

CFO Magazine's "Working Capital Survey": Do Selected Firms Work for Shareholders?

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*The annual "Working Capital Survey" made its debut in 1997 in **CFO Magazine**. The survey ranks the efficiency of working capital management at 1,000 companies across 35 industries based on two measures of financial data: cash conversion efficiency and days of working capital. In this paper, we seek to determine whether shareholders reward companies that score high on the criteria used to determine a firm's rank by **CFO Magazine**. First, we test for share price announcement effects for firms named in **CFO Magazine's** "Working Capital Survey." While there are significant positive abnormal returns for selected firms, the gains reverse themselves in subsequent days. Second, for each year of the survey, we test whether firms named to the top ten within their respective industries have holding period returns that exceed the returns of a matched sample. Sample firms outperform matched firms on a raw return basis, although these differences are not statistically significant. Both the Sharpe and Treynor measures of risk-adjusted return indicate that sample firms generally outperform the matched sample. Finally, we test whether annual returns are positively related to **CFO Magazine's** ranks of cash conversion efficiency and days of working capital. We find a positive relationship between a firm's return and its cash conversion efficiency rank but no relationship between return and days of working capital rank.*

Introduction

Cash flow is the lifeblood of firms, and efficient working capital management is the key to achieving healthy cash flow. Firms with weak working capital management strategies give up flexibility and potentially a competitive advantage. An

example of the importance of working capital management was the mid-2000 decline of Amazon.com's stock price. In June 2000 (Ames and Wolverton, June 23, 2000) an influential Lehman Brothers Inc. bond analyst Ravi Suria issued a stern warning about Amazon.com's "weak balance sheet, poor working capital management, and massive negative operating cash flow." Within days, the company's stock, which had reached a 52-week high prior to the warning, plummeted more than two-thirds. Articles in both the *Wall Street Journal* (Carlton, June 26, 2000, A3) and *Washington Post* (Schwartz, July 15, 2000, E2) identified poor working capital management as the cause of Amazon's decline. The more recent proliferation of corporate scandals regarding the integrity of earnings further underscores the importance of working capital management and a strong balance sheet.

Both accounts receivable and inventory management are key success variables to efficient working capital management strategies. Nike CEO Philip Knight singled out inventory as the most important issue on which Nike's long-term fate relies. He noted that in order "to protect margins and brand value, the company needs to manage its inventory better" (Fredeen, 2000). A 2004 *Business Week* cover story (Holmes and Bernstein, September 20, 2004) indicated that Nike had made significant changes by focusing on, as one Nike insider, Mark Parker, stated, "the basic pieces of the business: operating principles, financial management, supply-chain renovation, and inventory management."

CFO Magazine recognizes the importance of the basic pieces of the business as well. *CFO Magazine* was launched in 1985. According to CFO.com, the publication enjoys a circulation of 559,000 worldwide and is the leading business publication for C-level (e.g., chief executive officer, chief financial officer, etc.) and senior financial executives. The annual "Working Capital Survey" made its debut in 1997 in *CFO Magazine*. The magazine identifies working capital management as one of the key issues facing financial executives in the 21st century. The inaugural 1997 "Working Capital Survey" ranked the efficiency of working capital at 1,000 companies across 35 industries based on two measures of financial data: cash conversion efficiency and days of working capital.

Most research in the area of working capital management has consisted of surveying financial professionals concerning their opinions on their firms' working capital practices. [See Sanchez (1992), Smith and Belt (1989), Beranek and Sherr (1991) and Ricci (1999) as examples.] This paper fills a gap that exists in the literature. Unlike previous studies, which attempt to identify and describe the problems faced by firms regarding working capital management, we attempt to link measures of working capital management directly to shareholder value. We seek to determine whether shareholders reward companies that score high on the criteria used by *CFO Magazine* to determine a firm's rank. First, we test for share price announcement effects for firms named in *CFO Magazine*'s "Working Capital Survey." Second, we test whether the returns of firms named in the top ten within their respective indus-

tries exceed the returns of a matched sample of firms during each year of the survey. Finally, we investigate the relationship of annual returns and *CFO Magazine's* rankings of firms based on cash conversion efficiency and days of working capital.

Literature Review

Much of the working capital literature is practitioner oriented and focuses on describing the issues surrounding working capital management rather than on linking working capital management to shareholder wealth. Survey studies dominate the literature. Much working capital research focuses on the impact of accounts receivable management on firm cash flows. Receivables are a significant portion of working capital for American corporations. Hill and Sartoris (1992) note that from 1970 to 1990, receivables in typical manufacturing corporations constituted almost 17 percent of total assets. Based on annual survey data, *CFO Magazine* (Myers, 2006) notes overall improvements in the related working capital variables such as accounts receivable and accounts payable over the last several years. Thus, given the gains that have been made in working capital management in the last 15 years, one might expect a smaller proportion today.

The two primary concerns firms have regarding receivables are the lost cash flows arising from bad debts and from administrative costs. Sanchez (1992) surveys over 8,000 firms and finds that on average 25 percent of receivables are delinquent at any given time. He also finds that less than one percent of delinquent receivables is ever written off as a loss. As a result, he views collections not so much as enforcement of payment but more as "the process of completing the sale." He argues that internal processes are critical to accounts receivable management.

Regarding minimizing administrative costs, Smith and Belt (1989) report that most of the respondents of the Fortune 1000 companies that were surveyed used more than one method of determining to whom to grant credit and monitor customers' payment behaviors. Beranek and Sherr (1991) find that 58 percent of the respondents to their survey establish credit limits for over 90 percent of their customers. Also, the vast majority of firms that responded to a survey by Byl (1994) use more than one method to report the status of their receivables to management. All methods employed by firms to control accounts receivable increase administrative costs and, if not successful, hurt the bottom line.

Ricci (1999) surveys 200 randomly-selected credit managers on the topics of pre-sale issues, post-sale issues, and reporting issues. Although Ricci finds that several methods were being used to identify creditworthy customers, using multiple methods did not have an impact on the level of past due accounts. Furthermore, no relationship existed between the amount of money spent on information and the percentage of sales turning into bad debts. Despite this, a majority of the firms in the survey were willing to pay higher investigation costs as the size of potential sales

increased. According to Ricci's survey, one factor that did tend to reduce the number of past-due accounts was the effective setting of credit limits.

Regarding maximizing shareholders' wealth in the post-sale arena, Ricci concludes that firms did appear to be maximizing the present value of their cash flows. Firms have been accelerating collections both in the determination of the payment due date and in using concentration banking, lockboxes, electronic payments, and other means in recent years. Ricci, like Gilbert and Reichert (1995), finds that about 60 percent of firms use the percentage-of-sales model or an internally developed model to forecast receivables. As one might expect, those firms that employed more methods to forecast and monitor receivables had a lower level of past due accounts. Ricci also finds that firms that used multiple methods to report receivables management (e.g., DSO, aging schedules, and bad debt percentages) tended to have lower bad debt levels.

Although Ricci's study is comprehensive and significant, it fails to address shareholder value directly. Instead, it assumes that more efficient receivables management will increase earnings and hence share price.

Barth, Cram, and Nelson (2001) investigate the role of accruals in predicting future cash flows and show that each accrual component reflects different information relating to future cash flows. Separate analysis of the change in accounts receivable, change in accounts payable, change in inventory, and other cash management related variables increased the sample firms' ability to predict future cash flows. In fact, these variables were more successful than several lags of aggregate earnings in predicting future cash flows.

Daly (1997/1998) listed several companies that had embraced the concept of reengineering their fundamental business processes to compete internationally. She focuses on the benefits of improved accounts payable systems and the need to effectively train employees who coordinate the implementation of new working capital management processes. Efficient working capital management is particularly important to bankers. Good management means more cash flow to repay loans. Banks continue to offer firms new ideas, products, and services for improving working capital management. Improving collection practices, inventory controls, and trade credit practices are beneficial for the company, the firm's lenders, and their investors. A common technique that bankers use to measure the appropriateness of working capital investment is to compare the company's working capital ratios with industry statistics published by Risk Management Associates (RMA). Strischek (2001) observes that bankers also look to *CFO Magazine's* annual "Working Capital Survey" as a source of evaluating potential loans.

CFO Magazine's List

Recognizing the importance that Wall Street places on cash flow generated by successful companies, *CFO Magazine* and REL Consultancy Group rank the nation's

largest public companies on working capital performance.¹ The survey results are based on available data from public filings.

According to *CFO Magazine* (1997), the REL Working Capital 1000 Survey was designed for use by chief financial officers (CFOs) who wish to benchmark their companies' performances against peers. REL's website (www.relconsult.com) offers CFOs and other finance professionals interactive benchmarking of company performance against peer groups of their choice. We argue that the survey also may be valuable to investors searching for companies and industries that are the most efficient asset managers and cash-flow generators.

The annual "Working Capital Survey" measures the efficiency of working capital management at roughly 1,000 companies of a pre-designated minimum size (\$480 million in sales) in 35 industries. The original survey used cash-conversion efficiency (CCE) and days of working capital (DWC) on an equally weighted basis to determine firm rank. CCE is calculated as cash flow from operations divided by sales. DWC represents a summary of unweighted days sales outstanding (DSO), payables, and inventory. It is calculated as the sum of receivables plus inventory less payables divided by average daily sales. DWC is negative if the sum of accounts receivable and inventory is less than payables. DSO and inventory turnover are reported separately for each ranked firm in *CFO Magazine*. In 2000, *CFO Magazine* included days payable outstanding (DPO) in its annual presentation of outstanding firms. *CFO Magazine* ranks the top ten firms overall in each industry. The magazine states that rankings are comparable across firms and industry peers. In addition, for each firm listed, *CFO Magazine* provides the CCE, DWC, DSO, inventory turnover, and DPO (in the 2000 survey). Results measure the firm's average working capital over a three-year window.

The rationale behind the survey's launch is that effective working capital policies may offer firms a competitive advantage. *CFO Magazine* points out that every dollar locked up in working capital weighs down performance; but once unlocked, each dollar supports investment and value creation now and in the future. What makes this survey unique is that the ranking is based on accounting-based ratios rather than a panel of experts (e.g., *Fortune's* "Most Admired" lists), editorial staff (e.g., rankings by *Working Mother* or *Mother Jones*), or employees (e.g., *Fortune's* "100 Best Companies to Work For"). Thus, the working capital surveys are objective and free of any biases that opinion-based surveys may contain.

¹ REL Consultancy Group is a leading global consulting firm focused on working capital management. In 2005 REL was acquired by the Hackett Group. The firm is now called Hackett-REL. According to their website, they offer "total working capital management advisory, benchmarking, and transformation services to liberate cash flow from operations through improved working capital, reduced costs, and increased service effectiveness."

Research Hypothesis

Do investors believe that working capital policies are important? This paper attempts to answer this question empirically. First, we investigate the possibility of an announcement effect associated with the release of the *CFO Magazine* “Working Capital Survey.” The first hypothesis is that there will be a positive share price response associated with the announcement of *CFO Magazine*’s “Working Capital Survey.” A positive market response would indicate that the market perceives that these firms are worthy of positive reevaluation of share price based on the survey’s findings. Such a response may indicate that the market pays attention to the basics such as working capital management in assessing potential investments. The last several years have seen shorter sales cycles and tremendous technological changes. Companies that are not placing a priority on CCE may not be effectively managing growth. A positive response would lend support to the theory that “companies that do the best job of converting sales to cash today also give themselves the best chance for succeeding tomorrow” (p. 69, Myers, 2000).

Conversely, a negative response could be associated with the perception that too many resources are going into working capital management. For example, there are costs associated with data collection and monitoring receivables. The more methods the firm uses to monitor receivables, the more costly it is for the firm. In addition, there is some downside risk associated with an extremely aggressive approach to working capital management. If a firm is able to internally generate liquidity, the likelihood that they will have to use outside capital providers to fund growth is lessened. Murphy, Callaghan, and Prakash (2005) find that the short selling of shares of firms who must seek outside sources of capital drives down stock prices and firm values. The ability to avoid outside equity capital often is perceived as an advantage, at least by financial managers. Note the enormous cash balances of some firms today. There are also relationship issues at stake. As multiple financial managers note in the *CFO Magazine* surveys, they cannot improve their working capital numbers at the expense of their suppliers, although many firms have tried (Reason, 2002). An aggressive approach regarding DPO can backfire, destroying relationships with suppliers.

Finally, a lack of response to the announcement could indicate that working capital management isn’t that important, at least not to investors. Also, it might indicate that the survey does not have enough impact in terms of investor readership. The magazine is targeted at C-level managers and thus does not have the widespread practitioner audiences of magazines such as *Fortune* and *Forbes*. Moreover, the information contained in the survey is delayed relative to actual firm performance. In other words, it is possible that the market knows that these firms are good working capital managers and that share prices reflect this knowledge.

We also examine long-term performance by estimating buy-and-hold abnormal returns (BHARs). Barber and Lyon (1997) expanded on the work of Ritter (1991) in

developing BHARs. Ritter was the first to argue that cumulative abnormal returns (CARs) and BHARs can be used to answer different questions. A BHAR is the difference between the return on a buy-and-hold investment in a sample firm less the return on a buy-and-hold investment in an asset or portfolio. Barber and Lyon find that BHARs correct several biases that arise from estimating long-term CARs. While we do not have an event window issue in this paper, we will present the BHAR outcomes as support for our holding period return and CAR results.

The second hypothesis is that annual returns to those firms named to the top ten within their respective industries will exceed matched sample benchmark returns and risk-adjusted performance measures during each year from 1997 to 2000 and for the overall four year period. Matched sample firms are a more appropriate benchmark than a broad market index (e.g., the S&P 500) because the matched sample comparisons reflect investment style. The matched sample firms are selected based on industry classification (SIC code) and market capitalization. In order to select a matched firm, we (1) isolate all firms that share the same two-digit SIC code, (2) remove any firm that appears on the *CFO Magazine* “Working Capital Survey” list, and (3) select the firm that has the closest market capitalization value. All data used for matches come from the Research Insight® database using data corresponding with the release year of each of the working capital surveys. We test this hypothesis by investigating both raw and risk-adjusted returns. For each year of the survey, we compare raw and risk-adjusted returns to benchmark returns and test for significant differences between the survey sample and matched sample firms for both raw returns and for Jensen’s alpha.

The third hypothesis is that higher annual returns will be related positively to CCE rank and to days of working capital rank. In order to test this hypothesis, we include in our cross-sectional regression the annual returns for all firms making *CFO Magazine*’s “Working Capital Survey” as the dependent variable. We use the firm’s overall rank for these working capital variables to explain returns. This allows us to investigate whether strong working capital ratios and/or overall rank of these ratios result in superior share price performance. In an alternative model, we use the reported CCE and DWC ratio as our independent variables.

Measures of Performance

As noted, the sample in this study is based on the firms that made one or more of the *CFO Magazine* annual “Working Capital Survey” lists. Since making its debut in June 1997, the *CFO Magazine* “Working Capital Survey” has appeared annually. We

consider firms included in the surveys that appeared in each year from 1997 to 2000.²

Daily price data for the cumulative abnormal returns test are from CRSP. The monthly return data, market capitalization data and SIC codes are from Research Insight®. For illustration purposes, the industry leaders recognized by *CFO Magazine* for each survey holding period are presented in Table 1. Annual turnover percentages for the top position in each industry also are supplied for the year subsequent to the survey. The corresponding matches for the industry leaders based on market capitalization and SIC codes are presented in Table 2. In order to qualify for status as a matching firm, the firm must not have appeared in the top 10 of a *CFO Magazine* “Working Capital Survey” during the period of our study. Basic descriptive statistics regarding the *CFO Magazine* sample firms are presented in Table 3. Note that the average sales of sample firms are approximately \$727 million with a relatively small range. The mean return for the sample firms is 0.53 percent per month, however, with a minimum monthly return of -12.83 percent and a maximum return of 19.6 percent. Note also that there is a wide range of observations when it comes to the relevant working capital variables. For example, days of working capital averages 46.12 days with a minimum of -57.20 days and a maximum of 872.00 days.

Standard event methodology is used to test for abnormal returns associated with firms listed in *CFO Magazine*’s “Working Capital Survey” [Dodd and Warner (1983), based on the earlier work of May (1971) and Patell (1976)]. We calculate abnormal returns on the announcement (distribution) date for each *CFO Magazine* survey and multi-day cumulative abnormal returns around the announcement date. Distribution dates for each issue were obtained from *CFO Magazine*. The market model is used to estimate expected returns. Parameter estimates (e.g., intercept term and portfolio beta) are calculated for the period (-150, -51). Expected returns are estimated during the interval (-50, 10).

We examine the annual stock market returns to the *CFO Magazine* survey firms over the period 1997 to 2000. Monthly closing prices and dividends are collected for both the *CFO Magazine* firms and the matched sample firms. Equally weighted monthly total returns (both dividends and capital gains) are calculated for both the *CFO Magazine* firms and the benchmark firms. Annual returns are calculated using the geometric mean of the equally weighted monthly returns of each group. The returns to the CFO portfolio and benchmark raw returns are tested for differences for each individual survey year. A paired difference test is used to calculate a Student t-test statistic:

² The survey was revised in 2001, and the data now are presented differently. The survey has continued to change to a lesser degree each year since 2001. As such, we consider only the 1997–2000 survey data because of its consistency of presentation.

Table 1—Sample Firms for Each Survey Holding Period

Industry	1997	1998	1999	2000
Aerospace	General Dynamics	General Dynamics		
Airlines	Comair Holdings	Southwest Airlines	Boeing	Boeing
Apparel	Dixie Yarns	Guess?	Cintas	Guess?
Beverage	Coca-Cola	PepsiCo	PepsiCo	PepsiCo
Building Materials	Owens Corning	Southdown	Florida Rock Industries	Vulcan Materials
Chemicals	Freeport McMoRan	Phosphate Resource	Phosphate Resource	Methanex
Computer, Office Equipment	Pitney Bowes	Komag	Cisco Systems	Cisco Systems
Conglomerates			Tenneco	Johnson Controls
Electric, Gas Utilities	PECO Energy	SeagullEnergy	Southern Union	Applied Materials
Electronics, Electrical Equipment	Atmel	Hadco	Hadco	UST
Food	UST	UST	UST	UST
Food and Drug Stores	Casey's General Store	Hannaford Brothers	Hannaford Brothers	Casey's General Store
Food Services	McDonalds	McDonalds	McDonalds	McDonalds
Forest and Paper Products	Plum Creek Timber	Plum Creek Timber	Plum Creek Timber	St. Joe's
Furniture	Lear	HON Industries	HON Industries	HON Industries
General Merchandise	Bradlees	Dollar Tree Stores	Dollar Tree Stores	Dollar Tree Stores
Health Care	Universal Health Services	Baxter International	Lincare Holdings	LincareHoldings
Health Care Equipment			Becton, Dickinson	Baxter International
Industrial and Farm Equipment	Falcon Building Products	Briggs and Stratton	Freeport- McMoRan	Placer Dome (Ind/Min/Con)
Metal Products	Phelps Dodge	Phelps Dodge	Phelps Dodge	Freeport-McMoRan

Table 1 (continued)—Sample Firms for Each Survey Holding Period

Industry	1997	1998	1999	2000
Metal Products	Phelps Dodge	Phelps Dodge	Phelps Dodge	Freeport-McMoRan
Metals	USX U.S. Steel Group	Nucor	Nucor	Nucor
Min. Crude-Oil Products	Homestake Mining	Freeport-McMoRan		
Motor Vehicles and Parts	Borg-Warner Automotive	Chrysler		
Personal and Household Products			General Motors	Borg-Warner Automotive
Petroleum	Union Pacific Resources	Vastar Resources	Nu Skin Enterprises	Nu Skin Enterprises
Pharmaceuticals	Amgen	Amgen	Vastar Resources	Vastar Resources
Publishing and Printing	E.W. Scripps	E.W. Scripps	Amgen	Amgen
Recreational			Lee Enterprises	Washington Post
Rubber and Plastic Products	M.A. Hanna	Tredegar Industries	Hollywood Entertainment	Polaris Industries
Scientific, Photo and Control	Eastman Kodak	Eastman Kodak	Eastman Kodak	Eastman Kodak
Semiconductors		Micron Technology	Linear Technology	Maxim Integrated Products
Soaps and Cosmetics	Procter & Gamble	Clorox		
Specialist Retailers	Ferrellgas Partners	Gap	Gap	Electronics Boutique
Telecommunications	SBC Communications	Century Telephone Ent.	U.S. West	Tellabs
Textiles	Unifi	Unifi	Unifi	Unifi
Toys and Sp Games	Polaris Industries	Callaway Golf		
Transportation			Norfolk Southern	Burlington North/Santa Fe
Wholesale Trade	Deluxe	Cytec Industries	Suiza Foods	Boise Cascade Office Products
Total Number of Holdings	32	33	33	33
Turnover (number)		21	13.5	15
Turnover (percentage)		65	41	45

Table 2—Matched Sample Firms for Each Survey Holding Period

Industry	1997	1998	1999	2000
Aerospace	Goodrich Corp	Goodrich Corp	Honeywell International	Honeywell International
Airlines	Continental Airlines	Continental Airlines		
Apparel	Interface	Gadzooks, Inc.	Tommy Hilfiger Corp	American Eagle Outfitters
Beverage	Pepsico	Nestle	Anheuser-Busch Companies	Anheuser-Busch Companies
Building Materials	LaFarge	LaFarge	Centex Construction Products	Hanson PLC
Chemicals	Newport Mining	Scotts Company	Scotts Company	Lubrizol Corporation
Computer, Office Equipment	Sanyo Electric Co	Standard Motor Products	Hewlett Packard Company	Hewlett-Packard Company
Conglomerates			Autoliv Inc.	Lear Corporation
Electric, Gas Utilities	Magnetek Inc.	Magnetek Inc.	Northwest Natural Gas	NRG Energy, Inc.
Electronics, Electrical Equipment	Xilinx Inc.	Benchmark Electronics	Benchmark Electronics	Juniper Networks, Inc.
Food	Swedish Match AB	Swedish Match AB	Swedish Match AB	Swedish Match AB
Food and Drug Stores	West Marine	Whole Food Market	Whole Foods Markets	Sonic Automotive
Food Services	Six Continents PLC	Six Continents PLC	Six Continents PLC	Six Continents PLC
Forest and Paper Products	Louisiana-Pacific Corp.	Louisiana-Pacific Corp.	Louisiana Pacific Corp.	Trizec Hahn Corp.
Furniture	Miller (Herman) Inc.	Miller (Herman), Inc.	Miller (Herman) Inc.	Miller (Herman) Inc.
General Merchandise	Family Dollar Stores	Family Dollar Stores	Family Dollar Stores	Family Dollar Stores

Table 2 (continued)—Matched Sample Firms for Each Survey Holding Period

Industry	1997	1998	1999	2000
Health Care Equipment	Chromcraft Revington	Graco Inc.	Bard (C.R.) Inc.	Guidant Corp
Industrial and Farm Equipment	Inco LTD	Inco LTD	Cominco	Newmont Mining Corp
Metal Products	LTV Corp	Allegheny Technologies	Inco LTD	Cominco
Metals	Lihir Gold LTD	Cominco	Allegheny Technologies	Allegheny Technologies
Mining, Crude-Oil Products	Federal-Mogul Corp	Ford Motor	Ford Motor	Superior Industries Intl.
Motor Vehicles and Parts			Priority Healthcare Corp	Geniva Health Services
Personal and Household Products			Anadarko Petroleum Corp	Unocal Corp
Petroleum	CSX Corp	Anadarko Petroleum Corp	Biogen Inc.	Immunex Corp
Pharmaceuticals	Pharmacia Corp	Aventis	Media General	Knight-Ridder Inc.
Publishing and Printing	Dow Jones & Co	Dow Jones & Co	Loews Cineplex Entertainment Corp	Thor Industries
Recreational				
Rubber and Plastic Products	U.S. Industries	General Cable Corp	Fuji Photo Film	Fuji Photo Film
Scientific, Photo and Control	Canon Inc.	Canon, Inc.	Analog Devices	Applied Micro Circuits Corp
Semiconductors	Johnson & Johnson	Avon Products & Chemicals		
Soaps and Cosmetics	Suburban Propane Partners	TJX Companies	TJX Companies	AC. Moore Arts & Crafts
Specialist Retailers	AT & T	Broadwing Inc.	Broadwing Inc.	Tycom LTD
Telecommunications	Fruit of the Loom	Burlington Industries	Burlington Industries	Uniroyal Technology Corp
Textiles	Arctic Cat, Inc.	Brunswick Group		
Toys and Sporting Games				
Transportation	Moore Corp	Cabot Corp.	CSX Corp	Union Pacific Corp.
Wholesale Trade			Dean Foods Company	United Stationers Inc.

Table 3—Sample Descriptive Statistics

Variable	Observations	Mean (Standard Deviation)	Mm	Max
RETURN (%)	1094	0.53% (0.28%)	-12.83%	19.69%
SALES (000s)	1094	\$726,746 (\$430,108)	\$801	\$990,701
CCE	1094	14.20 (12.13)	-4.00	173.00
DWC	1093	46.12 (42.74)	-57.20	872.00
DSO	1092	43.58 (23.36)	0	127.50
INV	1092	13.53 (23.54)	0.60	485.00
DPO	273	33.77 (21.27)	2.00	183.00

$$t = \bar{d} / s_d * \sqrt{n} \quad (1)$$

where:

$\bar{d}$ = The mean difference between the benchmark return and portfolio return each month;

s_d = The standard deviation of the difference between the returns each month; and

n = Number of months between each survey.

The Sharpe index (Sharpe, 1966, 1994) measures return per unit of total risk. It is the appropriate risk-adjusted return measure when the industry being analyzed is the only one held by an investor. It is known as the reward-to-variability ratio and is calculated:

$$\text{Sharpe index} = \frac{d_i}{s_{d1}} \quad (2)$$

where:

$d1$ = Mean monthly difference between the portfolio or benchmark return and the T-bill return, geometrically linked over each survey year.

s_{d1} = The sample standard deviation of the monthly return differences.

In addition, the Treynor index (Treynor, 1965) measures return per unit of systematic risk. It is an appropriate measure of risk-adjusted return if the investor is well diversified and is not exposed to company-specific risk. It is calculated:

$$\text{Treynor index} = \frac{d_i}{\beta} \quad (3)$$

where:

d_1 = The mean monthly difference between the portfolio or benchmark return and the T-bill return, geometrically linked over each survey year; and

β = Portfolio beta, or market beta ($\beta_m = 1$).

Betas are calculated with monthly returns using a simple regression of the S&P 500 returns and the portfolio returns.

Jensen's alpha (Jensen, 1968) indicates whether a portfolio exhibits above average risk-adjusted returns. A positive (negative) alpha indicates that the portfolio consists of undervalued (overvalued) securities. It is calculated by regressing the portfolio's monthly risk premium on the market's monthly risk premium.

BHARs, which consist of the simple buy-and-hold return on the sample portfolio minus the simple buy-and-hold return on the matched sample portfolio, are included as well. Barber and Lyon (1997) demonstrate that this method eliminates the bias introduced by summing daily or monthly abnormal returns (see also Lyon, et al., 1999). To test the null hypothesis that the buy-and-hold abnormal returns are equal to zero, we employ the following t-test statistic:

$$t_{\text{BHAR}} = \overline{\text{BHAR}}_{it} / (\sigma(\text{BHAR}_{it}) / \sqrt{n}) \quad (4)$$

where:

$\overline{\text{BHAR}}_{it}$ = Average buy-and-hold abnormal return;

$\sigma(\text{BHAR}_{it})$ = Cross-sectional standard deviation of the buy-and-hold abnormal returns; and

n = The number of matched comparisons.

Finally, we conduct a cross-sectional regression using the annual returns of those firms that made the *CFO Magazine* "Working Capital Survey" in a given year as the dependent variable. The independent variables include the CCE rank and DWC rank as reported by *CFO Magazine*. The cross-sectional regression allows us to investigate whether neither, one, or both of the ratios used to determine the overall ranking of *CFO Magazine*'s "Working Capital Survey" also plays a role in achieving superior holding period returns during the year of the respective survey's release. As an alternative specification, we use the actual CCE and DWC as independent variables. The regression equations are as follows:

$$\text{Annual Return}_i = \alpha + \beta_1 \text{CCERANK}_i + \beta_2 \text{DWCRANK}_i + \varepsilon_i \quad (5a)$$

$$\text{Annual Return}_i = \alpha + \beta_1 \text{CCE}_i + \beta_2 \text{DWC}_i + \varepsilon_i \quad (5b)$$

where:

CCERANK = Cash conversion efficiency rank as indicated by *CFO Magazine*;

DWCRANK = Days of working capital rank as indicated by *CFO Magazine*;

CCE = Cash conversion efficiency; and

DWC = Days of working capital.

Results

Event study results are presented in Table 4. There is a significant, positive response to the announcement of the *CFO Magazine* selected firms. The day 0 abnormal return is 0.53 percent and is significant at the one percent level. This result is consistent with our hypothesis of a positive response. The market values strong working capital management and is using the information provided in *CFO Magazine* to reevaluate the survey firms. In the period +6 to +15 days, however, there is an offsetting negative response of -0.62 percent, and it too is significant at the one percent level. The subsequent reversal of the positive share price response is puzzling and is inconsistent with our hypothesis. Why would the market systematically negatively revalue the shares of firms who are good working capital managers? One possibility is that the market initially overreacts to the *CFO Magazine* rankings and subsequently revises expectations. When firms are announced as good at something, and get press coverage because of it, the market takes notice. There is more interest in these firms, at least momentarily. Once the buzz is past, traders may reevaluate their initial reactions. It is not that the firms are necessarily poor investments and warrant being sold; it is simply that market participants overreacted to the news initially.

Table 4—Average Cumulative Abnormal Returns and Test Statistics for Announcements of Inclusion in CFO's Working Capital Survey, 1997-2000 (n = 1094, equally-weighted market index)

Interval	Average CAR (%)	Z
(-15,-6)	0.11	0.66
(-5,-1)	-0.04	-0.30
(0, 0)	0.53	7.40***
(+1, +5)	0.14	0.14
(+6, +15)	-0.62	3.73***

* Significant at the ten percent level

** Significant at the five percent level

*** Significant at the one percent level

In contrast to the event study results, Table 5 indicates that of the BHARs only the 1998 holding period return is positive and statistically significant (at the ten percent level). Thus, the reversal of the initial positive response in the event study results is reflected accurately in the longer-term BHAR analysis.

In Table 6 we report regression results that relate working capital management rank to return.³ Equation (5a), as described previously, relates annual return as the

³ No significant results were obtained with the second variation of this model, so the results are not reproduced in this document but are available upon request from the authors. The absolute measures of the ratios do not provide explanatory power in explaining the annual returns in any survey year.

dependent variable with the ranks on each of the working capital variables as independent variables.

$$\text{Annual Return } \alpha + \beta_1 \text{ CCERANK}_i + \beta_2 \text{ DWCRANK}_i + \varepsilon_i \quad (5a)$$

Table 5—CFO Buy-and-Hold Abnormal Returns (BHARs) 1997-2000

Year	BHAR (in percent)	t-test	Significance
1997	-6.19	-0.84	
1998	18.80	1.85	*
1999	7.67	0.78	
2000	-5.58	-0.40	
Year	Multi-year	t-test	Significance
1997-2000	3.68	0.71	
* Significant at the ten percent level			
** Significant at the five percent level			
*** Significant at the one percent level			

Table 6—Regression Results Based on Rank for Announcements of Inclusion in CFO's Working Capital Survey, 1997

Return $\alpha + \beta_1 \text{ CCERANK}_i + \beta_2 \text{ DWCRANK}_i + \varepsilon_i$	
Coefficient	1997
Intercept	-0.00129 (0.6645)
CCERANK	0.00001** (0.0374) VIF = 1.01
DWCRANK	-0.00001 (0.232 1) VIF = 1.01
F-statistic	2.69
(P-value)	(0.0702) *
Adjusted R ²	0.0139
Number of Observations	N = 241
* Significant at the ten percent level	
** Significant at the five percent level	
*** Significant at the one percent level	

Here the results are more interesting.⁴ The 1997 regression shows that the cash conversion efficiency rank variable is positive and significant at the five percent level. As hypothesized, this implies that at least to some degree, the return to shareholders is influenced by how well firms manage working capital, as defined by *CFO Magazine*. We use the variance inflation factor (VIF) to test for multicollinearity.

⁴ Inclusion of total sales as a control variable for size does not alter the significance of the results obtained.

Based on the benchmark level of 10, we do not find evidence of multicollinearity in the data.⁵ The VIFs are reported in the regression table.

The raw, risk-adjusted, and matched sample returns are presented in Table 7. Interestingly, casual observation would lead one to believe that the *CFO Magazine* survey firms outperform the matched sample, at least in terms of raw returns. The raw returns of the sample firms are greater than the raw returns of the matched sample firms. None of the t-tests, however, are statistically significant. Also, it appears that there is an outlier in the 1998 sample, because the difference in returns is large, yet the t-test reveals that the difference is statistically insignificant. Based on Jensen's alpha, the results are similar. The only instance of statistical significance is the 2000 Jensen's alpha, which indicates that the sample firms outperformed the market.

Table 7—CFO Working Capital Investment Strategy Comparison of Compound and Risk-Adjusted Returns

Year	CFO Sample			CFO Matched			CFO Sample			CFO Matched			Beta Value	
	Raw			Sample			Sample			Sample			CFO	
	Return			Return			Return			Return			Sample	
	Means			Sharpe			Sharpe			Trey.			Alpha	
1997	15.87	14.52	0.13	0.69	0.64	12.71	11.58	0.85	0.83	-0.39	-0.41			
1998	26.32	10.50	0.63	0.85	0.31	21.98	9.34	0.99	1.03	0.50	0.56			
1999	-4.52	-10.68	0.44	-0.67	-0.86	-14.55	-18.59	0.61	0.78	-0.43	-0.48			
2000	17.32	21.48	-0.27	0.73	0.73	20.97	16.69	0.61	1.04	2.38	2.02*			
Multiyear Holding Periods														
97-00	13.16	8.25	0.49	0.47	0.23	11.38	5.68	0.76	0.89	0.69	1.40			

* Significant at the ten percent level

** Significant at the five percent level

*** Significant at the one percent level

Both the Sharpe and Treynor indexes are generally higher than the matched sample ratios. Based on the Sharpe reward-to-variability ratio, the "Working Capital Survey" firms outperform the match sample firms in all but the 2000 annual periods and in the overall four year holding period from 1997 to 2000. In 2000, the matched firms equal the working capital firms with Sharpe ratios of 0.73 each. With respect to the Treynor index, the *CFO Magazine* working capital firms outperform the matched sample each year and in the overall four-year holding period. The results are consistent across hypotheses.

Conclusion

A primary goal of this study is to fill a gap in the existing literature. We move beyond opinion-based, descriptive studies, which are typical in the working capital literature, and present an empirical work that attempts to link working capital management to shareholder wealth. By exploring the relationship between the selection

⁵ See Neter, et al., 1989.

to *CFO Magazine*'s "Working Capital Survey" firms and shareholder returns, we seek to determine whether investors believe that efficient working capital policies are important in evaluating the future prospects of a firm. We find some evidence that investors do care about working capital policy.

Both the event study results and the BHAR results imply that the concern for working capital management by the investing public is weak at best, at least with respect to the *CFO Magazine* "Working Capital Survey." While we do find a positive response of 0.53 percent (significant at the one percent level) to the announcement of *CFO Magazine*'s best managed firms with respect to working capital, it reverses in the +6 to +15 day window (-0.62 percent). The reversal could be indicative of market participants reappraising their initial reaction to the survey release. Regression results demonstrate that the rankings of the cash conversion efficiency ratios in the 1997 survey are positively associated with the annual returns in 1997. This indicates a relationship between working capital rank on CCE and returns generated during the initial year of the survey. Last, the raw return results indicate that there is no difference in the performance of the *CFO Magazine* sample firms versus the matched sample firms, despite what looks like higher returns to the sample firms on the surface. Both the Sharpe and Treynor ratios indicate that on a risk-adjusted basis, the sample firms do outperform the matched sample. Overall, these results indicate that shareholders recognize the value of strong working capital management.

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