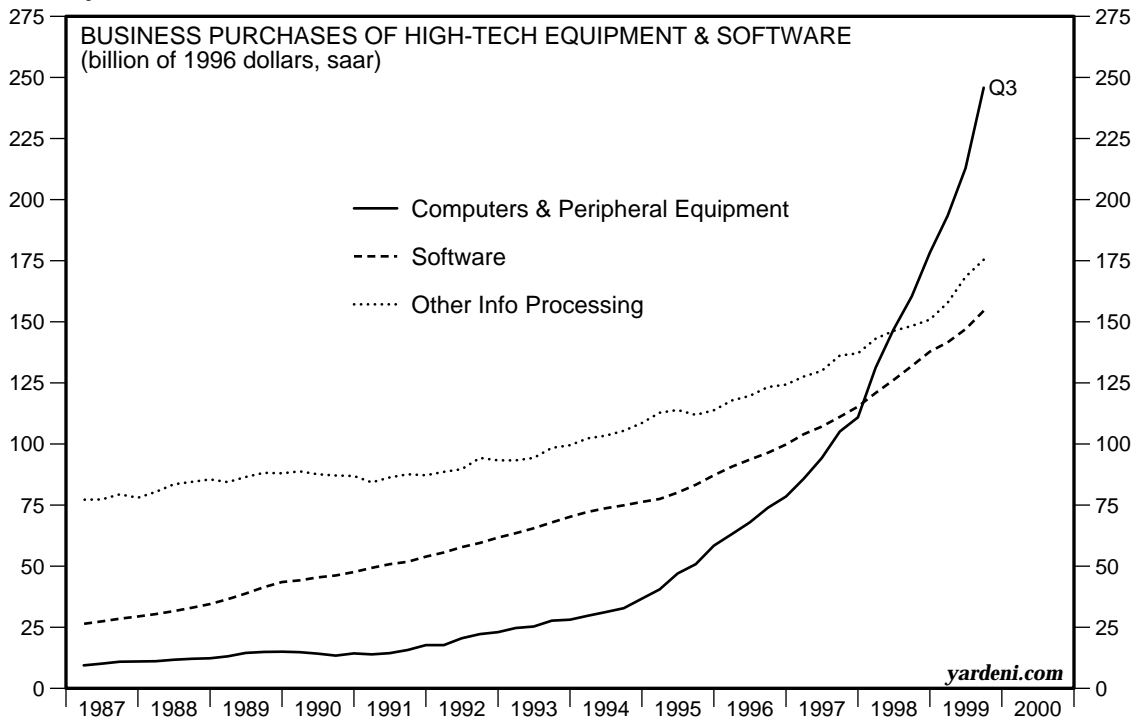
- High-Tech -

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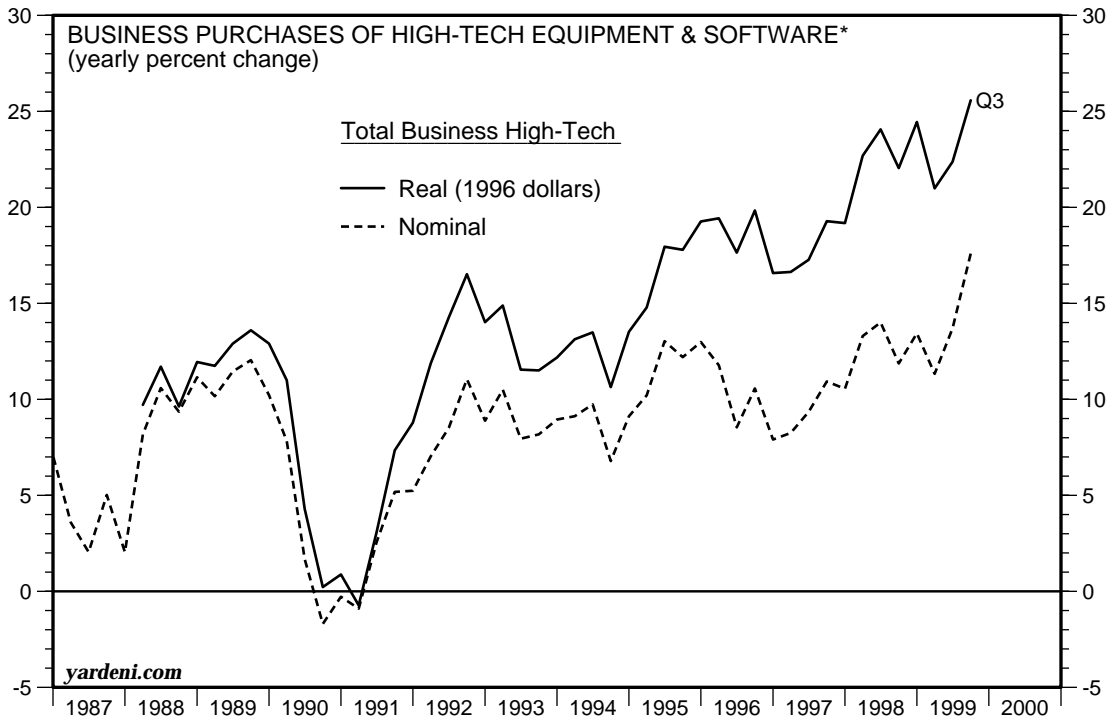
Business high-tech spending rising at rapid pace led by computer outlays, which are up tenfold since 1995 in real terms.

#6



- High-Tech -

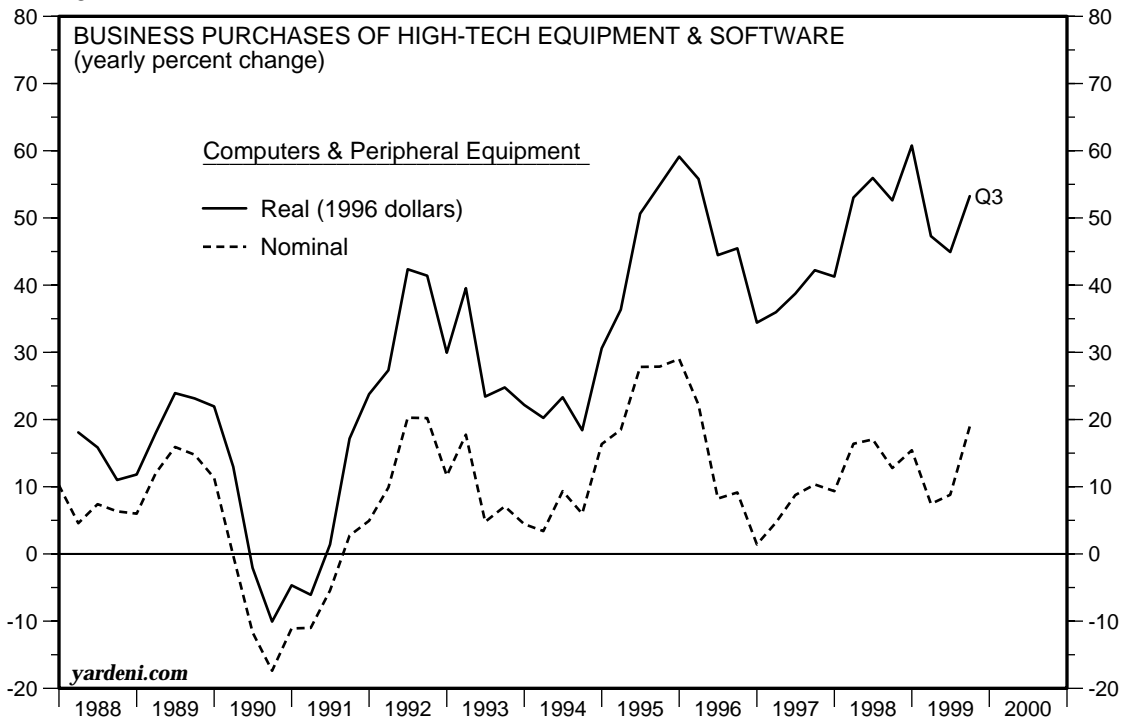
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During the third quarter, growth rates of business high-tech spending hit record highs of 25.6% and 17.6% in real and nominal terms.

* Information processing equipment & software spending which includes office, computing & accounting machinery, communication equipment, photographic equipment, and scientific and engineering instruments.

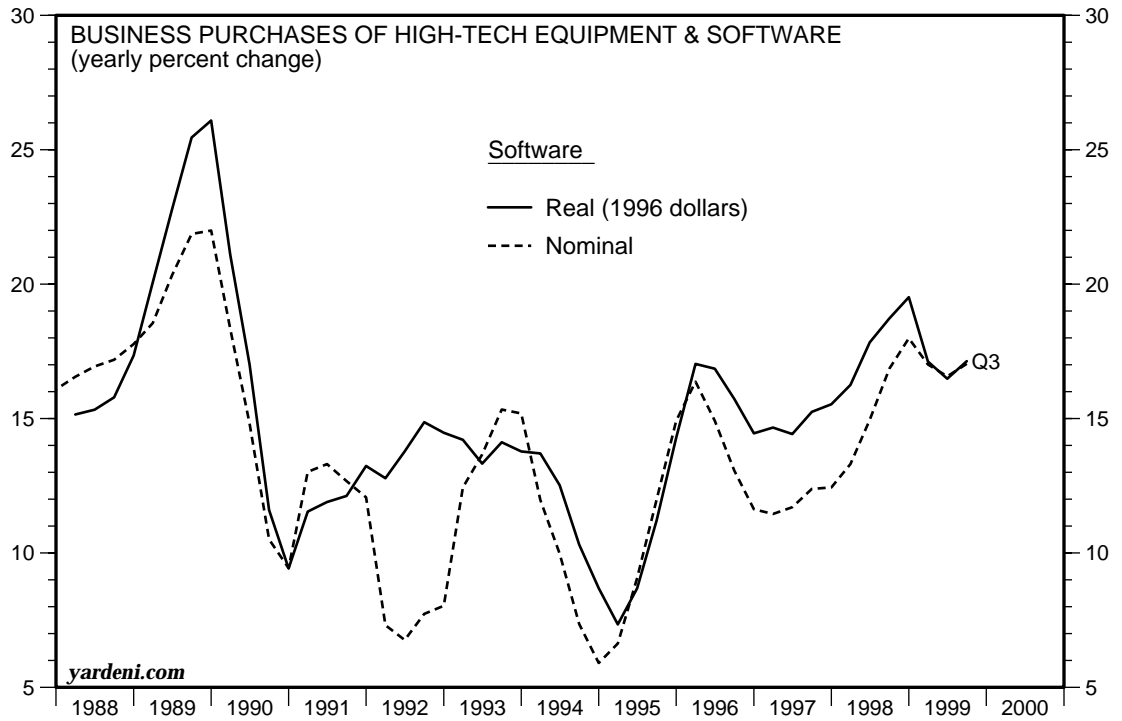
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Business computer outlays up 53.2% and 19.0% in real and nominal terms. Nominal rate is highest since 1995, but below that year's peak.

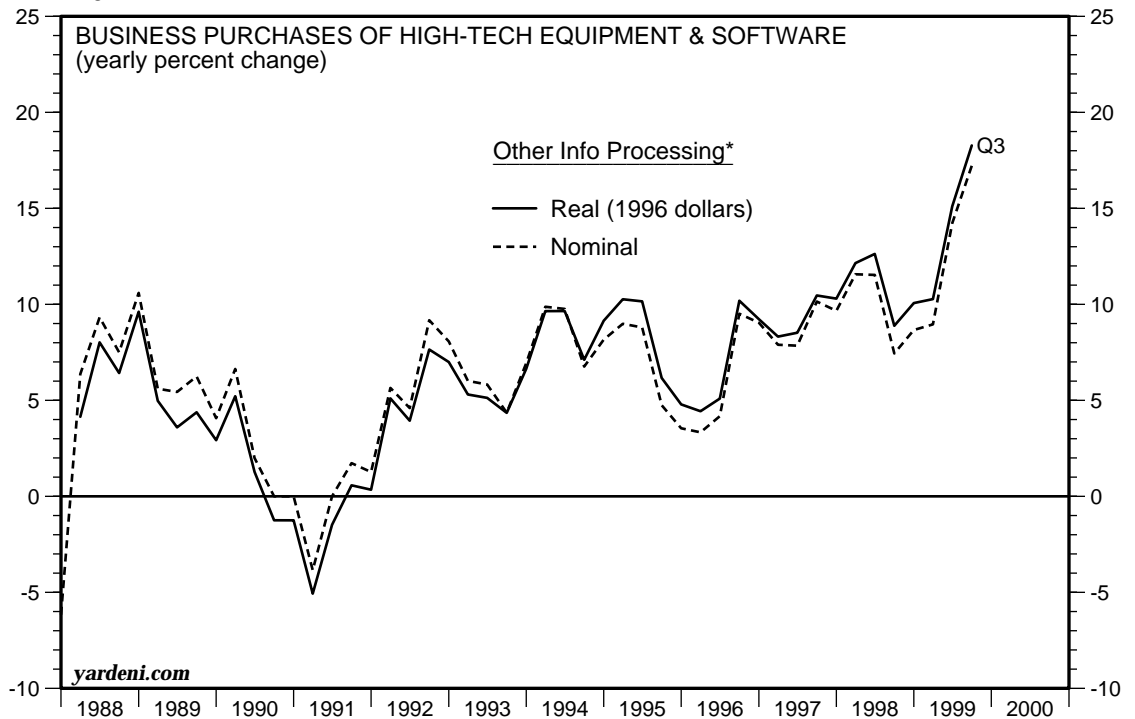
- High-Tech -

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Business software outlays up 17%.

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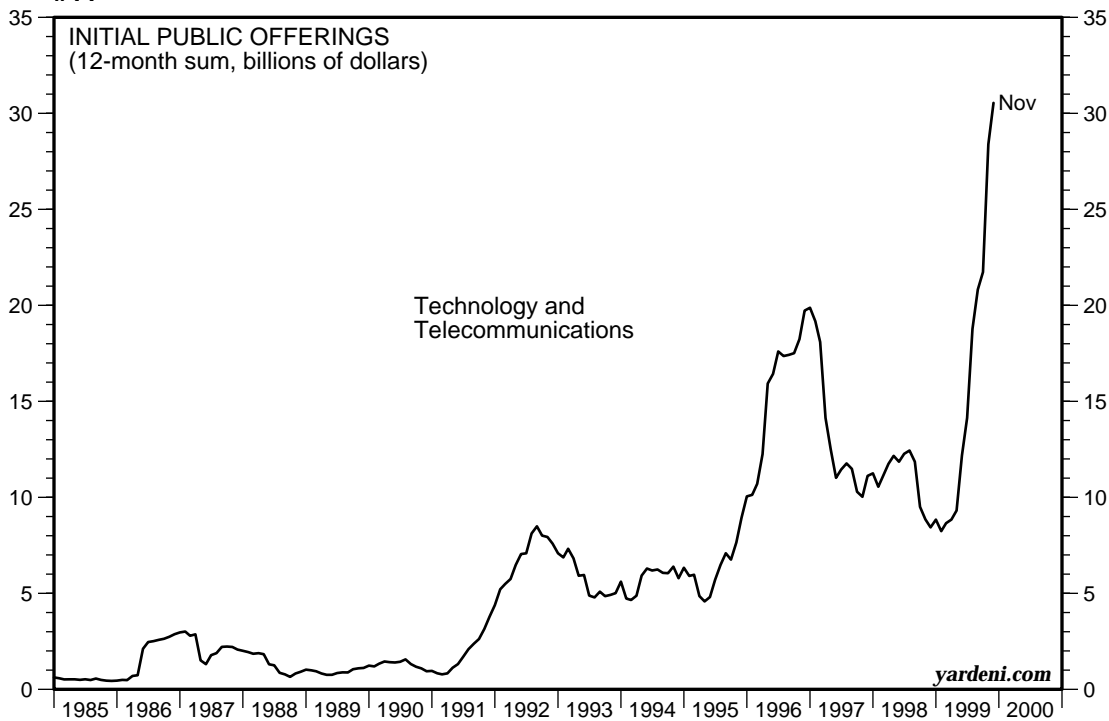


Growth rate of business spending on "other information processing" jumps to record high.

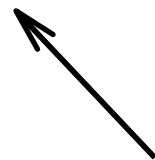
* Includes office & accounting machinery, communication equipment, photographic equipment, and scientific and engineering instruments. Excludes computers and software.

- High-Tech -

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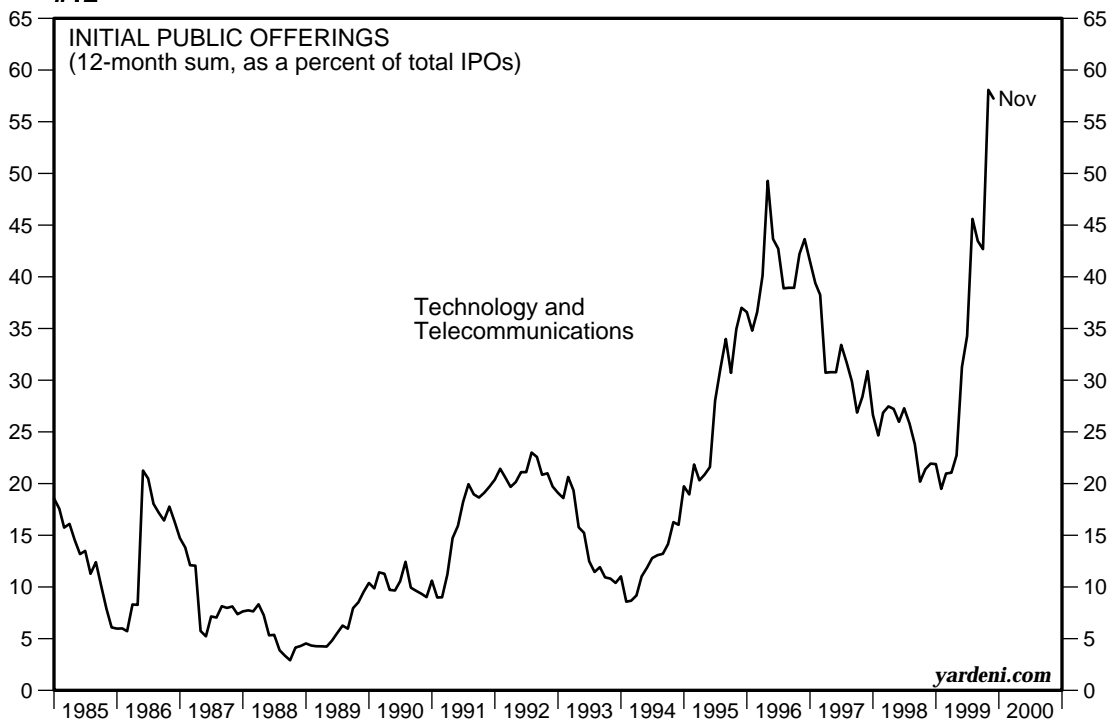


* Source: Securities Data Corp.

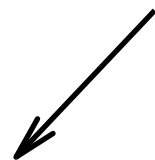


Tech and telecom IPOs soar to a record 12-month sum of \$30 billion and account for more than 55% of total IPOs over the past year.

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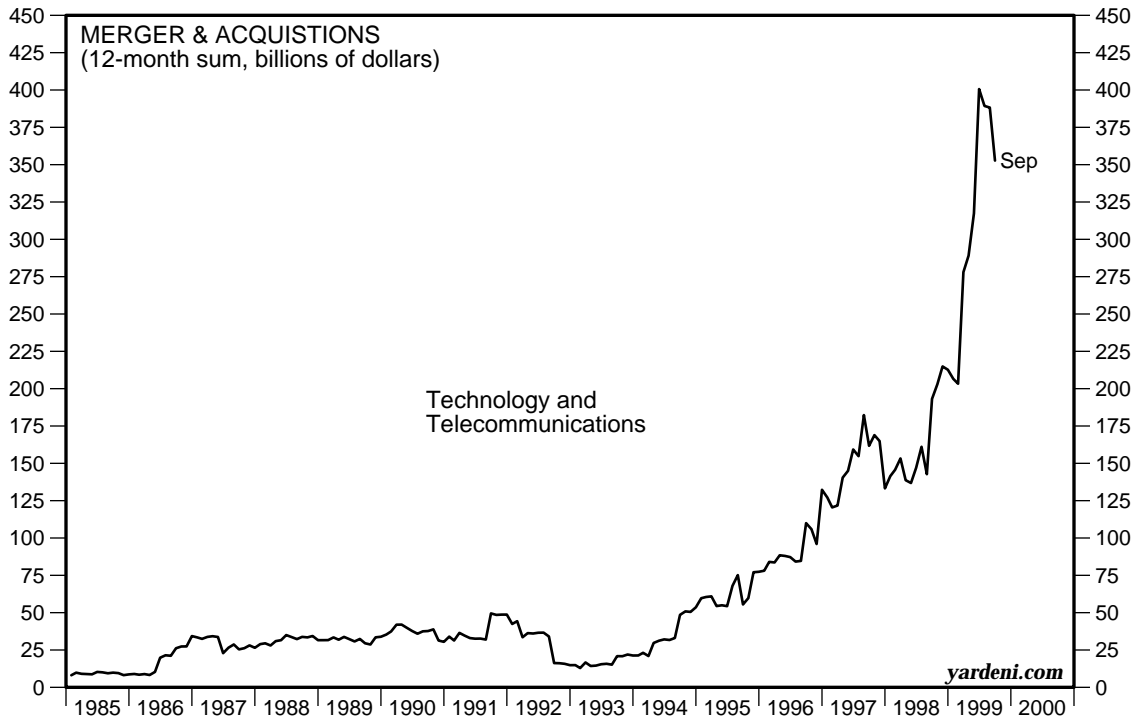


Source: Securities Data Corp.



- High-Tech -

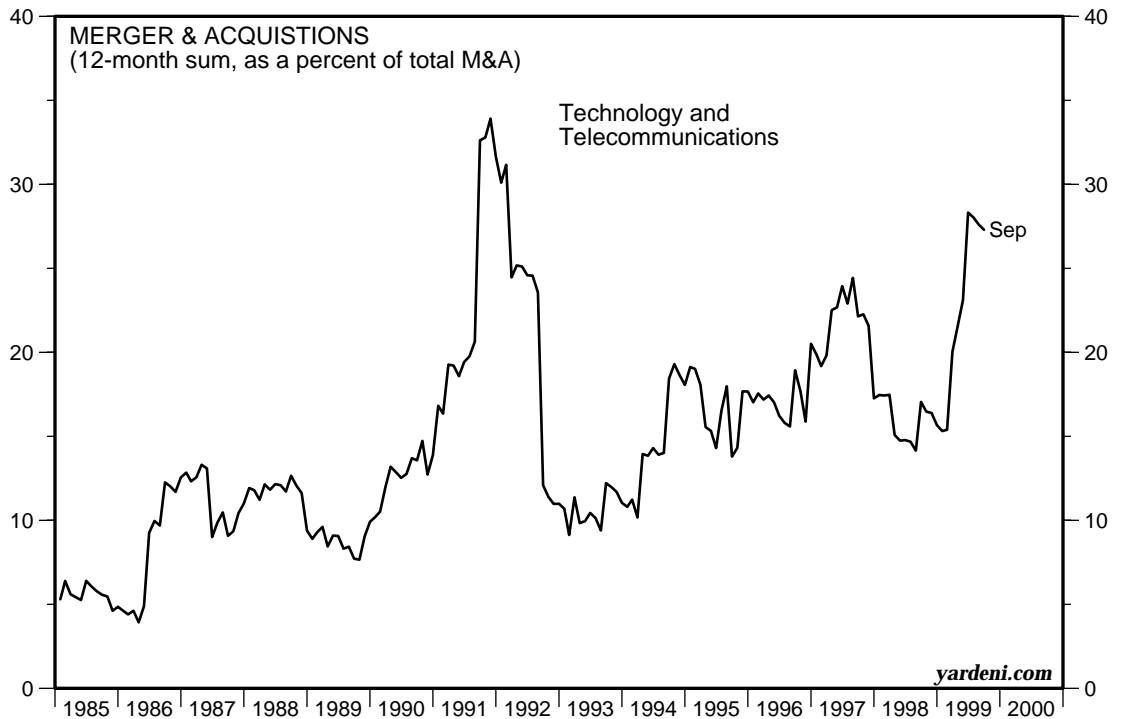
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Source: Securities Data Corp.

Technology and telecom M&A activity exceeds \$350 billion over past 12 months and accounts for more than a quarter of total M&A activity.

#14



Source: Securities Data Corp.