

CAPITAL FLOWS

The case for investment in the support chip makers: swelling growth on the backs of DSPs and mixed product lines, but vulnerability in PC graphics and video chips.

By Clara Basile and Ellen Ullman
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There's more to computing than CPUs and RAM, although it's easy to lose sight of the fact. Intel's newest processor dominates our thinking about chips. The battle between the Pentium and PowerPC draws extended coverage in the trade press. When computer makers advertise their machines, they start with the CPU and memory; the other devices fall to the bottom of the spec list.

But, to anyone who has been looking closely at the computer ads, it's clear that the list of "other" features is beginning to grow. Where manufacturers once felt content to specify VGA graphics and the size of the hard disk, they now tell us about the size of not one, but two caches; about support for PCMCIA devices; about CD-ROM drives, on-board SCSI-2, sound cards, speakers, and networking connections. And all of these features on the list require supporting silicon.

Sitting quietly beside the new high-end central processor and lines of 4 megabyte SIMMS are all those other chips inside the machine. Their makers do not buy television ads that air during episodes of "Star Trek: The Next Generation." Most buyers have no idea who made those chips, nor do they care. But we wondered who was benefiting from this increasing functionality in computing because one thing appears certain: whether or not the PowerPC steals market share from the Pentium, users expect their computers and computing devices to do more for them. And every time a new high-end chip goes out the door, several supporting chips go along with it.

This month, we take a look at the stocks of the companies that make the supporting semiconductors. To see this group more clearly, we removed Intel from our calculations. Like analyses of the computer industry that are done with and without IBM, we wanted to get a clearer look at the group without the dominant player. Our goal was to find emerging leadership as we near the end of the current market decline.

Looking for Market Leadership

As we discussed in our January article ("The Deadly Embrace of 1994"), this year is a difficult one for technology investors. After rising through the first quarter, the technology sector on average began to drift sideways. Meanwhile, the wider market began a broad decline. However, despite the difficulties of 1994, we see signs the first phase of the market decline probably is behind us.

The evidence for the end of the decline comes from our sentiment indicator. This measure tells us when investor sentiment is approaching a negative extreme, which may indicate market bottoms. The closer the indicator comes to 100, the more negative the sentiment and the more likely we are due for a sentiment shift from negative to positive sentiment. After being in a mildly positive range of 30 - 50 over the past year, sentiment is now moving toward an extreme on an intermediate basis (6- to 9-month cycle). That is, the majority of investors are now bearish on the market. We are not yet at *the* bottom, but we are moving closer to the end of the current decline. In our work, we are on target for a major bear-market low in late 1994 or early 1995.

As we entered into the first phase of the decline, we looked for ways to minimize losses while earning respectable gains. We sought stability in the steady-Eddy data services stocks. Now, however, we need a different strategy for a later phase of the market decline. Instead of stability, we are looking for growth. We're looking for those areas where leadership may be re-emerging in the market.

However, finding leaders within the current broad decline is not a simple matter. The trend in technology is still negative: less than 30% of THE REDHERRING Tech 250 issues are currently in uptrends. The situation is not improved when we look at the individual subgroups within the Tech 250. Even the relatively strong semiconductor and semiconductor equipment groups are moving sideways at best. Only 8% of the Tech 250 semiconductor stocks are in uptrends -- and none of those in semiconductor equipment.

Broad technology themes are not telling us where leadership might soon emerge. In the current market, gains and losses are averaging out within technology subgroupings, producing an overall sideways motion for the group. It's not enough to pick all the stocks in one group or another, since no one group is currently showing emergence as a whole.

Since overall subgroups do not look attractive, we realized we had to examine the technology groupings more closely, with more knowledge of the underlying technologies and markets. Recalling the growing list of features in high-end computers, we decided to take a closer look at semiconductors, concentrating on suppliers of supporting ICs. We created a group of 19 companies involved in support chips (see Figure 1). We then divided this group by its key products and markets. What emerged were three categories of suppliers: those involved primarily in signal processing, those with a more mixed product offering, and those selling mainly into the desktop graphics and video market.

<i>Figure 1</i>
Support Chips by Product & Market
(all prices as of 4/29/94)
Signal Processing
Analog Devices (ADI)-\$27 3/8
Exar (EXAR)-\$24 1/4
Integrated Circuit Systems (ICST)-\$12 3/4
LinearTechnologies (LLTC)-\$47 1/2
Maxim Integrated Products (MXIM)-\$48 7/8
National Semiconductor (NSM)-\$20 5/8
Sierra Semiconductor (SERA)-\$8 1/4
Triquint Semiconductor (TQNT)-\$10
Mixed Product Line
Cirrus Logic (CRUS)-\$36
Cypress Semiconductor (CY)-\$16 5/8
Dallas Semiconductor (DS)-\$18 1/2
Integrated Device Technology (IDTI)-\$30 1/8
Motorola (MOT)-\$44 1/2
Texas Instruments (TXN)-\$76 1/2
Zilog Inc. (ZLOG)-33 1/2
PC Graphics & Video
Chips & Technologies (CHPS)-\$4 1/2
S3 Corporation (SIII)-\$8 1/8
Trident Microsystems (TRID)-\$5 3/4

Signal Processing

The segment we call "signal processing" is involved in the market for digital signal processors (DSPs), mixed signal processors, and other controllers involved in the digitizing of audio, video, and voice. These companies also supply integrated circuits used in audio amplifiers, as well as controllers and sensors for industrial controls. In addition, they are players in the growing automotive uses for chips: the sensors used in air bags, anti-lock braking systems, speed-sensitive power steering, traction control, and all the other high-technology finding its way into today's cars.

As suppliers of DSPs, the digital processing companies come closest to a pure play in semiconductors for the nascent market in multimedia, interactivity, and wireless communications. Indeed, it's possible to call these new applications "signal computing," to copy a phrase from Jerry Fishman, president and COO of Analog Devices. The market for these applications is poised for rapid expansion. Texas Instrument's vice chairman Pat Weber sees the "explosive growth" in DSP applications, going from \$60 million in DSP units 1993 to \$180 million on a cumulative basis by 1995.

Even if interactivity does not materialize soon as major source of DSP sales, the digital processing companies have customers in well diversified markets, including workstations, PCs, modem manufacturers, telecom, networking, automotive, audio, and industrial controls. This diversification of applications and customers ameliorates the risk. If one market falters or fails to materialize, the others still may grow.

Mixed Product Line

The second group of semiconductor companies we called the "mixed product line" segment. These companies supply a wide range of semiconductor products: CPUs, peripheral controllers, memories, SRAMs, DSPs, etc. They also have fairly well diversified customers, including computer OEMs, peripheral makers, industrial equipment companies, and military suppliers.

While they are generalized IC suppliers, most of these mixed product companies also have a substantial investment in the signal processing technologies supplied by our first group (only Cypress does not appear to have a current involvement in digitizing chips). The mixed product companies therefore stand to grow with the nascent digital communications applications, only not as quickly. And, to the extent that they offer signal processing chips, they can participate in the growth of interactive and cellular markets with less risk, due to their product diversification.

The challenge for the smaller mixed product line companies is to move out of commodity-content areas into products that offer more differentiation. For example, Integrated Device Technology expects to reduce their percentage of sales involved in static RAMs, which have high commodity content, and into the more differentiated chips for LANs, WANs, and mobile communications.

PC Graphics & Video

The segment we call "PC Graphics and Video" includes four companies that supply graphics accelerators, LCD controllers, and boards/chips for desktop processing of video. They participate mainly in the desktop and portable PC market.

The companies in this segment stand to benefit from the continued expansion in graphics, but the growth does not promise to be explosive. It is an already-established market and a fairly narrow one. These companies appear to be somewhat vulnerable technologically. With their fairly narrow product lines, it's not certain they can withstand the rapid pace of change in technology in this area. Also, their revenues will tend to rise and fall with PC sales. In short, while these product

areas may see some expansion, the companies are not as well diversified in technology, products, or customer base.

Outperformance in Signal Processing and Mixed Products

Analyzing semiconductors from the perspective of our three support-chip categories yielded clear results. In place of the languid sideways movement of the overall semiconductor group, we found strong outperformance in the "signal processing" and "mixed product line" segments. As Figure 2 shows, in the 3 1/2-year bull cycle from December, 1990 to date (4/29/94), technology outperformed the overall market, and the signal processing and mixed products outperformed technology. Meanwhile, the group we call "PC graphics and video" lagged behind. We found similar results when we analyzed annualized stock price returns (Figure 3).

Clearly, by dividing the semiconductor group into segments, we were able to separate the leaders from the underperformers responsible for the average sideways movement in semiconductors. While there is no guarantee that the signal processing and mixed product line segments will continue to annualize at the rates in shown Figure 3, for the current year, these two segments are up while *everything else in technology is down*. We would not necessarily pick one segment over the other (notice that Figure 2 shows the two segments converging in the period December, 1993 to April, 1994). Our approach would be to invest in both of the outperforming segments.

While an investor would do well to buy all the issues in the signal processing and mixed product segments, we do have some favorites among them. **National Semiconductor** bottomed in 1990 at a price of \$3.00. Over the next two years, National Semi could be a \$40.00 stock. **Cirrus** has nearly completed an intermediate downturn and could rally for the rest of the year. It is one of the few stocks where the long-term trend is still up and whose uptrend is still accelerating. Cirrus would have to decline by 25% to reverse this long-term uptrend. **Integrated Device Technology** is also in a long-term uptrend, but we believe it has not yet corrected enough on an intermediate basis. We would buy IDT after further correction. We would also consider buying both **Texas Instruments** and **Motorola** on corrections. In **Sierra** we see a potential turnaround candidate.

The stocks in our support-chip segments should benefit not only from increased functionality in computers, but also in the expanding role of semiconductors in products ranging from telephones to cars. With or without the development of interactive television, it is certain that the digitizing of our analog world is an accelerating theme. The wave form of a sound, the color and extent of light, the speed of a rotating tire, the temperature of a liquid -- these are only a few of the analog signals and measurements that must be converted to the underlying zero/one code of computers. And those digitized signals will increasingly be transmitted through both wired and wireless networks. To the extent that our support-chip companies participate in signal processing, networking and communications, they stand to benefit from some of the newest and most rapidly expanding technologies in computing.

Clara Basile co-founded Avalon Capital Management with partners Dave Rahn, Bruce Erickson and Bill Oberman. Avalon is a northern California investment firm that provides personalized investment portfolios for individuals.

Ellen Ullman is a software engineering design consultant and principal at NeoLogica. San Francisco-based NeoLogica specializes in new-product services for start-up and established technology companies.