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## NETWORKING INDUSTRY

### *A New Way to Listen to the Music: ROIC*

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- Over an intermediate to long-term investment horizon, an investor's primary focus should be value creation—how much economic value has been and will be created from the funds invested in and deployed by a company.
- Return On Invested Capital (ROIC) is a superior quantitative touchstone with which to assess value creation. We believe ROIC to be an important guide to a company's future prospects for value creation and to be significantly more informative than traditional investment heuristics—EPS, EBITDA and ROE—which can be misleading indicators of value-creating industries and companies, in our opinion.
- Confirming our belief that the networking industry is in the early stages of what we believe to be a relatively long investment cycle, the industry continued to generate an exceptional ROIC throughout the past 11 calendar quarters.
- 3 of the 12 companies we follow in the networking industry achieved an ROIC in excess of 100% over the four-quarter period ending in the third quarter of calendar 1996; 5 of the 12 companies exceeded 60%; 9 exceeded 35%; and 10 exceeded 25%. These 12 companies collectively achieved an aggregate ROIC of 62% during this same period.
- Benefiting from both industry consolidation and high barriers to entry, the industry's leading vendors are well positioned to reap the lion's share of the billions of dollars to be invested in building advanced networks, and should be able to maintain their extraordinary levels of profitability, over the next decade, in our opinion.
- Largely by avoiding competition with Cisco and the other leading networking vendors, a number of smaller, younger networking companies—Ascend, PairGain and VideoServer in particular—have achieved impressive levels of ROIC by successfully gaining "first mover advantage" in their specific market segments of the networking industry.

## *Value Creation Is King*

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Traditionally, guided by security analysts and the financial press, investors have focused on reported earnings as the single most important investment criteria in evaluating a corporation's operating performance and investment merit. In recent years, an increasing number of academic scholars, analysts and investment managers have turned to free cash flow as a more accurate analytical tool to assess operating performance and to project future stock prices. We believe, however, that both of these measures have serious shortcomings as effective investment guides.

We instead propose that over an intermediate to long-term horizon an investor's principal investment criteria should be value creation—more specifically, how much economic value is being and will be created from the funds currently and prospectively invested in and deployed by a company. We believe that the key driver of intermediate to long-term value creation is Return On Invested Capital (ROIC).

ROIC measures the amount of cash generated by each dollar of capital invested in a company's operations. Alternatively stated, ROIC measures how effectively a company has deployed the capital invested in its business in generating cash flow. A company whose ROIC exceeds its cost of capital generates positive net cash flow, thereby creating value; a company whose ROIC is less than its cost of capital generates negative net cash flow from an economic perspective, thereby destroying value; and a company whose ROIC equals its cost of capital neither creates nor destroys value.

A company can create value by any one of the following four means:

- Reallocating or otherwise improving the use of its existing capital to increase the spread between its ROIC and its cost of capital.
- Deploying more invested capital in its current business, provided the returns generated by such capital exceed its cost.
- Investing additional capital in new projects (lying outside of the traditional scope of its business) yielding a marginal ROIC in excess of the cost of such additional capital.
- Lowering its cost of capital.

One common theme runs through each of the above value-creating strategies: in order to generate more cash flow than is consumed by its business, a company must earn a higher ROIC than its cost of capital. The ultimate size of this net cash flow to investors is driven by the following three factors:

- The size of the spread between a company's ROIC and its cost of capital.
- The length of time such spread persists.
- The amount of capital that can be invested at such spread.

The ideal value-creating company is one that has an ROIC that far exceeds its cost of capital and that has an unlimited number of investment opportunities each of which will yield an ROIC greater than the cost of the capital required for such

investment. The larger the positive spread, the longer it can be sustained by the company, and the more capital that can be invested in the company's business, the greater will be the net positive cash flow generated by the company.

While the positive spread between each investment's ROIC and corresponding cost of capital ideally should be equal to or greater than the spread between the company's current ROIC and cost of capital, each investment will create value as long as its spread is positive, regardless of the size of the spread. If a company's cost of capital exceeds its ROIC from current and prospective investment projects, however, any growth will transfer value from the company's investors to its customers, suppliers, management and/or employees.

## *Early Warning System: Identifying Changes on the Margin*

By analyzing ROIC and its constituent components, cash flow and invested capital, we believe that we can more accurately assess how effectively, how much and how long capital can be invested by a company in its business. In short, we believe that ROIC analysis provides us with insight as to the exploitability, size and time span of a competitive advantage.

Of equal importance as a guidepost to investors, ROIC analysis facilitates the early and accurate identification of fundamental changes in operating performance by quantifying the magnitude and direction of change in operating profitability. In contrast, the reported earnings metrics of EPS, EBITDA and ROE often fail, are slow to reflect or, even worse, mask changes on the margin in a company's business.

More specifically, analysis of the level of marginal or incremental ROIC relative to historical ROIC—and concomitantly the change in the level of sequential ROIC quarter-over-quarter and year-over-year—for both individual companies within an industry and the industry as a whole can provide an early warning system regarding fundamental shifts and emerging trends in their competitive dynamics, profitability and investment attractiveness.

Industrywide marginal ROIC that exceeds historical ROIC (i.e., increasing sequential ROIC) and extraordinary levels of ROIC are the hallmarks of an industry that is young, strong and growing. Companies that compete in such an industry typically foster high investor expectations and are rewarded with high P/E valuations. In contrast, a sequential decline in ROIC or marginal ROIC below historical ROIC (other than due to seasonal factors) may indicate that the long-term investment opportunities in the industry are dissipating, which is a sign of a maturing industry. While this shift may be due to increased competition within the industry, saturation of demand or a number of other factors, the more substantial the decrease and the longer the trend continues, the more likely it is that this change is indicative of a fundamental shift in the economics of the industry.

Within an industry, a company that consistently earns an ROIC in excess of the industry average and that is able to maintain or increase the level of its ROIC typically deserves and is rewarded with a higher market valuation than its peers. Similarly, ROIC consistently below the industry average and that is declining on a sequential basis typically indicates an ailing or weak competitor that merits and receives a discounted valuation relative to its peers.

## *ROIC Analysis Applied to Mergers and Acquisitions*

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On a micro level, marginal ROIC analysis can be used to assess the profitability and thus the potential for long-term value creation of a particular merger or acquisition by comparing the change in cash flow to the increase in invested capital resulting from the transaction.

In general, we view mergers and acquisitions with what we believe to be a healthy degree of skepticism as to their potential for creating value for the surviving or acquiring company and its investors. We believe that diversification alone is never a sufficient justification for an acquisition since a company's investors are perfectly capable of independently investing their capital in the target company if they so desire.

In order to create value, a merger or acquisition must result in the surviving entity's generating greater positive net cash flow per dollar of invested capital in its operations than the net cash flow per dollar of invested capital generated by the merging entities or the acquiror prior to the transaction. This increase can be realized in one of two basic ways: by generating additional cash flow or by reducing the amount of invested capital required to produce the same level of cash flow. For example, the recent spate of mergers and acquisitions in the banking industry have been driven largely by the latter as banks have recognized that they can achieve large cost savings without adversely impacting revenues by eliminating redundant branches, administrative personnel and cost centers.

In the networking industry, merger and acquisition transactions have been driven predominantly by the leveraging of complementary products and R&D to generate greater net cash flow from the same base of invested capital than could be individually generated by either of the independent companies. These networking merger and acquisition transactions have typically been of two varieties: a merger of two large established organizations—or alternatively, an acquisition of the smaller by the larger—each of which has existing commercial products, customers and salesforces and/or distribution channels. Such mergers and acquisitions include the merger of Synoptics and Wellfleet to form Bay Networks in September 1994, the acquisition of Chipcom by 3Com in October 1995, and the recently completed acquisition of Stratacom by Cisco.

The other principal merger and acquisition paradigm that has emerged in the networking industry involves the acquisition by a mature company with an established sales force and/or distribution channels of a relatively young company having impressive R&D, technology and/or products but lacking sufficient marketing, sales and financial resources to commercialize its technology or to effectively capture the market opportunity on its own. Shareholders of the acquired company typically receive a significant premium for their shares. The acquiror in turn gains desired technology and products to complement and/or expand its current product line and perhaps to penetrate a rapidly expanding market niche when such technology and products would have been more costly and taken longer to design, develop and commercialize on its own. The acquiror typically can easily integrate the acquired technology into its own products and/or add the acquired products to its line-up. In many instances, the two companies already have in place a supply, joint marketing or joint venture agreement.

We believe that ROIC analysis provides a means of quantifying the value generated or destroyed by such transactions by taking into account both the additional capital invested in the acquiror/surviving company's business and the additional marginal cash flow generated therefrom.

## *Moats and Walls*

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In the long run, in order to sustain extraordinary (i.e., above average) ROIC, a company must create or compete in an industry that has high barriers to entry. In the absence of entry barriers, a high level of ROIC within an industry will lead existing competitors to increase the amount of capital invested in their operations in an effort to grow their businesses and reap additional correspondingly high returns. In addition, high ROIC will attract into the industry new entrants seeking to capture a portion of these extraordinary returns.

In the absence of barriers to entry, the amount of capital attracted to an industry will be roughly proportional to the level of ROIC generated by the industry—the higher the industrywide ROIC, the more capital will be attracted to the industry. Inevitably, once the pace of investment overtakes the industry-demand growth rate, ROIC for the industry will begin to decline as the rate of increase in net additional investment overtakes the rate of increase in net cash flow generated by such additional investment.

In the networking and other technology related industries, barriers can exist in a variety of forms including, most prominently, the following:

- Intellectual property which is protected by patents or copyrights or which is difficult and time consuming to reproduce.
- “First mover advantage” which is a phrase used to express the inherent advantages that come to the first company to exploit a new technology market. The following five economies of scale derive from first mover advantage in the networking and other technology related industries: customer feedback, volume leverage from the cumulative production of integrated circuits, economies of scale from software-based products, crucial early customer wins and distribution.

## *What About Cash Flow?*

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The father of the dividend discount model, John Burr Williams was one of the first investment analysts to equate investment values with cash flows. Williams first set forth this equation in his seminal work, *The Theory of Investment Value*, published in 1938, as follows:

*The value of any stock, bond or business today is determined by the cash inflows and outflows—discounted at an appropriate interest rate—that can be expected to occur during the remaining life of the asset.*

Applying John Burr Williams's formula, in order to analyze the process of value creation, we must first identify the primary source of cash flow. After studying several different approaches, we believe that the best economic model is based on the definition of cash flow proposed by the consulting firm Stern Stewart & Co. and used in its EVA analysis<sup>1</sup>. Stern Stewart argues that the "best" definition of cash flow is net operating profit after paying cash taxes, commonly referred to as NOPAT. Essentially, NOPAT is cash earnings from a company's operations less cash taxes that would have been paid on such earnings in the absence of tax effects relating to short- and long-term financing considerations.

Cash flow as defined as NOPAT is a function of revenues minus operating expenses (including depreciation, which we discuss in the following section of this note) minus cash taxes. Revenues are the product of units times average selling prices. Future revenues are thus a function of the following two drivers:

- Unit growth (traditional demand analysis) which is a direct reflection of demand for the company's product(s). Demand for technology products tends to fall along traditional product lifecycles.
- Pricing trends (traditional supply analysis) which are a function of competition. Barriers to entry, product substitution and rivalry among competitors are the primary determinants of pricing competition.

### *Traditional Investment Analysis—Misguided by EPS, EBITDA and ROE*

Traditional investment analysis focuses on a company's statement of operations while looking at its balance sheet only to gauge how effectively the company is managing its inventory and accounts receivable. Myopic focus on the level of—or sequential quarter-over-quarter or year-over-year change in—reported profits, however, can result in misleading conclusions and, at best, conveys insufficient information regarding the true economic vitality of a company's current and prospective operations.

The following example serves to illustrate this point. Companies A and B both compete in the same industry, trade at the same stock price, have the same number of outstanding shares and each earned \$1 in 1995. Company A, however, only required \$10 of capital to produce its \$1 of earnings while Company B required \$20 of capital. Carrying through our example and further highlighting the inadequacy of earnings and earnings growth as investment guideposts, both companies double their earnings to \$2 in 1996. Company A, however, only required \$5 of additional capital to produce its additional \$1 of earnings while Company B required \$25 of additional capital to produce its additional \$1 of earnings. Analyzing these companies on the basis of earnings and earnings growth, an investor would be indifferent between them—both companies generate the same amount of earnings and the same earnings growth rate.

The two companies, however, are far from equivalent, as clearly reflected by analyzing each company's respective ROIC. Company A increased its ROIC from 10% in 1995 to 13.33% in 1996 and generated a marginal ROIC of 20% on each dollar of additional capital invested in its business in 1996. In contrast, starting with a lower ROIC, 5%, than Company A in 1995, Company B proceeded to further

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<sup>1</sup> EVA is a registered trademark of Stern, Stewart & Co.

widen its profitability gap with Company A by generating only a 4% marginal ROIC on each dollar of additional capital invested in its business in 1996 which resulted in an ROIC of 4.33% in 1996. This 4% marginal ROIC fell short of both Company B's historic 1995 ROIC and Company A's 1996 marginal ROIC. Company A thus generated twice as much value as Company B in 1995, slightly more than three times as much value in 1996 and five times as much value on each dollar of additional new capital invested in 1996.

Another objection to using the traditional investment metrics of EPS and ROE concerns their use of reported profits as opposed to economic profits, or NOPAT. "Reported profits" is the product of accounting conventions under Generally Accepted Accounting Principles (GAAP). These conventions leave management with a certain amount of latitude over the earnings they choose to report by giving management discretion over the classification and timing of certain items as expenses on the statement of operations or as liabilities on the balance sheet. Reported profits also tend to mask the profitability of a company's operations by including net interest income (expense) and other nonoperating items.

We believe that when evaluating an investment, investors should focus on the returns currently and, more importantly, prospectively generated by the operations of the company. All other income or expense, including interest expense related to debt financing, is temporal in nature—i.e., either nonrecurring or susceptible to quick reduction or elimination.

One-time nonrecurring gains or losses clearly are extraordinary, unrelated to the company's operations, and do not impact future profits.

Interest income typically is generated by investing cash balances not otherwise required to fuel the company's operations in short-term instruments pending management's determination of how and when to utilize such cash to augment the company's operating assets. These short-term investments typically earn riskless treasury rate returns. According to the "risk-return" correlation theorem, from an investor's point of view, any profits earned on cash balances should have no impact on the investment decision since such profits and the underlying cash assets are both riskless and temporary in nature, and thus are neither value creating nor value destroying. Temporary cash balances, moreover, while nominally contributing to a company's cash flow, reduce a company's profitability to the extent the company's non-cash assets generate greater than treasury-rate returns.

Interest expense also should be irrelevant to an investment decision since such expense is the byproduct of a company's financing or capital structure decision and has no bearing on the economic value generated by a company's business. A company may choose debt financing for a variety of reasons, including unavailability of the equity markets or the company's desire to capture for its existing shareholders what it believes to be value-enhancing opportunities. From an investor's perspective, this choice has most significance when a company's debt burden is so heavy as to have or potentially to have an adverse impact on the company's operating decisions.

The following example illustrates why we seek to eliminate interest expense when analyzing a company's ability to create value. Should a young company with rapidly expanding revenues and commensurate capital needs choose to finance such growth by borrowing, the interest expense resulting thereby will reduce the

level of reported profits (or may increase the level of reported losses or convert what would have otherwise been a profit into a reported loss). This interest expense can be reduced or eliminated at any time in the future through, among other methods, refinancing with a credit facility having a more favorable interest rate or repayment with funds generated internally or raised through a secondary equity offering.

As an investment guidepost, ROE also suffers from the potential for dramatic discontinuities created by replacing a substantial amount of equity capital by an equivalent amount of debt financing. While such replacement will significantly increase ROE in the year in which it is effected by reducing the amount of equity in the denominator of the ROE metric, it will have no beneficial impact on the company's operations (if the debt burden is too large, it may in fact crimp operating flexibility); as measured by operating cash flow, the company's profitability will remain unaffected. The company's total cash flow, moreover, will be reduced by the net interest expense of the debt service (which equals the interest expense less the corresponding tax shield).

Due to the shortcomings of EPS and ROE addressed above, many companies and investors have respectively promoted and focused on EBITDA as a more accurate measure of true operating performance. EBITDA, however, overstates the amount of income generated by a company's operations by deducting neither the amount of tax that would have otherwise been incurred on the income generated by a company's operations nor the amount of depreciation of the company's assets. An operating expense that reduces the operating cash flow available to a company's investors, cash taxes on operating income should be treated no differently than any other operating expense such as cost of goods sold or selling, general and administrative expense.

The actual dollar amount by which a company's assets depreciate in value is also a real economic expense; this amount reflects the actual "consumption" of a company's assets. While GAAP prescribed depreciation expense represents only a rough approximation of the actual dollar amount by which a company's assets are "consumed," we believe that such approximation provides a more accurate assessment of the actual level of consumption than complete omission of any such charge under EBITDA calculations.

The recent spate of restructuring-related "nonrecurring" charges taken by a large number of companies in a variety of industries provides a prominent example of management reporting practices that tend to obfuscate rather than shed light on the true economic profitability of a company's operations. By taking all such charges relating to a restructuring in a single year, regardless of when such restructuring-related expenses actually are incurred, a company cloaks its true operating performance both in the year in which the charge is taken and in future years in which the expenses are actually incurred, as follows:

- Future reported earnings are shielded from these charges while the immense size of the charge in the quarter and year in which taken tends to numb investors as to the shortcomings of the company's current operations.
- The charge immediately and significantly reduces the size of the company's capital base which in turn increases the level of the company's future ROE based upon the company's reported financial statements.



- If upon consummation of the restructuring the aggregate amount of restructuring-related expenses actually incurred falls short of the amount of the restructuring charge originally taken, the company can add the amount of this shortfall back to its reported earnings in its income statement in the year in which the restructuring is consummated.
- A number of companies, moreover, have taken more than one nonrecurring charge on what appears to be an almost periodic basis, in effect in an effort to repackage in a more investor-acceptable form the potential shortcomings in their operating performance.

## *Applying ROIC Analysis to Technology Companies*

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Technology companies, particularly young ones, typically have simple income statements. In general, their capital structures are straightforward as these companies are almost always financed entirely with equity. Their income statements break down into four pieces: revenues, operating expenses, interest income/expenses (almost always income), and taxes. NOPAT, therefore, is simply a direct function of revenues minus operating expenses minus taxes. Using this formula, the key drivers of value creation—i.e., cash flow or NOPAT—are ROIC and growth in invested capital.

For most technology companies, the last of the four methods of generating value enumerated in the first section of this note—lowering the cost of capital—provides relatively modest benefits. First, a company can only manipulate its cost of capital within a limited range. Second, technology companies have traditionally had only limited access to the debt markets due to the nature of their principal assets (i.e., intangibles consisting principally of patented intellectual property and the brain power of their employees) and the riskiness of their cash flows. Because technology companies typically are financed only with equity, their cost of capital is their cost of equity.

We thus focus our analysis on the other three methods of creating value, each of which are driven by ROIC. By analyzing historical trends in and current levels of ROIC, we believe that we can identify those companies that are value creators or destroyers and assess the extent to which they have created or destroyed value. In addition, and more importantly, we believe that this measure can help us to assess their prospects for long-term value creation or destruction in the future.

## *ROIC Analysis of the Networking Industry*

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Figure 1 sets forth the quarterly annualized ROIC, respectively, for the 12 networking companies that we follow plus four other leading networking vendors (these 16 companies<sup>2</sup> account for more than 95% of the entire networking industry's revenues and NOPAT and are thus referred to as "the industry" hereinbelow) and the quarterly annualized aggregate ROIC for the industry as a whole from the first quarter of calendar 1994 through and including the third quarter

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<sup>2</sup> Data for Stratacom is separately broken out from Cisco for all quarters prior to its acquisition by Cisco in Q2 1996.

of calendar 1996<sup>3</sup>. Figure 2 sets forth the amount of NOPAT generated by each of these 16 networking companies as well as the aggregate levels of NOPAT for the industry. Figure 3 presents the amount of capital that has been invested in each of the 16 companies and the industry total during this same time period. In addition, for a point of reference outside of the networking industry, The Coca-Cola Company has been included in each of the ROIC, NOPAT and invested capital figures.

**Figure 1: ANNUALIZED ROIC**

	1994				1995				1996		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
ASND		174.0%	156.8%	144.2%	116.3%	127.2%	89.4%	149.9%	132.1%	107.4%	98.6%
BAY	42.8%	47.6%	60.1%	54.1%	62.2%	73.4%	68.0%	63.2%	38.0%	30.5%	25.7%
COMS	53.4%	51.2%	55.7%	74.7%	54.3%	50.6%	47.0%	33.4%	37.7%	37.5%	36.6%
CS	80.2%	80.0%	72.1%	71.2%	75.0%	78.9%	73.2%	71.6%	55.4%	57.8%	57.8%
CSCO	213.3%	207.9%	245.1%	123.9%	123.4%	127.4%	142.7%	125.8%	137.2%	141.4%	178.1%
FORE	127.4%	65.7%	80.5%	86.6%	88.6%	74.6%	85.5%	94.2%	34.9%	22.6%	21.9%
PAIR	34.7%	28.1%	37.9%	40.1%	39.3%	38.6%	49.9%	49.3%	70.3%	74.7%	76.0%
SHVA			76.6%	106.2%	83.2%	64.7%	32.6%	38.8%	31.3%	45.0%	32.3%
SYNX							-49.7%	18.2%	-166.6%	-105.5%	-76.0%
TXCC				-71.3%	-108.7%	-44.7%	-53.6%	-6.1%	-5.9%	-2.9%	-133.0%
USRX	31.9%	28.7%	21.1%	25.1%	46.5%	42.9%	48.1%	48.5%	44.5%	43.6%	34.0%
VSVR				77.0%	73.0%	116.6%	264.1%	186.2%	232.4%	161.6%	200.0%
CSCC		49.7%	124.3%	150.1%	83.9%	99.6%	124.9%	150.9%	146.3%	136.3%	114.2%
NN	92.1%	64.8%	57.8%	60.5%	56.4%	37.9%	42.1%	46.1%	42.4%	47.8%	39.9%
ODSI	22.1%	31.1%	34.0%	50.1%	35.1%	42.2%	48.8%	37.2%	30.7%	30.8%	19.4%
STRM	62.3%	71.1%	89.6%	98.2%	92.7%	88.5%	82.2%	66.9%	59.3%		
XYLN								16.2%	49.1%	28.4%	32.6%
Total	78.2%	73.8%	78.0%	74.9%	72.7%	72.4%	73.0%	66.3%	61.0%	61.7%	59.4%
Total-Cisco	58.4%	54.2%	56.4%	62.6%	59.7%	57.3%	56.3%	51.8%	44.9%	43.4%	39.1%
Coca-Cola	30.2%	39.9%	39.1%	33.4%	34.2%	46.5%	37.9%	32.9%	35.4%	44.5%	21.9%

Source: Company reports and Robertson, Stephens & Company estimates.

<sup>3</sup> All references herein are to calendar—as opposed to fiscal—periods unless otherwise indicated. Ascend, Cascade, Optical Data Systems, PairGain, Shiva, Sync, TranSwitch, VideoServer and Xylan each has a December 31 fiscal year-end and therefore fiscal quarters that correspond to the calendar quarters. The following networking companies' fiscal years end in the following months: Cabletron: February; Fore: March; Newbridge Networks: April; 3Com: May; Bay Networks: June; Cisco: July. References to the third quarter of calendar 1996 for each of these companies are thus references to their respective fiscal quarters ended in the following months: Cabletron: Q2: August; Fore Q3: September; Newbridge Q2: October; 3Com Q1: August; Bay Q1: September; Cisco Q1: October.

**Figure 2: NOPAT**

	1994				1995				1996		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
ASND		1,691	2,155	2,798	3,215	5,115	7,641	13,081	19,363	28,244	34,240
BAY	29,721	32,514	35,971	35,991	37,355	40,793	49,991	67,124	56,373	52,065	44,447
COMS	36,308	33,099	36,904	68,575	53,973	52,361	56,276	63,623	72,847	80,939	90,219
CS	32,426	34,829	37,051	40,247	43,579	45,923	50,115	52,849	56,611	59,885	64,101
CSCO	81,321	85,728	94,036	107,927	118,343	137,687	161,360	187,439	220,241	280,041	307,282
FORE	1,460	1,385	2,252	3,334	4,157	4,741	5,657	7,192	8,334	9,372	11,412
PAIR	1,235	1,220	1,713	2,368	2,702	3,111	4,192	4,850	5,778	7,020	8,536
SHVA	1,131	565	1,012	1,727	1,999	1,400	2,755	3,686	3,636	6,311	5,565
SYNX							-543	331	-3,608	-3,011	-2,714
TXCC				-505	-908	-530	-774	-177	-170	-97	-3,646
USRX	10,131	11,234	8,467	9,678	22,805	24,584	32,755	40,561	50,662	63,556	67,939
VSVR				390	527	827	947	1,337	1,607	1,920	2,435
CSCC	875	1,217	2,662	3,878	3,838	4,837	6,194	8,547	10,612	15,938	19,395
NN	33,752	31,034	31,974	37,744	36,701	26,196	32,029	36,712	37,424	47,350	45,845
ODSI	1,146	1,704	1,965	3,004	2,648	3,163	3,826	3,073	3,208	3,632	2,492
STRM	2,262	3,156	5,097	8,048	10,355	11,868	13,236	13,786	14,996		
XYLN								451	2,511	2,082	3,484
Total	233,050	239,375	261,260	325,202	341,289	362,076	425,657	504,465	560,424	655,246	701,030
Total-Cisco	151,729	153,647	167,225	217,275	222,946	224,389	264,297	317,026	340,183	375,205	393,748
Coca-Cola	535,976	739,415	692,132	599,772	612,365	876,322	700,764	674,813	723,000	963,417	468,536

*Source: Company reports and Robertson, Stephens & Company estimates.*

**Figure 3: INVESTED CAPITAL**

	1994				1995				1996		
	Q1	Q2	Q3	Q4	Q1	Q2	Q2	Q4	Q1	Q2	Q3
ASND		3,888	5,497	7,764	11,057	16,089	34,199	34,915	58,635	105,196	138,837
BAY	278,017	273,175	239,363	265,943	240,375	222,240	294,092	424,650	593,750	682,245	690,704
COMS	271,997	258,438	265,162	367,037	397,522	413,790	479,079	761,198	773,330	862,867	986,117
CS	161,736	174,145	205,428	226,181	232,551	232,940	273,691	295,199	408,926	414,275	443,223
CSCO	152,516	164,919	153,441	348,304	383,597	432,322	452,228	596,184	642,016	792,134	690,221
FORE	4,582	8,433	11,188	15,402	18,768	25,440	26,458	30,543	95,649	165,729	208,399
PAIR	14,255	17,384	18,087	23,636	27,471	32,210	33,593	39,321	32,866	37,580	44,951
SHVA			5,288	6,505	9,613	8,657	33,832	38,015	46,408	56,057	68,886
SYNX							4,375	7,289	8,665	11,419	14,289
TXCC				2,834	3,341	4,746	5,776	11,676	11,512	13,463	10,965
USRX	127,011	156,337	160,676	154,371	196,122	229,261	272,470	334,588	455,577	583,635	799,731
VSVR				2,026	2,885	2,836	1,435	2,872	2,766	4,754	4,869
CSCC		9,797	8,569	10,336	18,305	19,433	19,838	22,662	29,008	46,761	67,914
NN	146,627	191,706	221,323	249,663	260,410	276,453	304,149	318,508	353,251	396,462	459,473
ODSI	20,749	21,921	23,098	23,964	30,139	29,987	31,352	33,045	41,752	47,229	51,440
STRM	14,517	17,758	22,748	32,797	44,659	53,668	64,389	82,439	101,198		
XYLN								11,107	20,465	29,358	42,736
Total	1,192,007	1,297,900	1,339,868	1,736,762	1,876,813	2,000,073	2,330,957	3,044,209	3,675,774	4,249,163	4,722,754
Total-Cisco	1,039,491	1,132,981	1,186,428	1,388,458	1,493,217	1,567,752	1,878,729	2,448,025	3,033,758	3,457,029	4,032,533
Coca-Cola	7,093,750	7,407,620	7,081,390	7,192,620	7,165,640	7,536,000	7,391,500	8,198,300	8,165,120	8,664,740	8,576,260

Source: Company reports and Robertson, Stephens & Company estimates.

As set forth in the figures, not only did the networking industry achieve an aggregate quarterly annualized ROIC of approximately 60% in the most recently reported calendar 1996 third quarter, but moreover the industry has maintained an extraordinary level of ROIC for the past 11 quarters while more than quadrupling the amount of invested capital deployed in its business. Regarding the downtrend in the industry's aggregate ROIC from 78% to 60%, we believe this trend is largely a function of the industry's growth. We note that almost three years later, at 60%, the industry's return on invested capital is still phenomenal and that the industry has managed to generate this return notwithstanding an almost fourfold increase in its size (as measured by invested capital) during this time period, which translates to an annualized growth rate of approximately 142%. As the industry continues to grow and mature, we would expect its ROIC to continue to drift lower, but also to remain at extraordinary levels.

A number of observations can be drawn from this data. Clearly, during this time period the networking industry consistently has achieved a phenomenal level of ROIC and has generated an extraordinary level of NOPAT, while growing dramatically as measured by invested capital. In the process, the industry has created a significant and increasing level of value. Indeed, we believe that the networking industry currently is one of the leading industries in terms of ROIC and value creation.

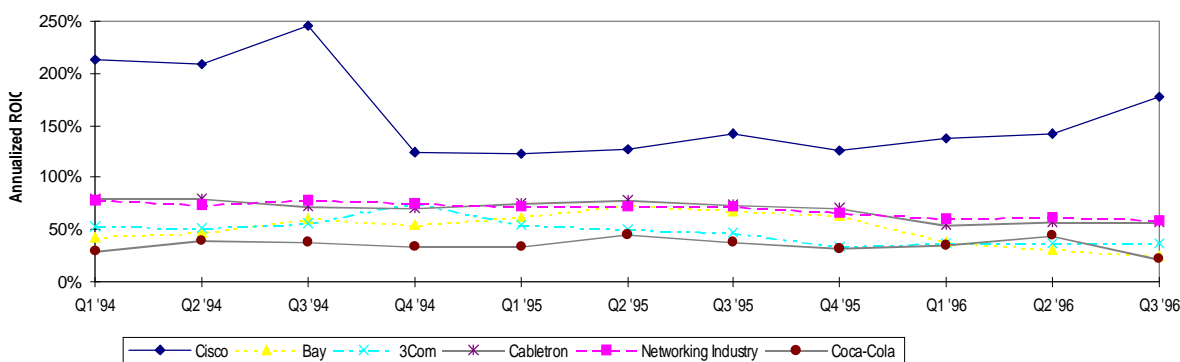
Thus, in response to the questions of how well, how much and for how long capital can be successfully deployed into the networking industry, we believe that the current level of extraordinary ROIC and the prevailing trends in the networking industry regarding ROIC, NOPAT generation and deployment of invested capital support the following conclusions:

- The industry is in the fifth to sixth year of an approximately 20-year investment cycle.
- During at least the next several years of this cycle, the industry will continue to generate an extraordinary level of ROIC while deploying a significantly greater amount of invested capital into its business.
- Given our first two observations, the industry should continue to generate NOPAT far in excess of its current working capital and prospective growth requirements and thereby continue to generate increasing cash balances.
- The accelerating trend of industry consolidation should continue, with the largest and strongest competitors—and those competitors which dominate certain market segments largely by virtue of first mover advantage—acquiring smaller and less established and/or resource constrained competitors.

Indicative of the general health of the industry, throughout the period spanning the first quarter of calendar 1994 through the third quarter of calendar 1996, the four leading networking vendors—Cisco (CSCO \$62-3/4, Buy), 3Com (COMS \$72-3/8, Long-Term Attractive), Bay (BAY \$21-1/2, Market Performer) and Cabletron (CS \$37-5/8, Buy)—maintained extraordinary levels of profitability (although to varying degrees of success) as measured by ROIC and consistently accounted for the bulk of the NOPAT generated by the industry. While each of these four vendors continues to generate an impressive level of NOPAT and extraordinary ROIC, Cisco in particular appears to have strengthened its dominant position in the networking industry.

ROIC analysis helps us to frame and quantify Cisco's operating performance against that of its three closest competitors during the period dating from the beginning of 1994 through the third quarter of calendar 1996 (see Figures 4 and 5).

**Figure 4: ROIC: CISCO, CABLETRON, 3COM AND BAY**



Source: Company reports and Robertson, Stephens & Company estimates.



**Figure 5: ROIC: CISCO, CABLETRON, 3COM AND BAY**

	1994				1995				1996		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
CSCO	213.3%	207.9%	245.1%	123.9%	123.4%	127.4%	142.7%	125.8%	137.2%	141.4%	178.1%
CS	80.2%	80.0%	72.1%	71.2%	75.0%	78.9%	73.2%	71.6%	55.4%	57.8%	57.8%
COMS	53.4%	51.2%	55.7%	74.7%	54.3%	50.6%	47.0%	33.4%	37.7%	37.5%	36.6%
BAY	42.8%	47.6%	60.1%	54.1%	62.2%	73.4%	68.0%	63.2%	38.0%	30.5%	27.4%
CS+COMS+BAY	55.3%	56.9%	61.9%	67.4%	62.0%	64.0%	59.8%	49.6%	41.9%	39.4%	38.3%

*Source: Company reports and Robertson, Stephens & Company estimates.*

At the beginning of this period, as measured by quarterly annualized ROIC, while each of Cisco, Cabletron, 3Com, and Wellfleet/Synoptics (the two entities which eventually merged to form Bay) was extraordinarily profitable, Cisco's profitability was at least two and one-half times that of its nearest competitor. For Q1 1994, the four companies' respective annualized ROICs were as follows: Cisco 213.3%; Cabletron 80.2%; 3Com 53.4%; and Wellfleet/Synoptics 42.8%. At the end of this period, in terms of profitability, Cisco continued to outdistance its rivals, with an ROIC greater than three times that of its nearest rival. For Q3 1996, the four companies' respective ROICs were as follows: Cisco 178.1%; Cabletron 57.8%; 3Com 36.6%; and Bay 25.7%. As a result, from Q1 1994 through Q3 1996, Cisco increased its share of the industry's aggregate profits at the expense of its three rivals; during this period, while Cisco's share increased from 35% to 43%, the other three vendors' collective share declined from 43% to 28%.

Somewhat surprisingly, Cisco's profitability advantage does not appear to be directly correlated to its size (see Figures 6 and 7). As measured by invested capital, Cisco was less than 60% the size of each of 3Com and Wellfleet/Synoptics and only slightly larger than Cabletron at the end of Q1 1994. At the same time, for the Q1 1994 calendar quarter, Cisco generated approximately 125% more NOPAT than 3Com, 175% more NOPAT than Wellfleet/Synoptics and 150% more NOPAT than Cabletron. By the end of Q3 1996, Cisco's NOPAT as a percentage of each of these three competitors was 240%, 590% and 380%, respectively. Moreover, at the end of Q3 1996, prior to the consummation of Cisco's \$4.7 billion acquisition of Stratacom, although having grown at a significantly faster rate than its competitors, Cisco had still deployed significantly less invested capital in its business than 3Com, approximately the same amount as Bay and only twice as much as Cabletron while generating approximately 600%, 240% and 380% more NOPAT than each of these three respective competitors.

**Figure 6: NOPAT: CISCO, CABLETRON, 3COM AND BAY**

	1994				1995				1996		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
CSCO	81,321	85,728	94,036	107,927	118,343	137,687	161,360	187,439	220,241	280,041	307,282
CS	32,426	34,829	37,051	40,247	43,579	45,923	50,115	52,849	56,611	59,885	64,101
COMS	36,308	33,099	36,904	68,575	53,973	52,361	56,276	63,623	72,847	80,939	90,219
BAY	29,721	32,514	35,971	35,991	37,355	40,793	49,991	67,124	56,373	52,065	44,447
CS+COMS+BAY	98,455	100,441	109,927	144,812	134,907	139,078	156,382	183,596	185,830	192,888	198,767

*Source: Company reports and Robertson, Stephens & Company estimates.*

**Figure 7: INVESTED CAPITAL: CISCO, CABLETRON, 3COM AND BAY**

	1994				1995				1996		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
CSCO	152,516	164,919	153,441	348,304	383,597	432,322	452,228	596,184	642,016	792,134	690,221
CS	161,736	174,145	205,428	226,181	232,551	232,940	273,691	295,199	408,926	414,275	443,223
COMS	271,997	258,438	265,162	367,037	397,522	413,790	479,079	761,198	773,330	862,867	986,117
BAY	278,017	273,175	239,363	265,943	240,375	222,240	294,092	424,650	593,750	682,245	690,704
CS+COMS+BAY	711,751	705,757	709,953	859,162	870,447	868,970	1,046,862	1,481,047	1,776,006	1,959,387	2,120,043

Source: Company reports and Robertson, Stephens & Company estimates.

Cisco's profitability and dominance relative to its three competitors is further highlighted by comparison with 3Com, Bay and Cabletron taken as a collective group: Cisco generated over 50% more NOPAT (\$307 million versus \$199 million) from one-third as much invested capital (\$690 million versus \$2.12 billion) (see Figures 6 and 7).

Particularly noteworthy, in each of the 11 quarters from Q1 1994 through Q3 1996, Cisco maintained its quarterly annualized ROIC in triple digits, ranging from 123.4% to 245.1%, while increasing the amount of invested capital deployed in its business by approximately 350%.

In contrast, the profitability of both 3Com and Bay appears to have been declining steadily since the latter half of Q4 1994 and mid-1995, respectively. From Q4 1994 through Q3 1996, 3Com's quarterly annualized ROIC has declined steadily from approximately 75% to approximately 37%. During this period, 3Com managed to generate only a 32% increase in its quarterly NOPAT from a 169% increase in the amount of capital invested in its business.

Bay's ROIC appears to have peaked in Q2 1995 and steadily declined since to an 11-quarter low of 25.7% for the most recent quarter. Like 3Com, Bay's dramatic increase in the amount of invested capital deployed in its business has yet to generate correspondingly high returns. In spite of increasing its invested capital by \$469 million, from \$222 million in Q2 1995 to \$691 million in Q3 1996, Bay's NOPAT in Q3 1996 exceeded its NOPAT in Q2 1995 by only \$3.7 million.

We observe that the operating performance of each of Cisco, Bay and 3Com has been fairly volatile on a quarter-over-quarter basis from Q1 1994 through Q3 1996. We attribute this volatility to the principal means through which each of these companies has chosen to grow its business—mergers and acquisitions.

To be exact, over the past 11 quarters, Cisco has consummated 14 acquisitions (not including six companies in which Cisco has taken a minority interest), Bay has consummated five acquisitions in addition to the merger of Wellfleet and Synoptics and 3Com has consummated 10 acquisitions including the acquisition of Chipcom. Each of these mergers and acquisitions increased the level of capital invested in these companies' businesses. The returns on such investments (at least in the short-to-intermediate term), however, have not been uniform as evidenced by the volatility in quarter-over-quarter ROIC.

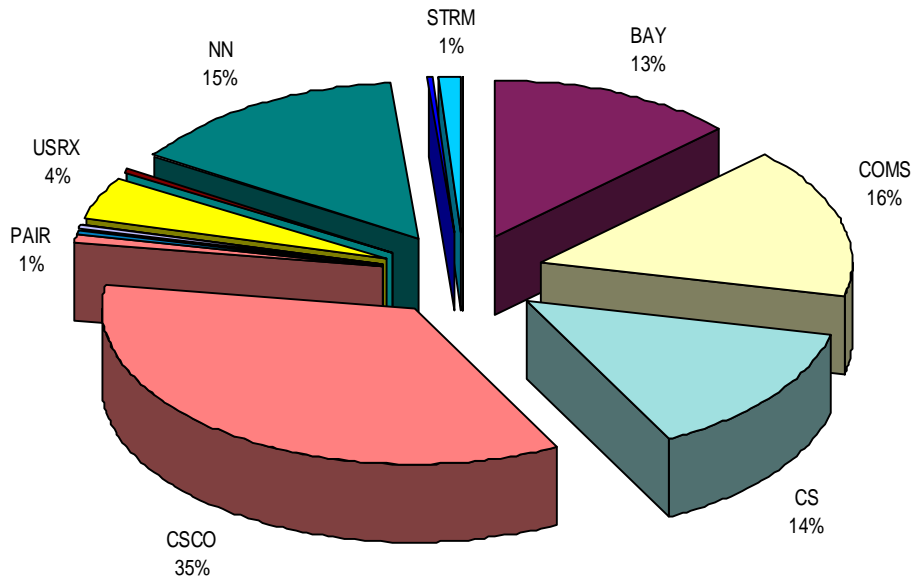


We also note that as measured by ROIC, the merger of Wellfleet and Synoptics to form Bay and 3Com's acquisition of Chipcom, as well as the various other acquisitions consummated by Bay and 3Com, to date do not appear to have generated significant, if any, returns to either Bay or 3Com, respectively.

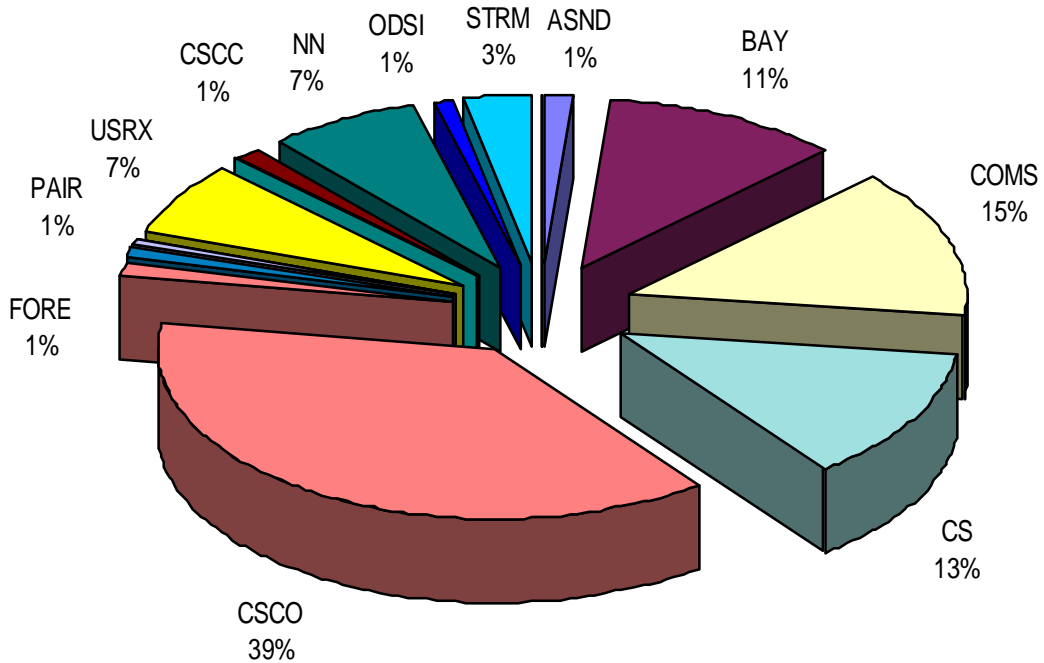
In contrast to its three principal rivals, Cabletron, until fairly recently, has shunned acquisitions in favor of internally generated growth. As a result, prior to undertaking a number of acquisitions in calendar 1996, the company achieved a consistent ROIC in the relatively narrow range of 70–80% from Q1 1994 through Q4 1995.

Figure 8: SHARE OF INDUSTRY NOPAT: Q1:94, Q2:95, Q3:96

Share Of Industry NOPAT: Q1 1994

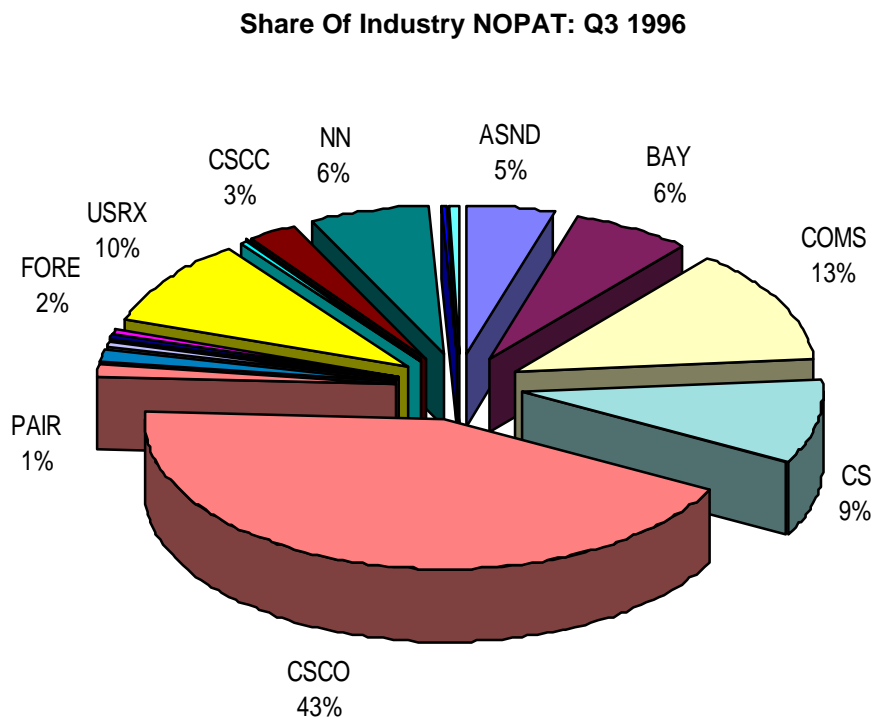


Share Of Industry NOPAT: Q2 1995



Source: Company reports and Robertson, Stephens & Company estimates.

Figure 8: SHARE OF INDUSTRY NOPAT: Q1:94, Q2:95, Q3:96, CONTINUED



Source: Company reports and Robertson, Stephens & Company estimates.

Exploring whether there is any correlation between Cisco's market position and its overall profitability, Figure 8 shows our calculation of the share of the industry's aggregate profits, or NOPAT, for Q1 1994, Q2 1995 and Q3 1996, respectively. Our analysis indicates that the four leading vendors have generated the lion's share of the industry's profits with Cisco clearly commanding a dominant share. We estimate that Cisco, Cabletron, 3Com and Bay accounted for approximately \$506 million, or 72%, of the networking industry's \$701 million total NOPAT in Q3 1996 (and approximately 85% of its revenues), with Cisco being responsible for more than 43% of the total. We believe that this concentration of profits within the networking industry reflects both the continuing consolidation of competitors within the industry and the significant barriers to entry that confront potential entrants into the industry.

Given the extraordinary level of ROIC generated by these companies, increased capital investment translates into very strong cash flow growth. In fact, all four of these large networking vendors have self-financed their growth over the last few years while generating enormous amounts of excess cash on their balance sheets.

As set forth in Figure 3, while having increased significantly since the first quarter of calendar 1994, the level of invested capital in the industry currently is still relatively small. Benefiting from both the presence of high barriers to entry and the increasing consolidation of companies within the industry (of which they have been the principal driver), we believe the four leading networking vendors are well positioned to reap the lion's share of the billions of dollars to be invested in building

advanced networks over the next decade and to generate substantial cash flow, and thereby create substantial value for the investors of this capital.

Notwithstanding the domination of the industry by these four large vendors in general and Cisco in particular, a number of networking companies have carved out highly profitable market niches for themselves. Ascend (ASND \$66, Buy), FORE (FORE \$35-1/4, Buy), PairGain (PAIR \$63-7/8, Buy), VideoServer (VSVR \$46-1/8, Buy) and Cascade (CSCC \$62-1/8, not rated), in particular, have successfully targeted and focused on dominating one particular market or product segment of the networking industry.

Largely avoiding competition with Cisco, these five companies have recognized and seized substantial, lucrative and largely untapped market opportunities. Formerly nonexistent or relatively insignificant prior to the entrance of each of these respective companies, these market segments are in the midst of a rapid and dramatic expansion. We note, moreover, that Ascend, Cascade, FORE, PairGain and VideoServer have played instrumental roles in advancing the size and scope of these markets by stimulating demand for their respective technologies and products.

The strength of these companies and their present and prospective market opportunities are evidenced by the extraordinary levels of ROIC they have consistently generated over an extended period of time. Notably, extraordinary ROIC in practically every quarter since March 1994 (or, if later, the date of their initial public offerings)—in the case of Ascend, Cascade and VideoServer, well in excess of 100% in all but two of the quarters since the respective date of each of their initial public offerings—have enabled these companies to generate sizable and growing cash balances from relatively modest levels of capital investment.

The above observations reinforce our belief that the networking industry is in the early growth stage of a 20-year investment cycle. In our opinion, with the future of the computer industry being driven by continued investment in advanced networks and communication systems, and given the presence of significant (although not insurmountable) and growing barriers to entry into the networking industry, the financial health of the networking industry has never been stronger and the long-term outlook for the networking industry remains outstanding.

Our bullishness on the outlook for the networking industry is simple to state. Unit demand looks outstanding, whether it is viewed on a short-term, intermediate-term, or long-term basis. Industry pricing looks stable as the industry has consolidated among a few key vendors and the barriers to entry appear to be increasing. As measured by their ROIC and the increasing amount of invested capital deployed in their businesses, the four leading vendors and their five much smaller, highly focused and rapidly growing brethren are all highly profitable and appear to have an abundance of highly attractive opportunities in which to continue to invest and grow their businesses; we believe these companies can self-finance their expected growth and continue to generate excess cash flow from additional new invested capital deployed in their businesses.

Our principal concern is not with the operating businesses but with investors' expectations as reflected by the current substantial market valuations of these companies. Such valuations require that these companies continue to maintain their extraordinary levels of profitability and value creation while growing their businesses for many years to come.

Given accelerating demand throughout the industry driven by the three prevailing trends of the upgrading of corporate networks, the extension of the reach of the network and the continuing buildout of the Internet, we believe that these companies will have strong growth opportunities and will continue to generate extraordinarily high and fairly stable ROICs and concomitantly large excess cash balances. These growth opportunities should be highly profitable and sustainable given the accelerating trend of industry consolidation together with the significant barriers to entry into the networking industry. Given all of the foregoing, we are hard pressed to find a more attractive industry in which to invest.

### *Cash Balances: A Problem (All Companies Should Have)?*

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The industry's extraordinary level of profitability has created an interesting problem. As previously noted, a number of networking companies—Cisco in particular—have begun to accumulate sizable cash balances which far exceed the working capital and growth opportunity needs of their businesses. The product of increasing customer demand, revenue growth and increasing deployment of invested capital by the industry to support such growth, these cash balances, moreover, are growing at an accelerating rate.

Companies typically invest cash balances in excess of short-term working capital needs at risk-free treasury rates. By definition, these balances neither create nor destroy value. Value being generated or destroyed by a company's operations, ROIC analysis therefore does not take these cash balances into account in assessing the profitability of a company; rather, the balances enter into the ROIC analysis only upon their conversion into operating assets which contribute to the generation of operating revenues and profits.

If excess cash balances neither create nor destroy value, the question arises as to what is the optimal use of these balances from an investor's perspective. Given the extraordinary returns generated by the operations of most of the networking vendors, to the extent a networking company can continue to grow its business and the marginal ROIC resulting from such growth exceeds its cost of capital, the company should reinvest in its business the cash generated by its operations in order to generate additional positive cash flow.

As we have already noted, however, most networking companies not only are currently self-financing their growth but also are generating cash balances that far exceed their near-term operating needs.

One prominent investment opportunity available to these companies is to use their excess cash balances to make acquisitions. Such acquisitions may be—and many of the networking industry's acquisitions have been—motivated by the desire to acquire R&D technology and expertise that would otherwise be too costly or take too long to replicate or by larger strategic and competitive considerations such as Cisco's recent purchase of Stratacom (although, we note, this was a non-cash acquisition). Provided that following the acquisition the ROIC generated directly or indirectly by the acquired entity or its assets exceeds the cost of the acquisition, the acquisition will generate value and be a desirable use of the acquiring entity's excess cash balances regardless of the motivation for the acquisition.

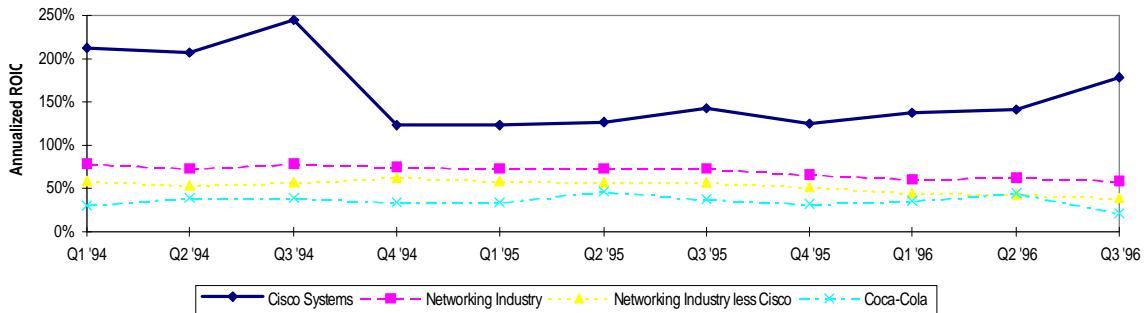
Cash acquisitions, however, result in large tax assessments on the acquired entity's shareholders which in turn usually increases the cost of the acquisition to the acquirer. We believe this significant tax disincentive, together with the rich currency provided by buoyant stock prices, is largely responsible for most of the acquisitions within the networking industry taking the form of stock purchases or mergers. Given the dilution that typically accompanies such stock merger and acquisition transactions, we believe that most other arguments put forth for such acquisitions are not valid.

Stock repurchase programs offer another means by which companies can generate value from their cash balances. By repurchasing its shares out of its accumulated and unspent NOPAT, a company returns to its shareholders all or a portion of the excess cash generated by its operations and thereby reduces the negative financial leverage resulting from such excess cash. Moreover, because the repurchase is made either in the open market or by means of a self-tender offer, it is limited to only those shareholders who desire to monetarize all or a portion of their investment.

The reduction in cash balances will have no impact on the company's operations or profitability as long as the company is able to pursue all of its favorable investment opportunities from its existing invested capital and remaining cash balances. As we would expect, the repurchase will have no impact on the company's ROIC, since the cash used for the repurchase is not currently invested in the company's operations and thus is not part of the company's invested capital; rather, this "excess" cash is that portion of the NOPAT, or net cash flow, previously generated by the company's operations which was not required to finance either current operations or future growth and expansion.

### Cisco: A 600-Pound Musical Genius (Speaking of Gorillas)

Figure 9: CISCO SYSTEMS ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994-Q3:1996



Source: Company reports and Robertson, Stephens & Company.

As for individual companies, Cisco dominates the industry in terms of value creation. Cisco generated annualized ROIC of approximately 178.1% in the third quarter of 1996. Cisco's level of ROIC was almost three times the industry's aggregate annualized ROIC of 60%. If Cisco's ROIC was not included, the aggregate annualized ROIC for the industry in Q3 1996 would have been only 39.5%. Moreover, from the first quarter of calendar 1994 through and including the third quarter of calendar 1996, Cisco has consistently maintained its quarterly annualized ROIC well in excess of 100% (during this time period, it has ranged

between 123.4% and 245.1%) and steadily increased its generation of NOPAT (increasing its NOPAT from \$81.3 million in Q1 1994 to \$307.3 million in Q3 1996) while steadily and sizably increasing the amount of capital invested in its business from \$152.5 million to \$690.2 million.

Cisco's ability to maintain this level of profitability is especially impressive given that it is no longer a small company and reflects the significant economic advantages derived from being the first company to establish a beachhead in a new technology market—what we refer to as “first mover advantage.” Cisco increased its share of the industry's NOPAT (see Figure 8) to 43% in Q3 1996 from 39% in Q2 1995 and 35% in Q1 1994. This NOPAT—the numerator in our ROIC calculation—is the product of an immensely profitable business.

Cisco's operating performance to date lends the strongest support to our belief that it is nearly impossible for competitors to overcome these early advantages if the market leader continues to invest in its business. In recent quarters, it is particularly noteworthy that Cisco was able to maintain its stellar operating performance as measured by ROIC despite what appears to be a fairly significant ongoing technology transition to a switched network architecture underway throughout the industry. This trend first became visible in Q1 1996. By observing Cisco's ROIC and NOPAT in future quarters we should be able to track Cisco's ability to continue to weather and manage this transition and thereby gauge the degree of resilience of the “first mover advantage” principle.

In short, Cisco has managed, and appears to continue to manage, its growth exceedingly well. We believe that this level of value generation—the ability to grow its business while generating consistently singular returns—places Cisco in a category of dominant and phenomenally profitable companies in other industries including, most notably, Microsoft (MSFT \$79-7/8) in the software industry.

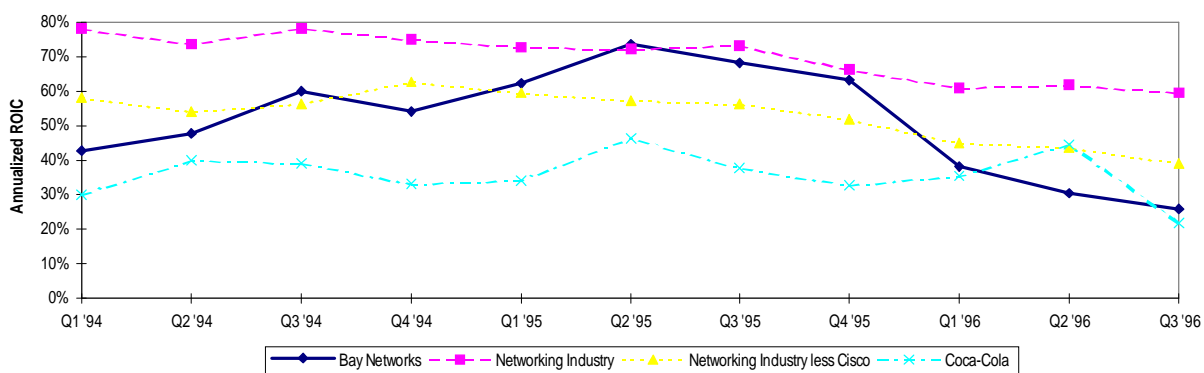
We will be interested to see what long-term impact Cisco's acquisition of Stratacom will have, if any, on Cisco's ROIC which in turn will be indicative of whether such acquisitions will have created or destroyed value for Cisco's stockholders. Valued at \$4.7 billion, the acquisition, which took the form of a stock acquisition, has significantly increased the amount of invested capital deployed by Cisco—initially without a corresponding proportional return. However, given the profitability of Cisco's core business, Stratacom's acquisition impact may be minimal.

It should be noted that Cisco has approximately \$2.6 billion of cash and cash equivalents invested in risk-free treasury securities. We believe that approximately 98% of this amount constitutes excess cash over and above Cisco's growth and quarterly working capital requirements. We believe that given Cisco's demonstrated ability to consistently earn outsized returns and to finance its growth from current operations, this money should either be used to acquire another networking vendor having a high ROIC or be returned to Cisco's shareholders via a stock repurchase program. Any cash acquisition of a company having a high ROIC (all other things remaining the same) will generate value for Cisco's shareholders, even if the acquired company's ROIC is less than Cisco's ROIC. We are mindful of the significant tax disincentives to cash acquisitions but note that such disincentives may in fact be outweighed by the extraordinary level of ROIC and NOPAT generated by a number of networking vendors.

Interestingly, Cisco recently canceled its stock repurchase program (as did Bay, 3Com and Cabletron) because of concerns regarding the SEC's posture toward the eligibility of pooling accounting treatment for any acquisition of another company using stock when undertaken within two years of such repurchase program. This self-imposed moratorium leads to a dilemma for Cisco (and similarly situated networking vendors)—what to do with its sizable and growing amount of excess cash. We believe that the simple and rather obvious solution is for Cisco to live without the pooling accounting treatment. Cisco, however, along with a number of other vendors, appears to believe that the market is incapable of looking beyond noneconomic accounting window dressing. For those networking vendors like Cisco who lack faith in the intelligence of the market and are thus fixated on using pooling accounting, there may in fact not be an economically efficient method of either deploying its excess cash or returning it to shareholders.

## Bay Networks: Still Playing Off Key

Figure 10: BAY NETWORKS ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994–Q3:1996



Source: Company reports and Robertson, Stephens & Company.

As shown by quarterly annualized ROIC and level of NOPAT, Bay's business is substantially less profitable than Cisco's. Furthermore, its business has been declining in profitability for the past six quarters. After Bay's quarterly annualized ROIC peaked at 73.4% in Q2 1995, it experienced a precipitous decline in its quarterly annualized ROIC throughout the balance of calendar 1995 and into the third quarter of calendar 1996. Essentially, during this period Bay has been unable to generate significant and sustainable returns from a huge increase in invested capital deployed in its business.

The respective trends in ROIC and NOPAT for Bay are revealing as to its competitive position in the industry. While Cisco more than tripled its NOPAT from the first quarter of calendar 1994 through the third quarter of calendar 1996, Bay managed to increase its NOPAT from \$29.7 million to \$44.4 million, representing an increase of only 49%. This increase in quarterly NOPAT was largely generated by a \$413 million (approximately 150%) increase in invested capital, from \$278 million in Q1 1994 to \$691 million in Q3 1996. Bay drove this increase in invested capital principally through acquisitions including the Wellfleet/Synoptics merger. Thus, on an annualized basis, Bay's \$413 million increase in invested capital generated a marginal annualized ROIC of approximately 14% in Q3 1996, far

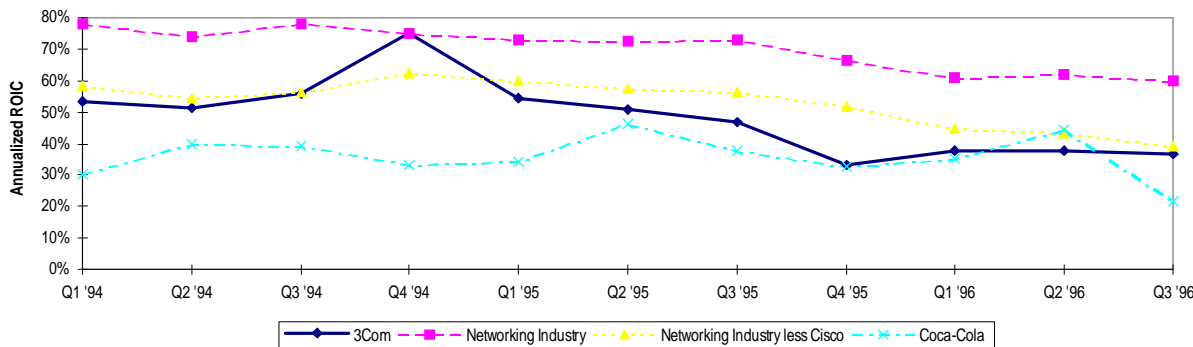


below the 42.8% annualized ROIC generated by the company in Q1 1994 and most likely less than the company's weighted average cost of capital.

With the networking industry's growth surging, Bay's stagnating returns on invested capital have resulted in a decline in its share of the industry's total profits to 6% in Q3 1996 from 11% in Q2 1995 and 13% in Q1 1994.

### 3Com: Acquisition of Chipcom Causes Tempo to Drag

Figure 11: 3COM CORPORATION ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994–Q3:1996



Source: Company reports and Robertson, Stephens & Company.

Similar to Bay, ROIC analysis highlights 3Com's failure to keep pace with Cisco and provides insight regarding 3Com's operating performance since the first quarter of calendar 1994.

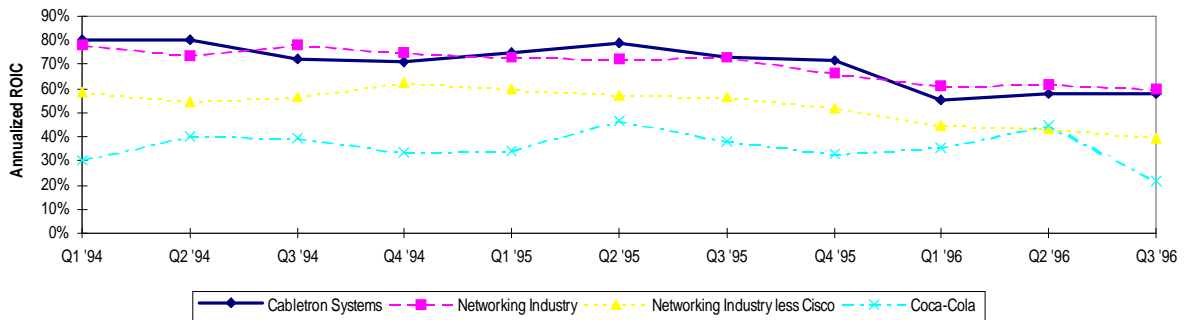
From the first quarter of calendar 1994 through the third quarter of calendar 1996, the defining event for 3Com was its acquisition of Chipcom in Q3 1995. ROIC analysis supports our belief that this acquisition has not benefited 3Com's operating performance. 3Com's ROIC has steadily declined since Q4 1994 from a high of 74.7% (annualized) to 36.6% (annualized) in Q3 1996. Following the Chipcom acquisition, 3Com's annualized quarterly ROIC fell from 47.0% in Q3 1995 to 33.4% in Q4 1995 and has hovered in the 37% to 38% range in each of the last three quarters. Even after removing Cisco's performance from the industry's aggregate ROIC, 3Com underperformed the industry in each of the last seven quarters. 3Com's return on its investments over the past 11 quarters pales in comparison to Cisco's ROIC. 3Com generated less than one-third as much NOPAT as Cisco in Q3 1996 from a greater capital base.

Like Bay, 3Com has substantially increased the amount of invested capital deployed in its business since Q1 1994. In fact, 3Com has deployed more capital—an additional \$714 million, representing an increase of 263%—during the past 11 quarters than any other networking vendor. We attribute this increase to the principal means through which 3Com has chosen to grow its business—acquisitions. To be exact, 3Com has consummated 10 acquisitions over the past 11 quarters. Each of these acquisitions increased the level of capital invested in 3Com's business. The returns on such investments (at least in the short-term), however, have not matched 3Com's former returns, as evidenced by its sliding ROIC.

The cumulative impact of these 10 acquisitions has been a dramatic increase in the level of invested capital in 3Com's business without a corresponding commensurate increase in quarterly NOPAT. The amount of invested capital in 3Com's business at the end of the third quarter of calendar 1996 was more than three and one-half times as much as the amount of capital invested in its business in the first quarter of calendar 1994, representing approximately a 263% increase. While 3Com's invested capital was steadily and sizably increasing, its ability to generate NOPAT did not keep pace. Its NOPAT for Q3 1996 represented a 150% increase over its NOPAT for Q1 1994. With its profitability failing to keep pace with that of the overall industry, 3Com's share of the industry's total NOPAT declined to 13% in Q3 1996 from 16% in Q1 1994.

## Cabletron: Still Playing Well But Sitting Outside the Spotlight

Figure 12: CABLETRON SYSTEMS ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994-Q3:1996



Source: Company reports and Robertson, Stephens & Company.

Cabletron's ROIC reflects both Cabletron's consistently impressive operating performance and its decision to forego acquisitions and instead to focus on operating its business and to rely on its own internally generated R&D for new products and networking solutions. From Q1 1994 through Q4 1995, the company maintained its quarterly annualized ROIC in the 70–80% range. During this time span, Cabletron steadily and consistently increased its quarterly NOPAT from \$32.4 million in Q1 1994 to \$52.8 million in Q4 1995. The company generated this 64% increase in NOPAT from only an 83% increase in invested capital deployed in its business. However, accounting for 9% of the networking industry's total NOPAT in the third quarter of 1996, down from 14% in Q1 1994, Cabletron has grown more slowly than the overall industry.

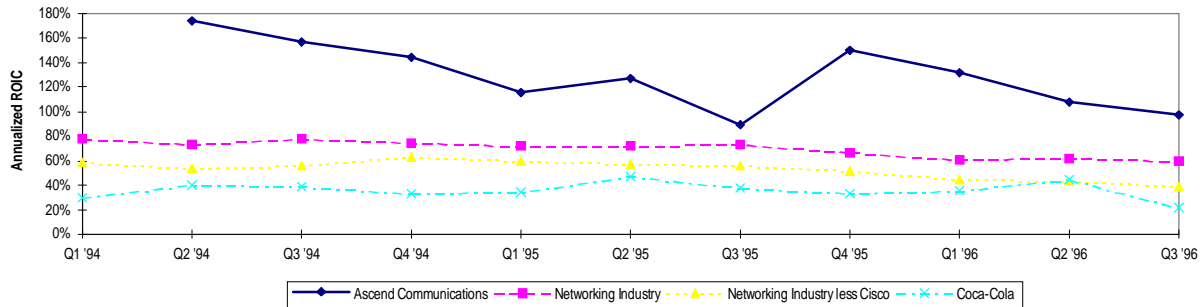
During the same time period, each of Cisco, Bay and 3Com more than doubled the amount of invested capital deployed in their businesses—largely through mergers and acquisitions. Not surprisingly, given the large number of companies absorbed by Cisco, Bay and 3Com, the ROIC of each of these companies shows a much higher degree of volatility than does the ROIC of Cabletron.

Consistent with this observation, upon the acquisition of the Enterprise Business Networks Unit (ENBU) from Standard Microsystems Corporation (SMSC \$9-3/4) in January 1996, Cabletron's quarterly annualized ROIC fell to 55.4% in Q1 1996 as

the acquisition alone increased the amount of capital deployed in Cabletron's business by \$85.7 million, or approximately 30%, without a corresponding increase in NOPAT. The company, however, was able to increase its ROIC to 57.8% in Q2 1996 and to maintain this level of profitability in Q3 1996, in spite of having consummated two additional acquisitions.

## Ascend: Perfect Pitch, Perfect Time

Figure 13: ASCEND ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994–Q3:1996



Source: Company reports and Robertson, Stephens & Company.

Since becoming public, Ascend has consistently been able to earn a phenomenal ROIC on ever larger amounts of invested capital deployed in its business. In nine of the past 11 quarters, including its last four quarters, Ascend has achieved an ROIC well in excess of 100%, while increasing the amount of capital deployed in its business from \$3.9 million in Q2 1994 (its first quarter as a public company) to \$139.7 million in Q3 1996. During this same period, the company steadily and dramatically increased its quarterly NOPAT from \$1.7 million in Q2 1994 to \$34.2 million in Q3 1996, an increase of 2,500%. During this period, Ascend increased its share of the industry's total NOPAT from 0.8% to 4.8%. Equally remarkably during this entire period, Ascend's growth was entirely internally generated.

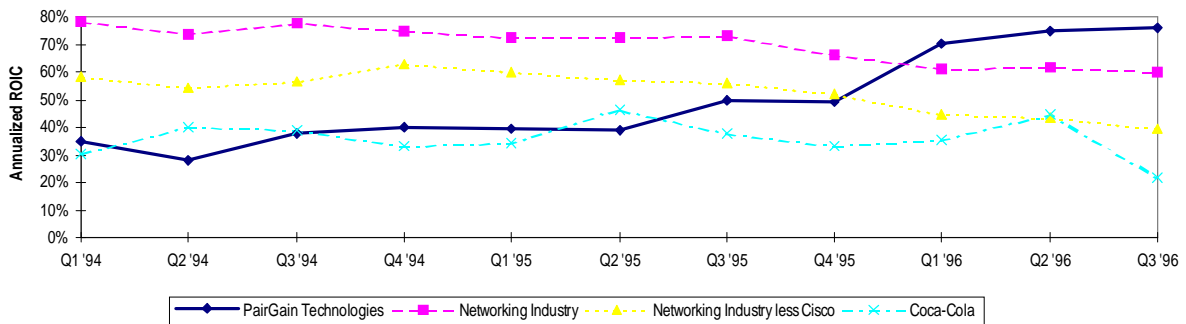
We believe Ascend's growth and sustained extraordinary level of returns are directly attributable to and evidence of the significance of first mover advantage in the various market segments of the networking industry. Having been the first company to address one of the fastest growing segments of the networking industry—wide-area and remote-access networking—Ascend has generated enormous returns while growing dramatically from a relatively small revenue base in Q2 1994 by leveraging the explosive growth of the Internet and by addressing fast-growing end markets not served by such vendors.

We believe that the market for wide-area access devices will experience the same level of explosive demand growth in the next few years that the local area networking market has produced in the past several years. Wide-area access has become the bottleneck for many corporate networks and is becoming the focus area for investment by corporations over the next few years. We believe that the MAX family of integrated access hubs, which provides users with a flexible wide-area access platform offering broad application support, is emerging as one of the leading products in this market and will continue to gain market share during the next few years, which should further contribute to the company's ROIC and NOPAT.

Ascend also has emerged as one of the key providers of dial-up access hubs for the Internet access market. Ascend's MAX and Pipeline products provide a system-level solution for Internet access providers to support multiple dial-up customers using a diverse set of access protocols, from ISDN to analog modems to frame relay. Ascend's integrated solution is significantly less expensive than alternative discrete solutions sold by other vendors. Thus, we believe that Ascend has the potential to emerge as one of the standard solutions in the Internet access markets, which should further drive Ascend's future ROIC.

## PairGain: An Emerging Symphony

Figure 14: PAIRGAIN ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994–Q3:1996



Source: Company reports and Robertson, Stephens & Company.

PairGain's first mover advantage in xDSL technology for the "last mile from the CO to the curb" is reflected in its ROIC. Having started the Q1 1994–Q3 1996 period as a highly profitable company, PairGain has generated consistently higher returns on its invested capital throughout the period: ranging from 28–40% from Q1–Q4 1994, 39–50% from Q1–Q4 1995, and 70–76% from Q1–Q3 1996. The company currently generates more than twice as much NOPAT from each dollar of capital invested in its business as it did at the beginning of this period.

We estimate that over the past 11 quarters, PairGain increased its generation of quarterly NOPAT by more than 600% from approximately \$1.2 million to approximately \$8.5 million. PairGain generated this significant increase in NOPAT from only a 215% increase in invested capital from approximately \$14.3 million to approximately \$45 million. PairGain's NOPAT thus increased three times faster than its invested capital. Alternatively stated, each additional dollar of capital invested by PairGain in its business over the past 11 quarters is currently generating an annualized return of 95%<sup>4</sup>.

We view this level of, and positive trend in, operating profitability as a reflection of PairGain's exploitation of a large and growing market niche in the networking industry which has yet to be addressed by any of the four leading networking vendors. This market niche is the provisioning of High-bit-rate Digital Subscriber Lines (HDSL) which, through advanced digital signal processing, allows telecom

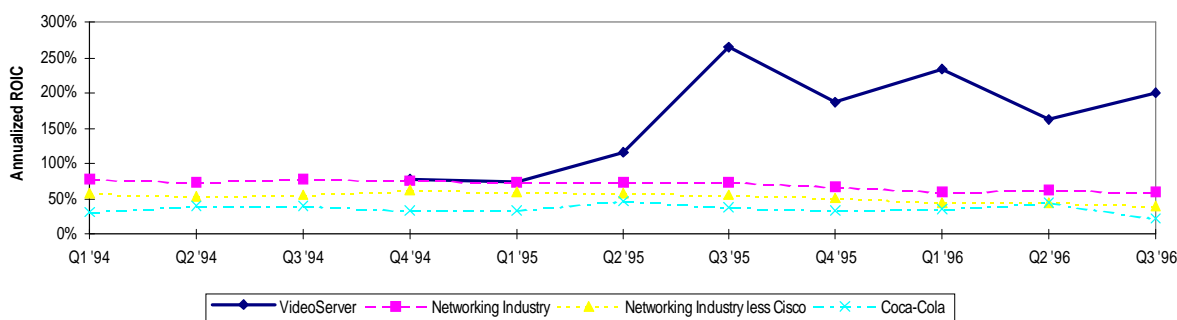
<sup>4</sup> Marginal quarterly annualized ROIC = Additional NOPAT/Additional Inv.d Capital = [(Q3 1996 NOPAT—Q1 1994 NOPAT)\*4]/(Q3 1996 Inv.d Capital—Q1 1994 Inv.d Capital)

carriers to upgrade existing copper transmission lines to carry high speed, fiber-optic data traffic to the “last mile,” thereby leveraging the billions of dollars of investment in copper transmission lines.

We believe the accelerating pace of the extension of enterprise networks and the sheer magnitude of the installed base of copper wire in the last mile should enable PairGain to continue to generate extraordinary ROIC while deploying a large increase in invested capital in its business well into the future. Moreover, PairGain is using its advanced integrated circuit design capability and systems level development expertise to design new telco transmission products for new markets. We believe that these new products will materially contribute to the company’s returns on invested capital through the balance of 1996 and into 1997. As noted above, we believe the high barriers to entry and PairGain’s first mover advantage should translate to high returns for PairGain from these growth opportunities.

## VideoServer: A Musical Prodigy

Figure 15: VIDEOSERVER ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994–Q3:1996



Source: Company reports and Robertson, Stephens & Company.

Since becoming a public company in May 1995, VideoServer has achieved phenomenal profitability. The numbers speak for themselves. In three of the last five quarters, including the most recent quarter, VideoServer has earned an annualized return on its invested capital in excess of 200%. In each of the last six quarters, VideoServer has achieved an annualized ROIC of greater than 100%. In VideoServer’s eight quarters as a public company, its quarterly annualized ROIC has ranged from a low of 73% to a high of 264%.

While VideoServer has demonstrated that it deploys its capital extremely effectively, to date the amount of invested capital deployed by VideoServer and the NOPAT generated therefrom have been relatively modest. VideoServer currently deploys only \$4.9 million of invested capital and accounts for only 0.2% of the industry’s NOPAT.

In answer to the question of how much capital will VideoServer be able to deploy at these returns and for how long, we believe that VideoServer will be able to earn extraordinary returns on increasing levels of invested capital for many years to come. It should be noted that at the end of Q3 1996 VideoServer had more than

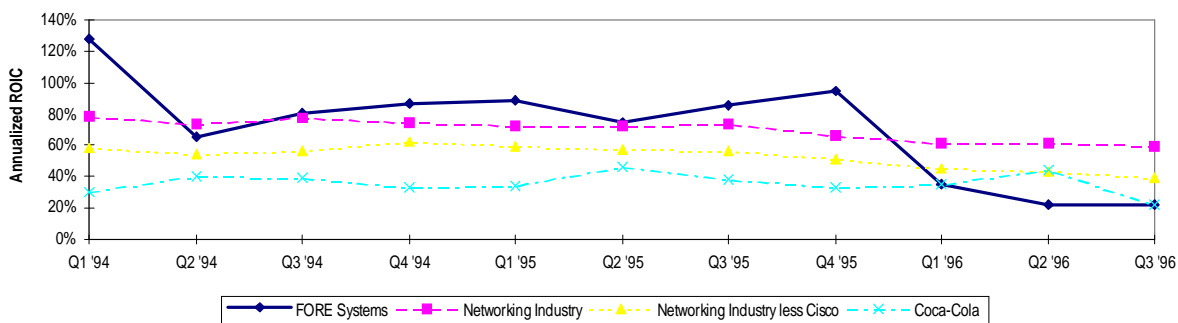
\$50 million in cash from the proceeds of its IPO and from operations which it has yet to invest in its business.

Our confidence in VideoServer's ability to maintain its extraordinary profitability is based on VideoServer's having gained "first mover advantage" in the multipoint conferencing segment of the networking market, a market segment which has been left largely unaddressed by the four leading networking vendors. The leading provider of multimedia conference servers, VideoServer is emerging as the industry standard for multipoint control servers, a device used to establish a simultaneous videoconference with multiple sites.

Because of VideoServer's leading market position and superior technology, we believe the company has the potential to emerge with architectural control of future videoconferencing and multimedia collaboration networks. Desktop videoconferencing and multimedia exchange represent the next stage in collaborative computing. In our opinion, VideoServer's products represent a key piece of the network infrastructure needed to build these networks. Moreover, real-time collaboration, in our opinion, has the potential to be one of the most important applications to run on the Internet. In our view, VideoServer's equipment is well positioned to become one of the key pieces of equipment to support this application.

## *FORE: Playing Rachmaninoff and Beethoven at the Same Time Is Hard*

**Figure 16: FORE SYSTEMS ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994–Q3:1996**



Source: Company reports and Robertson, Stephens & Company.

Prior to undertaking a number of acquisitions, FORE achieved impressive profitability from Q1 1994 through Q4 1995, achieving a quarterly annualized ROIC that ranged between 65.7% and 127.4% and that ranged between 75% and 94% from Q3 1994 through Q4 1995. Following FORE's acquisitions of Cell Access Technology in Q4 1995 and Alantec in Q1 1996, however, the company's ROIC fell to 34.9% in Q1 1996 and then further declined to between 22% and 23% in both Q2 1996 and Q3 1996.

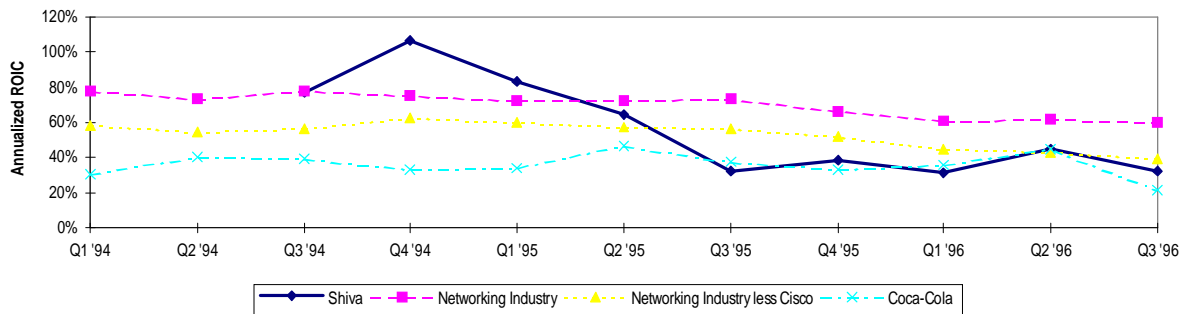
We believe that the initial decline reflected the impact of the Alantec acquisition in particular. The Alantec acquisition significantly increased FORE's invested capital, from \$30.5 million in Q4 1995 to \$95.6 million in Q1 1996, representing a greater than 200% increase. (We note that unlike most of the acquisitions that have been consummated in the past two years in the networking industry and similar to the

SMC ENBU acquired by Cabletron, Alantec brought to FORE already commercialized and widely acclaimed products. (In contrast to the SMC-ENBU, Alantec was already a relatively profitable company.)

Moving forward, we believe that in order for FORE to attain the extraordinary level of profitability of other networking vendors which have seized first mover advantage in their respective market segments, the deployment of ATM switches by both enterprises and carriers in both LANs and WANs must accelerate. In our view, increasing ATM market penetration should most immediately benefit FORE given its more than 50% ATM networking equipment market share. More than any other networking vendor, FORE has focused its capital investment in ATM technology. Should ATM finally take off, FORE's profitability should soar with it, by our estimate.

### *Shiva: Catchy Tune But Can You Dance To It?*

**Figure 17: SHIVA CORPORATION ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994–Q3:1996**



Source: Company reports and Robertson, Stephens & Company.

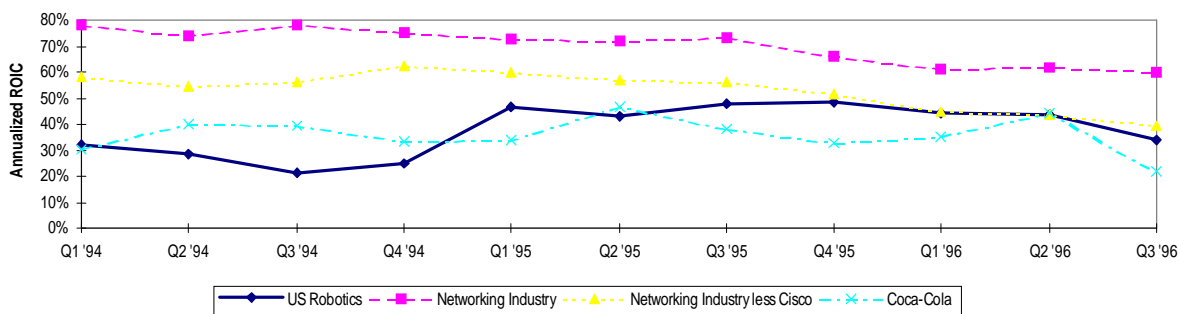
Since peaking in Q4 1994, one quarter following the company's IPO, the ROIC of Shiva (SHVA \$36, Long-Term Attractive) has steadily declined from 106.2% to its current level of 32.3%. While otherwise respectable, this ROIC is far below that of Ascend and what we would expect from Shiva, which remains in our view the leading vendor of LAN extension remote access products. We believe that this lower ROIC, relative to both our expectations and its ROIC prior to the third quarter of 1995, indicates that Shiva has been driving its earnings growth through increasing deployment of capital in its business, as opposed to increasing returns on that capital.

The increase in Shiva's capital base is most directly attributable to Shiva's acquisitions of Airsoft in Q2 1996 and Spider Systems in Q2 1995. The Spider acquisition resulted in almost a fourfold increase in the company's invested capital from \$8.7 million in Q2 1995 to \$33.8 million in Q3 1995. Meanwhile, Shiva's quarterly NOPAT only approximately doubled from \$1.4 million to \$2.8 million. The net result was the pairing in half of Shiva's ROIC from an annualized rate of 64.7% to 32.6%. Subsequent to the Spider acquisition, in the past four quarters Shiva has maintained its ROIC in the 30–45% range while earning approximately a 30% annualized return on each additional dollar of capital invested in its business during this period.

We believe that Shiva's products and technology are the most advanced in the market for LAN extension products, an important subsegment of the overall market for remote access devices. Given Shiva's leading market position and the explosive growth of the overall market for remote access products, however, we are somewhat surprised by the negative trend in Shiva's return on invested capital and note that the company's current profitability is a bit lower than we would otherwise expect.

## U.S. Robotics: Has the "Maestro" Lost His Baton?

Figure 18: U.S. ROBOTICS ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994-Q3:1996



Source: Company reports and Robertson, Stephens & Company.

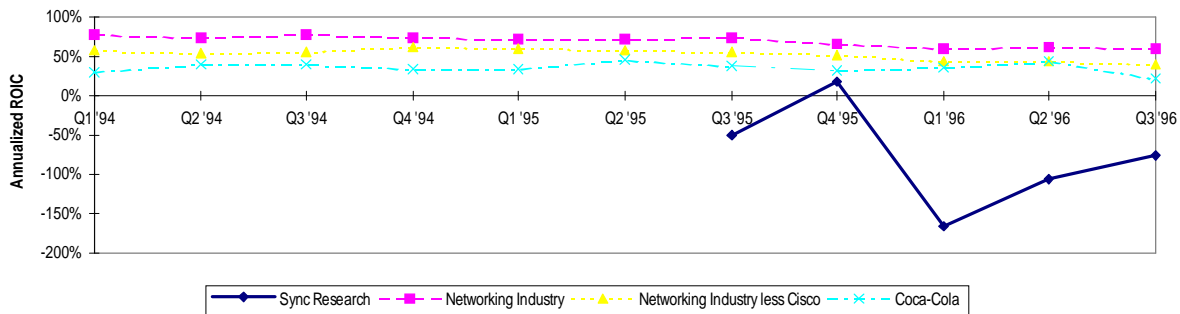
While today accounting for approximately 10% of the industry's profits, up from only 4% in Q1 1994, U.S. Robotics (USRX \$71-1/8, Market Performer) has driven its earnings since Q1 1994 principally through increased sales of and upgrades from 9.6 Kbps to 14.4 and 28.8 Kbps (including 33.6 Kbps) modems. Having attained a brief lead on its competitors, the company enjoyed a stable pricing environment which translated into an improvement in the company's quarterly annualized ROIC from a range of 21% to 32% in calendar 1994 to a range of 43% to 49% in calendar 1995. These upgrades and sales volume increases, however, have required large growth in the company's invested capital. Beginning around Q1-Q2 1995, with no further upgrades being introduced by the company, its competitors catching up to its current offerings, and a maturing sales cycle, U.S. Robotics's ROIC began to stall and then decline as price competition has eroded its margins.

The increase in U.S. Robotics' invested capital is also a product of a series of acquisitions that the company made during the past six quarters, including Scorpio Communications, Amber Wave Systems, Megahertz Corporation, ISDN Systems, and Palm Computing. While helping to broaden the company's product line beyond its traditional desktop modems to include WAN hub (the "Total Control" product line) and ISDN systems products, this product expansion has yet to generate meaningful returns on the company's investment.



## Sync Research: Too Early to Hear How the Song Will Sound

Figure 19: SYNC RESEARCH ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994–Q3:1996

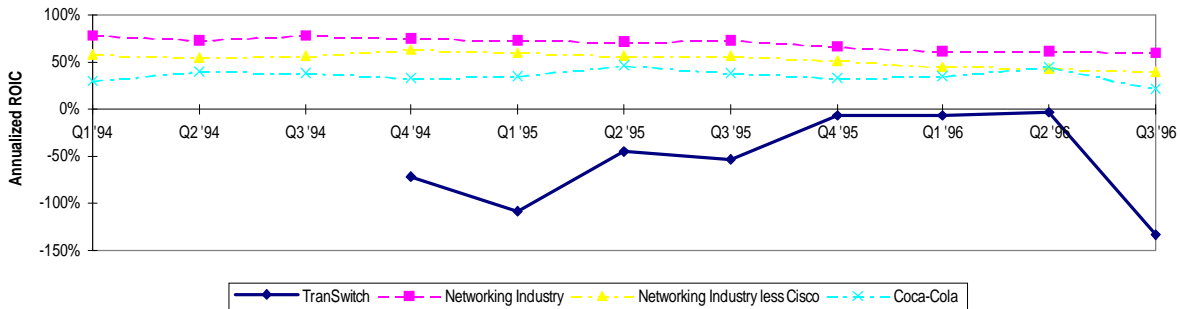


Source: Company reports and Robertson, Stephens & Company.

Throughout most of its short life as a public company, Sync Research (SYNX \$15, Long-Term Attractive) has generated negative returns on its invested capital. Sync is a young company in a relatively young segment of the networking industry. Customer interest in Sync's FrameNode product family is running very high, but there remains limited visibility as to actual near-term revenues from the product. The company's profitability and ability to generate value—at least in the near to intermediate term—we believe is strongly tied to the materialization of these revenues.

## TranSwitch: The Orchestra Is Still Tuning Up

Figure 20: TRANSWITCH ROIC VERSUS NETWORKING INDUSTRY ■ Q1:1994–Q3:1996



Source: Company reports and Robertson, Stephens & Company.

Similar to Sync, a young company in a young market segment of the networking industry, TranSwitch (TXCC \$5-1/8, Long-Term Attractive) has yet to generate positive returns on its working capital. Having become a public company in June 1995, TranSwitch has not achieved sufficient volume production to cover its investments in developing and commercializing its ASIC technology. We note that the company's fabless semiconductor strategy minimizes the company's investment in plant and equipment thereby enabling it to devote its resources to research and development. Going forward, meaningful positive returns on its investments are contingent upon design wins for TranSwitch's advanced integrated circuits used in broadband communications being translated into volume orders.

December 17, 1996

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### ***Mechanics of Our Calculation of ROIC For the Networking Industry***

This appendix sets forth our methodology for our calculation of ROIC for the networking industry.

#### ***ROIC = NOPAT/Invested Capital***

We calculated each company's ROIC for each quarterly period by dividing its Net Operating Profit After Tax (NOPAT) for each quarterly period by the aggregate amount of capital invested in the company's business at the end of each such period. NOPAT is derived as follows:

#### ***Net Operating Profit After Tax (NOPAT)***

NOPAT is operating profit free from any effects of capital structure. We calculate NOPAT by taking a company's reported EBIT and subtracting out cash operating taxes which is defined as taxes payable, in cash, on the company's net operating profit (as adjusted). To derive this cash operating taxes amount, we take the provision for income taxes line item from the Statement of Operations and adjust this amount by the value of the tax shield provided by interest expense and by the value of any additional tax incurred on investment income derived from excess cash balances. We then add to this adjusted EBIT amount any noncash charges such as goodwill amortization and LIFO charges which were included in the EBIT line item on the company's income statement.

NOPAT calculation:

- Operating income (EBIT)
- less cash operating taxes
- plus goodwill amortization.

Calculation of cash operating taxes:

- Income tax provision on the income statement
- less taxes that were due in respect of interest income for the period, which amount equals the company's applicable (federal) statutory tax rate multiplied by the amount of interest income earned in the period
- plus the tax shield in respect of interest expense for the period
- less the change in net deferred tax liability from the prior period to the current period.

We note that in our quarterly ROIC models, we have not made the deferred tax adjustment since most 10-Qs lack the more in-depth tax accounting disclosure provided on an annual basis in a company's Form 10-K or annual report. This lack of more detailed disclosure is particularly problematic for those companies that have made one or more acquisitions involving the write-off of deferred taxes

accrued by the acquired company or companies. While such write-offs are noneconomic events and thus should not result in any adjustment being made to reported taxes to derive NOPAT, such write-offs are infrequently disclosed in the quarterly earnings releases and 10-Qs issued by public companies and thus cannot be backed out of the reported increase or decrease in deferred taxes for the quarter. As a result, we found that making the deferred tax adjustment on a quarterly basis tended to obscure rather than help reveal a networking company's true operating performance. Therefore, we chose to omit the deferred tax adjustment to reported earnings in deriving NOPAT.

Exhibit 1 sets forth our calculation of NOPAT for Ascend Communications for Q3 1996:

**Exhibit 1: Q3 1996 ASCEND NOPAT CALCULATION**

	September
<b>NOPAT</b>	
EBIT	55,225
<i>Adjusted Taxes:</i>	
Tax Provision	22,124
+ Interest Expense Tax Shield	0
- Tax on Interest Income	(1,138)
- Tax on nonoperating income	0
Total Adjusted Taxes	20,986
Amortization of Goodwill	0
NOPAT	<u>34,240</u>

*Source: Company reports and Robertson, Stephens & Company.*

***Invested Capital***

Invested Capital is the amount of all cash that has been invested in the company's business since its inception. Invested Capital can be calculated using either an operating approach or a financing approach. Under either approach, we (a) add the cumulative total of all nonrecurring charges by which the company reduced its net income in the current and prior quarters, and (b) subtract total excess cash, which equals cash generated by the company and not reinvested in its business or required to fund working capital. As an estimate of cash required to fund working capital, we use as a rule of thumb 2% of cash and equivalents. "Excess" cash thus equals 98% of cash and equivalents, plus the full amount of all short and long-term investments.

***Operating Approach***

Invested Capital equals the sum of a company's working capital, net PP&E and Goodwill.

***Financing Approach***

Invested Capital equals stockholders' equity, plus equity equivalents plus total outstanding debt and debt equivalents.

Exhibit 2 sets forth our calculation of Invested Capital, using both the operating approach and the financing approach, for Ascend Communications for Q3 1996:

**Exhibit 2: Q3 1996 ASCEND INVESTED CAPITAL CALCULATION**

	September
<b>Invested Capital: Operating Approach</b>	
Cash & Equivalents	299,603
Receivables	89,529
Inventories	42,382
Other Current Assets	10,984
Adjusted Current Assets	<u>442,498</u>
Accounts Payable	21,080
Accrued Liabilities	21,729
NIBCLs	<u>42,809</u>
Net Working Capital	399,689
Net PP&E	26,017
Other Operating Assets	3,710
Other Operating Liabilities	0
Operating Invested Capital	<u>429,416</u>
Goodwill	0
Accumulated Goodwill Amortization	<u>0</u>
Gross Goodwill	0
Nonoperating Investments	32,718
<i>Cumulative Nonrecurring Charges:</i>	
Current Quarter Charge	0
Prior Cumulative Charges	0
Total Cumulative Charges	<u>0</u>
Total Invested Capital	<u><u>462,134</u></u>
<b>Invested Capital: Financing Approach</b>	
Stockholders' Equity	463,040
Deferred Income Taxes	(12,456)
Accumulated Goodwill Amortization	0
Adjusted Equity	<u>450,584</u>
<i>Interest Bearing Debt:</i>	
Notes Payable & Long-Term Debt	11,550
Long-Term Debt	0
Other Long-Term Liabilities	0
Total Interest Bearing Debt	<u>11,550</u>
Cumulative Charges	0
Total Invested Capital	<u><u>462,134</u></u>

*Source: Company reports and Robertson, Stephens & Company.*

*Note: Robertson, Stephens & Company maintains a market in the shares of Ascend Communications, Inc.; Cisco Systems, Inc.; FORE Systems, Inc.; Microsoft Corporation; PairGain Technologies, Inc.; Sync Research, Inc.; TranSwitch Corporation; U.S. Robotics Corporation and VideoServer, Inc. and has been a managing or comanaging underwriter for or has privately placed securities of Ascend; PairGain; Sync Research; TranSwitch Corporation and VideoServer within the past three years.*

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**Additional information is available upon request.**

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