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The incremental impact of analyst initiation of coverage

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Abstract

I compare the return surrounding a sell-side analyst's initiation of coverage to the return surrounding a recommendation by an analyst who already covers the stock. The market responds more positively to analysts' initiations than to other recommendations. The incremental price impact of an initiation is 1.02% greater than the reaction to a recommendation by an analyst who already covers the stock. I examine whether the hypothesis that analyst coverage increases liquidity explains this incremental return. I find that liquidity improves after initiations, but that one must extend the liquidity hypothesis in order to fully explain the incremental price impact. Liquidity gains subsequent to analyst initiation depend on the analyst's recommendation. The more positive the initial recommendation, the greater the subsequent liquidity improvement. I also find that the initiation abnormal return correlates with the subsequent improvements in liquidity. Corporations should encourage analyst coverage to capture this liquidity benefit.

JEL classification: G14; G24
Keywords: Sell-side analysts; Initiation of coverage; Liquidity

1. Introduction

Analyst initiations, defined as the first report a sell-side analyst produces about a stock, appear to be important corporate events. Financial news providers such as CNBC often repeat news of the initiations; analyst recommendation collection services make a special note of initiations; and initiations that appear on the Broad Tape show significant abnormal returns (Kim et al., 1997). In Barber et al.'s (2001) large-sample analysis of analyst

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recommendations, however, the abnormal returns associated with initiations seem unremarkable compared with other recommendations.[1] This paper examines whether initiation abnormal returns are more positive than abnormal returns to recommendations by sell-side analysts who already cover the stock. Previous research, such as BLMT (2001), cannot be used to determine whether an incremental positive return exists because it lacks controls for firm-specific characteristics and controls for confounding events, which Juergens (2000) argues affect the abnormal returns surrounding analysts' recommendations. This paper isolates the incremental price impact of analyst initiations of coverage while controlling for firm-specific characteristics and confounding events.

Documenting the incremental impact of analysts' initiations is important because many papers predict positive externalities from increased analyst coverage.[2] If these externalities exist, then we should discern their effects in initial returns. One example of this research is the liquidity hypothesis developed by Brennan and Subrahmanyan (1995), who contend that an increase in analyst coverage improves liquidity. If the market recognizes that analyst initiation improves liquidity, then the market reaction to initiations should be positive relative to other recommendations. Furthermore, a finding that analyst initiations improve liquidity contains important implications for the resources public companies allocate to increase and retain analyst coverage.

I compare the price reaction to analysts' initial recommendations with the price reaction to recommendations made by analysts who already cover the firm. I find that, relative to other reports, analysts' initial reports have a positive impact on stock prices. Using a sample of 2128 company-matched analysts' recommendations from the 1995 Institutional Brokers Estimate Service (IBES) database, I find a 2-day size-adjusted incremental impact of 1.02%. I also examine the incremental impact of an initiation while controlling for other factors, such as recommendation and analyst coverage, which can affect the impact of an analyst's report. In these tests, the incremental impact of an analyst's initiation of coverage is 0.98%, confirming the existence of a significant incremental impact.

The market interprets analyst initiation as a positive signal. This result is consistent with previous research emphasizing the positive externalities arising from analyst coverage. Brennan and Subrahmanyan (1995) and Brennan and Tamarowski (2000) suggest that an increase in analyst coverage improves liquidity because enhanced competition between informed traders reduces the asymmetric information component of the bid–ask spread. This liquidity hypothesis is compelling and several results support it. I examine trading volume, quoted spreads, and institutional ownership before and after the initiation of coverage. I find evidence that liquidity improves subsequent to the initiation of coverage.

The incremental price impact of analyst initiation depends on the initial recommendation. Positive recommendations, buy and strong buy, produce a significantly more positive *incremental* price reaction than negative, hold and sell, initial recommendations. I extend the liquidity hypothesis to explain this result. I find that the more positive the analysts'

[1] Barber et al. (2001): Table 3, p. 540.

[2] A partial list includes Arbel and Strebel (1982), Merton (1987), Moyer et al. (1989), and Chung and Jo (1996). A more general result concerning the value of third-party monitoring is found in Hsueh and Kidwell (1988).

initial recommendation, the greater the liquidity improvement. Strong buy initiations attract more liquidity than less aggressive buy, hold or sell recommendations. I also find that the stronger the initial recommendation, the stronger the relation between initial returns and subsequent liquidity improvement. Thus, liquidity improvements to initiations depend not only on the level of analyst coverage, but also on the analysts' recommendations. As one consequence of these results, corporations should encourage analyst coverage to capture the incremental liquidity benefits. However, when deciding on the amount of resources allocated to obtain analyst coverage, corporations should be aware that if an analyst's initial opinion is negative, the liquidity benefits from an initiation will be smaller.

The next section of the paper discusses the existing hypotheses about sell-side analysts that predict an incremental impact from analysts' initiations. Section 3 describes the data used in the empirical tests, and Section 4 describes the results. Section 5 presents direct tests of the liquidity hypothesis, and Section 6 concludes the paper.

2. Hypothesis development

An initiation is defined as the first report a sell-side analyst produces about a specific stock. I will refer to its counterpart, a report by an analyst who already covers the firm, as a continuation.

2.1. An analyst's decision to initiate coverage

An initiation of coverage by a sell-side analyst represents the commitment of resources by the brokerage firm. When deciding how to allocate analyst services, brokers must weigh the benefits of covering a particular stock against the opportunity costs of covering a different stock. Benefits include the expected commission revenue from trades and potential financing and consulting revenue obtained from the covered firm. Conversations with brokerage analysts and research directors suggest three main reasons why equity analysts initiate coverage. The first is that the analyst believes that she can generate trading in the security. In this case, the initiation would occur when she can offer a particularly compelling story about why a stock's fundamental value and current price differ. Second, analysts initiate coverage because the corporate finance department asks for coverage of a particular stock. The corporate finance department believes that analyst coverage will encourage underwriting business. Third, she has discovered that her important clients have significant holdings in the company. For these clients, the analyst sees her role as that of service and support, providing a flow of information to her clients.

2.2. The market reaction to analysts' initial recommendations

Several papers examine the market reaction to analysts' initiations. Peterson (1987) finds significant abnormal returns associated with the initiation of a security in Value Line. He argues that initial reviews provide more new information to Value Line clients than

continuation reviews. Kim et al. (1997) use the dissemination of analysts' initial buy recommendations as a proxy for the existence of private information. They find that significant positive abnormal returns occur at the open, 4% for NYSE/AMEX stocks and 7% for NASDAQ firms. Branson et al. (1998) also find significant (3%) abnormal returns associated with initial buy recommendations. These results suggest that initiations are important, but they do not compare initiation abnormal returns to continuation abnormal returns and therefore cannot determine whether an incremental impact exists.

Three existing hypotheses predict differences between initiation returns and continuation returns. The first, a liquidity hypothesis, suggests that increased analyst coverage improves liquidity and thus predicts a positive incremental price impact from all analyst initiations. Brennan and Subrahmanyan (1995) and Brennan and Tamarowski (2000) argue that an increase in analyst coverage results in lower bid–ask spreads. They contend that more analyst coverage results in a greater number of informed traders in the market for a stock. As a result, prices will tend to be more informative after the initiation. With more informative prices, uninformed traders face smaller expected losses from transactions with informed traders. Smaller expected losses to informed traders should reduce spreads. If an increase in analyst coverage reduces the bid–ask spread, then the results of Amihud and Mendelson (1986, 2000) and Amihud et al. (1997) predict that the required rate of return on the security should decline and the current price of the security should increase. Thus, the liquidity hypothesis predicts that the market reaction to the initiation of coverage will be strictly greater than the market reaction to a continuation, regardless of the analyst's recommendation.

A second hypothesis, first suggested by Peterson (1987), argues that analyst initiations contain better information than continuation reports. McNichols and O'Brien (1997) provide empirical support for this hypothesis. They compare individual analyst's initiation earnings forecasts against the same analyst's continuation earnings forecasts, finding that individual analysts' initiation earnings forecasts are more accurate than their continuation forecasts. McNichols and O'Brien conclude that analysts expend more effort or otherwise possess better information in their initial reports.

A third hypothesis developed by Moyer et al. (1989) maintains that analyst coverage is an effective monitoring device. The additional monitoring activity that accompanies an initiation should reduce agency costs and increase the value of the company. Chung and Jo (1996) find that the level of analyst coverage is positively related to Tobin's q. Conducting an interesting cross-sectional analysis, they suggest that at the margin, more analyst coverage should increase a firm's Tobin's q.

The liquidity, better information, and monitoring hypotheses all provide explanations for initiation returns. This paper concentrates on the liquidity hypothesis, which is by itself sufficient to explain the results in the paper. To completely explain the incremental price impact of initiations, I must extend the liquidity hypothesis in two ways: in a time-series analysis of analyst coverage and liquidity, and by investigating the role played by the analysts' initial recommendation. The empirical work in Brennan and Subrahmanyan (1995) and Brennan and Tamarowski (2000) constitutes a cross-sectional analysis of the relation between the level of analyst coverage and liquidity. If their conclusions are correct, then liquidity should improve subsequent to an analyst initiation. I find that liquidity improves after initiations, thus confirming their results using a time-series of

liquidity measures. I find, however, that the incremental impact of an initiation depends on the initial recommendation. To test whether the liquidity hypothesis can explain this result, I examine whether the analyst's initial recommendation exerts an effect on subsequent liquidity. I find that the analyst's initial recommendation explains the degree of liquidity improvement. The more positive the initial recommendation, the more liquidity improves. This result is consistent with the idea that an initial strong buy recommendation will attract more new investors than an initial hold recommendation.

2.3. Identifying the incremental impact of analyst initiation

To identify the incremental impact of analysts' initiations, I compare the price impact from initiations to the price impact from continuations. In this framework, one must control for factors shown to influence the impact of an analyst's report. The first set of tests reported control for firm-specific and market-wide influences by matching initiations to continuations by firm and calendar time. Subsequently, I compare the effects of a sample of initiations with a sample of continuations after controlling for the analysts' strong buy, buy, hold, or sell recommendations, and the level of analyst coverage.

3. Data

One estimates the incremental impact of analysts' initiations by comparing the difference between initiation and continuation abnormal returns, matched by firm and calendar time. Analyst recommendations come from IBES in the 2nd and 3rd quarters of 1995. My study restricts the sample to two quarters because a larger sample increases the difficulty of identifying confounding events and a shorter time frame also makes it less likely that the sample will experience any exogenous liquidity shocks.[3]

3.1. The IBES database

The IBES detailed recommendation database begins in the last quarter of 1994 and contains information on the analyst, the analyst's broker, the recommendation and the recommendation date.[4] I begin collecting analyst initiations at the beginning of the 2nd quarter of 1995 and continue until the end of the third quarter of 1995. IBES records a start date that indicates when a brokerage begins coverage of a particular stock. In order to confirm that this date is accurate, I follow McNichols and O'Brien (1997) and examine the first 6 months of the database. I confirm that a particular analyst recommendation is an

[3] Previous drafts of this paper used an earlier data set of initiations and continuations collected from the DJNS Broad Tape from 1988 to 1992. Because the Broad Tape is censored, it does not include all recommendations; these recommendations could not be matched by company and calendar quarter as well as the IBES data could be matched. However, the incremental initiation price impact in the Broad Tape data was similar in magnitude to the IBES data results.

[4] IBES is confident that the date they record the analyst recommendation is also the date of the public release. A sub-sample of the IBES data, also recorded on the DJNS, confirmed this assertion (see below).

initiation if there is no report on the firm by that brokerage during the first 6 months of the IBES database.[5] I consider recommendations to be continuations if there is at least one previous recommendation on the database. The sample of initiations consists of all initiations on the IBES database that (i) had at least one other analyst covering the security, and (ii) comprised the only analyst report on the firm that day.

To control for cross-sectional differences in stocks, particularly size, between the initiation and continuation sample I further restrict the sample by pairing an initiation with a continuation on the same firm. For each initiation, I search for a continuation that meets the following conditions: (i) the continuation recommendation is about the same firm; (ii) the continuation was the only analyst report on the firm that day; and (iii) the continuation occurred in the same calendar quarter. Where more than one continuation meets the above criteria, I chose one at random. The resulting sample consists of 2518 paired observations of analyst initiations (1259) and continuations (1259) matched by company and calendar quarter.

The final principle in vetting the sample was to include events in which a single analyst's comments appear to be an isolated event, and to exclude those which contained simultaneous corporate disclosures. Therefore, I further restrict the sample by excluding observations that: (i) occurred within 2 days of an earnings release by the company, or (ii) had other concurrent news releases. I also delete recommendations for initial public offerings (IPOs) and sample pairs where the continuation recommendation is a reiteration of that analyst's earlier opinion.[6] The last condition ensures that every continuation is either an upgrade or a downgrade; this condition guards against potential biases from continuations that contain no new information. The final sample of 2128 recommendations in the paired sample comes from 131 different brokers; the largest single broker contributes 8.0% of the sample recommendations. IBES classifies recommendations into five standard categories: strong buy, buy, hold, underperform, and sell. Relatively few underperform and sell recommendations exist, so I collapse these two categories into a single sell classification. The resulting sample consisted of 410 initial strong buy recommendations, 280 continuation strong buys, 331 initial buys, 329 continuation buys, 301 initial holds, 404 continuation holds, 22 initial sells, and 51 continuation sells.

Data on stock returns comes from the CRSP daily master tape for NYSE/AMEX and NASDAQ securities. The abnormal returns reported in the study, AR, are size-adjusted returns, calculated by subtracting the appropriate CRSP market capitalization decile returns from the sample firms' raw return given on the appropriate CRSP NYSE/AMEX or NASDAQ tape.[7] CRSP provides data on firm size, which I define as the market value of

[5] Use of the DJNS confirms the accuracy of this method. A search of the DJNS found 973 initiations during the IBES sample period. In only two cases was a previous recommendation by the same brokerage also recorded. These observations were discarded. Furthermore, the dates recorded on the IBES tape coincided with the dates on the DJNS database in all but three cases; the observations with date mismatches were also discarded.

[6] IPO initiations, defined as stocks that have been publicly listed for less than 250 trading days, may be anomalous because of the strong corporate finance incentives faced by analysts at this time. Michaely and Womack (1999) and Rajan and Servaes (1997) examine IPO analyst recommendations.

[7] Womack (1996) tests several alternative measures of abnormal returns in his analysis of analysts' recommendations. He finds that his event study results are robust to the choice of abnormal return measure.

equity at the end of the prior calendar year (1994). I collect data on the number of analysts covering a firm from the IBES summary tapes at year-end 1994 and 1995.

4. Results

4.1. Event study results

I compute 2-day size-adjusted abnormal returns for all 2128 analyst reports in the sample. Table 1 presents the cross-sectional average abnormal returns for initiations and continuations. Panel A of Table 1 presents the abnormal returns for all recommendations. All initiations produce a statistically significant 0.75% abnormal return. In contrast, the abnormal return for all continuations is −0.26%. The difference, 1.02%, is statistically significant (t-statistic = 5.99).

Panel B of Table 1 examines the differences in the market reaction to analysts' reports sorted by recommendation. Initiation reports that carry a strong buy recommendation show a positive abnormal return of 1.49% (t-statistic = 6.80). Continuation strong buy reports are also associated with significant positive abnormal returns, 0.75% (t-statistic = 2.77), but continuation returns are lower than initiation returns. The difference, 0.74%, is statistically significant. Initial buy recommendations demonstrate a significantly positive abnormal return of 0.64% (t-statistic = 3.49), but continuation buys are negative and insignificant at −0.11%.[8] Hold recommendations produce insignificant abnormal returns for initiations (0.09%, t-statistic = 0.38), but negative abnormal returns, −1.03% (t-statistic = −4.51) for continuations. Hold continuations could be negative because, for holds, downgrades from buy and strong buy (n = 375) are much more prevalent than upgrades from sell (n = 29). The difference between initiation and continuation hold recommendations is 1.12%, which is statistically significant with a t-statistic of 3.29. Sells produce negative abnormal returns for both initiations (−0.32%, n = 22) and continuations (−0.74%, n = 51) but because of the small sample size, neither abnormal return is significant. The difference between initiation and continuation sells is positive, 0.42%, but insignificant.

Overall, the event study results tend to support the liquidity hypothesis because the incremental impact of analyst coverage is positive for all recommendations and significant for all but sell recommendations. Although the liquidity hypothesis does not hold for sell recommendations, the difference-in-means test has little power to reject the null hypothesis given the small sample of sells. Non-parametric Wilcoxon tests (not tabulated) produce similar test statistics. The hypothesis of equal initiation and continuation abnormal returns is rejected at 0.09, 0.01, and 0.01 levels for strong buys, buys and holds, respectively, and fails to reject (p-value = 0.17) for sell recommendations. The relative frequency of recommendations is interesting in that initiations are more likely than continuations to be strong buys and less likely to be holds and sells. This distribution is consistent with McNichols and O'Brien's (1997) hypothesis that analysts are more likely to initiate coverage on stocks they view favorably.

[8] Continuation buys do not produce positive abnormal returns because downgrades (n = 194) outnumber upgrades (n = 145) in the continuation buy recommendation sample.

Table 1
Abnormal returns around the release of an analyst's report

Grouping	Initiations	*t*-Stat	*N*	Continuations	*t*-Stat	*N*	Difference	*t*-Stat
Panel A: All recommendations								
	0.75%	6.53**	1064	− 0.26%	− 1.93	1064	1.02%	5.99**
Panel B: By recommendation								
Strong buy	1.49%	6.80**	410	0.75%	2.77**	280	0.74%	2.13**
Buy	0.64%	3.49**	331	− 0.11%	− 0.60	329	0.75%	2.82**
Hold	0.09%	0.38	301	− 1.03%	− 4.51**	404	1.12%	3.29**
Sell	− 0.32%	− 0.26	22	− 0.74%	− 1.75	51	0.42%	1.19

Panel C: Initiations by analyst coverage decile

Decile	Analyst coverage	Size ($MM)	Positive reports abnormal returns	*t*-Stat	*N*	Negative reports abnormal returns	*t*-Stat	*N*
1	1–3	199	2.61%	3.82**	78	− 0.51%	− 0.52	21
2	4	298	1.36%	3.01**	82	− 0.11%	− 0.15	24
3	5	418	1.35%	2.50**	73	− 1.11%	− 2.02**	23
4	6	462	0.30%	0.72	64	− 0.23%	− 0.55	22
5	7–8	699	1.22%	2.74**	103	− 0.18%	− 0.33	32
6	9–10	1175	0.80%	1.71	57	0.02%	0.04	36
7	11–13	1995	0.67%	2.06**	92	0.35%	0.94	48
8	14–16	2876	1.65%	3.89**	69	− 0.02%	− 0.03	30
9	17–22	6106	0.42%	1.51	66	− 0.15%	− 0.45	46
10	23–36	15,093	0.25%	0.89	57	0.34%	0.87	41

Panel D: Initial recommendations and long-run abnormal returns

Month relative to initiation	All Initiations	*t*-Stat	Positive initiations	*t*-Stat	Negative initiations	*t*-Stat
− 2	1.40%	4.11**	1.97%	4.67**	0.08%	0.14
− 1	0.89%	2.74**	1.45%	3.73**	− 0.40%	− 0.69
0	1.12%	2.99**	2.07%	4.52**	− 1.04%	− 1.63
1	− 0.24%	− 0.80	0.03%	0.06	− 0.86%	− 1.65
2	0.58%	1.73	0.78%	1.86	0.11%	0.22
3	− 0.57%	− 1.59	− 0.82%	− 1.94	0.01%	0.01
4	− 0.52%	− 1.40	− 0.75%	− 1.60	0.02%	0.03
5	0.03%	0.09	0.14%	0.30	− 0.20%	− 0.35
6	0.01%	0.01	− 0.19%	− 0.42	0.45%	0.78
7	1.08%	2.97**	1.38%	2.98**	0.41%	0.69
8	0.45%	1.22	0.60%	1.33	0.11%	0.17
9	0.45%	1.27	0.51%	1.14	0.31%	0.58
10	0.19%	0.48	0.24%	0.49	0.06%	0.11
11	− 0.16%	− 0.44	− 0.40%	− 0.94	0.40%	0.62
12	− 0.27%	− 0.76	− 0.16%	− 0.37	− 0.51%	− 0.90
N=	1064		741		323	

Panel C of Table 1 examines firm size and initiation abnormal returns by analyst coverage decile. To construct this table, I group 1064 initiations into deciles by their level of analyst coverage at the time of the initiation. I observe several interesting regularities in the data. The first regularity is a monotonic relation between analyst coverage and size, a result that has been observed in studies of analyst coverage (Bhushan, 1989; O'Brien and Bhushan, 1990). In addition, initiations tend to occur in smaller firms with low levels of pre-existing analyst coverage. This regularity is apparent from the fact that not until the sixth decile does average firm size rise above $1 billion nor does analyst coverage rise above the single digits. The impact of the initiation is larger for lightly covered firms. Initiations with positive recommendations show positive abnormal returns for all analyst coverage deciles, but the largest abnormal returns generally occur in the smallest coverage deciles. Negative recommendations are associated with small positive and negative returns that are generally insignificant. Further, no pattern seems to emerge in the reaction to negative recommendations across deciles. Lastly, an interesting pattern exists in the relative frequency of positive reports across coverage deciles. The lowest deciles have positive initial recommendations that approach or exceed 80% while the highest deciles receive positive initiations less than 60% of the time.

4.2. Permanent valuation impact

To determine whether the abnormal return associated with analyst initiations is permanent or temporary, I compute the monthly size-adjusted abnormal returns for the months surrounding the date of the initiation. Individual stock monthly excess returns are calculated as:

$$R_m^i = \left[\prod_{t=1}^{n}(1+r_t^i) - \prod_{t=1}^{n}(1+r_t^{\text{size}})\right] \tag{1}$$

where R_m^i is the abnormal return in month m for firm i; r_t^i is the daily raw return for firm i on day t; and r_t^{size} is the daily CRSP size-decile portfolio return for size i firms.

Notes to Table 1:

Abnormal returns around 2128 analyst recommendations reported to IBES in the 2nd and 3rd quarters of 1995. Two-day size-adjusted abnormal returns are presented for each report where event-day zero is the date IBES reports the recommendation is released. An initiation is the first ever public recommendation made by an analyst on a particular security. If the analyst has made previous recommendations, then the report is a continuation. Abnormal returns are presented in three panels. Panel A covers all recommendations. Panel B looks at initiations and continuations by analyst recommendation. Panel C examines only initiations abnormal returns by level of analyst coverage and by whether the initial report was positive (strong buy and buy) or negative (hold and sell). The *t*-statistics test whether a particular event-day abnormal return is different from zero. Panel D reports average cumulative monthly size-adjusted abnormal returns. Individual firm monthly excess returns are calculated as:

$$R_m^i = \left[\prod_{t=1}^{n}(1+r_t^i) - \prod_{t=1}^{n}(1+r_t^{\text{size}})\right]$$

where R_m^i is the abnormal return in month m for firm i, r_t^i is the daily raw return for firm i on day t, and r_t^{size} is the daily CRSP size-decile portfolio return size i firms. Daily returns are cumulated over all n days in month m to calculate the monthly abnormal return.

** Significant at the 0.05 level.

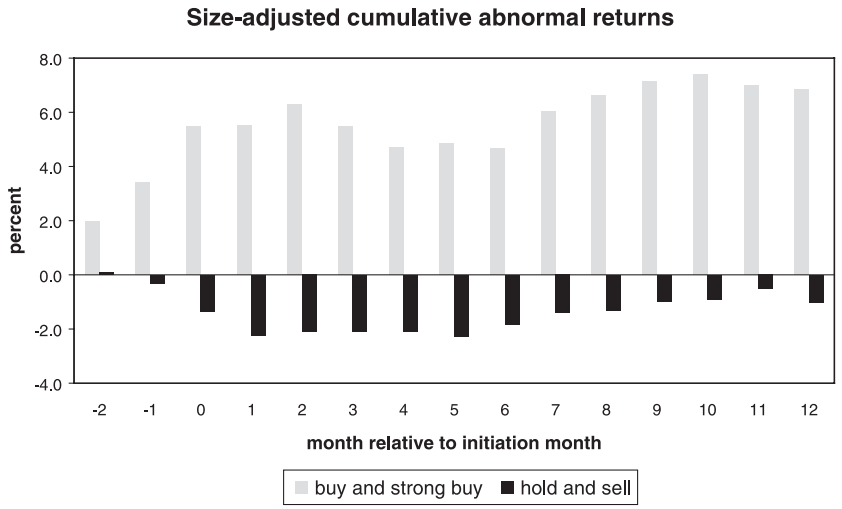

Fig. 1. Long-term abnormal returns around analyst initiations. Panel D of Table 1 reports the mean monthly abnormal returns (MAR) in event-month t. MAR is calculated from Eq. (1). This figure plots the cumulative monthly abnormal returns: $\mathrm{CMAR}_T = \sum_{t=-2}^{T} \mathrm{MAR}_t$.

Cumulative daily returns over all n days in month m produce a monthly abnormal return.[9]

Panel D of Table 1 and Fig. 1 present the results. The monthly abnormal returns are significant in month -2 and month -1, a result consistent with Brennan and Hughes (1991), who find that analyst coverage tends to increase subsequent to positive price performance. The initiation month produces a significant positive abnormal return, but after that month, stock prices show no consistent pattern. Prices do not mean revert; which suggests that the price impact from an initiation is a permanent positive event. However, interesting differences emerge in the pattern of abnormal returns when the full sample of initiations is divided into those with positive initial recommendations and those with negative initial recommendations. Initiations with positive recommendations show significant positive abnormal returns beginning in month -2 through the initiation month. In contrast, negative initiations are associated with insignificant abnormal returns. Positive initiations have permanent positive effects, while negative initiations have no overall effect. One could explain this result if the initial recommendation were related to the subsequent liquidity change. Section 5 examines this issue.

4.3. Regression specification

I control for variables that could affect the price reaction to an analyst's report in a regression framework. In each regression, the dependent variable is the size-adjusted 2-

[9] This methodology follows Womack (1996).

Table 2A
Summary statistics for the regression variables

Variable	Mean ($MM)	Median	Standard deviation	Minimum/maximum
SIZE	2878 ($mm)	692 ($mm)	7390 ($mm)	10/83,068 ($mm)
NA	11	9	7.3	1/36

SIZE is the market value of common equity.
NA is the number of analysts already covering the firm prior to the analyst's report. Summary statistics for the continuous independent variables used in the cross-sectional regressions reported in Table 3.

day return on the announcement day and the following day.[10] All regressions are specified as:

$$AR_i = \alpha + \beta_A \text{Information}_i + \beta_B \text{Recommendation}_i + \beta_C \text{Initiation}_i + \varepsilon_i. \quad (2)$$

In this specification, Information, Recommendation, and Initiation refer to categories of independent variables. The β's refer to a set of coefficients of the variables in each category. The Information variables proxy for the amount of information produced about the firm. They include the size of the firm (Collins et al., 1987; Shores, 1990) and the number of analysts currently covering the stock (Bhushan, 1989; Brennan and Hughes, 1991; Pearson, 1991).[11] Panel A of Table 2 presents summary statistics on size and analyst coverage. The average size of the firms in the sample is $2878 million; the smallest firm has a market value of $10.0 million and the largest firm has a market value of $83,068 million. The average number of analysts already covering the firm prior to the analyst's report is 11; the range is 1 through 36.

The Recommendation variables include dummy variables for strong buy, hold and sell recommendations (the abnormal return surrounding a buy recommendation is reflected in the intercept) that control for the analyst's recommendation. The asymmetry of returns to upgrades and downgrades in the continuation hold recommendation sample suggests that it could be important to control for whether the continuation is an upgrade or a downgrade. For this reason, the regression specification includes dummy variables for upgrades and downgrades.

The Initiation variables measure the incremental impact of the initiation in the regression framework. Two regressions use a single dummy variable for all initiations, but a third uses four separate initiation dummy variables sorted by the initial recommendation. A joint test of the four separate initiation dummy variables can test whether the incremental impact of an initiation is equal for all initial recommendations. If the test is rejected, the liquidity hypothesis must explain the result in order for the hypothesis to provide a sufficient explanation of initiation returns.

[10] The regressions were also run using the 3-day cumulative abnormal return from event-days −1, 0, and +1, as the dependent variable. There are no material differences between the results reported in the paper and the results using the 3-day CAR as the dependent variable.

[11] A Box–Cox transformation was used to test for linearity and failed to reject the hypothesis that using the log of one plus the number of analysts is the correct linear specification.

Table 2B
Summary statistics for the regression variables

Dummy variable	Frequency
UP—an upgrade of an analyst's existing recommendation	452
DOWN—a downgrade of an analyst's existing recommendation	612
SBUY—analyst's recommendation is strong buy	690
HOLD—analyst's recommendation is hold	705
SELL—analyst's recommendation is sell	73
SBUY INITIATION—initial report is released with a strong buy recommendation	410
BUY INITIATION—initial report is released with a buy recommendation	331
HOLD INITIATION—initial report is released with a hold recommendation	301
SELL INITIATION—initial report is released with a sell recommendation	22

Definitions and frequency of dummy variables used in the cross-sectional regressions reported in Table 3. The sample consists of 1064 initial recommendations and a control group of 1064 continuation recommendations for a total of 2128.

Panel B of Table 2 defines and reports the frequency of the dummy variables used in the regressions. There are more downgrades (612) than upgrades (452) in the continuation sample. This asymmetry of upgrades and downgrades in the full sample reinforces the necessity of controlling for upgrades and downgrades separately in Eq. (2). Because of the high correlation between analyst coverage and size (0.801), the latter is excluded from the reported regressions, but the inclusion of size did not significantly affect the coefficients of interest.

4.4. Regression results

Table 3 presents the OLS regression results.[12] The coefficient of the dummy variable INITIATION in column A of Table 3 measures the incremental impact of all analysts' initiations. This coefficient, 0.83%, is positive and significant. This result indicates that relative to continuations, initiations have a significant incremental impact on firm value. However, it is probably not correct to pool the effects of upgrades and downgrades into the intercept. When these coefficients are estimated separately in column B, the coefficient on INITIATION increases to 0.98% and is statistically significant.[13] This result supports the liquidity hypothesis.

Column C splits the INITIATION dummy variable observations into four groups according to the initial recommendation. In column C, the coefficients of the strong buy, buy, hold and sell initial recommendation Dummy variables are all positive. However, only the coefficients on strong buy and buy initiations are significant. Tested jointly, a χ^2 test of the four initiation coefficients in column C reject the joint hypothesis that they are all equal to zero (p-value < 0.01). A joint test of the two positive initial recommendation

[12] These regressions are heteroscedastic. Using White's (1980) test, all three regressions reject the null hypothesis of no heteroskedasticity. White's (1980) heteroskedastically consistent estimates are used to calculate the t-statistics and the χ^2 statistics in Table 3.

[13] The intercept must be suppressed when upgrade and downgrade variables are included to avoid the dummy variable trap.

Table 3
Regression results. Determinants of abnormal returns around the release of analysts' reports

	(A)	(B)	(C)
INTERCEPT	0.07 (0.21)		
Information			
log(NA)	− 0.10 (− 0.80)	− 0.13 (− 0.98)	− 0.13 (− 0.96)
Recommendation			
SBUY	0.85*** (3.88)	0.69*** (3.05)	0.38 (0.90)
HOLD	− 0.83*** (− 3.87)	− 0.68*** (− 3.41)	− 0.56* (− 1.77)
SELL	− 0.55 (− 1.19)	− 0.37 (− 1.12)	− 0.20 (− 0.41)
UP		0.52 (1.27)	0.76* (1.68)
DOWN		− 0.16 (− 0.40)	− 0.25 (− 0.61)
Initiation			
INITIATION	0.83*** (4.79)	0.98*** (2.94)	
SBUY INITIATION			1.49*** (2.86)
BUY INITIATION			0.93** (2.41)
HOLD INITIATION			0.77 (1.64)
SELL INITIATION			0.61 (0.85)
ADJ. R^2	4.44%	5.02%	5.43%

This table presents OLS regressions of 2-day size-adjusted percentage abnormal returns for 2128 company-matched analyst recommendations. Analyst recommendations come from the IBES detail recommendation tape for the 2nd and 3rd quarters of 1995.

t-statistics calculated using White's (1980) heteroskedastically consistent standard errors are reported in parentheses.

* Significant at the 0.10 level.

** Significant at the 0.05 level.

*** Significant at the 0.01 level.

coefficients also rejects the null that the impact is equal to zero (p-value = 0.02). In contrast, a joint test on the negative (hold and sell) initial recommendation coefficients fails to reject the null that the impact is equal to zero (p-value = 0.22). A test of the equality of the positive and negative coefficients also rejects the null (p-value = 0.20). These results can only prove consistent with the liquidity hypothesis if liquidity improves after the initiation and if the amount that liquidity improves increases in the strength of the recommendation. Section 5 examines both of these issues.

4.5. Robustness of the regression results

Neither all analysts' (Stickel, 1992, 1995) nor all brokers' (Barber et al., 2000) recommendations exert the same impact on stock prices. If noted analysts or prestigious brokers were heavily represented in the initiation sample, then reputation effects could explain some of the results. To examine if reputation effects influenced the results in the paper, I determine the reputation of each analyst and broker based on the 1995 *Institutional Investor (II)* magazine research rankings. Reputation is a measure that is inherently difficult to quantify. I assume that brokers who were among the top 20 most prestigious

firms in the *II* 1995 rankings were highly regarded brokers. For particular analysts, I follow Stickel (1995) and use the presence of an analyst on the *II* All-American research team (any level) as a proxy for highly regarded analysts.

II's top 20 brokerage firms are generally large firms and therefore contribute extensively to the sample. These firms contribute 408 initiations (38.3%) and 331 (31.1%) continuation recommendations to the sample. When a top 20 brokerage firm initiates coverage, the incremental impact is marginally higher (0.24%) than the impact from other brokers. When a top 20 brokerage firm issued the matched continuation recommendation, then the incremental impact of an initiation is marginally lower (-0.06%). Although the direction of these effects is predictable given the strong reputation of these firms, the marginal effects of broker reputation were not significant. Broker size did produce an impact on the results. When the sample is restricted to include only those brokers who issued at least 10 initiation reports (661 initiations), the coefficient on INITIATION in column B of Table 3 increases from 0.98% to 1.41%. This result complements Barber et al. (2000), who find that large brokers' buy recommendations outperformed small brokers' buy recommendations. The incremental price impact of large brokers' initiations is also greater than that of small brokers.

II All-American research analysts contributed 186 initiations (17.5%) and 178 continuations (16.7%). Controlling for *II* All-American analysts did not have a significant effect on the incremental impact of an initiation. This result does not indicate that analyst reputation effects do not exist in the sample. A deeper examination of *II* All-American analysts found that continuation downgrades were significantly more negative than downgrades from other analysts (-1.96%, t-statistic $= -3.24$), and upgrades were more positive, though not significant (0.88%, t-statistic $= 1.61$). Hold initiations by *II* All-American analysts had a significantly lower incremental impact than hold recommendations by other analysts (-2.03%, t-statistic $= -2.64$). However, initiations by highly regarded analysts with recommendations other than hold did not produce significant differences to those reported in Table 3. Controlling for reputation also increased the significance of the hold and strong buy coefficients in column C of Table 3.

Although reputation effects similar to those documented by Stickel (1992) do indeed exist in the sample, they had no significant effect on the conclusions reported in Table 3. In every alternative specification, the incremental impact of an initiation was positive, significant and similar in magnitude to the 0.98% reported in column B. The finding that positive recommendations were jointly positive and significant and negative recommendations were insignificantly different from zero is also robust to the inclusion of reputation effects.

Other robustness checks included controls for upgrades and downgrades that skip a rank (Stickel, 1995), including observations where the continuation is a repetition of the analyst's previously stated opinion (as opposed to an upgrade or downgrade) and separate regressions of initiations and continuations. In an initiations-only regression the coefficient on the number of analysts, which is negative and insignificant in Table 3 becomes significantly negative. This result is consistent with the results presented in Table 1, Panel D. The more analysts that already cover a firm, the lower the market reaction to an initial recommendation.

As a final robustness check, I matched initiations to continuations by firm, quarter and also by recommendation. Matching by recommendation reduced the sample size considerably, from 1064 to 308, but the regression results were similar in magnitude, although weaker in statistical significance. Notably, in the liquidity tests (Section 5) this subsample produced strong results consistent with those reported below for the full sample.

5. Initiation of coverage and liquidity

Brennan and Subrahmanyan (1995) and Brennan and Tamarowski (2000) base their conclusion that analyst coverage decreases the asymmetric information component of the bid–ask spread on cross-sectional tests of the relation between the level of analyst coverage and trading costs. Because analyst coverage is endogenously determined (O'Brien and Bhushan, 1990), a more direct test of whether analyst coverage increases liquidity examines the time-series of liquidity before and after initiations. A finding that initiations improve liquidity supports the liquidity explanation of the event-study results presented above.

5.1. Liquidity before and after initiations

Table 4 presents several different measures of liquidity around the initiation of coverage for the 906 individual stocks in the initiation sample. Because an initiation can occur in either the 2nd or 3rd quarter of 1995, a single stock can exist in the initiation sample more than once. Table 4 presents data on analyst coverage, institutional ownership, trading volume, spreads and quote revisions for the first and fourth quarters of 1995. These are the quarters immediately surrounding the initiation period.

Liquidity is measured with volume and quoted spreads. Declining spreads or increased volume between the first and fourth quarters suggests that liquidity improves subsequent to analyst initiation. I report the results for three measures of volume, the average daily number of transactions, share volume and dollar volume, and three measure of spreads, the average daily time-weighted quoted spread, percentage spread and number of quote revisions. I calculate daily volume and spreads in the first and fourth quarters of 1995 for each stock using data from the consolidated TAQ database, which covers both NYSE/AMEX and NASDAQ issues. Average daily liquidity measures are averaged across stocks and then across all trading days in each quarter to produce an estimate of mean daily liquidity in each quarter. The table also reports total average active analyst coverage, defined as the total number of analysts submitting estimates to IBES in 1994 and 1995, and average institutional ownership in the sample, calculated from year-end 1994 and 1995 data from Spectrum.

It is necessary to calculate the average analyst coverage because an initiation does not guarantee that analyst coverage increases, a necessary condition for the liquidity hypothesis to hold. I find that analyst coverage increases from an average of 11.7 in 1994 to an average of 12.5 in 1995. One naive expectation is that initiation must increase analyst coverage, but this expectation ignores the fact that some analysts may drop

Table 4
Measures of liquidity around analyst initiations

Variable	1st quarter 1995	4th quarter 1995	Difference-in-means[a] (*p*-value)	Wilcoxon test[a] (*p*-value)
No. of transactions	134.7 (8.52)	197.8 (15.5)	0.03	0.05
Share volume	255.8 (15.2)	331.8 (21.6)	0.03	< 0.01
Dollar volume	8582 (739)	12,948 (1209)	0.07	0.05
No. of quote revisions	160.8 (9.08)	205.9 (12.8)	< 0.01	< 0.01
Quoted spread[b]	39.8 (0.55)	38.8 (0.53)	0.08	0.09
Percentage spread	2.10 (0.05)	1.83 (0.04)	< 0.01	< 0.01
Institutional ownership[c]	48.8% (0.73)	51.5% (0.71)	< 0.01	< 0.01
Number of analysts	11.7 (0.28)	12.5 (0.28)	0.03	0.01

This table presents difference tests for several measures of liquidity around analyst initiations. The sample consists of 906 stocks that were the subject of analyst initiations and continuations in the 2nd and 3rd quarters of 1995. The reported variables are the time-series averages of daily cross-sectional means for these firms in the 1st quarter and 4th quarter of 1995, the quarters immediately surrounding the initiation period. Standard errors are reported in parentheses next to each variable. The number of transactions, share volume, dollar volume, quote revisions, quoted spreads and percentage quoted spreads are consolidated values calculated from the TAQ database. The number of analysts is the number of analysts that submitted an earnings estimate to IBES in 1994 or 1995. Institutional ownership is obtained from Spectrum and is reported annually. 1st quarter institutional ownership is as of year-end 1994 and 4th quarter institutional ownership is as of year-end 1995. Difference-in-means and Wilcoxon test *p*-values are the *p*-value from a one-sided test that liquidity did not improve between the 1st and 4th quarters of 1995.

[a] Difference in means and Wilcoxon tests on transactions, share volume and dollar volume are conducted on normalized 4th quarter volume. Normalized volume is defined as 4th quarter actual volume divided by the ratio of V_{kmT}/V_{kmt}, where V is volume, k is a particular volume measure (transactions, share volume or dollar volume), m is the relevant market (NYSE/AMEX or NASDAQ), T is the 4th quarter of 1995 and t is the 1st quarter of 1995.

[b] Reported quoted and percentage spreads are time-weighted. Similar results are obtained if spreads are equally weighted.

[c] Institutional ownership among the 6592 firms not included in the sample rose modestly from 24.8% to 25.5% in 1995.

coverage over the sample period. Statistically, the increase in analyst coverage is significant; a difference-in-means test produces a one-tailed *p*-value of 0.03 and the Wilcoxon test a one-tailed *p*-value of 0.01.[14] Whether the increase in coverage is economically significant depends on whether volume and spreads significantly improve. Institutional ownership also increases significantly for these stocks and this result is consistent with O'Brien and Bhushan's (1990) evidence that analyst coverage and institutional ownership are jointly determined.

Liquidity increases significantly around analyst initiations. Transaction volume increases from 134.7 trades per day in the first quarter to 197.8 trades per day in the fourth quarter. Share volume increases from 255.8 thousand shares per day to 331.8 thousand shares per day. Dollar volume also increases from $8582 thousand per day to $12,948 thousand per day. These volume increases are all significant in difference-in-means tests that control for market-wide increases in trading volume over the period. The

[14] All *p*-values reported in Table 4, are for the one-tailed test that liquidity improves subsequent to an initiation.

Wilcoxon rank-sum test confirms the significant increase in trading volume, suggesting that the volume increases are a general phenomenon and are not driven by outliers. Spreads and spread revision frequency also increase over this period. The average number of quote revisions per day increases from 160.8 per stock in the first quarter to 205.9 per day in the fourth quarter. These differences are significant in both the difference-in-means test and the Wilcoxon test. Time-weighted quoted spreads decline from an average of 39.8 cents per share in the first quarter to 38.8 cents per share in the fourth quarter (p-value = 0.08). Percentage spreads significantly decline as well, from an average 2.10% in the first quarter to 1.83% in the fourth quarter (p-value < 0.01). The distribution of percentage spreads is skewed because it is bounded from below and contains several observations that are four to five times the median spread (median percentage spread falls from 1.75 to 1.52). In this case, the non-parametric Wilcoxon test provides the necessary confirmation that percentage spreads have declined (p-value < 0.01).

Not surprisingly, these results indicate that initiations reflect periods when analyst coverage is increasing, and this increase in coverage is associated with improved liquidity. Quoted spreads and percentage quoted spreads decline and quote revision frequency and volume increase after the initiation of coverage, and these changes are statistically significant. These results are consistent with the liquidity hypothesis explanation for the positive incremental impact to analysts' initiations.

5.2. Liquidity and initial recommendations

The liquidity changes presented above show that initiations are associated with periods of improving liquidity. However, an increase in analyst coverage alone, does not explain the difference in initial returns across recommendations. All initiations increase analyst coverage, but the stock return at the time of the initiation depends on the initial recommendation. This section examines whether liquidity changes are a function of the initial recommendation.

Panel A of Table 5 presents the average liquidity changes for each initial recommendation. I calculate the liquidity change for each stock as the stock's mean 4th quarter liquidity less its 1st quarter liquidity. I then average the stock-specific liquidity change across all stocks by initial recommendation. To compare liquidity changes to returns, I measure the liquidity change as the percentage change in: the number of trades, the share volume, the equally weighted quoted spread, the time-weighted quoted spread, the number of quote revisions, and the change in institutional ownership.

A striking pattern emerges in Table 5A and B. The stronger the initial recommendation, the greater the liquidity improvement. Strong Buy recommendations produce the greatest liquidity improvement for five of the six measures. The only exception is percentage institutional ownership, which rises by more for buy recommendations than for strong buy recommendations. Liquidity changes are positive for hold and sell recommendations, indicating that increased coverage does bring some liquidity to these stocks, but these improvements amount to considerably less than for the more positive initiations.

This pattern is consistent with the results in column C of Table 3, where buy and particularly strong buy initiations had a greater incremental price impact than holds and

Table 5A
Initial recommendations and subsequent liquidity changes. This table presents the mean differences in the percentage change in: number of transaction, share volume, equally weighted quoted spread, time-weighted quoted spread, number of quote revisions and institutional ownership. Percentage differences are measured as the change from the 4th quarter of 1995 less the 1st quarter of 1995.[a] Liquidity changes are calculated first for each stock and then across all stocks in an initial recommendation category

	Initial recommendation			
	Strong buy	Buy	Hold	Sell
%Δ transactions	46.0	28.3	15.0	6.9
%Δ share volume	55.4	38.5	25.9	13.8
%Δ equally weighted spread	− 0.41	− 0.28	− 0.06	− 0.25
%Δ time-weighted spread	− 0.43	− 0.31	− 0.07	− 0.22
%Δ quote revisions	36.1	30.1	22.8	29.8
%Δ institutional ownership	2.67	4.11	0.11	0.17

[a] The distribution of percentage change in the number of quote revisions is severely positively skewed. Although the mean shows the same pattern, the medians are presented to present a more accurate picture of the relative differences across recommendation categories.

sells. To confirm this effect, I run univariate regressions of the initiation abnormal returns on the liquidity change variables. Panel B presents the results of these regressions. Generally, the coefficients decline monotonically from strong buy to sell. For all variables except the change in institutional ownership, the liquidity improvement is significantly related to the strong buy initiation return. The coefficients for buy recommendations are all smaller than the strong buy coefficients and are only statistically significant for the change in quote revisions. For holds and sells, the coefficients, with one exception, are smaller than the buy coefficients and also insignificant. The exception is interesting: when institutional ownership continues to rise despite the sell recommendation, the sell initiation return is higher.

The results in Table 5A and B confirm that the liquidity hypothesis is sufficient to explain the incremental price impact to initiations. In addition, Table 5A and B provides an

Table 5B
Initial recommendations and subsequent liquidity changes. Beta coefficients and *t*-statistics (in parentheses) for univariate regressions of abnormal returns on the change in each liquidity measure from the 1st quarter 1995 to the 4th quarter of 1995. The regression specification:

$$AR_i = \alpha + \beta^* \text{liquidity change}_i + \varepsilon_i$$

is estimated separately for each initial recommendation

Independent variable	Initial recommendation			
	Strong Buy	Buy	Hold	Sell
%Δ transactions	0.0045 (2.38)**	0.0033 (1.52)	− 0.0011 (− 0.47)	0.0030 (0.41)
%Δ share volume	0.0042 (2.59)**	0.0029 (1.36)	0.0009 (0.45)	− 0.002 (− 0.31)
%Δ equally weighted spread	− 0.51 (− 2.30)**	− 0.43 (− 1.60)	0.016 (0.07)	0.008 (0.01)
%Δ time-weighted spread	− 0.39 (− 1.96)**	− 0.30 (− 1.07)	0.19 (0.96)	− 0.072 (− 0.13)
%Δ quote revisions	0.0032 (2.97)**	0.0025 (2.12)**	− 0.0017 (− 1.53)	− 0.0014 (− 0.30)
%Δ institutional ownership	0.017 (1.10)	0.020 (1.30)	0.001 (0.06)	0.105 (2.30)**

** Significant at the 0.05 level.

interesting extension to the liquidity hypothesis. The degree of liquidity improvement obtained from an initiation depends on the analyst's recommendation. Positive initial recommendations attract more traders and more liquidity to the stock than negative initial recommendations.

6. Conclusion

This paper examines public announcements of sell-side analysts' recommendations, focusing particularly on initiations of coverage. Relative to recommendations by analysts who already cover the firm, the market responds positively to analyst initiations. In a company-matched sample, the incremental impact of an initiation is 1.02%. This result is consistent with the liquidity hypothesis, which predicts that the incremental impact of initiations will always be positive because increased analyst coverage improves liquidity. Regression tests show that the incremental impact of initiations is a function of the analysts' initial recommendation. The incremental price impact to initiations with positive recommendations, strong buy and buy, is significantly positive, but initiations with negative recommendations, hold and sell, have insignificant positive incremental returns. I explain these results by extending the liquidity hypothesis. Liquidity improvements subsequent to initiations depend not only on increased coverage but also on the strength of the analyst's initial recommendation. Strong buy and buy initial recommendations are associated with greater liquidity improvements than hold and sell initial recommendations.

Liquidity improves significantly subsequent to initiations. This finding suggests that corporations can achieve significant liquidity benefits from analyst coverage. Therefore, a more proactive approach to investor relations can benefit the current shareholders of the company. I should, however, mention two potential limitations to this study. The study covers only a single year, and the initiation liquidity benefits could be a period-specific phenomenon. Secondly, it is possible that exogenous influences could drive both analysts' initiations and liquidity improvements making some stocks particularly attractive to both analysts and investors. Although the direct relation between analysts' recommendations and liquidity improvements argue against this explanation, the tests in the paper cannot disprove this alternative.

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