

PATTERN-MATCHING IN TECHNOLOGY

Analysts consider the sectors that make up the Tech 250 and the valuation patterns they have followed.

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In the **January issue**, we discussed technology's "deadly embrace" of 1994. After a four-year rise in the generation-long secular trend, which had carried most technology issues steadily upward, we foresaw a shouldering off in the rising momentum.

We saw Q2 through Q3/Q4 as a holding pattern akin to a software deadly embrace--one process waiting upon another, which, in turn, waits for the first. We expected high drama on the level of individual stocks--some rising, some falling in a rotational market--but a general pause before a new phase of growth.

Now, as we research this article in late-September 1994, we see that our timetable has been borne out. We have indeed seen a rotational market with an overall sideways motion in the technology sector: Between January 1 and September 23 of this year, 51% of the Tech 250 issues were up, and 49% were down, a virtually flat average movement. Now, however, we see signs that the secular trend in technology is on schedule for a release from the deadly embrace somewhere around the first quarter of 1995.

The June-July period of this year probably represented the bottom for many technology groups, including peripherals, enterprise computers, personal productivity software, enterprise software, information highway equipment, distributors, and design automation. In addition, since July, all the Tech 250 groups have been moving upward at the same time. We do not think we've necessarily seen the end of the deadly embrace: there is still a great deal of rotational movement on the level of individual stocks; there could still be one more "shake" in the secular trend, a re-test of the June/July bottom. But our evidence indicates that a secular trend in technology is setting up for a resumption of its upward motion.

In preparation for the overall resumption of growth in the technology sector, we decided to take a broad look at the Tech 250 groups. We decided to omit, for now, the information highway content providers; perhaps we will examine their boom/bust pattern in some future column. (However, note that we do see current buying opportunities in entertainment/educational software and in information highway operators, two groups that have been beaten down to interestingly low levels.)

Our broad look at technology found that groups fell into four patterns of stock-price movements: a secular leadership pattern (outperforming issues that are providing the upward momentum in the secular trend), a commodity-like pattern (stocks whose prices fluctuate in a classic supply-and-demand pattern), a normal technology pattern (stocks whose prices move in broad cycles with a steady upward bias), and a steadily falling pattern (stocks that have not, to date, benefitted from the upward secular trend). Figure 1 shows the four patterns and lists the technology groups that tend to move within each characteristic pattern.

Note that the patterns pertain to the group as a whole; individual stocks within groups may not conform to the model. For example, storage company EMC is a secular leader despite being in a group exhibiting a commodity-like pattern. Compaq certainly does not cycle like a commodity. And Novell, in the leadership enterprise software group, is not currently a secular leader,

although it may rejoin its leader groupmates. The patterns simply illustrate types of successful investment strategies, and offer a starting point for the evaluation of technology issues.

Secular Leadership Pattern

The secular leaders are the stocks that are carrying the secular trend upwards. As Table 1 shows, the leaders are in a position to benefit from steady growth areas (corporate networking, client/server computing), as well as from areas with potentially explosive growth (interactive media, high-performance microprocessors, mobile and "pervasive" computing). The combination of a steady baseline with exploding, speculative growth is what gives these groups their leading edge on the secular trend.

Table 1: Groups Leading the Secular Trend		
<i>Group</i>	<i>Growth/Expansion Opportunities</i>	<i>Commodity Risk</i>
Enterprise Software (those participating in client/server)	<ul style="list-style-type: none"> Steady growth in corporate client/server Expansion through interactive media 	Standardization of SQL engine and network systems
Information technology Services	<ul style="list-style-type: none"> Steady growth in outsourcing and consulting as networked systems become more complex 	Must constantly provide cost-savings to clients
Internetworking	<ul style="list-style-type: none"> Steady growth in corporate networks Expansion in "pervasive computing" Expansion through interactive media 	Standardization of hardware components such as adapters
Semiconductors	<ul style="list-style-type: none"> Steady growth in microprocessors are included in new types of hardware Expansion in high-performance chips Expansion in DSP chips 	Standardization of memory chips Low margins in mid- and low- end processors
Semiconductor Equipment	<ul style="list-style-type: none"> Expansion with Semiconductor group Shrinking geometries 	Must continually provide savings to semiconductor manufactures

Table 1 also shows the areas where the leaders are vulnerable to the pressures of comoditization. To the extent that companies within leading groups participate in areas undergoing standardization, they may lose their position as product forerunners and stock-price leaders. For example, enterprise software vendors Oracle and Sybase are currently secular trend leaders. But SQL engines are, necessarily, subject to standardization pressures. And, as Microsoft pushes its own SQL Server, ever lowering the price as Microsoft is wont to do to gain market share, databases will begin to compete more on price, less on features. Under the twin pressures of

standardization and price, SQL engine vendors may begin to take on aspects of the commodity model, a stock-price pattern we discuss below.

The groups shown in Table 1 may be clear leaders, but investors who do not already own these issues may find it hard to know when to enter the market. Secular leaders exhibit a characteristic pattern that can make purchasers wary during both advances and declines. These issues have a steady overall upward bias, but they are subject to sudden, scary drops in price. They rise and rise then--crash--they retreat violently. After the fall, these issues tend to recover quickly and resume their advance.

Because of this rise/dramatic-correction/rise pattern, investors have difficulty finding an entry point. While the stocks are rising, one tends to feel, "But they have risen so much already. How much higher can they go?" While they are falling, the drop is so drastic that it's hard to resist the crowd that is abandoning the stock in such a rumbling herd. One tends to think, "It's a leader, I've been meaning to buy it, but they all must know something that I don't know."

KLA, the maker of semiconductor manufacturing test equipment, is a recent example of the characteristic price patterns of technology secular leaders. Since we first discussed KLA in the July 1993 issue, the stock price advance has been steady and remarkably strong, rising from its April 30, 1993 price of \$12.25 to \$41.75 by June 6, 1994. Then, suddenly, by June 21, the stock had dropped to \$32.50. In about two weeks, however, it rebounded to \$43.00. After a short correction back to \$37.00, KLA climbed to a new high of \$50.00. Investors who avoided the stock at \$41.75 (thinking it already too high) or \$32.50 (thinking something had gone wrong with the company or waiting for a much deeper correction) were left gnashing their teeth at their missed opportunities.

Among groups the display secular leadership pattern, internetworking has been subjected to the largest retreat. For this reason, internetworking issues may offer an easier entry point for investors interested in buying leaders.

Commodity-Like Pattern

Our second pattern is one that is characteristic of commodities: prices rise and fall in regular cycles without a major bias upward or downward. Two groups--storage and desktops/ file servers--are ones whose products, among all those in technology, have been most subject to standardization of features and accompanying downward price pressures. The fortunes of these companies and products don't rely strictly on the supply/demand cycles of true commodities--they remain technology issues, after all. But, unable to rely on the premiums of hot new features and leading-edge technological developments, they are more exposed to commodity pressures than any other groups in the Tech 250. Due to the commodity-like nature of their products, these companies' stocks do not benefit consistently from the upward secular trend in technology.

Our research shows, however, that storage and desktop/file servers are currently in uptrends within the commodity price cycle. We may have seen the worst of the vendor shake-out in desktop systems. And interactivity, with its demands for huge, fast storage devices, may create new premium-feature opportunities for storage makers. Just as secular leaders are being stalked by commoditization, vendors of commodity-like issues may find new opportunities to ride the upward secular trend.

The design automation software group also displays the commodity-like pattern, which is something of a puzzle to us. On the basis of technology alone, this group should be part of the secular leadership shown by semiconductor companies and semiconductor equipment manufacturers. Makers of semiconductors should be looking towards design automation as a way to cut production costs; design automation should therefore be expanding along with the overall growth in microprocessing. These issues exploded in 1990-91 then disappointed investors for over

three years. Recurring expectations and disappointments may be responsible for the cyclical patterns in these stocks.

Normal Technology Pattern

The next pattern represents the largest number of technology groups. Indeed, we see this pattern as the normal and regular stock-price model for technology issues. Prices for issues in these groups display fairly regular cycles with an overall, steady upward bias. In this sense, the normal pattern combines that of secular leaders with commodity-like stocks. Their prices move in cycles, but in broader, less accelerated curves than those of the leaders--they tend to have longer downturns. And, although these groups advance steadily, their upward momentum is not as steep as that shown by secular leaders.

The normal pattern includes three groups--information highway equipment, information highway operators, and wireless--whose growth is speculative. Their future very much depends upon the decade-long development of interactive consumer media and advances in mobile computing. The speculative future of information highway applications is probably responsible for the rise and fall in these stocks, as investors respond to hot news then cool off when it becomes clear that developments in interactivity will not happen quickly.

Wireless, however, may be close to emerging as a secular leader. The group is currently at a trading top, but we are looking for a low and a buying opportunity early next year. The wireless group illustrates the fluidity of our technology patterns. Once a group can add some solid, steady product growth to speculations for future expansionary growth (as may be happening in wireless), the issues can move from "normal" players to market leaders.

Some enterprise software companies, like Novell, currently display the characteristic cyclical pattern, as does the personal productivity software group. For these issues, the cyclical movement is most likely the result of comoditization pressures. Except for the introductions of Lotus Notes and software agents, there have not been new categories of software created in recent years. There can be only so many viable competitors for word processors, spreadsheets, financial applications, human resources packages, client/server development tools, etc. As applications become more and more "generic," vendors must keep dropping their prices, especially in the face of Microsoft's relentlessly competitive downward pricing. Although software, by its nature, can never become a commodity like a standard Ethernet adapter, it is subject to comoditization forces, which may be giving these issues their cyclical pattern.

However, we see signs that the enterprise software group may be reforming itself. Laggard Novell is currently at the "right" place for a buy. Informix may continue to provide upside surprises. These issues may be poised to rejoin companies like Sybase and Oracle as secular leaders.

In addition, we see strength in computer peripherals. These companies may be benefitting from increasing demand for multimedia computing products and high-end system additions like color printers. We would recommend a buy for issues in this group.

Steadily Falling Pattern

Our last pattern includes a single Tech 250 group: enterprise computers. The overall retreat in these issues is, of course, the result of the shift away from mainframe-based and centralized computing to networked, distributed systems based upon less-expensive, standardized, Intel-based platforms. As a group, enterprise computer issues have gone steadily downward.

However, we do see signs that the downward trend may be coming to an end. We may have already seen sentiment shifts on IBM and Digital Equipment, and much of the bleak news about enterprise system companies may already be discounted in their low stock prices. And, during the difficult market of 1994, enterprise computers were one of the best performing groups. In general,

the group may be poised for a return to the normal technology pattern--just what we would expect to see as the overall secular uptrend resumes.

There is a slowly dawning realization that large, centralized computers are not going to disappear from the face of the earth. After the initial doom-saying about mainframes as dinosaurs comes the understanding that not every application can be reduced to 486s or Pentium boxes strung together on a LAN. Many complex systems require if not a mainframe, then some large mainframe-like box. Mainframes may play a role as servers for extremely large databases; they may find a niche in applications demanding a very high degree of parallelism (such as video servers); they may prove useful as huge network monitors, overseers of far-flung distributed architectures. And there are some systems, such as airline reservations, that may never entirely leave the mainframe: some applications rely upon a high degree of centralized control over a large central store of information.

Even large computers, then, may find their uses revitalized by new technical developments and new applications. Given the quickly-changing nature of technology, our four models of stock-price movement are not fixed in stone. Secular leaders must constantly outrun commoditization, and vendors of commodity-like technologies may find new features that add significant, non-commodity value to their products. Every vendor risks falling off the leading edge, and new technologies and applications are continually creating openings for growth.

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