Investment Policy

PaineWebber

Net for Naught?

As with most early "new technology" companies, many small Internet companies will not survive

Highlights

■ The Internet Revolution offers great potential rewards. But a review of history suggests that the risks are high when investing in young, high-growth industries:

- Of 485 auto companies that entered the business between 1900 and 1908, 262 were gone by the latter date. Only a few survived for long.
- Personal computer stocks boomed in 1982-83, but by February 1984 a group of 24 leading PC stocks were, on average, 50% below their 52 week high. Moreover, most of the leaders in the 1982-83 boom exited the business in a few years. Many of today's leaders (e.g., Compaq, Dell, Gateway) were not yet publicly traded companies during the boom.
- Biotech stocks soared in 1991 but sank in 1992. Of 35 leading biotech companies at year-end 1991, only 10 have a higher price now than at the end of 1991. Of the other 25, 6 were acquired (on average well below their year-end 1991 price); 13 never regained their year-end 1991 price; and 6 temporarily rose above their year-end 1991 price but are now below it. On average it took companies 3.5 years to surpass their 1991 closing price.

■ This experience suggests four risks to consider when investing in the Internet:

- One can pay too much for even the best company.
- Even an "industry leader" may not survive for long.
- Beware of mediocre companies that come to market simply because there is a demand for them.
- High-tech booms occur when cyclical trends in the stock market and economy favor an industry, but these trends can change rapidly.

■ List 75+ "pure" Internet plays. Survivability, not valuation, is key issue for many of these small Internet stocks. Fewer than a handful will likely prove to be good investments.

■ Also list 100+ "diversified" companies with *some* Internet exposure. There, best risk/reward is in established companies that can use growth of Internet to extend their franchise, but are not at risk of failure if their Web strategy misfires. Eight "Converging Technologies" stocks on *Highlighted List*: America Online, Compaq, Disney, Gannett, Microsoft, New York Times, Staples, WorldCom.

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Deja vu?

Today's mania for stocks that are even remotely Internet-related is not unprecedented. As discussed in detail below, in the past there have been distinct manias for other "new technology" companies, with investors furiously bidding up the stock prices of even the most speculative operation. And although such "new technologies" as the auto, PC and biotech industries have emerged as key segments of the economy, none of these previous speculative manias ended happily for investors. All of them shared the characteristic that, as long as there was a "greater fool" willing to pay up, stock prices went higher. But once reality failed to live up to hype, the bubble burst for many of these companies.

To those investors who desperately feel the need to have "Internet exposure" regardless of the price, consider the following questions:

- Just as the U.S. did not need 485 auto companies, do we really need *every one* of the 75+ "Internet companies" listed in Table A1b?
- How many of today's Internet "industry leaders" will share the same fate of Atari, Commodore and Tandy, the industry leaders in the PC business in 1982?
- And given their lack of earnings—and as was the case with biotech stocks in 1992—could the prices of many small Internet stocks plunge without becoming demonstrably cheap?

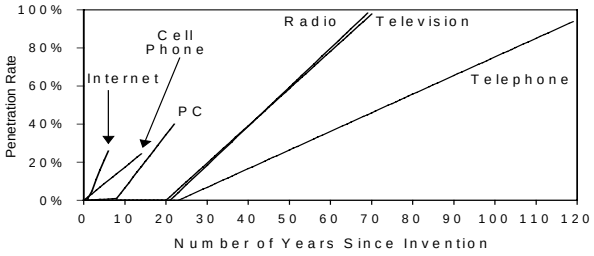
While the Internet *is unquestionably a tremendous source of growth* the prudent way to play the Web is via the strategy laid out in our September 1, 1997 report "Converging Technologies." As we noted, "the most valuable Web sites will be owned by the companies that already have strong brands, e.g., entertainment companies with large film and music libraries, newspaper companies with respected publications and retailers with a reputation for quality merchandise. One exception to this is 'portal sites,' the best example of which is America Online. . . which has a valuable franchise because it is the port by which many users enter the Web."

A question of tactics

The Internet is the technology that today best exemplifies the convergence of the computer, communications, consumer applications and content outlined in "Converging Technologies." While TV took 35 years to reach 30% of households, the Web should hit that mark by the year 2002, only eight years after its popular debut (Chart 1). The spread of the Web has been accelerated by

Chart 1

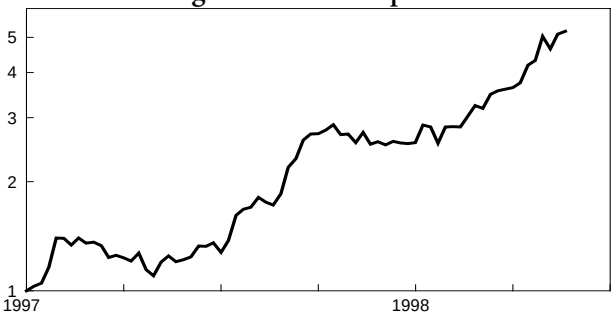
Years to reach various household penetration rates *of key new technologies*



Source: PaineWebber

Chart 2

Price index of eight Internet companies*



*Equal-weighted index of Amazon.com, America Online, Excite, E*trade, Infoseek Lycos, Netscape, and Yahoo!

Source: PaineWebber

the sharp decline in PC prices, which has boosted household penetration rates from 40% at the beginning of 1997 to 45-50% today.

Reflecting this explosive growth, "Internet stocks" have been soaring. Despite the drag from Netscape (down 47% since the start of 1997), an index of eight well-known Internet stocks—Amazon.com, America Online, Excite, E*trade, Infoseek, Lycos, Netscape, and Yahoo!—has climbed 419% since the start of 1997 and 81% thus far in 1998 (Chart 2). This puts many investors in a bit of a bind. Even if the Web's future is immensely promising, many stocks, at their current valuations, could turn out to be poor investments because they generously value the vast potential rewards of the Web without properly reflecting the great risks faced by small companies in young, dynamic, volatile industries.

To gain some perspective on this issue, it is useful to glance back at some other revolutionary industries that enthralled investors: autos, personal computers, and biotechnology. Unlike, say, environmental stocks in 1989 (remember when Waste Management was a growth stock?), these were all bona fide growth industries that have transformed the U.S. economy. Nevertheless, it was easy for the injudicious investor to lose a lot of money in them, for four reasons.

- You can pay too much for even the best companies. Amgen, for example, was the leader of the biotech surge of 1991, and justifiably so—from 1991 to 1997 earnings grew at a 27% annual rate. But, from year-end 1991 to mid-1993 the stock dropped 52%, and it took a full 3½ years for AMGN shares to break meaningfully above their year-end 1991 level. In 1991, Amgen was a great company but an overpriced stock.
- Even if you buy an "industry leader," it may not thrive for long. Many of the most prominent PC companies in 1981—such firms as Tandy, Commodore, and Atari—fell by the wayside in a few years. Some of the Internet related companies may suffer a similar fate.
- On Wall Street as elsewhere, demand begets supply, of distinctly varying quality. When a sector is very hot, venture capitalists may prematurely take unseasoned companies public. Not only are these companies risky investments but they may hurt industry profitability by overexpanding capacity.
- High-tech booms normally occur when cyclical forces—both economic forces and internal stock market dynamics—are favorable to the industry in question. When those conditions change, investor enthusiasm for the sector may wilt, even though the long-term prospects remain good. PC stocks were hurt by weak capital spending in 1985-86. Healthcare was hot in 1991, when corporate earnings were weak and investors craved "defensive" stocks, but it was out of favor two years later, when corporate profits were rebounding and the Clintons threatened to "reform" healthcare.

Autos: America's greatest growth industry

For sheer size, pace of growth, and money-making potential, no growth industry in American history has rivaled auto manufacturing. Its success dumbfounded the wise men of Wall Street. When Billy Durant, founder of General Motors, remarked that the auto industry would be producing 500,000 cars within a few years, George W. Perkins, a senior partner in J. P. Morgan and Company, exclaimed that such an idea was preposterous. Perkins advised Durant to stop mouthing such nonsense if he wanted financial support.

In 1908, the year that Perkins dispensed this piece of wisdom, 65,000 cars and trucks were produced; eight years later the figure was 1,617,708—more than three times Durant's bullish estimate.[1] In less than a decade a gigantic new industry, the backbone of the American economy in the twentieth century, sprang to life in the upper Midwest. A citizen of Flint, birthplace of General Motors, wrote, "One must see for himself; one must get into the atmosphere of the tremendous undertakings; one must himself walk over the literal miles of factories in process of construction before one begins to grasp the immensity of the manufacturing undertaken."[2]

What made auto manufacturing so wonderful for entrepreneurs like Henry Ford was that it was not capital intensive and was virtually self-financing. It was a design-and-assembly business; the heavy investment in machine tools was a burden that was borne by parts suppliers. Working capital requirements were modest because auto makers could take their time paying bills, but they sold cars to their affluent customer base for cash, often with a 20% advance payment. Furthermore, the business was not particularly cyclical in the early years and profit margins were high.

For all these reasons, return on capital was extraordinarily high for successful companies.[3] One early chronicler of the industry wrote, "It took no capital to get into the industry, in the sense that it took capital to get into the copper industry or the steel industry or the railroad industry. And the profits (when there were profits) bore almost no relation to the money invested. It was no question of making a mere 100 per cent on your money. If your company survived the struggle for existence, you might make 100 per cent on your money every year; with a really successful company you could do a good deal better than that."[4] Thus, the Ford Motor Company was started with a capital of just $28,000 and within fifteen months had produced a profit amounting to ten times that sum.[5]

Automaking's low capital requirements and high potential profitability meant that barriers to entry were low. Survival rates were also low. One contemporary study concluded that between 1900 and 1908, 485 companies entered the industry, but 262 companies had left it by the latter date.[6] *Ironically, then, for investors the industry was potentially lucrative but also very risky—to be successful, you had to bet on the right technology (steam, electricity or gasoline) and back a company that could consistently design and manufacture popular cars in a fickle, fast-changing market.* The two biggest winners used opposite strategies. Henry Ford used the rifle shot approach: build a company dedicated to making one great product, the Model T. Billy Durant, the quintessential deal making entrepreneur, used the shotgun approach of buying up dozens of auto makers and parts suppliers to create General Motors.

For investors today, the significance of the early auto industry is that, *even though this was a lucrative business with explosive growth, many individual companies proved to be poor investments*. The same goes for the Internet—great industry, with a bright future, but quite a few of today's "Internet plays" will not survive. Some will probably sell out for a good price as the industry consolidates, but others may simply fail.

Personal computers

Though not as lucrative, personal computers resembled early auto manufacturing in that it was a design and assembly business with *low barriers to entry and a huge number of untested competitors*. A money manager remarked in April 1984, "The manufacture of personal-computer hardware reminds me of the early days of the auto industry. It's an overcrowded market, but not for long."[7] In both cases the value of the enterprise lay in management's knowledge of technology and the market, which enabled it to design a machine that would sell. In this respect, Henry Ford and Steve Jobs had similar talents.

Personal computers were developed by hobbyists in the late 1970s, and made a grand entrance on Wall Street when Apple Computer went public in 1980. With IBM successfully breaking into the industry, the PC industry grew in size and credibility in 1981 and 1982, and was the darling of the explosive bull market from August 1982 to the summer of 1983. Eight personal computer companies went public in the first half of 1983.[8]

However, computer stocks cracked in the summer of 1983 and plunged in price over the next year or so. In February 1984 a group of 24 major companies were, on average, 50% below their 52 week highs (Chart 3).

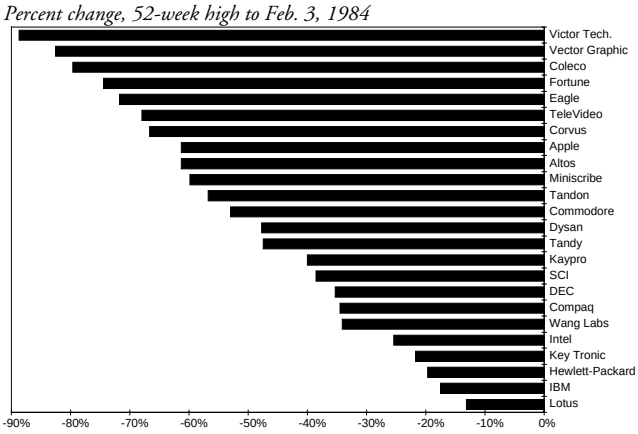
Many computer stocks were still in the doldrums in the autumn of 1985, more than two years after the PC boom peaked. In October 1985 a journalist wrote, "for the better part of two years, high-tech stocks have been just about the worst investments you could have made."[9] The three main reasons for this dreadful performance were:

- Excessive valuations in mid-1983.
- Too much competition; it was said in the summer of 1983 that 150 companies were selling personal computers.[10]
- Weak U.S. capital spending in 1985-86, as a result of the strong dollar which depressed corporate profits. Business investment in equipment, as reported in the GDP accounts, slowed from 19% growth in 1984 to 5% in 1985 and 1% in 1986.

Chart 3

Performance of 24 PC stocks, 1983-84

Percent change, 52-week high to Feb. 3, 1984



Source: Your Money, April 1984

What is striking about the personal computer industry in the early 1980s is that a shrewd observer, who understood that within a decade there would be a PC on every desk and in many family rooms, could still have lost a ton of money. The problem was *not just one of timing and valuation*—e.g. buying a good company too close to the mid-1983 top. The fact is that *remarkably few of the PC stocks that Wall Street was focused on in 1982 and 1983 have survived as successful computer makers*. If you had asked a Wall Street analyst for a short list of prominent PC makers at the end of 1982, it would have included:

- Apple—a legitimate PC company and a good way to play the industry.
- IBM—primarily a mainframe company, hence not a good way to play PCs.
- Atari—a division of Warner Communications, it disappointed investors and left the computer business.
- Commodore—considered a low-cost producer, it did not succeed long term.
- Tandy—its Radio Shack stores gave it an edge in distribution, but it did not remain a leader in personal computers. EPS rose only 34% from 1981 to 1986.
- Texas Instruments—its home computer business blew up in mid-1983.

Of these six, only Apple was a good long-term vehicle for playing the personal computer business, depending on one's entry price. (Although it continued to dominate PCs, IBM's EPS peaked in 1984 because of mainframe problems and would not surpass the 1984 level until 1996.) Aside from these six, there were literally dozens of other now-forgotten PC makers that captured investors' attention in the early 1980s. When in August 1983 an

analyst for a major Wall Street firm listed the companies he expected to survive the coming shakeout in the PC business, he named SCI Systems, Tandon, Verbatim, Corvus Systems, Cipher Data Products, Applied Magnetics, National Micronetics, and SofTech.[11] Most of today's leaders in the PC business—e.g., Compaq, Dell, and Gateway—were not public companies at the time. (Compaq went public in December 1983.)

Like other infant industries (perhaps including the Internet), it was difficult to correctly conceptualize the PC industry in the early 1980s. At the time, investors split it into two categories: "home computers" costing less than $1,000, and "personal computers" used in offices and generally costing $2,000-$5,000. In 1981 the president of Atari's computer division presciently and accurately summed up the challenges facing home computers:[12]

> "To get into the home, we need a computer that looks like a consumer product and is priced like one—between $500 and $1,000, not the $3,000 to $4,000 you see today. We'll need new computer languages so more artists and writers can create programs for the consumer. And we'll have to tie in with sources of data that you can reach over the telephone to get instant, updated information on things like airline schedules and restaurant reservations."

This sounds very much like a $900 PC hooked up to the World Wide Web. Unfortunately, such devices were not technologically feasible until about 1997. Efforts to make and sell "home computers" in the early 1980s were failures that cost investors a lot of money, because the computers could do little more than "play games and store recipes."

Biotech: In search of the "next Amgen"

General Schwartzkopf's January 1991 missile assault on Saddam Hussein's troops was the starter pistol for the 1990s bull market. The S&P 500 rose 26.3% in 1991, and this was definitely not an earnings-driven bull market; S&P earnings fell 14% in 1991 and rose only 11% the following year. Investors favored defensive stocks that would not deliver disappointing earnings reports. The quintessential defensive sector was biotechnology—the stocks could not disappoint because, with a few exceptions, they had no earnings! The industry had lost credibility in 1988 when Genentech's drug TPA failed to meet Wall Street's expectations, but the remarkable 154% climb of Amgen in 1990, which was driven by the success of its anti-anemia drug, restored biotech's lustre. Investors dreamed of owning the "next Amgen"—maybe a company that would cure AIDS.

Consequently, very much as PCs were the high tech/new issue darling of the 1982-83 bull move, biotech was the star in 1991. More than 30 biotech companies went public that year. PaineWebber's index of biotech stocks rose by 157%, but its most important sub-sector, biopharmaceutical stocks, rose 189%. *Investors were not always discerning buyers of these soaring stocks.* A broker at one firm was quoted by *Business Week* as saying, "It doesn't pay to be too smart, when 95% of the investors have no idea what they're doing."[13] *Business Week* noted, "If in January [1991] you had invested in one of six companies with 'immune' in its name—Immunex, ImmuLogic, ImmunoGen, Immunomedics, MedImmune, or Immune Response—you'd have had a 60%-1,200% gain by December."[14]

In November 1991 we pointed out the huge risks in biotech: "Since historically only 20-25 new drugs have been approved each year, and many of them have come from the large companies, it is obvious that nearly all—about 99 out of 100— of the small biotech companies will fail to become large companies. They will disappear or continue to live from hand to mouth on research contracts and the proceeds of public offerings. Amgen is a remarkable exception, because it has brought to market not one but two blockbuster drugs — Epogen and Neupogen." (See "New Frontiers: Industrial innovation and technological trends in the late 1990s," November 15, 1991.)

Exhibit 1
Soaring . . .

BusinessWeek

Biotech: America's Dream Machine

Will it Become the Dominant Growth Industry of the 1990s?

March 2, 1992

Exhibit 2
. . . then sinking

BusinessWeek

Why Biotech Stocks May Be Sick for a While

May 18, 1992

Biotech stocks peaked around the end of 1991, and sentiment on the group soured remarkably quickly thereafter. In early March, 1992 *Business Week* wrote a long and glowing article titled "Biotech: America's Dream Machine—Will it become the dominant growth industry of the 1990s?"[15] But in mid-May the magazine wrote a cautionary article titled "Why Biotech Stocks May be Sick for a While."[16] Stocks in the sector declined about 30% in the first half of 1992.

Several factors combined to change psychology on biotech stocks:

- As the U.S. economy started to recover, investors rotated out of defensive growth stocks and into cyclical stocks whose earnings seemed poised for a rebound after three weak years.
- Disappointing news on the drug approval front, notably the failure of Centocor's Centoxin to win FDA approval, reminded investors that it was a long, long way from the promise of pioneering research in the lab to generating solid earnings.
- More prescient investors started to worry that, as corporations and government struggled to restrain healthcare costs, drug companies would suffer.
- Finally, biotech stocks' lack of earnings meant that their prices could plunge without becoming demonstrably "cheap."

Table 1

A tale of 35 biotech stocks

Company	12/91 Price	1992 Low Price	5/5/98 Price	or Date Acquired
Affymax	$28.500	$14.000	$30.000	3/95
Alliance Phar	29.250	9.250	7.375	
Alteon	30.000	8.250	4.313	
Amgen[1]	37.875	24.625	59.813	
Applied Bioscience	14.250	8.375	10.844	9/96
Athena Neurosci[1,2]	14.625	6.625	8.462	7/96
Biochem Phar	9.813	5.313	25.125	
Biogen[1]	20.000	9.125	44.500	
Centocor[1]	53.500	9.500	41.125	
Chiron[1]	17.438	8.688	19.688	
Collagen	21.750	13.250	18.750	
Cygnus[1,2]	22.750	8.000	11.125	
Cytogen	18.500	13.375	1.313	
Diagnostic Products	36.750	20.125	28.938	
Enzon	14.125	5.875	5.875	
Genentech[3]	32.250	25.750	68.813	
Genetics Institute	38.000	38.000	39.250	1/92
Gensia Sicor[1]	34.667	18.250	5.063	
Genzyme[1,2]	28.519	15.777	31.438	
ICOS[1,2]	11.500	5.250	15.000	
Immune Response	39.250	12.250	12.750	
Immunex[1]	59.250	22.500	72.250	
Immunomedics	8.625	5.500	5.125	
Life Technologies	11.667	10.500	35.625	
Liposome Co	14.125	7.375	5.906	
Medimmune	43.750	12.500	53.125	
Molecular Biosystems	36.500	17.000	9.938	
Regeneron Phar	18.125	7.750	10.000	
Scios	22.500	6.250	12.750	
Sequus Phar[1]	18.500	6.875	12.063	
Somatogen	43.000	13.000	9.438	
Synergen	68.500	32.250	9.250	12/94
SyStemix	54.750	18.250	19.500	2/97
US Bioscience	78.000	12.250	9.063	
Xoma[1]	21.000	8.750	5.125	

Source: PaineWebber

As with many auto and PC companies, the risk in buying hot biotech stocks in 1991 was not merely one of valuation. After the 1992 sell-off many stocks never regained their year-end 1991 levels—and those that did typically took over three years to do it.

Consider the 35 stocks with the highest market value at year-end 1991, selected from a list of 89 biotech stocks monitored by PaineWebber at that time (Table 1).[17] These were relatively prominent biotech companies, not tiny start-ups. Of the 35 companies, only 10 have a higher price now than at the end of 1991. Of the other 25, 6 were acquired (on average well below their year-end 1991 price); 13 never regained their year-end 1991 price; and 6 temporarily rose above their year-end 1991 price but are now below it. On average it took companies 3.5 years to surpass their 1991 closing price.

Parallels with the past

The current mania for Internet stocks shares many of the same characteristics of previous manias for "new technology" companies:

- Demand is begetting supply, of distinctly varying quality. As with automaking earlier this century and PCs in the 1980s, there are low barriers to entry and a huge number of untested competitors.
- Cyclical forces—both economic forces and internal market dynamics—are currently very favorable. The economic cycle has been muted, with few booms, few busts and more soft landings. Interest rates are low, demand for advertising is strong, and capital is plentiful. And with home PC penetration rates continuing to rise, more and more consumers are surfing the Net in search of entertainment, driving the number of Web page "hits" to ever higher levels.

- The media is full of glowing reports about the new technology.
- Investors are not discerning buyers of soaring stocks, as was the case with biotech in the early 1990s.
- In an environment of slowing earnings growth, stocks with no earnings appear attractive because they are not prone to earnings disappointments.

If this mania plays out as others have in the past—and there is little reason to believe that "things are different this time"—then some, or all, of the following will likely happen:

- Survival rates will be low—too much competition in many sectors will ultimately lead to a shakeout. As Henry Ford and Billy Durant discovered, the challenge is to design and market a "best-seller" in a fickle, fast-changing market. But the handful of companies that do survive will dominate the market.
- The business environment will eventually become less favorable. As time passes and as venture capitalists and entrepreneurs fail to earn an acceptable return on their capital, the availability of funds to the industry will start to dry up. "Hits" to Web sites will fail to translate into consistent earnings growth. And as more sites start to charge fees, many Web surfers will decline to take out a subscription.
- Given inexperienced managements and / or a flawed business model, many "industry leaders" will not thrive for long, while some "Wall Street darlings" will likely "blow up."
- Too much will be paid for even the best companies. Just like the early auto business, even with lucrative and explosive growth, at current price levels many individual companies will prove to be poor investments. And while some companies will sell out for a good price as the industry consolidates, others may simply fail. Finally, many of the companies that eventually turn out to be industry leaders may not have even been created yet—remember, Dell only went public in 1988.
- Earnings will fail to materialize at many companies. Despite initial popularity, or even deep-pocketed parents, not every company that aspires to be part of the Internet will flourish.

Survivability, not valuation, is the key issue

Table A1a (page 10) shows that 108 diversified companies with some Internet exposure are trading at a *median* multiple of 3x sales. The *average* Market Cap/Sales is 13x.

By contrast, Table A1b (page 13) shows that, largely reflecting their very strong recent price gains, 77 companies perceived as "pure Internet plays," i.e., with significant Internet exposure, are currently trading at a *median* multiple of 9x sales. The *average* Market Cap/Sales is 26x. (The S&P 500 *median* market Cap/Sales is 1.5x; the *average* is 1.7x)

With these "pure plays" up 102% year-to-date on average (and a median gain of 64%), versus a 15% gain for the S&P 500, are these stocks overvalued? Consider some quick "back of the envelope" valuation. PaineWebber's Equity Valuation Model (EVM) suggests that a stock with a secular earnings growth rate of 25% is worth a P/E of 117x (versus 24x for the market). The ten technology stocks with the highest growth rates in our EVM (3Com, Applied Materials, Cisco, Compaq, Dell, EMC, Gateway, KLA-Tencor, Microsoft, Oracle) had an average net margin of 14.5% in 1997. This would imply then that a "fair" Price-to-Sales multiple of a typical high growth technology stock is 17x (i.e., 14.5% of 117).

The implication then is that many of the companies with significant Internet exposure that are listed in Table A1b may not necessarily be overvalued, *assuming that they can consistently grow their sales and earnings at a very rapid rate.* But, clearly, this is where the risk lies. Some companies will enjoy rapid sales growth over the next few years, *but this will not translate into sustainable long-term earnings growth.* And, given the intense competitive pressures, many other companies will *not be able to sustain either sales or earnings growth.* So the key issue for many of these stocks is *not valuation but, rather, survivability.* The bottom line: Like prior key "new technologies"—autos, PCs and biotech, for example—of those 75+ "pure Internet plays," fewer than a handful will likely prove themselves to be good investments.

An "icing on the cake" strategy

In playing the explosive growth of the Internet, the best risk/reward is likely to be found in established companies that can use the growth of the Internet to extend their franchise, but yet are not at risk of failure if their Web strategy misfires. To employ a cliché, this can be thought of as an "icing on the cake strategy." Perhaps a good analogy here is that it was a safer, and ultimately more rewarding, bet to invest in a large pharmaceutical company—such as Eli Lilly—as a play on biotech in the early 1990s. While biotech never turned out to be a huge profit center for the company, at least Eli Lilly did not go belly up as did many smaller pure biotech plays.

In "Converging Technologies" we identified several distinct sectors well positioned to benefit from explosive growth in the "Information Age."

Content companies

The Internet is simply the next medium in a long evolutionary chain that started with the newspaper:

Table 2

Revenue sources of media

	Advertising	Subscription	E-commerce
Newspaper	✔	✔	
Radio	✔		
TV	✔		
Cable TV	✔	✔	
Internet	✔	✔	✔

Source: PaineWebber

Like old media, new media's success depends on its ability to attract readers/viewers/listeners, and that requires *excellent content*. Therefore, well-established media firms such as newspapers and entertainment companies have a good chance to prosper on the Web. They have superior content and strong brand names, and by selling these products on the Web in new formats they can rather inexpensively sell existing product to new customers—a very attractive business proposition.

Of the 25 top Web sites in terms of advertising revenues, 3 are major newspapers—*USA Today*, *The Wall Street Journal*, and *The New York Times*. The *Journal* now has 200,000 subscribers who pay $49.00 per year ($29.00 if they are also print subscribers), as compared to 1.8 million subscribers to the print edition. Two attractive newspaper stocks that are building an Internet presence particularly successfully are **Gannett** and **New York Times**. As noted, *USA Today* and the *Times* are doing very well on the Net.

Broadly diversified entertainment companies should also win on the Web because they can use it to distribute existing product or to build new businesses that are off-shoots of existing operations. For example, in addition to distributing its proprietary content through Disney.com and ABC.com, **Walt Disney** has also built a potent new business in ESPN SportsZone, and has developed the Disney blast, a $4.95 a month offering to kids who use the Net. Not only does this reinforce a relationship with Disney's key demographic but cross-promotions reinforce the brands; the first page of ABC.com has a banner ad for Disney theme parks.

Portal sites

Portal sites, or "aggregators," offer a "front porch" to the Internet. This sector is likely to experience consolidation over the next few years; the world does not need seven or eight aggregators. To survive over the long term, aggregators have to become "destination sites" that users really want to visit, rather than front porches that become expendable once users become more conversant and comfortable with the Internet. A brand name is worthless if no one needs or wants your product.

America Online is the leading Internet Service Provider (ISP) with about 50% of the market. Its rapid growth should continue. AOL currently has 12 million members, up 48% from last year, while revenue should increase 56% this year from $1.7 billion to $2.7 billion. AOL's goal is to move from being a household luxury to an integral part of everyday life similar to cable TV. In fact, AOL competes directly with cable and television as its prime-time period is from 8 pm to midnight, the same as television. Studies have shown that AOL households watch 15% less television than non-AOL households.

Under pressure from heavy usage, Internet Service Providers such as AOL recently raised their fees. While some ISP's instituted a per hour fee beyond a certain limit, AOL raised its flat fee from $19.95 to $21.95 and maintained unlimited use. This is well-suited to AOL's unique business model which derives revenue streams from three sources: subscription fees, advertising, and Internet commerce. While most of the competition relies solely on subscriber fees and derives no incremental revenue from longer usage, AOL receives revenues from online commerce and advertising which benefit from longer usage time. This three-part revenue stream is a crucial source of strength for the company. AOL can turn traditional cost centers such as e-mail and chat into profit centers by selling advertising space in these areas. Via agreements with Internet retailers such as N2K and Amazon.com, the company receives transaction fees as a distribution partner. Advertising and commerce accounted for 13% of total revenue in 1997, and it is estimated that this number will increase to 16% by June, 1999.

The core subscriber revenue provides a reasonably predictable revenue stream and helps the company manage the growth of its business. After experiencing severe access problems in January, 1997 the company began a $350 million expansion program and since then has been adding 25,000 modems per month. Call failure rates have

fallen dramatically. AOL's high market share, strong brand name, and three-part revenue stream make it a particularly formidable presence on the Web.

PC-related

In "Converging Technologies" we wrote that, in the Information Age, the PC "will be the central, multipurpose consumer device." With PC penetration rates in the home continuing to rise, our forecast that the PC "will be as ubiquitous in the home as the telephone" looks to be on track.

Compaq, a leading PC manufacturer, continues to be a key beneficiary of the emergence of the PC as the central, multipurpose consumer device. And heavy spending on the Internet and Intranets is very positive for its server businesses. Many consumers have bought PCs in order to work out of the home, as telecommuting becomes more acceptable throughout corporate America. The resulting increased demand for home office products ranging from paper clips to filing cabinets is clearly a positive for **Staples**.

And while popularly thought of as "just a software company," perhaps no other company is better positioned for the Information Age than **Microsoft**. Given the company's dominant position across the entire Information Age spectrum, it is probably the leading beneficiary of the convergence of the computer, communications, consumer applications and content.

Networking companies

The emergence of the Internet as a new medium and the associated demand for high-bandwidth data transfers is a major positive for **WorldCom**. Through its UUNet subsidiary, WCOM remains the largest Internet access provider. It generates about $2 billion annually from Internet traffic, rising to about $2.4 billion if the merger with MCI goes through.

Table A1a

Diversified companies with *some* Internet exposure

Ticker	Company	Market Cap	Sales	Mkt Cap / Sales	Price 5/5/98	---price change--- 12 mo.	YTD	Description
COMS	3Com[1,4]	$12,247m	$5,550.9m	2.2x	$34.438	-3.5%	-1.4%	Infrastructure hardware
SEVL	7th Level	93	10.5	8.8	6.750	170.0	300.0	Content, entertainment
ADAM	ADAM Software	20	6.4	3.2	3.875	106.7	34.8	Content, educational
ADBE	Adobe Systems[1]	3,281	883.2	3.7	49.375	6.2	19.7	Content, application software
ADG	Advanced Comm.[2,5]	113	0.0	n/a	13.750	n/a	n/a	Service provider
AFFI	Affinity Technology	53	4.1	12.9	1.750	-53.3	-26.3	Commerce software
APTS	Apertus Technologies	15	8.7	1.8	0.938	-28.6	-21.1	Infrastructure software
ACTC	Applied Cellular Tech[4]	89	103.2	0.9	4.313	15.0	-4.2	Service provider
ASND	Ascend Communications[1]	8,100	1,179.7	6.9	42.000	-20.0	71.4	Infrastructure hardware
T	AT&T[2,3]	99,382	50,902.0	2.0	61.188	81.3	-0.2	Service provider
AXNT	Axent Technologies	329	56.7	5.8	26.563	123.7	54.0	Security hardware
BAY	Bay Networks	5,192	2,336.4	2.2	23.625	17.4	-7.8	Infrastructure hardware
BLC	A.H. Belo[3]	3,246	1,345.1	2.4	52.125	37.2	-7.1	Content, news
BBTK	Broadband Technologies[1]	104	12.2	8.5	7.750	-15.6	87.9	Infrastructure hardware
BRCM	Broadcom	1,638	67.3	24.4	52.000	n/a	n/a	Infrastructure
CUBE	C-Cube Microsystems	846	330.2	2.6	23.000	-16.4	41.0	Infrastructure
CS	Cabletron Systems	2,254	1,377.3	1.6	14.250	-61.4	-5.0	Infrastructure
CVC	Cablevision Systems	3,140	1,949.4	1.6	62.625	289.9	30.8	Infrastructure
CATP	Cambridge Tech. Partners	2,936	457.9	6.4	53.406	82.6	28.3	Infrastructure software
CD	Cendant[3]	10,482	3,593.0	2.9	24.563	0.8	-28.5	Content, membership services
ECP	Central Newspapers[2]	1,864	730.3	2.6	74.125	33.0	0.3	Content, news
CHKPF	Check Point Software[1]	1,060	100.1	10.6	30.750	22.7	-24.5	Security software
CSCO	Cisco Systems[1,4]	74,980	7,298.0	10.3	73.625	87.6	32.1	Infrastructure hardware
CKSG	CKS Group	340	141.5	2.4	22.875	-15.7	61.9	Commerce services and software
CMGI	CMG Info. Services	1,013	84.0	12.1	98.438	550.8	225.4	Infrastructure
CMPX	CMP Media	615	481.1	1.3	26.625	n/a	54.3	Publisher, net-related periodicals
CNWK	Cnet	555	38.0	14.6	37.563	73.7	27.3	Internet content
CMCSK	Comcast[1]	12,919	4,912.6	2.6	36.125	112.5	14.5	Infrastructure hardware
CPQ	Compaq[3]	46,424	25,466.0	1.8	30.563	64.3	8.2	Infrastructure hardware
CPTL	CTC Communications	70	46.1	1.5	7.000	-3.4	-46.9	Service provider
CYBR	Cybermedia	108	59.4	1.8	8.438	-33.8	-44.0	Security software
DCTC	DCI Telecomm[4]	28	n/a	n/a	1.969	-14.9	1.6	Service provider
DELL	Dell Computer[1]	56,471	12,327.0	4.6	87.688	280.2	108.8	Infrastructure hardware
DEC	Digital Equipment[2,3]	8,514	12,938.9	0.7	58.000	83.4	56.2	Infra. hardware and nav. software
DIS	Disney[3]	85,767	22,295.0	3.8	126.688	54.3	28.0	Content, entertainment
DVNTF	Diversinet[4]	54	0.3	195.6	3.781	236.1	450.0	Security products
EDFY	Edify	193	58.5	3.3	11.625	5.7	-38.0	Infrastructure software
SSP	E.W. Scripps	4,576	1,298.1	3.5	56.750	43.7	17.2	Content, news
FTPS	FTP Software	93	57.3	1.6	2.750	-45.0	22.2	Infrastructure software
GCI	Gannett[3]	18,913	4,852.6	3.9	66.625	48.5	7.8	Content, news
GTW	Gateway[2]	8,545	6,602.3	1.3	58.125	81.3	77.5	Infrastructure hardware
GTE	GTE[2,3]	56,814	23,864.0	2.4	59.125	24.8	13.2	Service provider
HRBC	Harbinger	1,011	127.5	7.9	37.125	61.4	32.0	Commerce software and services
IDTC	IDT	774	201.2	3.8	32.563	466.3	60.8	Service provider
MAXX	Imark Technologies[4]	8	0.1	144.9	1.750	-54.8	-26.3	Infrastructure
INFO	Infonautics	35	8.6	4.1	3.688	90.3	84.4	Content, educational
IREG	Info. Resource Eng.	44	16.0	2.8	8.125	-9.7	34.7	Security products
ITH	Integrated Technolgy	8	0.0	n/a	1.313	16.7	-12.5	Telephony
INTC	Intel[1]	133,293	24,623.0	5.4	81.875	0.8	16.5	Infrastructure hardware
IBM	Intl Business Machines	114,053	78,818.0	1.4	117.813	41.8	12.6	Infrastructure, service provider

Ticker	Company	Market Cap	Sales	Mkt Cap / Sales	Price 5/5/98	---price change--- 12 mo.	YTD	Description
INTU	Intuit[1]	$2,529m	$563.9m	4.5x	$52.875	120.3%	28.2%	Content, financial news & advice
ISSX	ISS Group	825	n/a	n/a	50.500	n/a	n/a	Security software
ITCD	ITC Deltacom	704	125.9	5.6	28.375	n/a	72.0	Service provider
JOIN	Jones Intercable[1,2]	100	n/a	n/a	19.500	100.0	14.7	Infrastructure hardware
KRI	Knight-Ridder	4,779	3,014.3	1.6	58.563	45.0	12.6	Content, news
MACR	Macromedia	594	96.3	6.2	15.594	107.9	87.6	Content, application software
MARG	Market Guide[4]	50	6.1	8.2	10.625	325.0	304.8	Content, financial information
MCIC	MCI Communications[1]	35,217	20,058.0	1.8	49.813	25.9	16.4	Service provider
MECK	Mecklermedia	196	61.0	3.2	23.625	16.0	-5.0	Publisher, net-related periodicals
MBRS	Memberworks[1,2]	436	104.3	4.2	30.250	105.1	44.0	Content, membership services
MCOM	Metricom	140	13.4	10.4	10.125	37.3	5.2	Service provider
MSFT	Microsoft[1]	212,531	13,664.0	15.6	87.750	46.0	35.8	Content and service provider
MMAC	Multimedia Access[4]	27	4.9	5.5	3.125	-44.4	-21.9	Telephony products
NVDC	Navidec[4]	20	6.0	3.3	6.188	54.7	52.3	Infrastructure
NETM	Netmanage	152	62.5	2.4	3.469	-4.3	23.3	Infrastructure software
NTPA	Netopia	97	47.8	2.0	8.375	71.8	45.7	Infrastructure
NETA	Networks Associates	4,953	659.2	7.5	70.844	9.1	34.0	Security products
NYT	New York Times	6,885	2,896.5	2.4	71.250	61.0	7.8	Content, news
NN	Newbridge Networks[3]	5,559	1,132.7	4.9	31.688	-11.1	-9.1	Infrastructure
NWS	News Corp	26,802	12,037.0	2.2	27.750	49.0	24.4	Content, news
NEWZ	Newsedge	122	52.2	2.3	14.063	70.5	54.1	Content, news
NPSI	North Pittsburgh Systems	236	65.7	3.6	15.750	-3.1	-14.0	Service provider
NOVL	Novell[1]	3,424	884.5	3.9	9.750	14.3	30.0	Infrastructure software
ODIS	Object Design	182	49.1	3.7	6.625	26.2	-20.9	Infrastructure software
ONTC	ON Technology	49	33.0	1.5	4.031	15.2	207.1	Security products
ORCL	Oracle[1]	25,127	6,679.3	3.8	25.813	-13.5	15.7	Infrastructure software
PAIR	PairGain Technologies[1]	1,277	284.2	4.5	18.500	-11.4	-4.5	Infrastructure hardware
PCTL	Picturetel	407	445.5	0.9	10.688	-17.0	64.4	Telephony products
QCOM	Qualcomm[1,3]	3,938	2,668.1	1.5	56.250	5.4	11.4	Infrastructure hardware
QDEK	Quarterdeck[1]	68	70.3	1.0	1.563	-40.5	-3.8	Infrastructure software
SCPI	Scoop[4]	9	2.0	4.3	1.594	-77.2	70.0	Content, news
SCUR	Secure Computing[1]	184	49.1	3.7	11.688	33.6	-1.1	Security products
SDTI	Security Dynamics	953	149.7	6.4	23.438	-31.1	-34.4	Security products
SGI	Silicon Graphics[3]	2,452	3,489.4	0.7	13.063	-18.4	6.1	Infrastructure
FON	Sprint[3]	29,678	15,195.8	2.0	68.938	51.5	17.6	Service provider
SE	Sterling Commerce	3,819	382.1	10.0	42.500	39.3	10.6	Commerce software
SUNW	Sun Microsystems[1]	15,779	9,452.9	1.7	41.813	39.7	4.9	Infrastructure
SYBS	Sybase[1,4]	710	878.6	0.8	8.781	-48.0	-34.0	Infrastructure software
TCOMA	Telecommunications Inc	17,298	6,429.0	2.7	34.125	135.3	22.1	Infrastructure
TCMM	Telecomm Industries[4]	15	17.1	0.9	1.281	5.1	-14.6	Service provider
TSCN	Telescan[1,4]	83	14.1	5.9	7.563	72.9	6.1	Content, develops and operates sites
TGNT	Teligent	1,545	3.3	466.5	29.375	n/a	19.3	Service provider
TWX	Time Warner[3]	45,404	13,397.0	3.4	78.813	74.2	27.1	Content, entertainment
TMC	Times Mirror[3]	5,439	3,348.5	1.6	61.875	10.0	0.6	Content, news
TMPW	TMP Worldwide	724	237.4	3.0	27.750	26.1	20.7	Advertising services
TONE	Touch Tone America[4]	7	1.8	3.9	1.500	41.2	37.1	Service provider
TRAC	Track Data	54	47.6	1.1	3.750	150.0	200.0	Content, news
TRB	Tribune Co.[3]	8,415	2,798.6	3.0	68.125	53.5	9.4	Content, news
TISX	Trusted Info. Systems[4]	295	42.2	7.0	21.375	137.5	113.8	Security products
TYRX	Tyrex Oil[4]	11	n/a	n/a	0.330	76.0	43.5	Security products
VONE	V-One	49	9.5	5.1	3.719	-25.6	6.3	Security products

Ticker	Company	Market Cap	Sales	Mkt Cap / Sales	Price 5/5/98	---price change--- 12 mo.	YTD	Description
VRTY	Verity	$110m	$36.9m	3.0x	$9.750	44.4%	95.0%	Infrastructure software
VSNT	Versant Object Tech	53	30.0	1.8	5.938	-13.6	-57.0	Commerce software
VIA.B	Viacom[3]	19,526	13,375.9	1.5	56.125	90.3	35.4	Content, entertainment
WCOM	Worldcom[1]	39,096	8,024.1	4.9	43.000	65.4	42.1	Service provider, infrastructure
WTLK	Worldtalk Comm.	37	12.3	3.1	3.563	-23.0	-5.0	Infrastructure software
ZICAF	Zi Corp[4]	89	1.2	72.1	4.281	18.1	49.7	Infrastructure
ZD	Ziff-Davis	1,725	n/a	n/a	17.250	n/a	n/a	Content
	Average	$12,164m	$4,280m	13x		50.7%	34.9%	
	Median	$799m	$150m	3x		33.6%	18.4%	
	S&P 500 Index	$8,525bn	$4,897bn	1.7x		34.4%	14.9%	
	S&P 500 Average	$17,050m	$9,795m	1.7x		32.2%	12.9%	
	S&P 500 Median	$7,618m	$5,112m	1.5x		29.1%	11.1%	

Table A1b

Internet "pure plays"

Ticker	Company	Market Cap	Sales	Mkt Cap / Sales	Price 5/5/98	---price change--- 12 mo.	YTD	Description
AMZN	Amazon.com	$2,265m	$219.1m	10.3x	$93.719	n/a	55.5%	Commerce - book retailer
AOL	America Online[3]	18,654	2,039.5	9.1	89.500	247.6	97.8	Service provider
AMTD	Ameritrade	429	117.8	3.6	29.563	126.3	1.1	Commerce - stock brokerage
ARIS	ARI Network Services	13	7.4	1.7	3.000	-40.0	140.0	Commerce services
ATHM	At Home	4,086	12.4	329.4	36.625	n/a	45.8	Service provider
BVSN	Broadvision	379	31.9	11.9	18.625	210.4	186.5	Infrastructure software
CDNW	CDNow	225	24.8	9.1	28.688	n/a	n/a	Commerce - music retailer
CKFR	Checkfree	1,361	225.4	6.0	24.719	45.4	-8.4	Commerce services and software
CNCX	Concentric Network	355	52.8	6.7	25.125	n/a	183.1	Service provider
CNKT	Connect	17	9.7	1.7	4.313	-11.0	2.2	Infrastructure software
CYCH	Cybercash	229	4.5	51.1	20.781	44.6	63.8	Commerce - digital currency
CYBG	Cyberguard	118	20.5	5.8	14.313	39.6	154.4	Security products
CYSP	Cybershop Int'l[4]	85	n/a	n/a	12.500	n/a	n/a	Commerce - retailer
CYLK	Cylink[1]	380	80.2	4.7	13.250	17.8	35.9	Security products
AMEN	DIDAX[4]	15	0.3	43.0	5.000	n/a	95.1	Service provider and retailer
DCLK	Doubleclick	683	38.3	17.9	41.625	n/a	n/a	Advertising solutions
DWEB	Dynamicweb Enterprises[4]	10	0.7	14.1	5.125	-33.2	-7.0	Infrastructure software
ETEL	E-Net[4]	74	0.5	151.7	12.875	157.5	154.3	Infrastructure software
EGRP	E*trade	970	208.8	4.6	25.000	37.9	8.7	Commerce - online stock brokerage
ELNK	Earthlink Network	765	92.7	8.3	68.000	597.4	164.1	Service provider
EGGS	Egghead.Com	226	307.5	0.7	9.813	127.5	51.0	Commerce - computer prdts retailer
EWEB	Euroweb Int'l[4]	11	1.3	8.4	2.156	130.0	430.8	Service provider
XCIT	Excite	1,383	65.6	21.1	66.750	621.6	122.5	Navigation services
EXDS	Exodus Communications	623	n/a	n/a	35.938	n/a	n/a	Service provider
EXGP	Expertelligence[4]	4	0.9	5.0	3.000	-25.0	166.7	Infrastructure software
FVHI	First Virtual Hldgs	15	1.3	11.2	1.688	-60.3	-43.8	Infrastructure
FSTW	Firstwave Technologies	23	16.1	1.5	4.625	54.2	32.1	Commerce software
GNET	Go2Net[1,4]	118	1.2	99.0	26.125	140.2	280.0	Content, web site operator
HDSK	Healthdesk[4]	10	0.4	25.6	1.813	-39.6	-44.2	Content, healthcare
HCOM	Homecom Comm.[4]	16	2.9	5.6	5.500	n/a	-64.7	Commerce software
HYBR	Hybrid Networks	62	15.9	3.9	6.031	n/a	-45.8	Infrastructure hardware
INNI	I / Net[4]	6	n/a	n/a	0.190	-44.7	-15.6	Infrastructure
ICMT	Icon CMT	122	55.7	2.2	18.656	n/a	n/a	Infrastructure
IIML	iMALL[4]	62	n/a	n/a	8.125	-54.9	91.2	Commerce - virtual mall
SEEK	Infoseek	873	42.8	20.4	32.031	402.5	198.0	Navigation services
ITVU	InterVU[2]	98	0.0	n/a	16.750	n/a	106.2	Infrastructure
KTEL	K-tel International	251	91.1	2.8	67.875	741.9	924.5	Commerce - music retailer
KTWO	K2 Design[4]	15	8.4	1.8	4.063	-26.1	116.7	Content, web site developer
LCOS	Lycos	1,005	35.5	28.3	64.594	316.7	56.1	Navigation services
MKY	Milkyway Networks	10	n/a	n/a	1.500	-63.4	1.7	Security products
MSPG	Mindspring Enterprises	509	64.2	7.9	63.250	644.1	88.1	Service provider
NTKI	N2K[1,2]	273	17.2	15.9	22.500	n/a	53.8	Commerce - music retailer
NTBK	Netbank[4]	140	n/a	n/a	22.813	n/a	94.1	Commerce - online bank
NETL	Netlive Communications[4]	6	0.0	327.8	2.000	-69.2	33.3	Infrastructure software
NSCP	Netscape Comm.[1]	2,952	533.9	5.5	30.125	-5.1	23.6	Infrastructure software
NSPK	Netspeak	290	6.9	42.3	23.625	n/a	-6.0	Telephony products
NSOL	Network Solutions[1,2]	767	53.2	14.4	48.750	n/a	271.4	Domain name registrar
OWAV	Onewave	49	5.2	9.3	3.375	68.8	107.7	Infrastructure software
WEBB	Online System Services[4]	47	2.8	16.9	14.625	631.3	125.0	Infrastructure
ONSL	ONSALE	497	116.8	4.3	26.563	431.3	47.6	Commerce - interactive auctions

Ticker	Company	Market Cap	Sales	Mkt Cap / Sales	Price 5/5/98	---price change--- 12 mo.	YTD	Description
OMKT	Open Market[1]	$579m	$65.1m	8.9x	$18.219	124.2%	89.3%	Electronic commerce software
OTEXF	Open Text	353	36.5	9.7	19.750	150.8	47.7	Infrastructure software
OZEMY	Ozemail Ltd	266	43.3	6.1	25.625	310.0	236.1	Overseas service provider
PPOD	Peapod	121	65.8	1.8	7.188	n/a	10.6	Commerce - food retailer
PLNT	Playnet Technologies[4]	2	0.4	5.8	0.100	-98.2	-60.0	Content, interactive games
PTVL	Preview Travel[1,2]	410	14.1	29.0	36.125	n/a	377.7	Commerce - online travel services
PCEL	Prime Cellular[4]	15	1.2	11.9	3.250	-16.1	333.3	Service provider support
POSO	Prosoft I-Net Solutions[4]	88	5.4	16.3	7.750	-22.5	-24.4	Internet training services
PSCO	Protosource[4]	4	0.8	5.1	5.750	9.5	9.5	Service provider
PSIX	Psinet	520	140.8	3.7	12.844	97.6	150.6	Service provider
RNWK	Realnetworks	938	38.9	24.1	30.375	n/a	118.9	Infrastructure software
RMII	Rocky Mountain Internet[4]	62	6.1	10.1	11.500	411.1	283.3	Service provider
SFNB	Security First Net. Bank	105	6.1	17.4	11.000	39.7	51.7	Commerce - online bank
SITE	Site Technologies[4]	6	1.0	6.3	0.719	-61.7	-39.5	Infrastructure software
SSOL	Smartserv Online[4]	8	0.8	10.0	2.094	-44.2	179.2	Content, news
SPLN	Sportsline USA[2]	521	15.9	32.8	36.750	n/a	241.9	Content, sports
SPYG	Spyglass	153	14.7	10.4	11.750	44.6	138.0	Commerce software
SNMM	Starnet Comm. Int'l[4]	25	n/a	n/a	1.094	n/a	4.7	Content, web site developer
THNK	Think New Ideas	193	33.2	5.8	27.750	806.1	236.4	Infrastructure software
UOLP	UOL Publishing	41	10.1	4.0	12.750	21.4	-22.7	Content, educational
USWB	USWeb Corp	874	32.4	26.9	24.688	n/a	163.3	Content, website consulting
VRSN	Verisign	748	12.1	61.7	36.063	n/a	n/a	Security products
VOCLF	Vocaltec Communications	184	17.5	10.5	16.813	144.5	-18.0	Telephony software
WAVO	Wavephore	242	24.3	9.9	13.313	83.6	42.0	Content, business info
WPNE	White Pine Software	25	11.1	2.3	2.688	-10.4	-2.3	Telephony software
YHOO	Yahoo!	5,255	87.6	60.0	116.750	386.5	68.6	Navigation services
UBET	You Bet Int'l[4]	65	n/a	n/a	6.750	63.6	50.0	Content, gambling
	Average	$693m	$77m	26x		144.5%	102.0%	
	Median	$153m	$16m	9x		49.8%	63.8%	
	S&P 500 Index	$8,525bn	$4,897bn	1.7x		34.4%	14.9%	
	S&P 500 Average	$17,050m	$9,795m	1.7x		32.2%	12.9%	
	S&P 500 Median	$7,618m	$5,112m	1.5x		29.1%	11.1%	

Source: PaineWebber

Notes

1. James J. Flink, *The Car Culture* (Cambridge, Mass., 1975), p. 61; Thomas M. Doerflinger and Jack L. Rivkin, *Risk and Reward: Venture Capital and the Making of America's Great Industries* (New York, 1987), pp. 152-153.
2. Lawrence R. Gustin, *Billy Durant: Creator of General Motors* (Grand Rapids, 1973), p. 94.
3. E. D. Kennedy, *The Automobile Industry: The Coming of Age of Capitalism's Favorite Child* (New York, 1941), Chapter 4; Lawrence H. Seltzer, *A Financial History of the American Automobile Industry* (Boston, 1928).
4. Kennedy, *The Automobile Industry,* p. 17.
5. Jonathan Hughes, *The Vital Few: American Economic Progress and its Protagonists* (Boston, 1966), Chapter 7.
6. Doerflinger and Rivkin, *Risk and Reward,* p.155. See also Seltzer, *Financial History,* p. 25.
7. John Case, "The PC Crapshoot," *Inc.* April 1984, p. 217.
8. John Glantz, "Personal Computers on the Mend?" *InfoWorld* July 29, 1985, p. 28.
9. Robert Sonenclar, "Computer Stocks; Is the Slump Over?" *Financial World* Oct. 15, 1985, p. 12.
10. "The Coming Shake-out in Personal Computers," *Business Week* Nov. 22, 1982, p. 85.
11. Gene G. Marcial, "Home Computer Stocks That Some Pros Still Favor," *Business Week* Aug. 8, 1983, p. 77.
12. Bro Uttal, "The Coming Struggle in Personal Computers," *Fortune* June 29, 1981, p. 90.
13. "Biotech: America's Dream Machine—Will it Become the Dominant Growth Industry of the 1990s?" *Business Week* March 2, 1992, p. 66.
14. *Ibid.*
15. *Ibid.*
16. "Why Biotech Stocks May Be Sick for a While," *Business Week* May 18, 1992, p. 120.
17. Linda Miller, *PaineWebber Biotechnology Monthly*: *January 1992*, Table 2, pp. 3-4.

Additional information is available upon request.

Prices of companies mentioned as of 5/5/98:

Advanced Micro Devices[3] AMD $25.750
Apple Computer[1] AAPL $29.688
Applied Magnetics APM $9.188
Applied Materials[1,4] AMAT $36.438
Barnes & Nobles[2] BKS $35.250
Computer Associates[3] CA $61.125
Cox Communications COX $46.500
EMC Corp[3] EMC $45.375
Ford Motor[2,3] F $45.875
Gateway[2] GTW $58.125
General Motors[3] GM $68.438
J.P. Morgan[3] JPM $134.563
KLA-Tencor[1,2,4] KLAC $41.500
Lilly (Eli)[3] LLY $66.313
Motorola[3] MOT $56.188
Nat'l. Semiconductor[3] NSM $21.438
SCI Systems SCI $40.188
Staples[1] SPLS $24.500
Tandy[3] TAN $47.375
Texas Instruments[3] TXN $66.250
Waste Management WMX $34.000

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[2]PaineWebber Incorporated has acted in an investment banking capacity for this company.

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[4]These securities can only be offered in such states as may be legally permissible.

[5]An officer of PaineWebber Incorporated or Mitchell Hutchins Asset Management Inc. is a director of the company being reported upon.

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