



The ride before the fall

An inside scoop on the high-tech stock market bust

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..... The market capitalization of many high-tech firms came down in a short period of time right around the turn of the millennium. There is no question that this was a shock to many people and disruptive to the economy as a whole. Stock options became worthless. Some investors lost a fortune in paper wealth. Other people lost their jobs.

To be sure, some part of reevaluation of technology companies involved the absence of clothes on the dot-com emperor. Many did not want to admit their earlier, overoptimistic economic forecasts, and so did not recognize the beginning of the fall. Further, the events of 11 September made an already bad situation worse. That said, this event only provides part of the story; the reevaluation of high-tech firms started prior to September. The reevaluation also extended beyond new firms to the big lead-

ers among them, such as Yahoo.

Large established firms—Intel, Cisco Systems, Microsoft, Lucent Technologies, Sun Microsystems, IBM, and JDS Uniphase, for example—were also revalued. The decline in these widely held firms hurt many sophisticated investors. The recent unexpected crashes and large losses should not have hurt such smart money.

These events illustrate some general principles about how to value ongoing, operating firms. To understand those principles, however, you need to address many simple myths about stock values. In particular, it is commonly stated that stocks were bid up by the Internet investment fad. That statement captures a grain of truth, but also begs a big question. Fads are social phenomena, affecting hula hoops and Beanie Babies. When smart money is at risk, its investors cannot

afford to lose money following social fashion. In other words, fads alone should not lead to the revaluation of firms.

In what sense did a fad influence high-tech stock value? Can we reconcile these events with conventional explanations, which are usually skeptical about the existence of such fads?

Just the facts

The facts are pretty startling on the surface. Table 1 summarizes these facts, derived from data sent to me by Janet Kidd Stewart, a *Chicago Tribune* business reporter. The table shows the recent market capitalization peak and trough for several high-tech stalwarts.

First, note the extent of the decline in market capitalization. Each company experienced a decline in market value in the hundreds of billions.

Table 1. Recent market capitalization for some leading high-tech firms.

Company	High market capitalization (billions of dollars)	Date of high	Low market capitalization (billions of dollars)	Date of low	Loss from peak (billions of dollars)	Loss from peak (%)
Cisco Systems	610.9	Mar. 2000	82.4	Sept. 2001	528.5	86.5
Microsoft	664.2	Dec. 1999	224.2	Dec. 2000	440.0	66.2
Intel	531.2	Aug. 2000	130.4	Sept. 2001	400.8	75.4
Lucent Technologies	250.8	Dec. 1999	17.0	Oct. 2001	233.8	93.2
Sun Microsystems	222.1	Sept. 2000	24.4	Sept. 2001	197.7	89
JDS Uniphase	124.9	Mar. 2000	6.8	Sept. 2001	118.1	94.5
IBM	260.2	July 1999	143.3	Dec. 2000	116.9	44.9
Yahoo	153.3	Jan. 2000	4.6	Sept. 2001	148.7	97

Second, notice the timing. Every peak occurred prior to or in early September 2000, with most happening in early 2000 or late 1999. Every trough occurred during or after December 2000. Most of those lows were prior to or during autumn 2001. In every case it took a little more than a year to travel between peak and trough. That is fast.

Third, notice the spread of the pain. Every major firm experienced a drop in market capitalization. To be sure, each of them experienced their pain in some unique business crisis, whether it was failing to reach a sales target for a new upgrade or failing to manage excess inventory in the supply chain. But looking beyond that, the similarity of the timing suggests some commonality in the underlying causes.

Fourth, notice the type of firms under the microscope. All these firms have a significant presence in the markets for information equipment and services. All of them have large fractions of revenue tied to business customers throughout the US economy. In other words, these companies are upstream in the value chain for IT services. Their experiences are probably linked because their downstream buyers are the same business organizations.

These facts would seem to suggest that an unexpectedly large industry-wide drop in demand caused a common reevaluation of all these firms. There is only one big problem with that explanation: This type of drop is not supposed to happen at these large firms this quickly.

Why? Because the biggest investors—mutual funds, growth funds, retirement accounts, insurance companies, and so on—own the biggest corporations in high-tech America, such as Intel, IBM, and Sun Microsystems. Large stockholders do not play around with their investments. These stockholders keep portfolios for the long haul, and they only move money around to spread risk.

Sophisticated buyers and sellers do not act like your average day trader. They do not buy and sell in response to a hunch, act at the behest of an anonymous tip, or retreat as part a short-run panic. These buyers and sellers anticipate the future,

make careful assessments, invest and hold for the long term, and develop portfolios of investments spread across a wide variety of firms.

More to the point, sophisticated buyers and sellers do not usually change their minds quickly about a firm's value. Sophisticated buyers estimate a firm's values based on anticipated profits, growth opportunities, comparative standing in the market, and a few other indicators, such as the track records of key executives. To be sure, there is a range of opinions about these matters, but when everyone does their homework, the variance of this range is usually small among smart investors.

Finally, sophisticated traders have the money to back up their opinions with actions that move stock prices. These movements are usually countercyclical. Sophisticated investors get out of the stock market when stock prices are too high and get into the stock market when stock prices are too low. Their actions effectively mute volatility—turning upswings into selling opportunities and downswings into buying situations. Altogether, the smart money brings stability to long-term stock market prices and, hence, to company valuations.

That is how things work. Sophisticated investors invest heavily in market research that frequently takes the pulse of vendors and customers. These investment analysts make a living out of not being surprised. Every economics textbook says so. And, obviously, in the latter part of the millennium, it did not exactly work that way in high-tech stocks. This is the interesting mystery here.

Explaining the decline

Even sophisticated investors must use significant guesswork and prognostication about future market prospects. They always have. But the basic principles never change. A firm's valuation must eventually reflect how much revenue a firm collects over the long haul and whether that revenue exceeds the costs incurred. In this light, what happened? The latter half of the 1990s brought together five coincident events that kept optimism

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Interest rates

Interest rates were low in the latter 1990s, particularly short-term rates. Low rates enable cheap borrowing and more risk taking by investors. This leads to more stock purchases. Low interest rates also make capital equipment purchases cheaper. Therefore, the setting was ripe in the latter part of the decade for an active market. But interest rates started going up in early 2000. This alone could not have caused the dramatic reevaluation, but it was a contributor.

Deregulation

The deregulation of telecommunications took a large yet somewhat halting step forward with the passage of the Telecommunications Act of 1996. This act fostered restructuring in the delivery of many basic data services and the entry of many new intermediate size firms, which generated several sustained years' worth of new equipment sales. By late 1999, however, insiders were beginning to understand that this act would not enable as much entry as originally forecast. Market analysts rescaled their estimates downward.

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Internet diffusion

Perhaps the most surprising event contributing to the great optimism about high-tech revenue was the diffusion of the Internet, which really took off in 1995. The commercialization of the browser and the US government's full privatization of the Internet brought about this diffusion. From that point forward, many observers forecast growth in demand for data services. To be sure, these forecasts were based on guesswork about how far diffusion would go. Certainly the guesses were too optimistic. By early 2000 most households and businesses with PCs had adopted the Internet. This was a onetime event, however. Upgrades to broadband and other new services were slower. The large growth associated with Internet diffusion was over.

Y2K

Somewhat to the IT consulting industry's amusement, fears about Y2K generated a temporarily large increase in IT budgets at major corporations in 1997 through 1999. Under the umbrella of "fixing potential Y2K problems," many CIOs used these increased budgets as a way to correct problems they had wanted to fix for years. These budget increases were temporary, of course. With the Y2K non-event, many CIOs did not get those elastic budgets in 2000 and beyond.

Attitudes

Lastly, and not trivially, the Internet's commercialization spawned a social movement about future change, and this movement worked its way into estimates of many upstream firms' prospects. At first, analysts were cautious. Anybody can go back and read the early 1996 reports coming from Mary Meeker of Morgan Stanley Dean Witter and Henry Blodget, then of Merrill Lynch, and find analyses that are measured in tone, financially careful, and accurate.

By 1999, however, this movement took on a different momentum. It involved a collective vision about the future that was unabashedly optimistic and on the edge of being unrealistic. This later, undisciplined form was revolutionary in tone. The leading prophets foresaw a new economy. They claimed that many old rules had become obsolete. Several of these prophets derided skeptics as old-fashioned and narrow-minded fuddy-duddies who "didn't get it."

Revolutionary fervor was intoxicating, and it was useful for recruiting employees to entrepreneurial firms. However, any sober-minded investor could read the financial reports of data sector companies and see a potential problem. All the growth forecasts were founded on projections about increased use of data services, which, in turn, depended on the rapid diffusion and commercial success of many of the new business models using Internet technologies. Those projections were unrealistic and based on the revolutionaries' assertion that every business and household in the western world would move to Internet services.

What happened?

Of course, this shift did not happen. Why did this become so suddenly apparent in late 1999 and early 2000?

The insiders played an interesting role. By 1999 many of the dot-coms were not showing the revenues their venture capitalists had anticipated from 1996 through 1998, the period when those firms were founded. Quietly, the smart venture capitalists started pulling their money out in 1999, refusing to start new firms. Sure, the market for initial public offerings was still strong in 1999. So some venture capitalists did not stop trying to go public with the firms they already had investments in, at least not right away. Yet, by mid 2000, short-term interest rates were rising. This was enough to make some big investors reconsider whether they wanted to invest in these IPOs.

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2000, the skeptics' views became public, and everyone started to reevaluate their previous assessments. And, low and behold, they discovered that they had founded their previous beliefs about the potential of dot-coms on excessively optimistic forecasts. It was not a pretty thing to watch.

It all came down

Optimism is a psychological state of mind. It is vulnerable to short-run influences and social pressure. It persists for any number of reasons, but not in the face of serious financial losses—at least, not with smart investors.

In other words, once the smart money saw that the most optimistic forecasts were unrealistic, they inconspicuously withdrew their money, selling to others who still were in the optimistic group. Other, mildly less smart money, then saw what was happening and within a few months, the new realism began to spread. The result was a massive and comparatively quick reevaluation of many high-tech firms.

Ironically, the new economy overvaluation was sunk by some pretty old textbook economics. It arrived just a little later and less gradually than most of the old-fashioned fuddy-duddies expected.