

THE GAME OF THE NAME: A COMPARISON OF CAPITAL MARKET  
REACTIONS TO DOTCOM VS. TRADITIONAL NAME CHANGES

July 18, 2000

Mani Subramani

Assistant Professor of Information and Decision Sciences  
Email: [msubramani@csom.umn.edu](mailto:msubramani@csom.umn.edu): Phone (612) 624-3522

Eric Walden

Doctoral Student of Information and Decision Sciences  
Email: [eric@aKINDofMAGIC.com](mailto:eric@aKINDofMAGIC.com): Phone (612) 624-3816

Information and Decision Sciences 3-365  
Carlson School Of Management  
321 19<sup>th</sup> Avenue  
University of Minnesota  
Minneapolis, MN 55455

The authors would like to thank Michael Cooper, Orlin Dimitrov, and P. Raghavendra Rau for making their paper available, Jungpil Hahn for building the Lexis Nexis agent to efficiently pull announcements off the internet, the University of Minnesota Seminar series for the chance to present the paper and for valuable feedback, Enterprise IG for their annual name change study, and Heather Killough-Walden for helping manage the data. As much as we would like to blame someone else, all errors and omissions remain the responsibility of the authors. The authors are listed alphabetically.

# **THE GAME OF THE NAME: A COMPARISON OF CAPITAL MARKET REACTIONS TO DOTCOM VS. TRADITIONAL NAME CHANGES**

**Abstract:** We conduct a series of two event studies to examine the effects of name changes on the market valuation of firms. In particular, we examine if the effect for the subset of events where the names were changed to suggest involvement with the Internet, usually with the .com suffix.

**Keywords:** Corporate Name Change, Electronic Commerce, Capital Market Valuation, Event Study

*Pleased to meet you, hope you guessed my name  
'Cause what's puzzlin' you is the nature of my game  
--The Rolling Stones (Sympathy for the Devil)*

## INTRODUCTION

A Company's name is the central element of its public image. Company names are rich repositories for symbols and meaning that the public and consumers associate with a variety of a firm's observable and unobservable attributes such as product and service quality, operating philosophy, etc. Firms with memorable brand names (e.g. Coca-Cola, McDonalds) regard the names as their most valuable assets (Meyers-Levy 1989). Well known names by themselves can often be quite valuable: PanAm, long after it went out of business sold its name for \$1.3 Million. Recently, the URL business.com sold for \$7.5 million (Chen 2000). A testimony to the current importance attached to the crafting of the *right name* for a firm is the volume of name changes by firms - this set an all time record in 1999. 2733 US corporations changed their names in this year, a growth of over 42 percent over the number of changes recorded in 1998 (See figure 1). The perceptions of carefully chosen names, be they informative or whimsical, can help boost a firm's market value (Marcial 1991). There is also some evidence that poor choices can have negative consequences because of the attributions surrounding them (Psychology Today 1981, Timon 2000). Firm names are a vital intangible asset that firms spend considerable time, money and attention to compose and create favorable allusions around.

Firms' names are an important means by which firms are associated with specific sectors of the economy, a feature that can have important implications for firms. Karpoff and Rankine (1994) report that in a nationwide survey of analysts, 54 percent of respondents indicated that a firm's name affects its P/E ratio and that a company's choice of name provides information that is significant in evaluating its future potential. Investor preference for companies with names that suggested their participation in the *tronics boom*—the expansion of the electronics industry in the late 1960s—created premiums for their stocks (Howe 1982). Similarly, during the early 80s, in the aftermath of the oil shock of the early 70's, firms viewed as associated with the petroleum industry—with a

'Seis' or 'Geo' attached to their name—were reportedly favored by investors (Fortune 1982).

In recent times, we have witnessed similar enhanced investor interest in firms participating in e-commerce activities, leading to spectacular growth in their market values, a phenomenon termed the *dotcom* effect (Subramani and Walden 1999). It is thus no surprise that one of the major trends observed in name changes during 1999 is the conversion of companies' names to ones suffixed by .com (see figure 1), a moniker that strongly suggests the important role played by Internet technologies in the firm's strategies. In this paper, we examine influence on capital market valuations of this emerging category of name changes by firms - the change to a name suggesting Internet related operations.

While there is considerable anecdotal evidence of the benefits to firms from name changes (Frankel 1997, Gong 1998), the evidence from research on the issue over the years is equivocal. Whilst early research has suggested that name changes have favorable effects on firm valuation (Horsky and Swyngedouw 1987), recent examinations have cast doubts on these results. Karpoff and Rankine (1994) examined the influence of name changes from 1979 to 1987 and found that they have negligible effects on their valuations. Howe (1982) finds no evidence of a name change effect in a sample of 121 firms in the period from 1962-1980. Further, he finds no significant effect of a name change in either the 1960's or 1970's. Bosch and Hirschey (1989) report a small effect of corporate name changes that is restricted to a sub sample of firms that underwent significant restructuring prior to the announcement. Further, even for these firms, the positive effects occurred before the announcement date, and in fact, there were negative effects for these firms after the announcement. The authors contend that, "*On an overall basis, it can be concluded that the valuation effects of name changes are only modest and transitory*" (Bosch and Hirschey 1998, pg. 72). The one exception to this general pattern of results is the recent study by Cooper, Dimitrov, and Rau (2000) who report a 109 percent cumulative abnormal return (CAR) for a sample of firms which changed their names in 1999 to signal their involvement with the Internet.

While the benefits are doubtful, it is clear however, that there are real and significant costs associated with corporate name change. Besides advertising costs, the costs

associated with changing names include changing of signage on buildings, trucks, letterheads and legal documents; as well as the costs of obtaining and communicating a new stock symbol. For example, the 1998 name change of the Toronto Police Service was estimated to cost \$2 million for “*New badges and shoulder flashes for more than 5,000 officers, plus cruiser decals, fatigue cap badges, keychains, station logo signs and letterhead* (The Toronto Sun 1997, p. 114).” International Harvester’s name change to Navistar International was estimated to cost between \$13-16 million, which was over 2% of the market value of the firm, at the time (Wall Street Journal 1986). American Bell spent an estimated \$30 million to change its name to AT&T information Systems (Merrill Lynch Pierce Fenner and Smith 1983). The most egregiously expensive change reported is that of the multinational oil company Esso to Exxon in 1972 which was estimated to cost \$200 million (McQuade, 1984). More recently, in the name change from Miningco.com to About.com, the company reportedly spent just under \$500,000 purchasing 4000 URLs to cover various permutations of the About name (e.g. abuot.com) (Nickell 2000). In light of such significant costs associated with name changes and the pattern of inconsistent results reported in the literature, it is important to understand the benefits, if any, linked to name changes and firm related factors associated with these benefits.

In an efficient capital market, investors are believed to recognize future benefit streams accruing from managerial initiatives announced by firms, a judgment subsequently reflected in the stock price of the firm. If name changes enhance future cash flows, the capital market would respond favorably to name change announcements by firms that would be reflected in a positive movement of their stock price. The event study methodology is designed, specifically, to take advantage of this aspect of financial markets, making it a very useful tool for management researchers to examine the consensus estimates regarding the future benefits streams attributable to organizational initiatives (Brown and Warner 1980, Brown and Warner 1985, McWilliams and Siegel 1997). We employ the event study methodology to assess the value implications of name changes announced by firms.

The series of prior event studies relating to name changes that serve as a baseline for the phenomenon enable us to examine another issue, the rationality of the stock market

vis-à-vis internet firms. Given the considerable hype surrounding the Internet, does the market response to name changes signaling involvement with the Internet similar to the response to other types of name changes? This is an important issue in the present as there is a widespread sense of unease regarding the high valuations of e-commerce stocks. A recent article in the business press (Tully 2000), examining the issue of e-commerce stock valuations commented *"Investors pay absurd prices for stocks they can't name in businesses they can't explain. Can anyone make sense of this?"* (page 80). After failing to explain the phenomenon using multiple alternative explanations, the report concludes with *"There is of course one theory left to explain what is going on. We mention it with trepidation because it has been so conspicuously wrong throughout the course of this long running bull market. But here it is: This market is stark, raving overvalued."*

Examining differences in market response to name changes cuing involvement with the Internet and those that do not, thus provides a unique lens to examine if market perceptions regarding Internet related stocks are out of line as anecdotal evidence would suggest. Our sample consists of firms that changed their name contemporaneous with the period when firms' e-commerce associations apparently cast their spell on investors. As prior studies have established a baseline for the influence of name changes on market valuations in the period from 1962-1987, a comparison of our results with prior results would provide data on the extent to which capital market valuations, particularly of firms engaged in e-commerce activities, have fundamentally been altered by investor expectations of extraordinary future payoffs. Further, if there is such irrationality, this would additionally be reflected in responses to firms changing their names to indicated Internet association rather than to the other set.

-----  
 Insert Figure 1 about here  
 -----

The paper is organized as follows. In the next section, we review the theoretical explanations suggested as the motivations for name change. After this, we explain the methodology, and our procedures for data collection and analysis. This is followed by a

discussion of our results and a discussion of implications and suggestions for future research.

## THEORY AND HYPOTHESES

A name change is part of managerial attempts to position the firm more advantageously. In general, the expectation is that this action offers positive outcomes for firms in current and future periods. If this is the case, investors should react positively to name change announcements, creating a positive abnormal stock market return - a risk-adjusted return in excess of the average stock market return - around the date of the name change announcement by firms. However, as detailed above, there are significant costs to changing a name, thus the real question is—do the future benefits of the name change outweigh the current costs of the name change.

### **Research Question 1: Value of Dotcom Name Changes**

Horsky and Swyngedouw (1987) identify two ways in which a name change can positively impact a firm. The first way is through signaling capital markets that deeper changes are underway. The signaling argument suggests that the name itself is unimportant, it only serves to notify potential investors that different, presumably better, business practices are being implemented. It is these new practices that will generate increased profitability in the future. The other way a name impacts firms is by directly generating utility to customers. The utility argument suggests that customers derive utility directly from the name, and are willing to pay more for the same product under a different name. These two sources of value likely operate at the same time, so that the name itself generates utility for customers, and the name signals other business changes. Thus, there is reason to believe that name changes will lead to increased firm valuation.

At the same time, there are several reasons to believe that name changes will not produce any significant change in firm valuation. The first is the cost of the name change. As detailed above, name changes can be very expensive, even for a relatively small firm. Further, there is no guarantee that the new name will be better, from the utility perspective. That is to say that if customers derive utility from the name of a firm, it is certainly possible that a different name will generate less utility for the customers. The very medium that dotcom firms are trying to exploit may actually negate the

signaling argument. Because of ubiquitous access to information sources on the internet and via proprietary financial sources, the new business practices the firms are attempting to signal may already be common knowledge, so that they are already reflected in the stock price (Subramani and Walden 1999). Thus, there is also good reason to believe that name changes will not significantly impact firm value. These arguments lead to research question 1.

***Research Question 1:** Do dotcom name changes lead to increased firm value?*

### **Research Question 2: Dotcom vs. Brick-and-mortar name changes**

While dotcom name changes are the current interest, it is good to have a baseline for comparison. This paper examines both dotcom name changes and brick-and-mortar name changes, and we are interested in how the two compare. From the utility perspective, dotcom name changes might perform better because they can produce utility in an additional way. The name of the dotcom firm is also the location, so that once a customer knows the name, she also knows where to find the firm. This is the virtual equivalent to naming a firm Sak's Fifth Avenue. Further, during the time frame of this study (1999) there was simply no hotter business to be in than the internet business. If a firm is signaling a move to better business practices then, during this time, there would have been very few practices that could compare with embracing the web. It is reasonable to believe that dotcom name changes would generate more value for firms than other sorts of name changes.

Nevertheless, if markets are rational and well informed then the operating models of the firm in question are already known, and only the firms that could really generate significant profits by moving to electronic commerce would be rewarded with high valuation. Thus, it is an empirical question of whether dotcom name changes are better than brick-and-mortar name changes.

***Research Question 2:** Do dotcom name changes increase firm value more than brick-and-mortar name changes?*

### **Research question 3: Comparison of sub-groups**

One of the major insights of Horsky and Swyngedouw (1987) was the idea that different types of firms have different value propositions of name changes. It is intuitively obvious that if consumers make purchase decisions more affectively than businesses, then a firm that sells consumer goods should profit more from a carefully chosen name than a firm that sells industrial goods. Hence, to get a better understanding of how name changes impact firm valuation, it is important to look at the performance of various sub-groups. This study considers five sub-groups identified by Horsky and Swyngedouw (1987), plus three sub-groups identified as having important differences in firm valuation by Subramani and Walden (1999). The coding of these sub-groups is detailed in appendix A. We are not interested in proposing hypothesis about which sub-groups receive more value from name changes. Rather, the focus is on exploring the possibility that certain sub-groups might be better positioned to benefit from a name change. A short description of why the sub-groups might be different is presented below.

#### *Radical*

Radical name changes are name changes where the new name is completely different from the old name. Radical name changes are generally more expensive than cosmetic name changes, as there is more to change. Radical name changes often indicate a move to a completely different business model or industry, and represent a clean break from the past. Consequently, radical name changes often occur when the firm name is greatly out of alignment with its marketplace.

#### *Business-to-Business*

Business-to-business (B2B) name changes are those undertaken by firms that sell predominantly to other firms, rather than to end consumers. Generally, B2B firms have fewer customers, and these customers purchase greater quantities. As a result, B2B firms, in general, have closer relationships with customers, which makes it easier to *get the word out* about the name change. However, it is less likely that B2B customers use as much affective processing so that name changes generate less direct utility.

### *Goods*

Goods producing firms are those that deal in a physical product. A goods producing firm often has more distant relationships with its customers than a non-goods producing firm. Further, the value of reputation for a goods producing firm may be quite significant, so that changing name represents a greater opportunity cost. On the other hand, the goods producing firm can print its name directly on the product, thus helping to alleviate some of the advertising costs.

### *Services*

A service producing firm generates its revenues from the provision of a non-physical service. These firms usually have closer relationships with the customers, because provision of a service requires such. Reputation might be very important for such firms, and to the extent that they rely on word-of-mouth advertising, a change in name may represent a great loss for service firms.

Note it is possible for a firm to produce both goods and services.

### *Information*

Information goods are identified as an important type of production of e-commerce firms (Shapiro and Varian 1999). Information goods may have considerable reputation effects, especially as individuals realize that not all internet sources are truthful. Further, the distinction between informational goods and non-informational goods have shown to be an important determinant of firm value in previous research (Subramani and Walden 1999).

### *Industrial*

The industrial products classification is concerned with the user of the product. Firms that produce industrial products often deal in small quantity, high dollar production, so they have fewer customers, and thus a lower cost to notify customers of the name change. However, it is less likely that the customers will be concerned with the name.

### *Consumer*

Consumer products are those used by end consumers. The producers of these products often have millions of customers, which they must inform of the name changes. At the same time, they often have substantial advertising budgets, and the name change may not add to that. Further, it is more likely that the users of these products will be concerned with the affective aspects of the name.

Note that a firm can produce both industrial and consumer products.

These discussions motivate the third research question which asks how different types of firms respond to name changes.

***Research Question 3:*** *Are there significant differences among different types of firms in the change in firm valuation?*

## METHODOLOGY

To calculate the effect of an event it is necessary to estimate what the return of the stock would have been, had the event not occurred. To do this, and to control for overall market effects, the return of the stock is regressed against the return of a market index. The estimated coefficients from that regression are used to calculate the predicted value of the stock over the time window in which the stock price is adjusted. This yields the regression:

$$R_{s,t} = \alpha_s + \beta_s R_{m,t} + \varepsilon_{s,t}, \quad (1)$$

where  $R_{s,t}$  is the return of stock  $s$  at time  $t$ :  $R_{s,t} = (\text{Price}_{s,t} - \text{Price}_{s,t-1})/\text{Price}_{s,t-1}$ . The subscript  $t$  indicates time, the subscript  $s$  indicates a specific stock, and the subscript  $m$  indicates the market. The  $\varepsilon_{s,t}$  is a random error term for stock  $s$  at time  $t$ , and the  $\alpha_s$  and  $\beta_s$  are firm dependent coefficients to be estimated. The return of the stock, rather than the price of the stock is used to control for autocorrelation. Specifically, we would expect that the *price* of a stock today is related to the price yesterday, but the *return* of a stock should be tied to the overall growth of the firm. For this study, we used the Standard and Poor's 500 index. We also examined the results using the Dow Jones Industrial Averages, and the NASDAQ composite index, and found substantially similar results.

The date of the event is  $t=0$ , and the window is  $t=[-10,10]$ <sup>1</sup>. To estimate the expected return we used the data from  $t=[-280,-11]$ ; 270 days of data. We used the coefficient estimates from this regression to predict the expected return over the  $t=[-10,10]$  time frame. From this we calculated abnormal return as defined by McWilliams and Siegel (1997):

$$AR_{s,t} = R_{s,t} - (\alpha_s + \beta_s R_{m,t}). \quad (2)$$

The coefficients  $a_s$  and  $\beta_s$  are estimates of the true parameters obtained via ordinary least squares. The abnormal returns are simply the prediction errors of the model over the event window. Notice here, that  $AR$  are abnormal returns, that is they are returns over and above that predicted by the general trend of the market on a given day. The assumptions of the methodology are that the abnormal returns are the result of the announcement, and not some other random event occurring on the same day. The strength of the method is linked to the improbability of random events across different firms on different days coinciding with the announcement of an e-commerce initiative. The standard errors are calculated by the formula defined by (Judge, Hill, Griffiths, Lütkepohl, and Lee, 1988, page 170).

$$\text{var}(AR_{s,\tau}) = \left( S_s^2 \left[ 1 + \frac{1}{T} + \frac{(R_{m,\tau} - \bar{R}_m)^2}{\sum_{t=1}^T (R_{m,t} - \bar{R}_m)^2} \right] \right), \quad (3)$$

Where  $S_i^2$  is the variance of the error from the estimation model,  $R_m$  is the mean market return over the prediction interval, and  $T$  is the number of days in the estimation interval. The  $\tau^2$  indicates observations within the event window, while the  $t$  indicates observations in the estimation interval. Notice then, that the standard error on any given day  $\tau$  of the prediction interval is a function of how far the market return on that day is from the mean market return during the estimation interval. So on days where the market return is very different from the expected market return the standard errors of abnormal

---

<sup>1</sup> We use a longer event window because previous name change event studies have found that the effects are often transitory (Karpoff and Rankaine 1994; Bosch and Hirschey 1998).

<sup>2</sup>  $\tau$  runs across the event window, which is -5 to 5 in this case. On the day of the event  $\tau = 0$ .

returns are greater. Notice, also, that the standard error depends on the length of the estimation interval, such that longer estimation intervals lead to lower standard errors.

Under the assumption that the returns on each day are independent, the standard errors are cumulative, so the proper standard error is the cumulative standard error. This is because adding independent normal variables requires adding the standard errors. Thus, we have the following equations to describe  $CAR$ , and  $\text{var}(CAR)$ :

$$CAR_{s,\tau} = \sum_{i=-5}^{\tau} AR_{s,i} \quad (4)$$

and

$$\text{var}(CAR_{s,\tau}) = \sum_{i=-5}^{\tau} \text{var}(AR_{s,i}). \quad (5)$$

From these equations we can calculate the average  $CAR$  across all firms, and the variance of  $CAR$ . The resulting equations are:

$$\overline{CAR}_{\tau} = \frac{1}{N} \sum_{s=1}^N CAR_{s,\tau} \quad (6)$$

and

$$\text{var}(\overline{CAR}_{\tau}) = \frac{1}{N^2} \sum_{s=1}^N \text{var}(CAR_{s,\tau}). \quad (7)$$

To test the hypothesis that the mean  $CAR$  is different from zero on any given day then, one would use a Student's t test, where under the hypothesis of zero returns, is of the form:

$$t = \frac{\overline{CAR}_{\tau}}{\sqrt{\text{var}(\overline{CAR}_{\tau})}} \sim t_{(\alpha, df=N-1)} \quad (8)$$

For a detailed summary and critique of event studies in management research, see McWilliams and Siegal (1997).

## DATA

We drew our data from reports carried by two prominent wire services: PR Wire and Business Wire that are well established as sources carrying news releases by firms. Prior event studies (Hunter 1999, Subramani and Walden 1999) have relied on these wire service reports as the sole sources for event data. Consistent with this tradition, we used keyword searches of reports carried by these two standard wire services as our sources

for data. Our search for name changes from 1997 onwards resulted in our sample of 332 unique instances of name changes announced in company press releases.

Our data suggests that the first announced *dotcom* name change was the January 28<sup>th</sup>, 1998 announcement by Egghead Inc. changing its name to Egghead.com. The incidence of such name changes was very small in 1998<sup>3</sup>, but there were 266<sup>4</sup> of these reported in 1999.

Focusing on 1999, our sample includes a total of 47 firms that announced a change of their name to something *dotcom* in the period from January 1<sup>st</sup>, 1999 to December 20<sup>th</sup>, 1999. To avoid confounds arising from differences in investor expectations in the early phase of the phenomenon in 1998 from that prevalent in 1999, we chose to confine our analysis to events occurring in the calendar year 1999. Further, we removed name changes resulting from mergers which occurred within the previous six months.

The detailed texts of the announcements of name change were used to code the nature of name change (radical vs. cosmetic) and the other independent variables of interest. The coding scheme used for this is provided in Appendix A. The authors jointly coded events occurring in 1998 and refined the coding scheme. Subsequently, both authors independently coded events occurring in 1999. The codes assigned independently by the authors overlapped in 74% of the cases. Differences in coding were resolved in mutual discussions.

As 270 days of history was required for inclusion in the analyses, we eliminated firms that were taken public within 9 months of the date of the name change. Further, we also eliminated firms where the name change event occurred within 180 days of a major restructuring such as a merger or an acquisition to minimize confounding on account of this extraneous event that is known to affect market returns. This results in 47 dotcom firms and 143 brick-and-mortar firms.

To separate sub-groups, we introduced dummy variables for each of the independent variables: Radical (1 if Radical, 0 if cosmetic), B2B (1 if the firm is engaged in B2B e-

---

<sup>3</sup>There were 10 such changes in the entire year.

<sup>4</sup>We arrive at this number the superset of the 95 events reported by Cooper, Dmitri and Rao (2000) and the 74 events identified in our search of the Wire Service reports. Surprisingly, there is a very minimal overlap between these two sets (just 13 firms), leaving us with an estimate of 157 for 1999.

commerce, 0 otherwise), Goods (1 or 0), Services (1 or 0), Information (1 or 0), Industrial (1 or 0), Consumer (1 or 0) and Net (1 or 0). The descriptive statistics for the sample of the 47 dotcom and 143 brick-and-mortar firms we coded is provided in Table 1.

-----  
 Insert Table 1 about here  
 -----

## RESULTS

The results of the examination of the first research question are presented in Figure 2. The bars represent the CAR from day  $-10$  to the day indicated by the bar. The shaded region represents a one standard error interval around zero for each CAR. A 95% confidence interval then would be approximately twice the height of the shaded region. From the figure, it can be seen that the CAR over the  $-10,+10$  window is about 7% with a standard error of approximately 13%. The figure shows that there is a spike in the CAR on the day of the announcement, but the change is small, relative to the standard error. The CAR then increases for a few days then drops back to the 7% level. Thus, there is not a great deal of support for the proposition that dotcom name changes increase firm value.

-----  
 Insert Table 2 about here  
 -----

We must note at this point that the absolute return generated by the name announcements was approximately 7% over a 21-day period, which seems like a very significant return. The important thing to note is that the variance of the firms in question is also quite high, so that while the CAR is large, it is not outside of the range of a change we would expect for an Internet firm over a 21-day period. Thus, our results are similar to previous results that find a minor, but non-significant increase in firm value from name change announcements. The difference is that our *minor* is much larger, and our *non-significant* band is much wider. This has important implications for future electronic commerce research using market data. While the market appears to be efficient and

rational, the variance associated with those bounds is much greater<sup>5</sup>. What this means for research is that if an effect is found using market data, then it is likely to be a robust effect indeed.

The second research question concerns the difference between dotcom and brick-and-mortar firms. The results for brick-and-mortar firms are presented in Figure 3. What we hope to understand is how dotcom name changes are similar to non-dotcom name changes. We have 143 observations in 1999. The results of the event study is presented in Figure 3. Once again we find no effect. One interesting thing to note is that in a comparison between the pooled data without outliers and the brick-and-mortar data, the standard error for dotcom name changes is roughly twice the standard error of non-dotcom name changes. Further, notice that the event-day effect for dotcom name changes is a move from CAR of 7.1% to 9.1%, or 2%. The brick and mortar event day effect is a move from 0.7% to 1.7%, which is 1%. Thus, both the event-day effect and the standard error are double for dotcom name changes. While neither is significant, a dotcom name change would have more option value.

-----  
 Insert Table 3 about here  
 -----

Another comparison which might be informative is to see how the value of name changes evolve over time. It might be that there is some time frame where name changes were very valuable, and another time frame where they were damaging. We plot the event day and one day after CAR's for both dotcom and non-dotcom name changes in the two figures below.

-----  
 Insert Table 4 about here  
 -----  
 -----

-----  
 Insert Table 5 about here  
 -----

---

<sup>5</sup> It would be interesting to look at option prices of firms that made *dotcom* name changes.

The final research question of interest is how name changes impact different sub-groups of firms. To examine the differences among sub-groups, we regressed the CAR on these variables. The results presented in Fig 2 suggest that services and consumer goods firms are significant for dotcom firms. However, the sign of each is negative. In view of the non-significant overall CAR, these results are only indicative and need to be interpreted with caution.

---

Insert Table 2 about here

---

## STUDY 2: ANALYSIS REPEATED WITH ENLARGED DATASET<sup>6</sup>.

In the course of developing this study, we learnt of a contemporaneous examination of the value of dotcom name changes, by researchers at Purdue University (Cooper Dimitrov and Rau 2000<sup>7</sup>) whose results were very different from ours. CDR report a statistically significant return to dotcom name changes, and an average abnormal return of more than 100% overall! Further, we found that there was very little overlap between the firms in our sample and the firms in their sample.

The fundamental difference between our study and that of CDR lies in the source of the data. One of the aims of CDR was to show that real-time financial research was made possible by the Internet and they derived their data—both event reports as well as data on securities—from sources on the Internet such as Hoovers ([www.hoovers.com](http://www.hoovers.com)) and FinancialWeb historic quotes (<http://financialweb.com/mktHistory.asp>) In contrast, our data collection strategy employed the conventional source for event study research - PR Wire and Business Wire for events and Bloomberg for stock data. The differences between the samples in the two studies are highlighted in

Table 3.

---

<sup>6</sup> Our study was a broad look at the relationship of name changes (both dotcom and others) to returns. CDR focused exclusively on dotcom name changes. In this section, we attempt to reconcile the results of our study on this sub sample of our data (n=47) and those of CDR.

<sup>7</sup> Hereafter CDR.

---

Insert Table 3 about here

---

The stocks examined by CDR are all traded on the OTC bulletin boards while those we examined were all predominantly on NYSE or NASDAQ. CDR note that “Since these are mostly extremely small capitalization companies, it is difficult to obtain current stock price information and company profiles from traditional academic sources such as CRSP, Compustat, etc.” Further, they report “We could not obtain market capitalization values for most firms in our sample; the data was simply unavailable. We contacted the OTCBB in an attempt to obtain market capitalizations. They informed us that they do not keep track of firm capitalization. For the 18 firms for which we did obtain market capitalization, the average (median) capitalization on the event date was \$11.47 (9.68) million.” This suggests that the CDR results are based on a very narrow set of stocks that is unrepresentative of the broader set of publicly traded firms and the results are therefore very limited in their generalizability.

From the table, it is apparent that the firms in this study were somewhat larger, more established firms. The mean income for our firms was \$164.3 million, while the CDR mean income was negative. Our average number of employees was about 700 times greater than the CDR sample.

In an attempt to broaden our sample base, we decided to include the firms from the CDR set for which we could find financial data reported on Bloomberg Financial Markets. We were able to obtain data from Bloomberg on 38 events unique to their sample (40% of their to their sample) and we pooled these unique events with those identified by us<sup>8</sup>, creating a total sample of 68 events.

### **Effect of dotcom name changes on Market Value**

We repeated the examination of research question 1 on the two new samples: the 68 pooled events and the 38 events drawn from the CDR dataset are provided in Figure 3 and Figure 4. In each of these tests, the CAR at the end of the event window is lower than

---

<sup>8</sup> Thus, common events were classified into our sample.

that required for significance. We thus find no support for the proposition that dotcom name changes are associated with enhanced market valuations.

-----  
 Insert Table 6 about here  
 -----

-----  
 Insert Table 7 about here  
 -----

While these are quite impressive results, several caveats are in order. The first is that the null hypothesis is the mean is zero and the variance is constant. Rejecting the null means that either the mean is not zero, or that a dotcom name change changes the variance of a stock's price. It seems reasonable to believe that a firm moving from a traditional business to a dotcom business would face considerably more environmental variance which should be reflected in the stock price.

A larger issue is the influence of outliers. This data has two significant outliers. The first is the change of Foodquest International Corporation (FDQI) to Dealcheck.Com Inc (DEAL), which resulted in a 450% return over the full window, 400%<sup>9</sup> of which occurred on day -5 (notice the spike in CAR on that day). The second was the change from EJM Entertainment (TIXXD) Findex.com (FIND), which resulted in a 930% change of which 890% occurred on day +1 (notice the very large spike in CAR on that day). Thus, we believe it is informative to look at the data with these observations removed. The results are presented in Figure 8 and Figure 9.

-----  
 Insert Table 8 about here  
 -----

-----  
 Insert Table 9 about here  
 -----

---

<sup>9</sup> The price increased from \$0.01 to \$0.05.

---

Previous research on name changes has found outliers to significantly influence outcomes. Thus, we examine the effects of outliers via a non-parametric test. Under the null hypothesis of no effect, we would expect half of the firms to have positive CAR's and half to have negative CAR's over any given period. We can thus develop a test statistic to see if significantly more than half of the firms have positive CAR (Karpoff and Rankine 1994). The statistic has the form<sup>10</sup>.

$$z = \sqrt{N} \left( \frac{\frac{P}{N} - 0.5}{0.5} \right)$$

Under the null hypothesis, this statistic is approximately distributed unit normal. The results of this test are shown in table 2.

---

Insert Table 4 about here

---

The test supports the proposition that there are no significant effects of dotcom name changes.

## Study 2 Discussions

Overall, we find no support for the hypothesis that dotcom name changes have any significant influences on the market values of firms. The conclusions based on a pooled sample of firms are consistent with the results in the two sub samples: the event data collected by us as well as the dataset created by CDR. While these results are different from the significant results reported by CDR, our results are consistent with prior results reported in the literature that also found no significant effects of corporate name changes on market value (Bosch and Hirschey 1987; Howe 1982; Karpoff and Rankine 1994).

---

<sup>10</sup> Note there is a typographical error in presentation of this statistic in Karpoff and Rankine p 1034. Thus we derive the statistic in appendix B.

These results raise a methodological issue related to the phenomenon. Our results are similar to the observations of prior researchers that conclusions regarding abnormal returns to name changes are extremely sensitive to the characteristics of firms included in the sample (Karpoff and Rankine 1994). For instance, the dataset assembled by CDR from Internet sources comprised of relatively small firms listed on the Nasdaq OTC Bulletin Board. Using this dataset, they report that name change announcements were associated with 100% abnormal return over a 21-day window. Our own sample drawn from the PR Wire and Business Wire overlapped only partially with this set - ours presumably comprised larger and more established firms listed on NASDAQ, NYSE and AMEX that receive greater attention from these established news services.

However, it is curious, that our results based on a sub sample drawn from their dataset revealed no relationship between name changes and abnormal returns. It must be noted that we used Bloomberg exclusively for data collection, while CDR used a much wider range of sources. Because of this, we were only able to include about one half of their data set. Further, because we counted firms in both data set as S&W data, the tests we carry out here are only based on one third of their total sample. While any differences here may be purely a result of our inability to gather data for the entire sample, there may be other considerations such as data accuracy, and sample selection. This is certainly an issue that bears further examination, as most researchers (us included) gather data from one source, trusting its accuracy, and assuming completeness. It is interesting to note that most other event studies have used the CRSP tapes as a trusted and complete data source. However, the CRSP tapes are not updated daily, forcing researchers who wish to do *real-time* analysis to use other data sources, which may present their own difficulties.

## CONCLUSION

This paper makes two contributions to the understanding of the value drivers of electronic commerce. First, we find that the benefit of a dotcom name change is negligible. This may seem like a shallow result at first blush. However, such a finding was far from equivocal. A common saying is that the internet changes everything, and in this new environment a name may be very extremely important. Given the cost and

effort required to change a corporate name, this has important implications for practice. Especially in light of the finding that 28% of online purchasing attempts fail due to unavailability of products, inability to complete the transaction, or dissatisfaction with the transaction (Business 2.0 2000). This would seem to indicate that investments in IT infrastructure would be a better use of on-line firms' budgets. Thus, our suggestion for practice is to concentrate on investments that produce real value for customers.

The second contribution of this work is the support we find for the rationality of markets with respect to dotcom firms. The similarity of our results with those of prior research on the phenomenon carried out on data from the 1979-1987 period is very interesting. In general, this indicates that the phenomenon has remained stable in the two periods. Further, this suggests that the relationship between name changes and abnormal return is invariant, even when the name changes are related to fads that are currently in favor with investors such as e-commerce. Finally, the consistency of our results with prior research provides reassuring information that the behavior of capital markets is fundamentally unchanged across the different regimes. While the popular press suggests that the market is overvalued and that we are witnessing a bubble in the valuation of Internet related stocks (Tully 2000), our data does not find support for this view. On the contrary, our finding is that dotcom name changes do not receive particularly favorable consideration by investors. The fundamental logic underlying market value revealed in the inter-relationship between name changes, even related to stocks in the Internet sector, appears to be consistent with that in prior periods.

Several authors (Shapiro and Varian 1999; Kauffman and Walden 2000) propose that the new economy will rapidly converge to the old economy. We concur. As this convergence occurs, it will not be the firms with the cutest commercials, or the flashiest names that succeed, but the firms that develop ways to provide real value to their customers.

## TABLES AND FIGURES

**Table 1:** Results of Coding

<b>Variable</b>	<b>Dotcom Firms (Total =47)</b>	<b>Brick-and-Mortar Firms (Total=143)</b>
Radical	37	94
B2B	32	106
Good	14	50
Service	44	110
Digital	30	53
Industrial	30	101
Consumer	27	69
Net	30	17

**Table 2:** Effects of Sub-samples

<b>Variable</b>	<b>Dotcom Firms</b>	<b>p-value</b>	<b>Conventi onal Firms</b>	<b>p-value</b>
Intercept	0. 26828	0. 5099	-0.00464	0.9693
Radical	-0. 13457	0. 3611	-0.06325	0.1347
B2B	0. 23561	0. 2228	0.08636	0.1504
Goods	-0. 08217	0. 6050	0.01304	0.8448
Services	-0. 55355	0. 0475	0.01673	0.8181
Information	-0. 13172	0. 3517	0.02147	0.6377
Industrial	0. 22430	0. 2457	-0.00993	0.8745
Consumer	-0. 46777	0. 0207	-0.02719	0.6712
Net	-0. 04665	0. 7086	-0.07295	0.2608
	N = 47; R <sup>2</sup> = 0.26; Adjusted R <sup>2</sup> = 0.11; F Value = 1.71; Prob F = 0. 1288		N = 143; R <sup>2</sup> = 0.06; Adjusted R <sup>2</sup> = 0.00; F Value = .99; Prob F = 0. 4461	

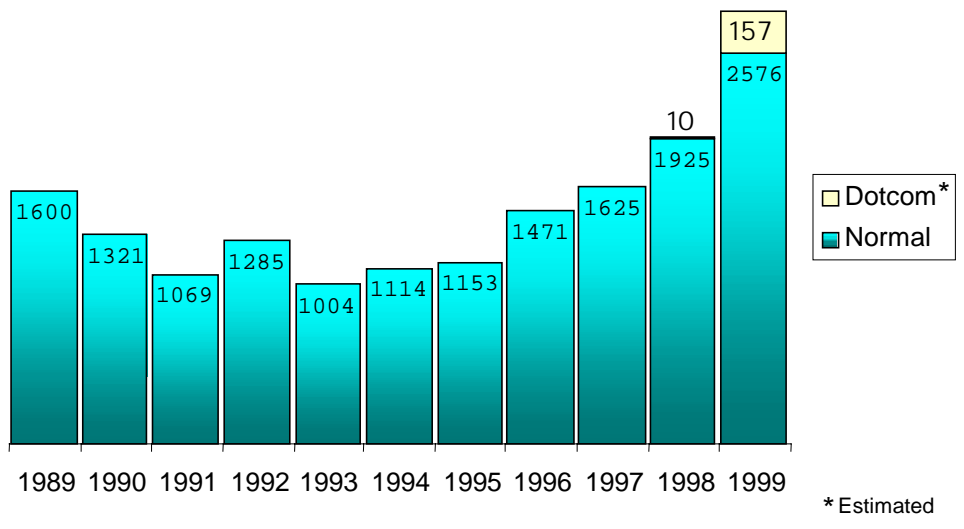
**Table 3:** Demographic details of samples used in our study and in CDR

		<b>Book Value per Share</b>	<b># Shares (millions)</b>	<b>Number of Employees</b>	<b>Income (millions)</b>	<b>Book Value (millions)</b>
<b>This Study</b>	Number					
	With Data	39	41	38	43	38
	MEAN	\$1.70	47.7	49315	\$164.3	\$317.1
	STD	\$2.60	176.0	286071	\$1175.6	\$1880.1
	MIN	-\$4.1	1.5	2	-\$221.3	-\$163.6
	MAX	\$10.3	1126.2	1763563	\$7690.0	\$11599.7
<b>CDR Data</b>	Number					
	With Data	9	9	7	11	9
	MEAN	\$0.8	36.6	70	-\$3.7	\$10.6
	STD	\$2.0	79.9	65	\$3.9	\$15.0
	MIN	-\$2.1	4.1	15	-\$13.9	-\$8.3
	MAX	\$5.3	249.2	196	\$0.0	\$33.2

**Table 4:** Test For Number Of Firms With Positive Returns (p-value < 0.1 in bold)

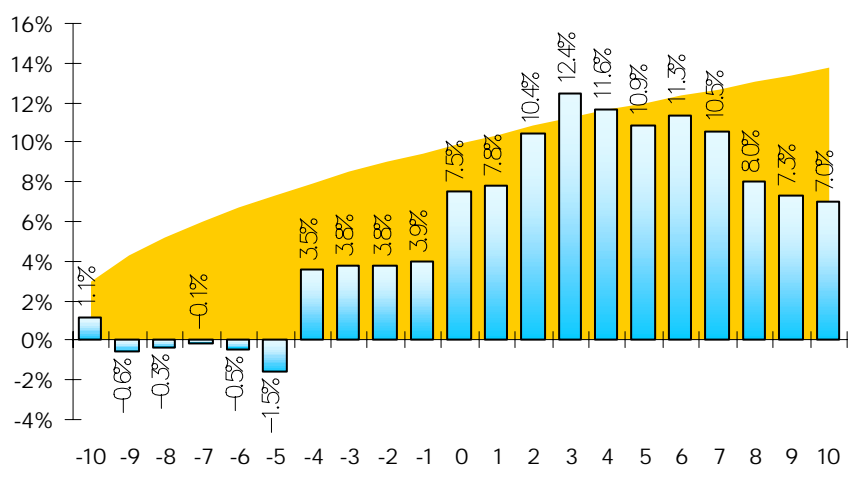
Day	All Data (N=68)		S & W Data (N=47)		CDR Data (N=21)	
	Percent > 0	P-Value	Percent > 0	P-Value	Percent > 0	P-Value
-10	46%	0.23	49%	0.44	38%	0.14
-9	38%	0.03	34%	0.01	48%	0.41
-8	41%	0.07	40%	0.09	43%	0.26
-7	41%	0.07	43%	0.15	38%	0.14
-6	38%	0.03	36%	0.03	43%	0.26
-5	40%	0.04	36%	0.03	48%	0.41
-4	40%	0.04	43%	0.15	33%	0.06
-3	49%	0.40	51%	0.56	43%	0.26
-2	40%	0.04	40%	0.09	38%	0.14
-1	41%	0.07	45%	0.23	33%	0.06
0	50%	0.50	55%	0.77	38%	0.14
1	56%	0.83	<b>60%</b>	<b>0.91</b>	48%	0.41
2	49%	0.40	57%	0.85	29%	0.02
3	49%	0.40	53%	0.67	38%	0.14
4	49%	0.40	55%	0.77	33%	0.06
5	50%	0.50	53%	0.67	43%	0.26
6	56%	0.83	57%	0.85	52%	0.59
7	57%	0.89	<b>60%</b>	<b>0.91</b>	52%	0.59
8	57%	0.89	<b>60%</b>	<b>0.91</b>	52%	0.59
9	56%	0.83	57%	0.85	52%	0.59
10	54%	0.77	55%	0.77	52%	0.59

**Figure 1:** Numbers of name changes by year

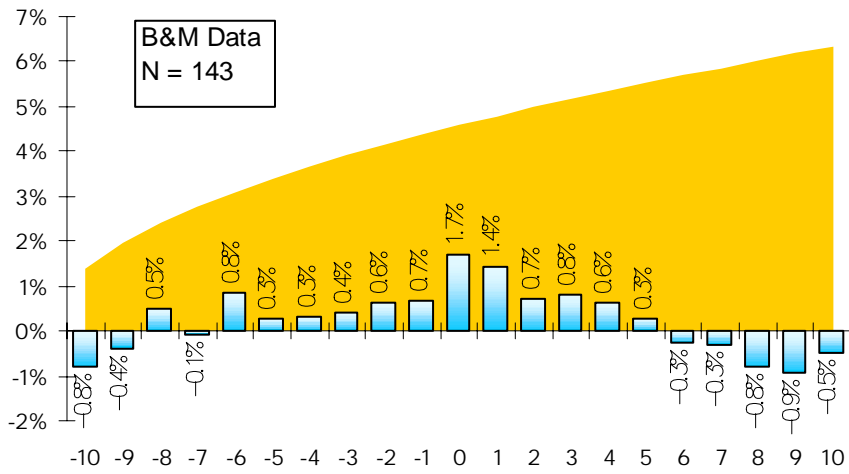


**Source:** ENTERPRISE-IG. Numbers for *DotCom* changes in 1998, 1999 based on reports by Cooper, Dmitry and Rao (2000) and those identified in our search of Wire Sources

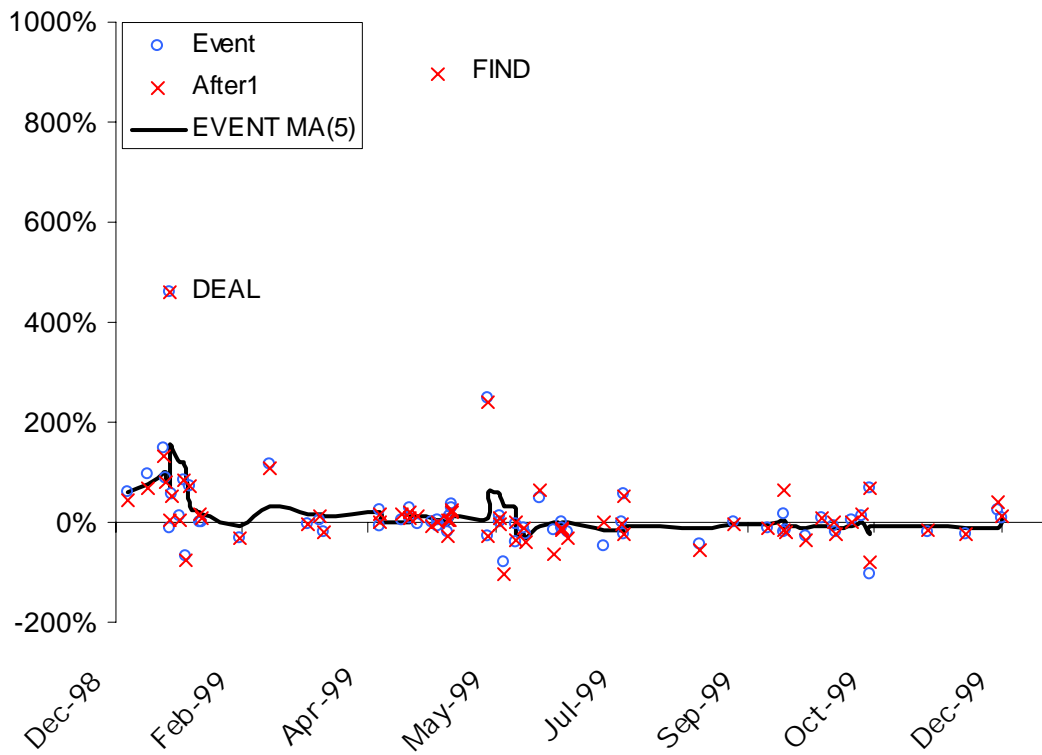
**Figure 2:** Cumulative Abnormal Returns For Dotcom Firms  
(Shaded region represents one standard error)



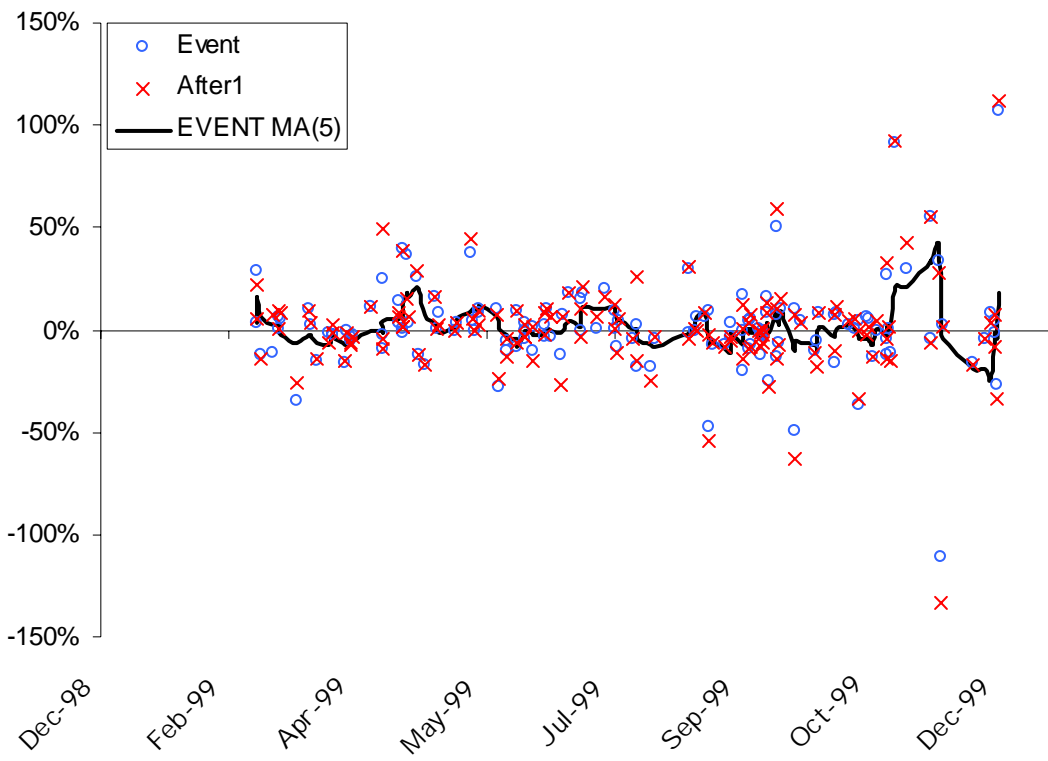
**Figure 3:** Cumulative Abnormal Returns For Non-Dotcom Name changes (Shaded region represents one standard error)



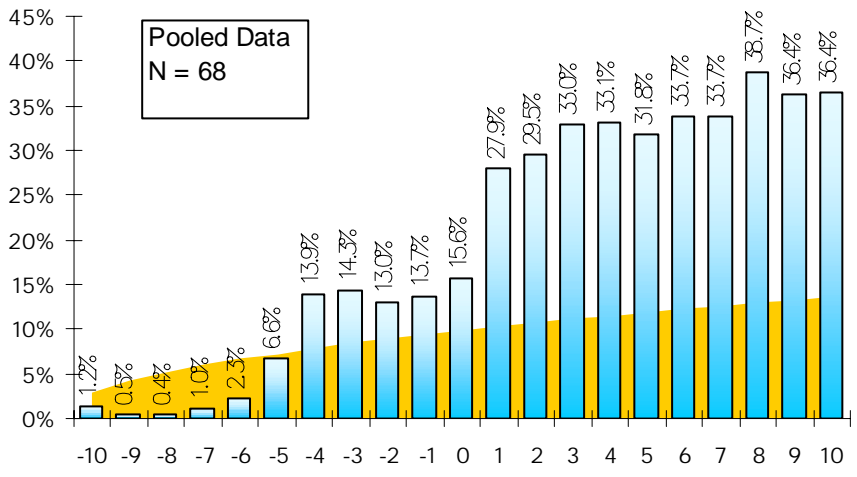
**Figure 4:** Dotcom Name Changes by Year



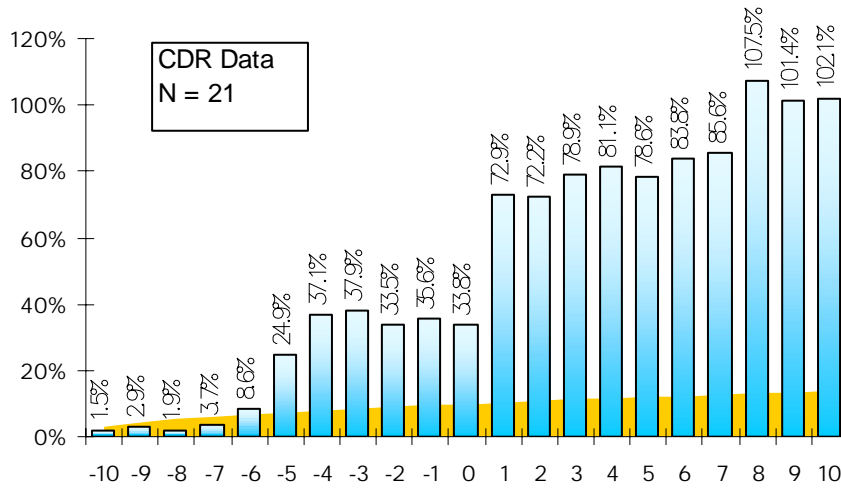
**Figure 5:** Non-Dotcom Name Changes by Date



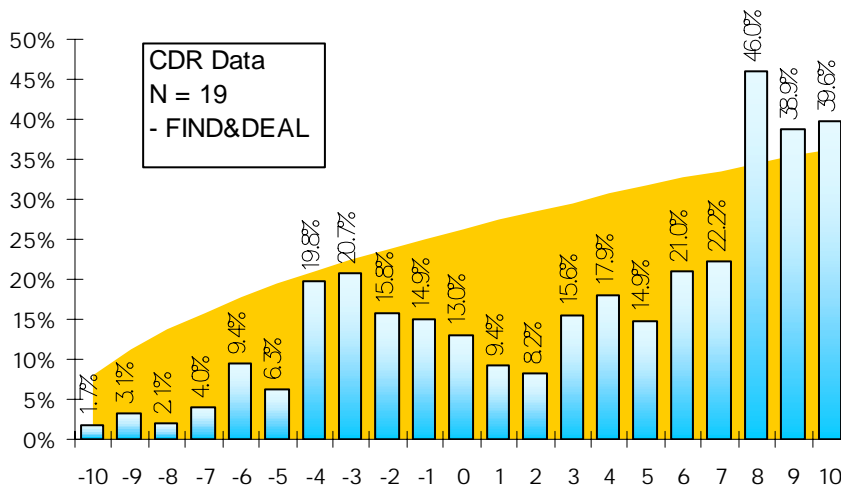
**Figure 6:** Cumulative Abnormal Returns For All Firms  
(Shaded region represents one standard error)



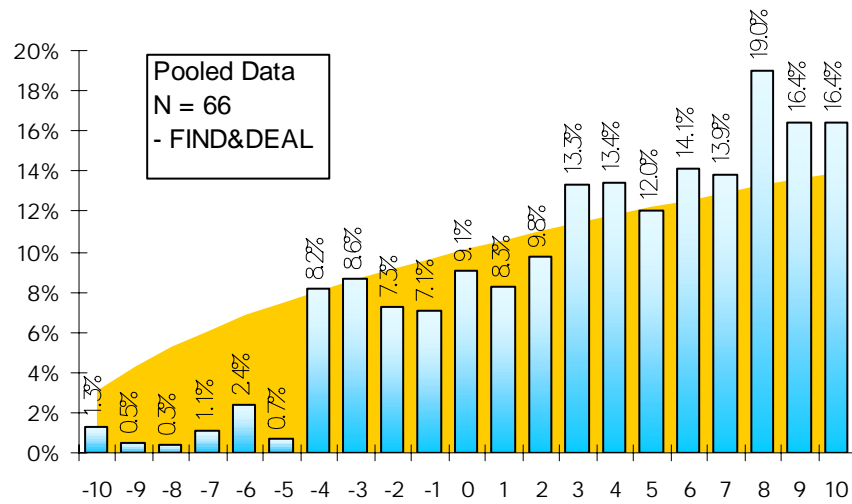
**Figure 7:** Cumulative Abnormal Returns For Cooper, Dimitrov, and Rau Firms  
(Shaded region represents one standard error)



**Figure 8:** Cumulative Abnormal Returns For Cooper, Dimitrov, and Rau Firms with Outliers removed  
(Shaded region represents one standard error)



**Figure 9:** Cumulative Abnormal Returns For Pooled Data with Outliers removed (Shaded region represents one standard error)



## BIBLIOGRAPHY

1. Bosch, Jean-Claude, and Hirschey, Mark (1989), "The Valuation Effects of Corporate Name Changes," *Financial Management*, Winter, 64-73.
2. Brown Eryn (2000), "Scaling a Vertical Learning Curve", *Fortune* Jan 24, 96-100.
3. Business Wire (1999), "Corporate Name Changes Boom in 1999 First Half-Set New Record," July 8.
4. Business 2.0 (2000), "Shopping Trips," May, p 451.
5. Chen, C. (2000), "A Good Name Is Priceless--Some of the Time," *Fortune*, Vol. 141 No. 3, February, 2, 184.
6. Dyer, J. H., and Singh H. (1998), "The relational view: Cooperative strategy and sources of interorganizational competitive advantage," *Academy of Management. The Academy of Management Review*; Mississippi State; October, 66-679.
7. Frankel, A. (1997), "Name-o-rama," *Wired*, June, (available online at: [http://www.wired.com/wired/5.06/es\\_namemachine.html](http://www.wired.com/wired/5.06/es_namemachine.html)).
8. Gong E.J. Jr. (1998), "Drugs Play the Name Game," *ABCNews.com*, June 16, (available online at: <http://archive.abcnews.go.com/sections/business/DailyNews/drugs980612/index.html>).
9. Horsky D., and Swyngedouw, P. (1987), "Does It Pay To Change Your Company's Name? A Stock Market Perspective," *Marketing Science*, 6, 4, Fall, 320-335.
10. Howe, John S. (1982), "A Rose By Any Other Name? A Note On Corporate Name Changes," *The Financial Review*, 17, 4, November, 271-278.
11. Hunter, S. (1999), "Which Investments in Information Technology Increase the Market Value of the Firm?" *Workshop on Information Systems in Economics (WISE)*, Charlotte , North Carolina, December 11-12.
12. Judge, G. G., Hill, R. C., Griffiths, W. E., Lütkepohl, H. and Lee, T. C. (1988), *Introduction To The Theory And Practice Of Econometrics*, John Wiley & Sons, New York.
13. Karpoff, Jonathan M., and Rankine, Graeme (1994), "In search of a signaling effect: The wealth effects of corporate name changes," *Journal of Banking & Finance*, 18, 6, December, 1027-1045.

14. Kauffman, R. J., and Walden, E. A. (2000), "Economics and Electronic Commerce: A Review and Framework for an Emerging Literature," University of Minnesota Working Paper # 00-04, July, (available online at: <http://misrc.umn.edu/wpaper/default.asp>).
15. MacKinlay, C.A. (1997), "Event Studies in Economics and Finance," *Journal of Economic Literature*, 35, 13-39.
16. Marcial G.G. (1991), "By Another Name, A Sweeter Stock?", *Business Week*, Oct 14, page 110
17. McWilliams, A. and Siegel, D. (1997), "Event Studies in Management Research: Theoretical and Empirical Issues," *Academy of Management Journal*, 40, 3, 626-657.
18. McQuade, W. (1984), "Cosmetic surgery for the company name," *Fortune*, April 30, 249-250.
19. Nickell, J. A. (2000), "What's in a Name?," *Business 2.0*, May, 140-145.
20. PR Newswire (1998), "The Failure Group, Inc. Shareholders Approve Name Change to Exponent, Inc.," January 15.
21. *Psychology Today* (1981), "Are Any Pretty Girls Named Gertrude?", September.
22. Robinson, E. (1999), "The \$20 million company...and its \$40 million ad campaign," *Fortune*, Nov 8, 315-316.
23. Shapiro, C., and Varian. H. R. (1999), *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press, Cambridge, MA.
24. Sinha, P. (2000), "Software Pretenders Back to Square One," *Times of India Online Edition*, (available online at: <http://www.timesofindia.com/today/03home7.htm>).
25. Subramani, M. and Walden, E. (1999), "The Dot Com Effect: The Impact of E-Commerce Announcements on the Market Value of Firms," Prabhuddha De and J. I. DeGross, *Proceedings of the Twentieth International Conference on Information Systems*, Charlotte, North Carolina, December 12-15.
26. Timon, C. (2000), "10 Tips For Naming...avoiding the moniker massacre," *Business 2.0*, :March, 151.
27. Tully, Shawn (2000) - "Has the Market Gone Mad?", *Fortune* Jan 24, 2000, 80-88.

## APPENDIX A (CODING SCHEME)

Coding (All coding relative to the current business of the firm)

Radical	<p>This variable is a <b>R</b> if the name change is radically different than the original name. An <b>A</b> indicates a cosmetic name change that is defined where the new name contains substantial and recognizable portions of the old name. When name of one subsidiary is changed radically but 2 others are not, on average, the name change is incremental rather than radical.</p> <p>Radical: Name conveys a significantly different connotation even if it retains some individual element of old name e.g. Superior Surgical Mfg Co to Superior Uniform Group. This is a radical change.</p> <p>Similarly, Cubic Automatic Revenue Services Group to Cubic Transportation Systems.</p> <p>Cosmetic: Minor Change to name: e.g. Intek Global to Intek Diversified.</p>
B2B	<p>This variable is a <b>B</b> if more than 50% of the firm's revenue is from sales to other firms. This is a <b>C</b> if more than 50% of the revenue comes from sales to end consumers.</p>
Goods and Services	<p>This variable is a <b>G</b> if the firm engages in the production of goods, and <b>NG</b> otherwise (if a subsidiary name change, then only the production of the subsidiary is considered). Goods are defined as the Bureau of Economic Analysis categories:</p> <ul style="list-style-type: none"> <li>• Agriculture, Forestry, and Fishing</li> <li>• Mining</li> <li>• Construction</li> <li>• Manufacturing <ul style="list-style-type: none"> <li>○ Durables</li> <li>○ Non-Durables</li> </ul> </li> </ul> <p>This variable is an <b>S</b> if the firm engages in one of the service industries, and <b>NS</b> otherwise. These industries are defined by the Bureau of Economic Analysis categories:</p> <ul style="list-style-type: none"> <li>• Transportation</li> <li>• Wholesale Trade</li> <li>• Retail Trade</li> <li>• Finance, Insurance, and Real Estate</li> <li>• Services <ul style="list-style-type: none"> <li>○ Hotel, and other lodging</li> <li>○ Business Services</li> <li>○ Health Services</li> <li>○ Education</li> </ul> </li> </ul>

Appendix - 2

	<p>If the firm produces both goods and services then the coding should be <b>GS</b>. Note that a firm must produce at least one type of product.</p>
Information Products	<p>This variable is a <b>D</b>(digital) if the firm predominately produces information products, which are defined as in Shapiro and Varian to be products with high fixed costs and near zero marginal costs. Otherwise the firm is coded as <b>T</b>(tangible)</p> <p>Informational Goods - typically characterized by very high fixed costs, largely incurred to produce the initial units but low marginal costs for producing subsequent units.</p> <p>Telecommunication products are <b>DIGITAL</b> as they approximate the informational goods model more closely than the model of tangible goods. As are online malls, auctions, insurance services, financial services rock concerts on demand, downloaded software, club points, online advertising, music created on CDs (the actual music producing firm), videos, public forum for discussions, Storage Area Networks (SAN)</p> <p>Non-Information goods-- Key criterion is the nature of incremental costs. Activities where significant human interaction involved are characterized by high incremental costs and are therefore tangible e.g. Packaged videos and CD's (selling CD's is different than selling music), jewelry, clothing, call center services, Software development services, cruises, travel, packaged software</p>
Consumer and Industrial	<p>This variable is a <b>P</b> if the firm or subsidiary in question produces consumer goods, <b>NP</b> otherwise. Where consumer goods are those that primarily provide utility to end consumers.</p> <p>This variable is an <b>I</b> if the firm or subsidiary in question produces industrial goods, <b>NI</b> otherwise. Industrial goods are defined as those that are used as the inputs to a production process, or those that are consumed by a firm in the day-to-day running of business.</p> <p>If the firm produces both industrial and consumer products then the coding should be <b>PI</b>. Note that a firm must produce at least one of these types of products.</p>
Net	<p>This variable is an <b>N</b> if the firm in question <u>currently</u> generates more than 50% of its revenues through online sales activities or internet related activities. Code as <b>O</b> if other than net.</p>
Type	<p>This variable is an <b>E</b> for name changes to .com, .net, or .org. In addition, if the name change is <i>e</i> or <i>i</i> something, where the <i>e</i> or <i>i</i> is expressly meant to denote a web firm (e.g. eLOT, iMan) code the change as <b>E</b>. This is an <b>X</b> for standard name</p>

Appendix - 3

	changes. For name changes where both the original and changed name are .com, .org, or .net then the coding should be E <sup>*</sup> .
Announcement Timing	This variable should be coded as <b>F</b> if it is the first, announcement associated with the board of directors, and as an <b>H</b> if it is the announcement associated with the shareholder approval and/or legal name change completion.
Repeat	Code as an <b>R</b> if the announcement is a reiteration of an announcement previously coded.
Mergers and Acquisitions	Mergers and Acquisitions are not included in the sample if they occurred within the previous six months. If they occurred prior to that, then we consider that the firm has been one firm for some time, and is changing name to realign with what they find to be their new business model, rather than out of the necessity of having one name for the entire firm. Code as an <b>M</b> if the announcement is non-event merger or acquisition.
Non-Event	Code as an <b>Y</b> if the announcement is not a name change event.
Interesting event	Code a <b>Z</b> if the announcement contains some interesting information that should be included in the final paper.

Each event coding should have 8 pieces, separated by commas.

Radical	B2B	Goods and Services	Information Product	Product type	Net	Type	Time
<b>R-A</b>	<b>B-C</b>	<b>G-S-GS</b>	<b>D-T</b>	<b>P-I-PI</b>	<b>N-O</b>	<b>E-X</b>	<b>F-H</b>

Hypothetical Examples:

9. Business Wire, December 15, 1999, Wednesday, 869 words, Executone Information Systems Announces Shareholder Approval of Sale of Computer Telephony Division and Company Name Change to eLOT, Inc., MILFORD, Conn., Dec. 15, 1999

R, B, GS, T, I, N, E, F

16. Business Wire, December 13, 1999, Monday, 577 words, Palm Computing, Inc. Files Registration Statement for Initial Public Offering, SANTA CLARA, Calif., Dec. 13, 1999

Y

## Appendix - 4

DATE	SW, CDR or B&M	Old Name	Old Symbol	New Name	New Symbol	CAR (-10,10)	STD ERR (Day 10)	P-value (Two Tail)
05-Jan-99	SW	CellularVision USA, Inc.	CVUS	SpeedUs.com, Inc.	SPDE	86.6%	69.5%	0.21
13-Jan-99	SW	JetFax, Inc.	JTFX	eFax.com	EFAX	83.8%	27.5%	0.00**
19-Jan-99	SW	Westergaard Online Systems, Inc.	WSYS	Westergaard.com,inc.	WSYS	96.2%	52.8%	0.07+
22-Jan-99	SW	UniStar Gaming Corp.	XTON	eLottery, Inc.	ELOT	75.6%	28.0%	0.01**
25-Jan-99	SW	Technology Guardian Inc.	TEGI	eSat Inc.	ESAT	0.1%	19.8%	1.00
27-Jan-99	SW	Prosoft I-Net Solutions	POSO	ProsoftTraining.com	POSO	70.5%	34.9%	0.04*
29-Jan-99	SW	Freepages Group Plc	FREEY	Scoot.com plc	SCOP	74.1%	16.2%	0.00**
02-Feb-99	SW	RomTech, Inc.	ROMT	eGames, Inc.	EGAM	58.0%	27.6%	0.04*
03-Feb-99	SW	Genisys Reservation Systems, Inc.	GENS	NetCruiseTravel.com, Inc.	NETC	-6.3%	38.8%	0.87
22-Mar-99	SW	namdirect.com	NAMC	internetADR.com	NAMC	21.7%	42.2%	0.61
14-Apr-99	SW	Make It So, Inc.	VIAX	eTracks.com, Inc.	VIAX	-7.6%	34.3%	0.83
23-Apr-99	SW	SIMS Communications Inc.	SIMSC	Medcomm.com	EMED	13.0%	45.5%	0.78
26-Apr-99	SW	Rocky Mountain Internet, Inc.	RMII	RMI.NET	RMII	-13.6%	46.2%	0.77
26-Apr-99	SW	Tel-Save.com, Inc.	TALK	TALK.com	TALK	12.7%	29.6%	0.67
05-May-99	SW	DIDAX INC.	AMEN	Crosswalk.Com, Inc.	AMEN	-21.7%	70.5%	0.76
11-May-99	SW	Telepartner A/S	TPARY	Euro909.com	ENON	-10.3%	51.9%	0.84
12-May-99	SW	USABancShares	USAB	USABanc.com	USAB	9.5%	21.0%	0.65
13-May-99	SW	Isleuth.com, Inc.	SLEU	TheBigHub.com	BHUB	-40.7%	95.5%	0.67
13-May-99	SW	Hollywood Productions, Inc.	FILM	SHOPNET.COM, INC.	SPNT	4.2%	71.9%	0.95
27-May-99	SW	Finet Holdings Corporation	FNHC	FiNet.com, Inc.	FNCM	-57.9%	63.7%	0.36
01-Jun-99	SW	Modacad Inc.	MODA	styleclick.com	IBUY	-11.8%	24.2%	0.63
01-Jun-99	SW	Restrac, Inc.	RTRK	Webhire, Inc.	HIRE	6.1%	32.0%	0.85
02-Jun-99	SW	GoodNoise Corporation	GDNO	EMusic.com Inc.	EMUS	-188.4%	435.7%	0.67
07-Jun-99	SW	Buffalo Capital VI Ltd.	BUFJ	Isolver.com Inc.	ISLV	-58.0%	126.6%	0.65
07-Jun-99	SW	Alpha Microsystems	ALMI	AlphaServ.com	ALMI	-18.4%	37.1%	0.62
17-Jun-99	SW	Proactive Technologies, Inc.	PTE	flightserv.com	FSW	71.2%	53.9%	0.19
25-Jun-99	SW	Recovery Network, Inc.	RNET	RnetHealth.com Inc.	RNET	110.0%	62.4%	0.08+
19-Jul-99	SW	7th Street.com	SEVL	Learn2.com	LTWO	-24.6%	44.3%	0.58
20-Jul-99	SW	Interactive Magic Inc.	IMGK	iEntertainment Network	IENT	-33.3%	29.7%	0.26
19-Aug-99	SW	Connect, Inc.	CNKT	ConnectInc.com	CNKT	-40.0%	25.9%	0.12
01-Sep-99	SW	Xitejewelry.com, Inc.	DGJL	NetJewels.com	DGJL	14.9%	18.8%	0.43
15-Sep-99	SW	BeFirst.com	FWHT	FindWhat.com	FWHT	-31.7%	39.9%	0.43
21-Sep-99	SW	Delphi Information Systems, Inc.	DLPH	ebix.com Inc.	EBIX	117.1%	67.1%	0.08+
21-Sep-99	SW	INSCI(R) Corp.	INSI	inSCI-statements.com	INSI	-17.9%	21.9%	0.41
22-Sep-99	SW	Electrocon International, Inc.	EPLTF	GETGO Mail.com, Inc.	GTGO	6.2%	27.1%	0.82

APPENDIX B: FIRMS IN SAMPLE

Appendix - 5

DATE	SW, CDR or B&M	Old Name	Old Symbol	New Name	New Symbol	CAR (-10,10)	STD ERR (Day 10)	P-value (Two Tail)
30-Sep-99	SW	Hospitality Worldwide Services	HWS	Hotelworks.com	HWS	-59.1%	85.4%	0.49
06-Oct-99	SW	Accent Software International	ACNTF	LanguageWare.net	LWNTF	25.0%	43.4%	0.57
11-Oct-99	SW	Asymetrix Learning Systems, Inc.	ASYM	click2learn.com, inc.	CLKS	-17.9%	42.4%	0.67
12-Oct-99	SW	Mustang Software, Inc.	MSTG	Mustang.com, Inc.	MSTG	-29.1%	46.6%	0.53
18-Oct-99	SW	Big Entertainment, Inc.	BIGE	Hollywood.com, Inc.	HOLL	7.0%	23.5%	0.77
22-Oct-99	SW	PageMart Wireless Inc.	PMWI	WebLink Wireless Inc.	WLNK	42.3%	26.1%	0.11
25-Oct-99	SW	The Scandinavia Company, Inc.	SCF	Xcelera.com	XLA	-79.9%	312.1%	0.80
25-Oct-99	SW	Keystone Fulfillment	HNV	Keystone Internet Services, Inc.	HNV	52.6%	66.2%	0.43
17-Nov-99	SW	Romac International	ROMC	kforce.com	ROMC	28.2%	42.6%	0.51
02-Dec-99	SW	Tadeo Holdings, Inc.	TDEO	TekInsight.com	TEKS	-65.9%	66.6%	0.32
15-Dec-99	SW	Intelligent Life Corp.	ILIF	ilife.com	ILIF	71.5%	42.0%	0.09+
16-Dec-99	SW	DuPont Photopolymer and Electronic Materials	DD	DuPont iTechnologies	DD	6.7%	9.6%	0.48
28-Jan-99	CDR	Rld Enterprises Inc	RLDS	Go-Rachels.Com Corporation	RACH	-72.3%	198.4%	0.72
22-Jun-99	CDR	Panther Resources	PTHR	Phantomfilm.Com	PHLM	162.3%	59.9%	0.01**
11-Jun-99	CDR	Eduverse Accelerated Learning Systems	EDUV	Eduverse.Com	EDUV	-20.9%	39.5%	0.60
28-Jun-99	CDR	Showstar Entertainment Corp	ABID	Showstar Online.Com	ABID	-9.8%	53.7%	0.86
18-Feb-99	CDR	Chopp Computer Corporation	CHPP	Ants Software.Com	ANTS	-33.7%	54.6%	0.54
11-May-99	CDR	New Generation Foods	NGNF	Creditriskmonitor.Com	CRMZ	-87.4%	345.6%	0.80
23-Mar-99	CDR	Securities Resolution Advisors Inc	PAID	Sales Online Direct Inc	PAID	-26.3%	95.1%	0.78
25-Jun-99	CDR	North American Natural	NANR	Pinkmonkey.Com Inc	PMKY	7.2%	102.5%	0.94
10-Jun-99	CDR	Nds Software Inc	NDSS	Homeseekers.Com Inc	HMSK	-27.6%	34.4%	0.42
17-Mar-99	CDR	Score Medical Corporeation	SCRE	Imatters.Com	IWEB	89.9%	44.1%	0.04*
07-May-99	CDR	Auto Network Gp Anwk	AUTO	Tradecenter.Com	AUTC	-35.7%	85.7%	0.68
12-Jul-99	CDR	Golden Pharmaceuticals	GPHI	Docsales.Com	DOCP	-40.2%	84.1%	0.63
21-Jan-99	CDR	Atlanta Technology Group Inc	ATYG	Docplus.Net Corporation	ATYG	-34.3%	121.8%	0.78
29-Apr-99	CDR	Frontier Financial Holdings	FDIR	Evision Usa.Com	EVIS	45.5%	107.8%	0.67
14-Apr-99	CDR	Microcap Financial Services	MFSI	Globalnet Financial.Com	GLBN	28.4%	64.0%	0.66
20-Jul-99	CDR	Qcs Corp	QCSC	Sourcinglink.Net	SNET	17.8%	49.9%	0.72
20-Jan-99	CDR	You Bet International Inc	UBET	Yobet.Com Inc	UBET	121.8%	26.9%	0.00**
02-Mar-99	CDR	International Food & Beverage Inc	IFDB	Internet Business'S International Inc	IBUI	440.1%	426.6%	0.30
27-May-99	CDR	Henley Gp	HNLY	Cis.Com	CISI	228.1%	60.0%	0.00**
21-Jan-99	CDR	Foodquest International Corporation	FDQI	Dealcheck.Com Inc	DEAL	457.3%	61.1%	0.00**
07-May-99	CDR	Ejh Entertainment	TIXXD	Findex.Com	FIND	933.7%	44.6%	0.00**

Appendix - 6

DATE	SW, CDR or B&M	Old Name	Old Symbol	New Name	New Symbol	CAR (-10,10)	STD ERR (Day 10)	P-value (Two Tail)
16-Dec-99	B&M	Wexford Technology, Incorporated	WXFD	sureBET Casinos, Inc.	DICE	71.5%	173.6%	0.68
15-Dec-99	B&M	Barrister Information Systems Corporation	BIS	BISPoint Technologies	BIS	-28.7%	38.6%	0.46
14-Dec-99	B&M	Inland Entertainment	INLD	Venture Catalyst Incorporated	VCAT	32.0%	34.3%	0.35
14-Dec-99	B&M	Top Source Technologies	TPS	Global Technovations, Inc.	GTN	-42.0%	33.8%	0.21
13-Dec-99	B&M	Principal Health Care of the Carolinas, Inc.	CVTY	Coventry Health Care of the Carolinas, Inc.	CVTY	15.7%	24.2%	0.52
10-Dec-99	B&M	Vacu-dry Company	VDRY	SonomaWest Holdings, Inc.	SWHI	-4.0%	22.9%	0.86
06-Dec-99	B&M	Middle Bay Oil Company Inc.	MBOC	3TEC Energy Corporation	TTEN	-18.5%	40.3%	0.65
24-Nov-99	B&M	Alexa Ventures Inc.	ALVEF	Eiger Technology, Inc.	ETIFF	40.1%	40.9%	0.33
23-Nov-99	B&M	ShareData Inc.	SHRD	Aztore Holdings, Inc.	AZHG	-187.2%	666.8%	0.78
22-Nov-99	B&M	PageMart Wireless, Inc.	PMWI	WebLink Wireless Inc.	WLNK	46.2%	23.6%	0.05+
19-Nov-99	B&M	CAM Data Systems	CADA	CAM Commerce Solutions	CADA	49.7%	17.1%	0.00**
19-Nov-99	B&M	CMS Continental Natural Gas, Inc.	CMS	CMS Field Services, Inc.	CMS	-4.6%	6.2%	0.46
10-Nov-99	B&M	The National Registry, Inc.	NRID	SAFLINK Corporation	ESAF	10.6%	79.7%	0.89
05-Nov-99	B&M	Alanco Environmental Resources Corp.	ALAN	Alanco Technologies Inc.	ALAN	64.8%	46.7%	0.17
04-Nov-99	B&M	Palomar Savings and Loan	CWBC	Palomar Community Bank	CWBC	-11.7%	15.0%	0.44
03-Nov-99	B&M	Leviathan Gas Pipeline Partners, L.P.	LEV	El Paso Energy Partners, L.P.	EPN	-5.6%	9.0%	0.53
02-Nov-99	B&M	Lucky	LDG	Albertson's Inc.	ABS	-13.2%	8.8%	0.14
02-Nov-99	B&M	Regency Voice Systems, Inc.	TSAI	Regency Systems, Inc.	TSAI	24.2%	14.4%	0.09+
02-Nov-99	B&M	First Community Bank of Southwest Georgia	PAB	The Bank of Grady County	PAB	-5.2%	13.5%	0.70
29-Oct-99	B&M	Quicken InsureMarket Service	INTU	QuickenInsurance	INTU	8.5%	18.7%	0.65
28-Oct-99	B&M	CenterSpan Communications Corp.	TMSR	CenterSpan Communications Corp.	CSCC	-35.3%	48.4%	0.47
26-Oct-99	B&M	First Mutual Savings Bank	FMSB	First Mutual Bank	FMSB	1.4%	14.8%	0.93
25-Oct-99	B&M	Hyperion Telecommunications, Inc.	HYPT	Adelphia Business Solutions, Inc.	ABIZ	1.5%	24.2%	0.95
22-Oct-99	B&M	Ultra Cycles	BIKR	Ultra Motorcycle Company	BIKR	-29.1%	52.2%	0.58
22-Oct-99	B&M	Fourteen Hill Capital, L.P.	PWCC	Point West Ventures, L.P.	PWCC	-23.0%	50.9%	0.65
21-Oct-99	B&M	Heckett MultiServ*	HSC	Harsco Mill Services Group	HSC	7.5%	9.5%	0.43
18-Oct-99	B&M	FutureLink Distribution Corp.	CTXS	FutureLink Corp.	CTXS	-3.5%	16.5%	0.83
14-Oct-99	B&M	Granite Financial, Inc.	GFNL	FNF Capital, Inc.	FNF	12.9%	13.5%	0.34
13-Oct-99	B&M	Aetna Retirement Services	AET	Aetna Financial Services	AET	-16.2%	9.4%	0.09+
13-Oct-99	B&M	American Real Estate Investment Corporation	REA	Keystone Property Trust	KTR	5.5%	9.3%	0.55

## Appendix - 7

DATE	SW, CDR or B&M	Old Name	Old Symbol	New Name	New Symbol	CAR (-10,10)	STD ERR (Day 10)	P-value (Two Tail)
07-Oct-99	B&M	Green Tree Financial Corporation	GNT	Conseco Finance Corp.	CNC	5.0%	13.3%	0.71
06-Oct-99	B&M	C3, Inc.	CTHR	Charles & Colvard	CTHR	-20.9%	23.9%	0.38
05-Oct-99	B&M	GSG Securities, Inc.*	JWG	JWGenesis Financial Group, Inc.	JWG	-24.9%	27.2%	0.36
30-Sep-99	B&M	Credit & Risk Management Associates*	FIC	Fair, Isaac*	FIC	23.0%	12.8%	0.07+
27-Sep-99	B&M	The Rattlesnake Holding Company, Inc.	RTTL	Spencer's Restaurants, Inc.	SPST	-66.7%	81.0%	0.41
27-Sep-99	B&M	SPS Payment Systems	AFS	Associates Commerce Solutions	AFS	9.7%	10.9%	0.38
22-Sep-99	B&M	Vodafone AirTouch Satellite Services	VOD	Globalstar USA	VOD	16.0%	10.0%	0.11
21-Sep-99	B&M	LOGAL Educational Software & Systems Ltd.	LOGLF	SimPlayer.com Ltd.	SMPL	2.9%	58.5%	0.96
20-Sep-99	B&M	Technor International, Inc.	TNOR	CellPoint Inc.	CLPT	51.2%	30.3%	0.09+
20-Sep-99	B&M	Processors Unlimited	USFC	USF Processors	USFC	-7.3%	13.1%	0.58
20-Sep-99	B&M	Crown Communications	TWRS	Crown Castle International Corp.	TWRS	5.1%	23.6%	0.83
17-Sep-99	B&M	Racom Systems, Inc.	RCOM	NewState Holdings, Inc.	NSTH	-95.5%	125.0%	0.45
16-Sep-99	B&M	Sensys Technologies, Inc.	STST	Sensytech, Inc.	STST	5.2%	20.6%	0.80
16-Sep-99	B&M	MySoftware Company	MYSW	ClickAction Inc.	CLAC	-1.2%	31.5%	0.97
15-Sep-99	B&M	Inmark Enterprises, Inc.	IMKE	CoActive Marketing Group, Inc.	CMKG	-8.5%	31.6%	0.79
15-Sep-99	B&M	Florida Panthers Holdings, Inc.	PAW	Boca Resorts, Inc.	RST	-2.1%	16.7%	0.90
15-Sep-99	B&M	Medtronic Micro-Rel	MDT	Medtronic Microelectronics Center	MDT	-9.2%	9.4%	0.33
14-Sep-99	B&M	UOL Publishing, Inc.	UOLP	Vcampus Corporation	VCMP	-21.7%	44.0%	0.62
14-Sep-99	B&M	Mellon Bank Corporation	MEL	Mellon Financial Corporation	MEL	1.8%	7.0%	0.80
13-Sep-99	B&M	Ocean Financial Corp.	OCFC	OceanFirst Financial Corp.	OCFC	-5.6%	11.2%	0.62
10-Sep-99	B&M	First National Bank of Chicago	ONE	Bank One Corporation	ONE	-10.3%	10.7%	0.34
10-Sep-99	B&M	Bozell Worldwide	TNO	FCB Worldwide	TNO	7.2%	13.5%	0.60
09-Sep-99	B&M	SVI Holdings Inc.	SVI	SVI Systems Inc.	SVI	-8.9%	17.4%	0.61
09-Sep-99	B&M	Objective Communications, Inc.	OCOM	Video Network Communications, Inc.	VNCI	-8.2%	34.9%	0.82
07-Sep-99	B&M	Western Country Clubs Inc.	WCCI	Atomic Burrito Inc.	ATOM	-23.8%	38.7%	0.54
07-Sep-99	B&M	Imagek, Inc.	IRSN	Silicon Film Technologies, Inc.	IRSN	23.0%	23.9%	0.34
07-Sep-99	B&M	UPC	UPCOY	UPC	UPC	-4.3%	7.4%	0.56
02-Sep-99	B&M	Atlantic Bank and Trust Company	ATLB	Capital Crossing Bank	CAPX	-7.7%	37.6%	0.84
02-Sep-99	B&M	Mutual Mortgage of the Piedmont, Inc.	AMNB	ANB Mortgage Corp.	AMNB	-4.1%	12.2%	0.74
31-Aug-99	B&M	CustomTracks Corporation	CUST	ZixIt Corporation	ZIXI	-33.3%	39.8%	0.40
26-Aug-99	B&M	Bull & Bear U.S. Government Securities Fund, Inc.	BXL	Bexil Corporation	BXL	-5.4%	4.6%	0.23

Appendix - 8

DATE	SW, CDR or B&M	Old Name	Old Symbol	New Name	New Symbol	CAR (-10,10)	STD ERR (Day 10)	P-value (Two Tail)
25-Aug-99	B&M	AvTel Communications, Inc.	AVCO	NetLojix Communications, Inc.	NETX	-98.2%	361.5%	0.79
25-Aug-99	B&M	Sirco International Corp.	SIRC	Essex Network Services Corp.	ELEC	-11.9%	63.8%	0.85
23-Aug-99	B&M	Club Hotel by Doubletree	PRH	Doubletree Clubs	PRH	23.7%	13.8%	0.09+
20-Aug-99	B&M	Medical Science Systems, Inc.	MSSI	Interleukin Genetics, Inc.	ILGN	23.6%	53.8%	0.66
19-Aug-99	B&M	Western Investment Real Estate Trust	WIR	Western Properties Trust	WIR	-2.1%	7.7%	0.79
17-Aug-99	B&M	Air Transportation Holding Company, Inc.	AIRT	Air T, Inc.	AIRT	23.8%	32.0%	0.46
17-Aug-99	B&M	Howmet Cercast (U.S.A.), Inc.	HWM	Howmet Aluminum Casting Inc.	HWM	-2.8%	11.2%	0.80
04-Aug-99	B&M	Compaq Capital Corporation	CPQ	Compaq Financial Services Corporation	CPQ	-2.7%	14.2%	0.85
02-Aug-99	B&M	Realty Information Group, Inc.	RIGX	CoStar Group, Inc.	CSGP	-65.3%	23.2%	0.01**
28-Jul-99	B&M	Irwin Naturals/4Health, Inc.	HHHH	Omni Nutraceuticals, Inc.	ZONE	46.9%	34.9%	0.18
28-Jul-99	B&M	Unique Casual Restaurants, Inc.	UNIQ	Champps Entertainment, Inc.	CMPP	0.9%	17.7%	0.96
26-Jul-99	B&M	Customer Development Corporation	CPS	ChoicePoint Direct	CPS	-8.5%	8.0%	0.29
21-Jul-99	B&M	Microfluidics International Corporation	MFIC	MFIC Corporation	MFIC	6.2%	44.9%	0.89
20-Jul-99	B&M	D.G. Jewellery of Canada Ltd.	DGJL	D.G. Jewelry Ltd.	DGJL	-13.1%	26.3%	0.62
19-Jul-99	B&M	Foodmaker Inc.	FM	JACK IN THE BOX INC.	JBX	-5.8%	11.8%	0.63
19-Jul-99	B&M	VDI Media	VDIM	VDI MultiMedia	VDIM	24.4%	23.3%	0.30
15-Jul-99	B&M	Aspect Telecommunications Corporation	ASPT	Aspect Communications Corporation	ASPT	22.7%	26.6%	0.40
12-Jul-99	B&M	Managed Care Solutions, Inc.	MCSX	Lifemark Corporation	LMRK	-1.3%	27.3%	0.96
07-Jul-99	B&M	Kit Karson Corporation of Willow Park, Texas	KTKC	Ness Energy International, Inc.	NESS	156.3%	47.9%	0.00**
06-Jul-99	B&M	VISTA Information Solutions Inc.	VINF	VISTA info	VINF	0.9%	22.0%	0.97
06-Jul-99	B&M	BRIO INDUSTRIES INC.	BRIO	Leading Brands Inc.	BRIO	13.7%	29.1%	0.64
01-Jul-99	B&M	DenAmerica Corp.	DEN	Phoenix Restaurant Group, Inc.	PRG	10.2%	26.8%	0.70
29-Jun-99	B&M	Kafus Industries	KS	Kafus Industries Ltd.	KS	-3.4%	18.6%	0.86
28-Jun-99	B&M	KELLEY OIL & GAS CORPORATION	KOGC	Contour Energy Co.	CONC	19.2%	34.1%	0.57
24-Jun-99	B&M	Online System Services, Inc.	WEBB	Webb Interactive Services, Inc.	WEBB	12.3%	31.6%	0.70
23-Jun-99	B&M	MacNeal-Schwendler Corp.	MNS	MSC Software Corp.	MNS	9.3%	11.5%	0.42
22-Jun-99	B&M	Omega Health Systems, Inc.	OHSI	VisionAmerica Incorporated	VSNAE	4.0%	26.3%	0.88
22-Jun-99	B&M	Nobel Learning Solutions (Developmental Resource Center schools)*	NLCI	Paladin Academy	NLCI	-4.1%	17.6%	0.82

Appendix - 9

DATE	SW, CDR or B&M	Old Name	Old Symbol	New Name	New Symbol	CAR (-10,10)	STD ERR (Day 10)	P-value (Two Tail)
17-Jun-99	B&M	Morrison Health Care, Inc.	MHI	Morrison Management Specialists	MHI	18.1%	6.6%	0.01**
17-Jun-99	B&M	Gensia Sicor Inc.	GNSA	SICOR Inc.	SCRI	-12.2%	26.3%	0.64
14-Jun-99	B&M	Crystal Oil Company	COR	Crystal Gas Storage, Inc.	COR	4.2%	4.3%	0.32
14-Jun-99	B&M	Cleco Services LLC	CNL	UtiliTech Solutions	CNL	-6.7%	6.2%	0.28
14-Jun-99	B&M	Transcom International Limited	TRIXY	New Tel Limited	NWLL	-9.2%	28.7%	0.75
11-Jun-99	B&M	CellPro, Incorporated	CPRO	CPX Corp.	CPRO	-29.3%	88.3%	0.74
11-Jun-99	B&M	Johnstown America Industries, Inc.	JAIL	Transportation Technologies Industries, Inc.	TTII	-15.6%	16.1%	0.33
07-Jun-99	B&M	Crag Technologies	WDC	Connex	WDC	-24.8%	24.3%	0.31
07-Jun-99	B&M	United International Holdings, Inc.	UIHIA	UnitedGlobalCom	UCOMA	-12.8%	22.4%	0.57
04-Jun-99	B&M	U-Ship, Inc.	USHP	United Shipping and Technology, Inc.	USHP	-31.5%	46.1%	0.49
03-Jun-99	B&M	Nitinol Medical Technologies, Inc.	NMTI	NMT Medical, Inc.	NMTI	4.3%	27.9%	0.88
27-May-99	B&M	Brown Group, Inc.	BG	Brown Shoe Company, Inc.	BWS	6.1%	11.6%	0.60
27-May-99	B&M	Modern Controls, Inc.	MOCO	MOCON, Inc.	MOCO	10.7%	17.7%	0.55
26-May-99	B&M	Wavo Corp.	WAVO	WavePhore Inc.	WAVO	-10.2%	39.6%	0.80
25-May-99	B&M	Jean Philippe Fragrances, Inc.	JEAN	Inter Parfums, Inc.	IPAR	9.6%	14.3%	0.50
24-May-99	B&M	SOFTWARE AG SYSTEMS, Inc.	AGS	SAGA SYSTEMS, Inc.	AGS	36.8%	24.1%	0.13
19-May-99	B&M	Interstate Energy Corporation	LNT	Alliant Energy	LNT	5.9%	5.9%	0.32
18-May-99	B&M	INA Investment Securities, Inc.	IIS	CIGNA Investment Securities, Inc.	IIS	-0.6%	4.2%	0.89
12-May-99	B&M	Acclaim Entertainment, Inc.	AKLM	Acclaim Studios**	AKLM	-2.0%	19.1%	0.92
11-May-99	B&M	Tompkins County Trustco, Inc.	TMP	Tompkins Trustco, Inc.	TMP	1.4%	4.9%	0.78
10-May-99	B&M	Hreasy	IS	Interim Assessment Services	IS	36.7%	14.8%	0.01*
06-May-99	B&M	Century Telephone Enterprises, Inc.	CTL	CenturyTel, Inc.	CTL	-10.5%	8.0%	0.19
04-May-99	B&M	Borg-Warner Security Corporation	BOR	Burns International Services Corporation	BOR	-10.1%	11.7%	0.39
03-May-99	B&M	Platinum Software Corporation	PSQL	Epicor Software Corporation	EPIC	21.7%	29.4%	0.46
30-Apr-99	B&M	Royce Global Trust, Inc.	FUND	Royce Focus Trust, Inc.	FUND	16.3%	10.9%	0.14
29-Apr-99	B&M	Cytel Corporation	CYTL	Epimmune	EPMN	11.8%	83.7%	0.89
28-Apr-99	B&M	Poe & Brown, Inc.	PBR	Brown & Brown, Inc.	BRO	8.6%	8.8%	0.33
28-Apr-99	B&M	BankAmerica Corporation	BAC	Bank of America Corporation	BAC	-6.0%	9.8%	0.54
28-Apr-99	B&M	Tyler Corporation	TYL	Tyler Technologies, Inc.	TYL	38.7%	23.6%	0.10
26-Apr-99	B&M	Security Life Reinsurance	ING	ING Reinsurance	ING	3.5%	10.7%	0.74
26-Apr-99	B&M	PC Quote, Inc.	PQT	HyperFeed Technologies, Inc.	HYPR	-20.1%	73.8%	0.79
20-Apr-99	B&M	Global DirectMail Corp	GML	Systemax Inc.	SYX	-0.4%	17.0%	0.98
20-Apr-99	B&M	Diefenbach Elkins and Davies Baron	IPG	The FutureBrand Company	IPG	-4.8%	7.3%	0.51

Appendix - 10

DATE	SW, CDR or B&M	Old Name	Old Symbol	New Name	New Symbol	CAR (-10,10)	STD ERR (Day 10)	P-value (Two Tail)
20-Apr-99	B&M	Brokers Transaction Services	SWS	SWS Financial Services, Inc.	SWS	66.0%	21.0%	0.00**
15-Apr-99	B&M	Cellular One of Southwest Colorado	AT	ALLTEL	AT	5.2%	7.5%	0.48
08-Apr-99	B&M	Alliance Capital Management L.P.	AC	Alliance Capital Management Holding L.P.	AC	-0.1%	8.5%	0.99
07-Apr-99	B&M	California Microwave, Inc.	CMIC	Adaptive Broadband Corporation	ADAP	50.7%	22.2%	0.02*
07-Apr-99	B&M	PhyMatrix Corp.	PHMX	Innovative Clinical Solutions, Ltd.	ICSL	-5.7%	31.8%	0.86
06-Apr-99	B&M	Republic Industries, Inc.	RWIN	AutoNation, Inc.	AN	5.9%	13.5%	0.66
05-Apr-99	B&M	Scangraphics, Inc.	SCNG	SEDONA Corporation	SDNA	-42.4%	33.9%	0.21
31-Mar-99	B&M	Harcourt Brace & Company	H	Harcourt, Inc.	H	-0.4%	6.0%	0.95
31-Mar-99	B&M	Guaranty National	OC	OrionAuto	OC	-6.8%	8.2%	0.41
30-Mar-99	B&M	Axiom Inc.	AXIM	Telesciences, Inc.	TLSI	18.8%	50.6%	0.71
25-Mar-99	B&M	Tel-Com Wireless Cable TV Corp	TCTV	5th Avenue Channel Corp.	FAVE	-32.9%	51.0%	0.52
23-Mar-99	B&M	Harmonic Lightwaves	HLIT	Harmonic Inc.	HLIT	37.5%	23.8%	0.12
22-Mar-99	B&M	Electromagnetic Sciences, Inc.	ELMG	EMS Technologies, Inc.	ELMG	3.3%	17.0%	0.85
17-Mar-99	B&M	JANUS AMERICAN GROUP, INC.	JAGI	Janus Hotels and Resorts, Inc.	JAGI	-33.8%	38.3%	0.38
11-Mar-99	B&M	Northern Telecom Limited	NTL	Nortel Networks Corporation	NTL	5.9%	12.0%	0.62
10-Mar-99	B&M	Fiserv Forms & Graphics	FISV	Fiserv Document Solutions	FISV	12.4%	10.8%	0.25
10-Mar-99	B&M	Casa Ole Restaurants Inc.	CASA	Mexican Restaurants Inc.	CASA	-1.8%	18.2%	0.92
08-Mar-99	B&M	The Southland Corporation	SLCM	7-Eleven, Inc.	SVEV	16.4%	20.4%	0.42
03-Mar-99	B&M	Securities Resolution Advisors Inc.	SRAD	Sales Online Direct Inc.	PAID	-45.1%	95.7%	0.64
02-Mar-99	B&M	NIPSCO Industries, Inc.	NI	NiSource Inc.	NI	3.8%	5.2%	0.46
02-Mar-99	B&M	Mike's Original, Inc.	MIKS	New Yorker Marketing Corp.	NYIJE	-74.8%	237.4%	0.75

SW, CDR, or B&M refers to the data set, and stands for either the dotcom dataset in this paper, the CDR data, or the brick and mortar data set in this paper.

For the p-values:

- + indicates significance at the 10% level of a two tailed test (i.e. the result is either in the top 5% or the bottom 5%)
- \* indicates significance at the 5% level of a two tailed test
- \*\* indicates significance at the 1% level of a two tailed test

## APPENDIX C: PROOF OF NON-PARAMETRIC TEST STATISTIC

First we construct an indicator variable which such that:

$$B_f = \begin{cases} 1 & \text{if CAR} > 0 \\ 0 & \text{if CAR} \leq 0 \end{cases} \quad (1d)$$

where  $f$  is a different subscript for each firm.

Under the null hypothesis that no event occurs  $B_f$  is distributed as a Bernoulli random variable with  $p = 0.5$ . That is to say that there is a 0.5 chance that  $B_f$  is positive, which means a 50% chance that a firm does better than average on any given day.

It is well known that the sum of  $n$  Bernoulli's with parameter  $p$  yields a Binomial distribution with parameters  $n$  and  $p$ . Thus, the number of firms with positive CAR's is distributed Binomial.

$$\sum_{f=1}^n B_f \sim \text{BINOMIAL}(n, p) \quad (2d)$$

It is also well known that a Binomial distribution with adequate degrees of freedom is distributed approximately normal, with mean  $np$  and variance  $np(1-p)$ .

$$\text{BINOMIAL}(n, p) \approx N(np, np(1-p)) \quad (3d)$$

However, we are interested in the relative percent rather than the absolute number, thus we must divide by the number of firms in the sample ( $n$ ).

$$\frac{N(np, np(1-p))}{n} \sim N\left(p, \frac{p(1-p)}{n}\right) \quad (4d)$$

From this we can construct a test statistic. First we note that,

$$\frac{P}{n} \sim N\left(p, \frac{p(1-p)}{n}\right) \quad (5d)$$

where  $P$  is the number of firms with positive return and  $n$  is the total number of firms in the sample. Simple algebra yields,

$$\frac{P}{n} - p \sim N\left(0, \frac{p(1-p)}{n}\right) \quad (6d)$$

$$\sqrt{n} \left( \frac{\frac{P}{n} - p}{\sqrt{p(1-p)}} \right) \sim N(0,1) \quad (7d)$$

Substituting in  $p = 0.5$ , and converting the  $n$  to uppercase  $N$  yields.

$$\sqrt{N} \left( \frac{\frac{P}{N} - 0.5}{0.5} \right) \sim N(0,1) \quad (8d)$$