

The short answer is a resounding yes! New research findings show that the top supply chain management companies significantly outperform their competitors across most financial measures. This article offers insights into those financial gains that differentiate the leaders from their rivals—and offers tips on how to get your top management interested in investing for supply chain excellence.

# Does Supply Chain Excellence Really

By Morgan L. Swink, Rajdeep Golecha and Tim Richardson

*Do top supply chain companies consistently outperform their peers financially?*

*What performance metrics are most powerful in distinguishing top performing supply chain companies from their competitors?*

*How do you justify supply chain investments and get your CFO interested in supply chain initiatives?*

**Questions like these** frequently form roadblocks to supply chain change initiatives. Getting executives, especially CFOs, to lend their support to supply chain improvements often means first convincing them of the financial potential of the investments.

To gain insight and provide some guidance on this task, we analyzed the financials of top supply chain management companies (Top SCM) and their

nearest competitors (Comparable companies) using data from 2004-2007. The analysis reveals some interesting correlations between dimensions of supply chain excellence and financial performance. It also provides insights into the operating policies of companies with top performing supply chains. We draw upon these results to develop expectations for returns on supply chain improvements, and to identify the financial metrics that seem to be the most important distinguishers of supply chain excellence.

The results conclusively show that leading supply chain companies do, in fact, outperform their peers in most financial measures—even when accounting for other factors such as size and financial leverage. The market also appears to reward supply chain excellence, as the leading supply chain companies show greater stock returns and economic value added. Over the 2004–2007 timeframe,<sup>1</sup> the supply chain leaders outperformed their closest competitors across the following metrics:

- 50 percent higher net margins.
- 20 percent lower operating and SG&A (Sales, General & Administration) expenses.
- 12 percent lower average inventories (days of sales).
- 30 percent less working capital expenses/sales.

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# PAY OFF?

- Twice the ROA (return on assets).
- Twice the ROE (return on equity).
- 44 percent higher economic value added.
- Twice the returns on stock prices.
- 2.4 times the risk-weighted stock returns.
- 46 percent greater market value-to-assets ratio.

These differences in performance are truly stunning. The following sections of this article discuss the approach we used to develop these findings and points out some surprising strategic implications for managers who seek to elevate their supply chain performance to the next level.

## Identifying the Top SCM Companies

One of the initial challenges in this type of study is to identify “top” companies that are truly excellent in their supply chain management capabilities and practices. We combined multiple sources of data to identify these organizations, thereby minimizing the bias associated with any single source. The sources included the following:

- *AMR Research Top 25/50 Supply Chain Rankings (2004-*

*2008)*. For several years AMR Research has identified the top 25 companies selected from the Fortune 500 based on a composite score of financial and perceptual metrics. The financial metrics (ROA, inventory turnover, and sales growth) account for 60 percent of the total score. The perceptual components (AMR Research Opinion and Peer Opinion Panel) are weighted at 20 percent each.

- *Michigan State University MBA SCM Rankings (2007-2008)*. Two MBA classes at the school’s Eli Broad Graduate School of Management conducted research in 2007 and 2008 to identify top supply chain management companies in each of 20 different industry segments, including all manufacturing, distribution, and retail firms with sales greater than \$100 million per year. The students first identified the six to eight companies that appeared in the top quartile of their respective segment most frequently over a two-year period on the

following supply chain oriented metrics: ROA, gross margin, inventory turns, cash-to-cash cycle time, and sales growth. Using information from company sources, direct interviews, and published articles, the students scrutinized the supply chain performance of these candidate companies. They then identified and reported on the top two or three companies in each industry segment.

- *CSC/SCMR/MSU Global Survey of Supply Chain Progress (2004-2008)*. Each year *Supply Chain Management Review*, CSC, and Michigan State have jointly conducted a survey on supply chain management practices and performance. One of the survey questions asks respondents to indicate who in their opinion represent the best supply chain companies. We included all companies that received at least three mentions by respondents in a given year.

- *Supply Chain Digest (SCD)/Cannondale Associates Ranking (2008)*. A recent study by *Supply Chain Digest* and Cannondale Associates ranks the top supply chains in the consumer packaged goods and retail industries.

While each of these sources has potential biases, the combination of all sources offers a more complete variety of perspectives. The AMR Research study, for instance, is limited to large firms (Fortune 500) while the MSU study addresses both small and large firms. The AMR study is broad based while the MSU study is industry focused. The AMR and MSU studies are both U.S. centered while the CSC/SCMR study gathers perceptions from international respondents as well. By combining the findings of these different studies we reduced the potential that a myopic perspective would unduly influence the selection of top supply chain companies.

In compiling our final list, we selected companies that were identified by at least two of the studies at any time within the 2004-2008 timeframe.

### Identifying Comparable Companies

Once we identified the Top SCM companies we next had to identify a Comparable

company for each. For this we used two sources: the Hoover's competitive report and Yahoo Finance Competitor Analysis. From the lists of direct competitors provided by Hoover's and Yahoo, we chose the company that was closest to each top supply chain company in terms of sales.<sup>2</sup> Table 1 at the end of the article lists each Top SCM company and the Comparable company selected.

As we mentioned earlier, part of the challenge with evaluating financial performance for the top companies is that most supply chain ranking systems either explicitly or implicitly use financial metrics as part of the rankings criteria. Importantly, our analysis determined that the financial criteria that influenced the selection of Top SCM companies do not actually have significant effects on overall performance differences between the top companies and comparable competitors. Our comparison indicated that only ROA and inventory turns are significantly higher on average for the Top SCM companies than for comparable companies. Cash-to-cash cycle and sales growth do not significantly differ between the two groups. And gross margin, in fact, is actually higher on average for the comparable companies.

Our conclusion: the use of these metrics in the original selection of the Top SCM companies does not appear to have systematically biased the results across the years.

EXHIBIT 1

#### Performance Comparison: Top SCM vs. Comparable Companies

	Performance Metric	Top SCM Company Average	Comparable Company Average	Is Top Company Performance Significantly Different?
Operational	Sales Growth	13%	16%	No
	Cash to Cash Cycle (days)	60 days	58 days	No
	Days of Receivables	55 days	55 days	No
	Days of Payables	55 days	78 days	Yes
	Days of Total Inventory	61 days	69 days	Yes
	% Inventory as Raw Material	35%	24%	Yes
	Goodwill/Sales	12%	27%	Yes
	Working Capital/Sales	13%	19%	Yes
	Operating Expense/Sales	23%	29%	Yes
	SG&A/Sales	23%	29%	Yes
	R&D Sales	7%	10%	Yes
	Advertising/Sales	4%	6%	Yes
	Gross Margin	40%	45%	No
	Net Margin	10%	7%	Yes
	Assets Allocated per Employee (\$000)	\$405	\$564	Yes
Revenue / Employee (\$000)	\$420	\$386	Yes	
Financial	ROS	14%	12%	Yes
	ROA	11%	5%	Yes
	ROE	29%	15%	Yes
	Economic Profit/Total Invested Capital	13%	9%	Yes
	Economic Profit/Capital Charge	2.66	1.69	Yes
Stock	Geometric Mean of Returns	1.13%	0.32%	Yes
	Average Mean of Returns	1.37%	0.67%	Yes
	Sharpe Ratio (Returns/Risk)	0.44	0.18	Yes
	Market Value/Assets	2.23	1.53	Yes

It's also important to note that our analysis explores differences on a wide range of operational, financial and stock market-based metrics that were not part of the initial ranking and selection procedures.

### The Results: Clear Differences Emerge

Exhibit 1 gives the comparison statistics for operational, financial, and stock-based performance metrics. We used a paired t-test to compare the average scores for the Top SCM and Comparable companies in each year on each of the metrics. This analysis estimates the significance of a difference between the average scores for two groups, while taking into account the pairings of companies across the two groups. Except for sales growth, cash-to-cash cycle, and days receivables, the reported differences are statistically significant at a 95 percent confidence level or higher.

Let's take a closer look at the results for each of the categories of performance metrics—operational, financial and stock performance.

#### Operational Performance

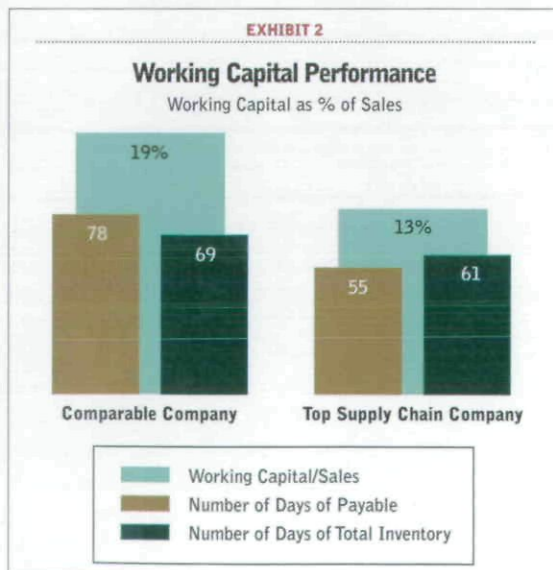
While sales growth differences for top companies and their competitors are not statistically significant, the Top SCM companies appear to do a much better job of managing their working capital (see Exhibit 2). In particular, Comparable companies need almost one and a half times more working capital than the top performers to support a comparable level of sales.

As expected, the number of days of total inventory is lower for the top companies than for the others. These leaders have evidently created process and planning efficiencies that enable them to support the same levels of sales as their rivals with less overall inventory. Interestingly, there appears to be a difference in inventory and market strategies across the two groups. Top SCM companies hold a significantly larger proportion of their inventories in raw form (35 percent vs. 24 percent for Comparable companies). This inventory profile suggests that the top companies are likely more responsive by making greater use of postponement and make-to-order strategies. Also, raw materials inventories have a lower value, possibly accounting for the overall lower cost of inventories in Top SCM companies.

Differences in how the two categories of companies manage cash also point to some interesting strategic choices. The cash-to-cash cycle values are not statistically different between the two groups (recall that cash-to-cash cycle is calculated as days receivables + days inventories – days payables). Days receivables values are equal across the two groups. However, the average days payables for Top SCM companies is 55 days vs. 78 days for Comparable companies. This difference runs counter to what we would expect. Conventional wisdom would suggest that the better performing and larger leading companies would be able to negotiate more favorable payment terms with their suppliers. Why would the Top SCM companies pay their suppliers faster than Comparable companies do? Perhaps purchasing managers in the top companies are making a trade-off. They are more willing to give favorable payment terms to their suppliers in return for excellent performance and closer relationships. We will explore this possibility further as we analyze differences in the expenses of the two groups of companies.

Top SCM companies had lower operating expenses per sales dollar than their counterparts (see Exhibit 3). They also enjoyed lower SG&A expenses, lower R&D expenses, and lower advertising expenses per sales dollar. It is remarkable that the Top SCM companies achieved statistically similar levels of sales growth as the Comparable companies given their lower expenses in these areas. The results suggest that the top companies have developed superior efficiencies in all the related areas of the supply chain, enabling them to get the most out of their internal resources. This efficiency is also reflected in their deployment of human resources, as their revenue per employee is greater on average than for their competitors.

Surprisingly, the Top SCM companies had lower gross margins on average as compared to the Comparable companies, indicating either that their costs of good sold (COGS) are higher or their pricing power is lower. Given that the Top SCM companies are able to generate more sales per dollar spent on R&D, SG&A, and advertising, they appear to have substantial pricing power. Thus, the gross margin result suggests that Top SCM companies have high-



er COGS, yet they also have lower operating expenses. The implication is that they are paying higher prices to their suppliers.

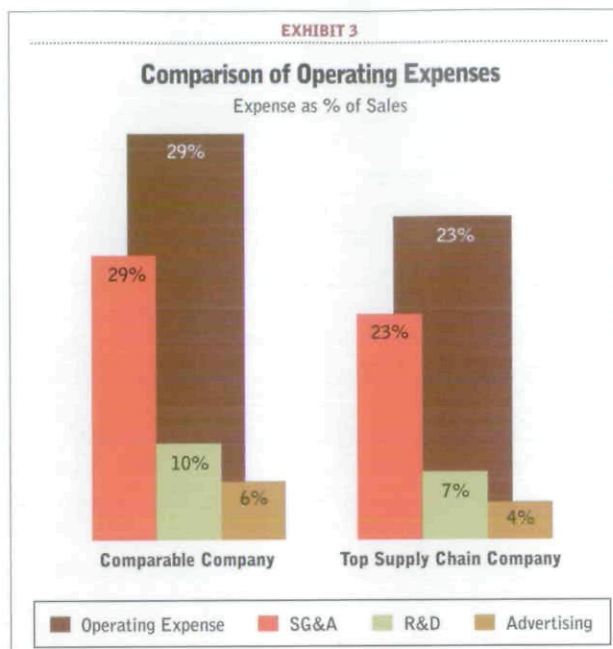
A comparison of net margins sheds more light on the results. Though their gross margins are lower, Top SCM companies have significantly higher net margins than their competitors on average. Thus, while the top companies appear to be paying more for goods sold, their improved internal operating efficiencies and marketing power are great enough to more than offset the higher purchasing costs, making them more profitable at the bottom line.

This brings us back to the trade-off we mentioned earlier. The Top SCM companies appear to be paying suppliers more (higher COGS) and faster (lower days payable) in order to reap benefits elsewhere. These other these potential benefits likely include:

- Lowered R&D Expenses through earlier and more intense supplier involvement.
- Lowered working capital through JIT delivery.
- Lowered transaction costs (operating and SG&A expenses) through greater integration with upstream and downstream partners.

The data are suggestive of each of these benefits, indicating that the top companies have opted to reward their suppliers in return for providing them with a lower total cost of ownership. The results also indicate that the Top SCM companies have a more variable cost structure. Their asset/employee ratios are almost 30 percent lower on average than the ratios for the Comparable companies. This result again suggests that the top companies are leveraging the capabilities of their suppliers, as they appear to have outsourced more of their asset-intensive processes.

A look at goodwill gives a final insight into the strategy of Top SCM companies. Goodwill is generated when one firm acquires another firm. It is defined as the difference between the purchase price and the fair value of the acquired company's net assets. The goodwill for Comparable companies is on average more than twice that for the top firms. A likely explanation is that Comparable companies



have had a greater propensity to grow through acquisitions, whereas the Top SCM companies have grown more organically. Growth through acquisition could also account for the apparent inefficiencies reflected in the higher operating expenses of the Comparable companies. It takes time to rationalize and fully integrate the different operating systems and products of acquired business units.

### Financial and Stock Performance

Between 2004 and 2007, the Top SCM companies outperformed their competitors

on every financial and stock market based performance metric that we evaluated. The top companies delivered a statistically significant better ROS. However, the more dramatic performance differences are reflected in ROA and ROE, where they delivered double the returns of Comparable competitors.

The Top SCM companies also performed better on economic profit, one of the most comprehensive financial performance measures. Economic profit measures the true profits of a company by subtracting from the total revenue the total cost of doing business, including operating costs, taxes, depreciation and the total cost of capital invested. We evaluated two economic profit metrics: annual economic profit per dollar of invested capital, and annual economic profit per capital charge (where capital charge = WACC X Invested Capital). The economic profit generated by the Top SCM companies was about 50 percent greater than that generated by the Comparable companies in this timeframe.

One would surmise that these kinds of financial results would make the Top SCM companies very attractive investments. The stock market data agree; they confirm that investments in Top SCM companies generated significantly higher average monthly stock returns when compared with rival options (see Exhibit 4). Investments in stocks of the Top SCM companies grew at more than twice the rate of Comparable companies. The Sharpe Ratio, which measures the stock returns weighted by risk, is two and half times higher for top companies. A final measure, Market Value/Assets, indicates that the

market placed a 45 percent greater value on the assets of the Top SCM companies over the assets of the Comparable companies. These results indicate that these top companies provide both higher and less variable returns.

### Key Questions Answered

The results of our study provide some useful guidance on the questions we asked earlier:

#### *Do top supply chain companies consistently outperform their peers financially?*

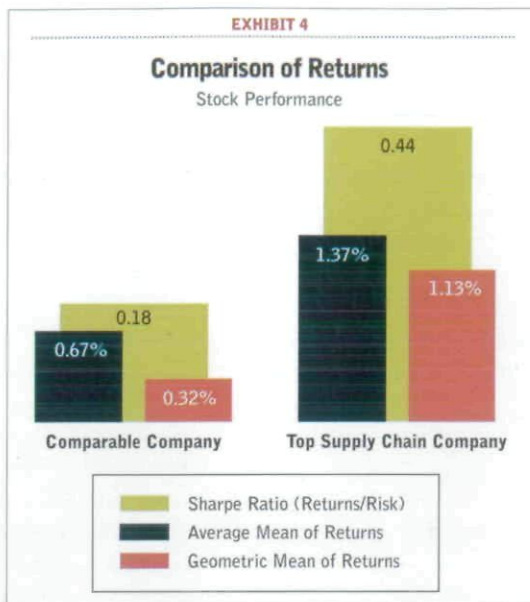
The results answer this question with a resounding yes! The magnitudes of the financial performance differences indicate that the payoffs are indeed substantial and highly desirable. Taken as a set, the average values for the Top SCM companies could be used to establish benchmarks for supply chain performance—though we hasten to add that there is high variability across industries. For example, 61 days of inventory might be quite lean for one industry and quite “fat” for another. In setting goals for improvement, managers would be advised to pick the top performers among their direct competitors as benchmarks.

#### *What performance metrics are most powerful in distinguishing top-performing supply chain companies from the others?*

To get an even more precise answer to this question we used a statistical technique called Logit Regression to identify the variables that have the greatest “predictive power.” The performance metrics that were found to be the most significant in identifying companies as Top SCM companies were:

- ROA (higher)
- SG&A/Sales (lower)
- Days of Total Inventory (lower)
- Working Capital/Sales (lower)
- Days of Accounts Payable (lower)

The data suggest that better scores on these performance variables are most likely to be strong indicators that a company is becoming a top performer in supply chain management.<sup>3</sup> Interestingly, these metrics collectively cover most of the elements of supply facing and customer facing processes in the supply chain. ROA gives



a broad measure of the productive use of the company's assets. SG&A/Sales gives an indication of sales and distribution efficiencies. Inventory and Working Capital/Sales metrics are suggestive of how well material and information flows are managed. Days of accounts payable gives an indication of supplier relationships. Remember that for the Top SCM companies, “better” in the case of days of payables means a lower number of days. As we pointed out earlier, the fact that this metric is such a strong differentiator hints at an important difference in the primary strategies that Top SCM

companies and Comparable companies may be using.

The top companies appear to be focusing on net margins rather than gross margins. We think they are minimizing total costs and maximizing efficiencies by investing more in their suppliers. This conjures up the old adage, “you get what you pay for.” Consider what the data have to say. The Top SCM companies do not have lower COGS, yet they appear to outsource more and they outperform their rivals on just about every other dimension. To us, this is strong evidence of the power of a supplier relationship model that prioritizes partnering with and rewarding the best and brightest suppliers.

The other surprising differentiating factor between the two groups of companies has to do with growth. While the Top SCM companies did not grow any faster than their rivals over the period we studied, disparities in goodwill suggest that they grew differently. Top SCM companies appear to have grown more organically, depending less on mergers and acquisitions to fuel sales improvement. This is surprising, especially given the larger size of the Top SCM companies. However, it does potentially explain why they have more efficient, faster moving supply chains. It may be better to invest in improving one's existing supply chain than to invest in acquiring someone else's.

#### *How do you justify supply chain investments and get your CFO interested in SCM initiatives?*

The results confirm that the potential value of becoming a Top SCM company is huge. They also establish the kinds of performance improvements that SCM managers might expect to see as they grow their operational

capabilities. These potential gains could be used to target improvements and to financially justify investments in technologies, collaborative partnerships, and employee training programs across the supply chain. An important first step is getting the CFO to be engaged and supportive. We offer two suggestions for making this happen.

First, highlight the potential gains associated with SCM excellence. Ask your CFO, what other investments could yield the kinds of returns implied by the findings of this study? The financial performance differences between Top SCM companies and their rivals are so substantial that it is hard to imagine other options yielding similar long-term returns.

When communicating the potential, it is important to speak the CFO's language. Look beyond the process improvements and operational metrics that are typically the focus of SCM initiatives. Find ways to translate operational improvements into financial returns that CFO and analysts care about. Tools such as the strategic profit model (also known as the DuPont model) and the balanced scorecard may be useful in making such translations. Using the performance differences highlighted in this and other studies of SCM leaders, develop your own supply chain performance scorecard that clearly links operational gains to top line, bottom line, and financial market-based results.

Also, find stories and examples that highlight the importance and potential of SCM initiatives. Researching the Top SCM companies in your industry can yield examples that bring a "real-world" note to proposals that will capture the imagination of your CFO. Perform retrospective case studies of the leaders to determine how they attained their leadership positions.

Second, clarify the importance of the CFO's role. The CFO needs to understand the role that his/her office plays in making SCM excellence a reality. The CFO's office typically controls both the data and the perspectives needed to prioritize actions according to their financial impact. CFO involvement is critical in directing SCM investments so that the right strategic capabilities are developed—and in the right time frame.

In addition, the CFO is needed to drive initiatives that span multiple functions or business units. A basic principle underlying supply chain management is that the benefits of boundary-spanning improvements greatly exceed the benefits of internal, functionally oriented initiatives. Because any given supply chain manager's scope of influence is typically limited, the CFO can play a critical role in driving changes—especially those that require give and take across functional lines. By pointing out the fact that the CFO has a unique overall perspective of the business, coupled with a keen insight into the

firm's financial workings, a savvy supply chain manager can show the CFO the importance of his or her role in justifying and implementing change.

### Moving Forward

The methods and results reported in this article can serve as a baseline for future studies of supply chain management performance. The results have provided some pretty convincing answers to lingering questions about the real benefits of being on the cutting edge of supply chain competence. SCM excellence clearly affects performance in ways that financial markets appreciate. It is up to you to get your CFO and other top executives motivated to put this information to use.

Compare your company's operational and financial performance profiles against those of the Top SCM companies. Where are the largest performance differences? What do these differences say about your current supply chain operating strategies? What kinds of initiatives are needed to close the gaps?

As we stated earlier, benchmarking the practices of the top performers could help to clarify the needed changes. Most important is to quantify the opportunity value of SCM excellence using terms and metrics that are important to your CFO and other financial analysts. These are the early steps needed to progress down the road that leads to greater profits from SCM superiority. ☐☐

### Notes:

- 1 Our analyses omitted 2008 data due to the extraordinary market conditions of that year. Do Top SCM Companies outperform their rivals in a down economy? It is difficult to answer this question using data from only a single year, as there is high variability in financial data from year to year. We plan to repeat these analyses once 2009 financials become available.
- 2 The Top SCM Companies are significantly larger on average than the Comparable Companies (average sales were \$45B and \$23B respectively), so one could argue that the differences in performance are due to scale and leverage. We used two methods to evaluate this possibility. First, we repeated the statistical tests on all the performance metrics, dividing each metric by sales in order to account for scale effects. Second, we used a technique called regression analysis to statistically control for size. In both procedures, the overall performance differences remained clearly evident.
- 3 We used these results to examine the values for each of the Comparable Companies to determine whether or not it should be classified in the Top SCM category. The model indicated that both Colgate-Palmolive and Lenovo should have been classified as Top SCM Companies. Interestingly, the recently published 2009 AMR top supply chain company list included Colgate-Palmolive for the first time. We take this as a partial validation of our results.

TABLE 1

### Top Companies and Comparable Competitors

Hoover's Industry Classification	Top SCM Company	Comparable Company
Specialty Chemical Manufacturing	3M	DuPont
Music, Video, Book & Entertainment Retail	Amazon.com	eBay
Alcoholic Beverages	Anheuser-Busch	Molson Coors Brewing
Computer Hardware	Apple	Sun Microsystems
Consumer Electronics & Appliances Retail	Best Buy	Circuit City
Construction, Mining & Other Heavy Equipment	Caterpillar	Komatsu
Computer Networking Equipment	Cisco Systems	Juniper Networks
Carbonated Beverages	Coca-Cola	Dr. Pepper Snapple
Discount & Variety Retail	Costco Wholesale	Sears Holdings
Drug Stores & Pharmacies	CVS Caremark	Rite Aid
Computer Hardware	Dell	Lenovo
Pharmaceuticals	GlaxoSmithKline (GSK)	Sanofi-Aventi
Consumer Products Manufacturers-Technology	Hewlett-Packard	Xerox
Auto Manufacturing	Honda	General Motors
Microprocessors, Microcontrollers & DSPs	Intel	AMD
Computer Software	IBM	Microsoft
Pharmaceuticals	Johnson & Johnson	Merck
Auto Parts Manufacturing	Johnson Controls	Magna International
Pharmaceuticals	Kimberly-Clark	SCA-Svenska Cellulosa
Food	Kraft Foods	HJ Heinz
Grocery Retail	Kroger	Safeway
Telecommunications Equipment	Motorola	Ericsson
Food	Nestle	Danone (Groupe)
Apparel Manufacture	Nike	Adidas
Telecommunications Equipment	Nokia	Ericsson
Automotive & Transport	PACCAR	Navistar International
Carbonated Beverages	PepsiCo	Dr. Pepper Snapple
Consumer Products Manufacturers	Procter & Gamble	Colgate-Palmolive
Grocery Retail	Publix Super Markets	Delhaize Group
Aerospace & Defense	Rockwell Collins	Honeywell Aerospace
Grocery Retail	SUPERVALU	Safeway
Discount & Variety Retail	Target	Sears Holdings
Grocery Retail	Tesco	Cameron International
Electronics	Texas Instruments	QUALCOMM
Auto Manufacturing	Toyota	General Motors
Consumer Products Manufacturers	Unilever Group	Colgate-Palmolive
Discount & Variety Retail	Wal-Mart	Sears Holdings
Drug Stores & Pharmacies	Walgreens	Rite Aid

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