The Role of Information in Stock Split Announcement Effects

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Abstract

This study investigates the role of information in stock split announcement effects by examining pure stock split announcements across a range of stocks differing in terms of information richness. Pure split announcements are defined as those that have no other firm-specific news in the six day period around the announcement day. The positive proxy for information richness is the number of analysts making annual estimates of firm earnings. The results presented support the hypotheses that market anticipation of split announcements is related directly to the stocks' information richness; the magnitude of the announcement effect (event days 0 and +1) is greater for information-poor stocks; the postannouncement market price adjustment process is rapid and complete for information-rich stocks, but is slow and incomplete for information-poor stocks.

Introduction

Many researchers have referred (and still refer) to stock splits as financial puzzles. The paradoxical nature of stock splits probably stems from two widely held, but diametric, views:

- Stock splits are merely costly paper shuffling exercises that cannot affect the value of the firm;[1]
- The value of the firm immediately and significantly increases upon the announcement of impending stock splits.

The second view recently has gained credence from studies that carefully document positive valuation effects around the time of stock split announcements. While several reasons for these announcement effects have been offered

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[1]For example, see Francis (1986).

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(including trading range, attention, signaling, and tax), important questions remain unanswered.

The purpose of this study is to determine the role that information plays in stock split announcement effects by examining pure stock split announcements across a range of stocks differing in terms of their information richness. The reason for suspecting that information and split effects are related is found in Merton (1987). He questions the received paradigm that in all cases the complete diffusion of public information occurs instantaneously and that investors process and react to that information immediately. An alternative model is that diffusion takes time; its rate differs across firms; and not all investors react promptly. If the alternative is a reasonable description of real capital markets, then the process by which market prices adjust to the information contained in stock split announcements will differ across firms.

Relevant Literature

Grinblatt, Masulis, and Titman (1984) find that stocks listed on the New York Stock Exchange (NYSE) and American Stock Exchange (AMEX) react positively to stock split announcements that are not contaminated by other contemporaneous firm-specific news. Their analysis supports both the trading range and attention hypotheses. Their findings are confirmed by Ball and Torous (1988) using a maximum-likelihood method that incorporates the possibility of a random event date rather than the standard multiday approach. Lakonishok and Lev (1987) find that splits are aimed primarily at restoring stock prices to a normal trading range; however, they also find some support for the signaling-based hypothesis. Further, Liljeblom (1989) confirms the presence of stock split announcement effects for stocks traded on the Stockholm Stock Exchange.

Brennan and Copeland (1988a) assume that managers use stock split announcements to communicate their private information about the firm's prospects to investors. Their signaling model is based on the relation between stock trading costs and stock prices, and they find that it explains a substantial portion of the observed split announcement returns. Conroy, Harris, and Benet (1990) find that bid-ask spreads increase in percentage terms subsequent to splits and impose a liquidity cost on investors; therefore, stock splits act as a valid signal.

Lamoureux and Poon (1987) argue that split announcement effects are due to the increase in the tax-option value of the split. Doran and Nachtmann (1988), Klein and Peterson (1989), and Asquith, Healy, and Palepu (1989) associate positive split announcement effects with favorable earnings forecast revisions and significant postannouncement earnings growth. McNichols and Dravid (1990)

find that managers signal their private information about the firm's future earnings by their choice of the split factor.

Brennan and Copeland (1988b) report a temporary increase in the stocks' betas on both the split announcement date and the effective date; moreover, they find a permanent increase in betas following the ex-date. Klein and Peterson (1988) find evidence of increased volatility and market inefficiency in call option prices around the announcement and ex-dates of large stock splits. Foster and Scribner (1991) find announcement effects after controlling for beta nonstationarity.

Dubofsky analyzes 1,856 NYSE and 696 AMEX stock splits with a split factor of two or greater from 1962 through 1987 and uncovers an increase in ex-split return variance for AMEX-listed stocks. The postsplit increase in daily return volatility is less for AMEX stocks than for NYSE stocks. After controlling for price and firm size, exchange trading location is a significant factor in explaining postsplit increased volatility.

Klein and Peterson (1988) study the behavior of call option prices around split announcement and ex-dates and observe that the abnormal price behavior documented in the stock market extends to the option market. Moreover, they find that call options do not reflect underlying stock price volatility increases until the ex-date. Sheikh (1989) also detects no increase in the implied standard deviations of stocks at the split announcement date; however, he observes increased implied standard deviations at the predictable split ex-dates which translate into excess returns for market makers in the options market.

In closing, this research extends the stock split literature by investigating the role of information in stock split announcement effects. The current research questions are motivated by Merton's (1987) insight that the dissemination of information throughout the market may not be an instantaneous event, but that it may be viewed as a gradual process that takes time. To implement this insight, a sample of stocks from the NYSE, AMEX, and over the counter (OTC) market is constructed. The sample then is grouped according to a positive proxy for their degree of information richness. Three hypotheses are tested:

- The degree of market anticipation is related directly to the stock's information environment, with greater anticipation for stocks about which there is more information;
- The magnitude of the two day split effect at the time of the announcement (event days 0 and +1) is greater for information-poor stocks than for information-rich stocks; and
- The market adjusts rapidly and completely to the split announcement for information-rich stocks, but not for information-poor stocks. Therefore, the effect continues.

The Sample

An important element of this study is that it includes firms whose stocks are traded over the counter in addition to stocks traded on the NYSE and AMEX. OTC stocks are included because they tend to be information-poor relative to exchange-listed stocks. Therefore, the role of information in stock split announcement effects, if it is important, should be evident.

The sources of data for this study are the daily returns files of the Center for Research in Security Prices (CRSP) for return data; the *Wall Street Journal* and *Barron's* for stock split announcements; and Institutional Brokers Estimate Service, Inc. (I/B/E/S) and Ford Investor Service, Inc. for the number of analysts making annual firm earnings estimates.

Stock split announcements are defined as pure if they are not contaminated by any other firm-specific news (e.g., dividend announcements, earnings forecasts, or share repurchases) on either the announcement day or during the three business days before or after the announcement day (event days -3, -2, -1, 0, +1, +2, and +3). This definition leads to a two stage sample construction process. Sample construction begins by using the Dow Jones News/Retrieval Text-Search Service[2] to identify articles that simultaneously contain stock split announcements[3] and do not contain dividend announcements during the four year period from January 1, 1984 through December 31, 1987. The initial search stage yields 157 stock split announcement articles. The *Wall Street Journal Index* is used to check the period around each of the 157 announcements for contaminating firm-specific news. If found, the announcement is deemed contaminated and is excluded. Fifty-two of the 157 initial announcements are contaminated. The final sample consists of 105 pure split announcements; 33 listed on either the NYSE or AMEX and 72 traded OTC.

The number of analysts making earnings estimates, as reported by I/B/E/S, is used as the positive proxy for the stock's degree of information richness.[4] From the sample of 105 stocks, one information subsample containing 49 stocks followed by zero analysts is created. The remaining 56 stocks are divided into two subsamples of approximately equal size based on the number of analysts making earnings estimates.

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[2]Dow Jones & Company, Inc. offers text-search services through Dow Jones New/Retrieval, an on-line comprehensive database. This service permits the convenient search of articles in the *Wall Street Journal* and *Barron's* for the presence of key words and the absence of key words. The preliminary search selected articles for consideration subject to the requirement that the word *split* be present and the word *dividend* be absent.

[3]To be considered, the split must be an exchange of at least five shares of common stock for four previously outstanding shares.

[4]Justification for this proxy is found in Arbel, Carvell, and Strebel (1983) and Carvell and Strebel (1987).

Table 1 shows the mean number (and range) of analysts making earnings estimates for stocks in subsamples I, II, and III to be 0.0 (0-0), 1.8 (1-3), and 12.6 (4-28), respectively. Because the stocks in subsample I are followed by zero analysts, the interpretation is that they are information-poor. Although all the stocks in subsamples II and III are followed by security analysts, only those stocks in subsample III are considered to be information-rich. Stocks in subsample III are considered to be information-rich because the mean number of analysts is 12.6, compared to 11.0 for the 2,000 stocks in the Ford database, a proxy for the market.[5]

Methodology

This research tests three hypotheses concerning the role of information in stock split announcement effects. They are:

- The degree of market anticipation is related directly to the stock's information environment, with greater anticipation for stocks about which there is more information;
- The magnitude of the two day split effect at the time of the announcement (event days 0 and +1) is greater for information-poor stocks than for information-rich stocks; and
- The market adjusts rapidly and completely to the split announcement for information-rich stocks, but not for information-poor stocks; therefore, the effect continues.

These hypotheses are tested using standard event study methodology in which the event is defined as the announcement date of the pure stock split.

Because no evidence of calendar-time clustering of announcement dates is found, it is assumed that overall market movements tend to average over the period.[6] Therefore, the mean-adjusted return methodology used in Grinblatt, Masulis, and Titman is deemed appropriate to use in this study. For each event day (-40, ... , 0, ... , +43), the cross-sectional mean daily return is compared to a postannouncement benchmark return. The benchmark return is the grand daily mean return over the 40 trading day period from event day +4, ... , +43, inclusive. A t-test is used to test the null hypothesis that the difference between the mean daily return for the event day in question and the grand mean daily return

[5]The Ford database is a product of Ford Investor Service, Inc. and includes 2,000 NYSE, AMEX, and OTC firms. The mean number of analysts making earnings forecasts is as of August 1989.

[6]This finding is consistent with Grinblatt, Masulis, and Titman (1984).

during the 40 day postannouncement benchmark period is zero against the two-tailed alternative hypothesis that the difference is nonzero.[7]

The Evidence

Aggregate Sample

Summary statistics for the number of analysts making earnings estimates—the positive proxy for information—are displayed in Table 1. The mean number (and range) of analysts following the 105 firms in the aggregate sample is 4.2 (0-28). Of the 105 firms in the sample, 49 (46.7 percent) are followed by zero analysts. The mean daily (unadjusted) percentage stock returns, t-statistics, and significance levels for stocks in the aggregate sample are displayed in column 1 of Table 2. The mean daily returns for days 0 and +1 are 1.928 percent and 1.337 percent, respectively. Each is significantly different from the grand daily mean postannouncement benchmark return of 0.166 percent. Thus, the presence of a stock split announcement effect for the aggregate sample is confirmed. In addition, the mean daily returns for days -1 and -2 are also significantly different from the mean postannouncement period return, providing strong evidence of market anticipation or leakage.

Three Subsamples

From columns 2 through 4 in Table 2, there is no evidence of market anticipation in subsample I; there is evidence of anticipation on days -1 and -2 in subsample II; there is evidence of anticipation on days -1, -2, -3, -4, and -5 in subsample III. These results provide strong support for the first hypothesis that the degree of market anticipation is related directly to the stock's information

[7]The t-statistic is the same as in Grinblatt, Masulis, and Titman (Table 3a, footnote b). For convenience, it is reproduced below:

$$t = \frac{R_t - \bar{R}}{\sum_{i=4}^{43} \left[\frac{(R_i - \bar{R})^2}{39}\right]^{1/2}}$$

where:

$\bar{R}$ = $\sum_{i=4}^{43} R_i/40$; and

R_i = Mean return across stocks on event day i.

environment, with greater anticipation for stocks about which there is more information.

Mixed support is found for the second hypothesis that the magnitude of the split announcement effect is greater for information-poor stocks than for information-rich stocks. The two day raw returns (and grand mean daily postannouncement benchmark returns) for subsample I, II, and III are 3.34 percent (0.28 percent), 3.95 percent (0.20 percent), and 2.68 percent (-0.37 percent), respectively. Their excess two day returns are 2.78 percent, 3.56 percent, and 3.42 percent, respectively. These mixed results may be interpreted by arguing that a firm followed by few analysts is likely to be a firm about which few investors are aware. Therefore, precisely because few investors are aware of such a firm, the full market reaction to the announcement may not be instantaneous. It may take time.

The results provide support for the third hypothesis that the market adjusts rapidly and completely to the stock split announcement during the postannouncement period for information-rich stocks but not for information-poor stocks. This is shown in Figure 1 which is an overlay plot of the cumulative mean daily (unadjusted) percentage returns on each of the three stock split subsamples. For firms in subsample I and II, the returns exhibit a noticeable upward trend; however, they do not do so for firms in subsample III. The cumulative returns during the 40 day postannouncement benchmark period is positive and substantial for stocks in subsamples I (11.17 percent) and II (7.90 percent), whereas the cumulative return for stocks in subsample III is -1.47 percent. Thus, during the postannouncement period, the cumulative change in the value of the firm and its persistence is related inversely to the number of analysts making estimates.

Summary and Conclusion

This study investigates the role of information on stock prices around the time of stock split announcements using data for the period from January 1, 1984 through December 31, 1987. This study includes not only stocks listed on the NYSE and AMEX, but also stocks traded OTC. The results support the hypotheses that the degree of market anticipation of the split announcement is related directly to the amount of information available about the stock; the magnitude of the announcement effect at the time of the announcement (event days 0 and +1) is greater for information-poor stocks than for information-rich stocks; during the postannouncement benchmark period, market price adjustment is rapid and complete for information-rich stocks but not for information-poor stocks.

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Table 1
The Number of Analysts Making Annual Earnings Estimates: A Positive Proxy for the Stock's Information Attribute

Category	Sample Size	Number of Analysts Mean	Minimum	Maximum
Ford Database	2,000	11.0	0	48
Aggregate Sample	105	4.2	0	28
Subsamples:				
I	9	0.0	0	0
II	25	1.8	1	3
III	31	12.6	4	28

Sources:
The Ford database is a product of Ford Investor Service, Inc. and includes 2,000 NYSE, AMEX, and OTC firms. Analyst statistics are as of August 1989

For the aggregate sample and each of the subsamples, the Institutional Brokers Estimate Service, Inc. is the source for the number of analysts making annual firm earnings estimates

Table 2
Mean Daily (Unadjusted) Percentage Stock Returns and t-statistics for Firms in the Aggregate Sample and Three Information Subsamples

Event Date	Aggregate (n=105) 4.2 Analysts	Subsample I (n=49) 0.0 Analysts	Subsample II (n=25) 1.8 Analysts	Subsample III (n=31) 12.6 Analysts
-10	0.349	0.357	0.714	0.041
	(0.839)	(0.219)	(1.264)	(0.323)
-9	0.273	0.386	0.405	-0.013
	(0.490)	(0.300)	(0.509)	(0.098)
-8	0.734	1.137	0.915	-0.049
	(2.610)**	(2.406)**	(1.759)*	(-0.053)
-7	0.110	0.594	-0.755	0.043
	(-0.258)	(0.882)	(-2.337)*	(0.331)
-6	0.443	0.398	0.772	0.248
	(1.272)	(0.335)	(1.408)	(1.182)
-5	0.869	1.063	1.034	0.429
	(3.231)**	(2.199)*	(2.050)*	(1.933)*
-4	0.213	0.081	-0.153	0.716
	(0.213)	(-0.557)	(-0.859)	(3.126)**
-3	0.449	0.228	0.496	0.759
	(1.299)	(-0.144)	(0.732)	(3.304)**
-2	0.834	0.866	1.031	0.625
	(3.072)**	(1.647)	(2.042)*	(2.748)**
-1	0.855	0.845	1.054	0.711
	(3.167)**	(1.586)	(2.099)*	(3.104)**
0	1.928	1.830	2.819	1.365
	(8.100)**	(4.350)**	(6.424)**	(5.816)**
1	1.337	1.479	1.103	1.301
	(5.383)**	(3.364)**	(2.219)*	(5.554)**
2	0.306	0.175	0.509	0.349
	(0.643)	(-0.291)	(0.764)	(1.602)
3	0.076	-0.178	0.544	0.100
	(-0.415)	(-1.281)	(0.848)	(0.567)
4	0.040	0.145	0.126	-0.195
	(-0.579)	(-0.376)	(-0.175)	(-0.657)
5	0.119	0.359	0.207	-0.331
	(-0.217)	(0.223)	(0.023)	(-1.220)
6	-0.096	0.020	0.245	-0.555
	(-1.206)	(-0.726)	(0.117)	(-2.152)*
7	-0.216	-0.348	-0.284	0.050
	(-1.755)*	(-1.759)*	(-1.181)	(0.358)
8	0.098	0.057	0.497	-0.158
	(-0.312)	(-0.623)	(0.735)	(-0.502)
9	0.089	0.192	0.037	-0.032
	(-0.356)	(-0.245)	(-0.393)	(0.019)
10	0.300	0.519	0.359	-0.095
	(0.613)	(0.672)	(0.396)	(-0.243)

The t-statistics test the null hypothesis that the difference between the mean daily return for the event day in question and the grand mean daily return during the 40 day postannouncement benchmark period is zero against the two-tailed alternative hypothesis that the difference is nonzero

* Statistically significant at greater than the 95 percent level

** Statistically significant at greater than the 99 percent level

Figure 1
Cumulative Mean Daily (Unadjusted) Percentage Return on Three Equally Weighted Subsamples of Pure Stock Split Firms. The Mean Number of Analysts Following Firms in Subsamples I, II, and III is 0.0, 1.8, and 12.6, respectively.