The Anatomy of the Performance of Buy and Sell Recommendations

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Brokerage house buy and sell recommendations influence stock prices. Short-term price reaction is a function of the strength of the recommendation, the magnitude of the change in recommendation, the reputation of the analyst, the size of the brokerage house, the size of the recommended firm, and contemporaneous earnings forecast revisions. The strength of the recommendation, firm size, and contemporaneous earnings forecast revisions are associated with price changes that appear to be permanent, information effects. The magnitude of the change in recommendation, analyst reputation, and broker size appear to have temporary, price pressure effects.

The buy and sell recommendations of Wall Street brokerage houses are of interest to individual investors, fund managers, and academic researchers. Brokerage houses constitute a large segment of the financial services sector and, as such, command attention. Analysts from these firms are interviewed on television, and their opinions are reported in newspapers and magazines. With hindsight, business commentators often attribute stock price changes to the buy and sell recommendations of brokerage houses and analysts.

The anatomy of the stock price performance of buy and sell recommendations is the focus of this study. Specifically, I identify factors that contribute to the stock price performance of buy and sell recommendations by analyzing the short- and long-term price performance of 8,790 buy and 8,167 sell recommendations issued within the 1988–91 period. The recommendations cover 1,179 stocks and were made by 1,510 analysts from 80 brokerage houses. This large data base allowed comprehensive analysis of brokerage houses and analysts.

This study is distinguished from prior work by the size and time frame of the sample and by a cross-sectional analysis of the determinants of the stock price performance of recommendations.[1] The cross-sectional analysis examined the following factors:

- the strength of the recommendation (e.g., strong buy versus buy);
- the magnitude of the change in recommendation, measured by whether the change in recommendation skips a rank;
- the reputation of the analyst issuing the recommendation, proxied by position on the *Institutional Investor* (*II*) magazine All-America Research Team;
- the marketing ability of the brokerage house issuing the recommendation, measured by the number of analysts it employs;
- differences in the information environments of the companies recommended, measured by differences in market capitalization of common equity; and
- simultaneously issued earnings forecast revisions.

The analysis also controls for earnings announcements issued within five days of the recommendation date and the calendar timing of the reporting of the recommendation, as proxied by month-end dated recommendations versus non-month-end dated recommendations.

THE SAMPLE

Brokerage house buy and sell recommendations from the four-year period 1988 to 1991 were supplied by Zacks Investment Research. Zacks also supplied earnings per share (EPS) forecasts. It obtains the recommendations and forecasts from written reports brokerage houses issue to customers and potential customers.

Brokerage houses use a variety of phrases to convey recommendations. Standardizing these

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phrases so that recommendations can be compared across brokerage houses requires some subjective judgment. Fortunately, many brokerage houses issue recommendations using the following five-point scale: 1 = Strong buy, 2 = Buy, 3 = Hold, 4 = Sell, and 5 = Strong sell. For brokers that do not use a five-point scale or a subset of the five-point scale, I relied on Zacks' conversion of broker-specific phraseology to a five-point scale.

In the following analysis, the date of the recommendation is the date recorded by Zacks. Zacks uses the date of the recommendation from the brokerage house report. Nevertheless, earlier dissemination is possible. Analysts at a brokerage house sometimes meet to discuss proposed changes in recommendations. Subsequent to the meeting—perhaps days after the meeting—the analyst covering a particular firm writes and dates the report containing the recommendation. Customers might be informed of the recommendation prior to the date of the brokerage house report, however. In addition, month-end dated (periodic) reports might summarize recommendations made earlier in the month. Because of the uncertainty of the recommendation date, the information content event window used in my analysis was expanded to include days before and after Zacks' date.

To be included in the analysis, the buy and sell recommendations had to meet several criteria. First, the recommendation must be preceded and followed by a different recommendation for the same company by the same broker. This criterion ensures that the brokerage house is actively following the stock and reduces the possibility of data errors.[2] Second, the brokerage house that issued the recommendation must have an identifiable analyst who issues earnings forecasts for the company the broker recommends.[3] This requirement allows tests of the analyst reputation effect and control for the possible simultaneous issuance of an earnings forecast revision; it also reduces the possibility of data errors. Third, stock returns must be available from the Center for Research in Security Prices (CRSP) for companies listed on the New York or American stock exchanges. Fourth, the market capitalization of the common stock of the firm must be within Deciles 4 to 10 of the distribution of all NYSE and Amex firms. This criterion excludes illiquid companies with low institutional interest.[4] Finally, the dates of the quarterly earnings announcements immediately before and after the buy or sell recommendation must be available from Zacks. This last requirement permits analysis of the impact of recommendations that isolates the influence of earnings announcements.

Table 1 presents the matrix of 21,387 changes in recommendation that met the inclusion criteria. About 55 percent of the recommendations are buys, 33 percent are holds, and only 12 percent are sells. These percentages are similar to those reported elsewhere. In the following tests, buy recommendations are defined as all upward revisions to a strong buy recommendation (designated 1) and all revisions to a buy recommendation (2) coming from a recommendation of hold, sell, or strong sell (3, 4, or 5, respectively). Sell recommendations are defined as all revisions to a 5, all revisions to a 4 coming from a recommendation of 1, 2, or 3, and all revisions to a 3 from a 1 or 2 recommendation. This definition of sells assumes changes from buy to hold are sell recommendations, which is consistent with Wall Street wisdom and the empirical results in Francis and Soffer. Revisions from 1 to 2 (strong buy to buy), from 5 to 4 (strong sell to sell), from 5 to 3 (strong sell to hold), and from 4 to 3 (sell to hold) are considered neither buy nor sell recommendations and are not included in the subsequent tests.[5]

Table 2 reports some sample characteristics. Of the sample stocks, 98 percent are listed on the

Table 1. Matrix of Changes in Recommendation

	New Rating						
Old Rating	1 Strong Buy	2 Buy	3 Hold	4 Sell	5 Strong Sell	Total	Percent
1 Strong Buy	—	2,982	2,303[s]	131[s]	115[s]	5,531	26
2 Buy	2,917[b]	—	3,372[s]	271[s]	90[s]	6,650	31
3 Hold	2,117[b]	3,305[b]	—	1,226[s]	541[s]	7,189	33
4 Sell	99[b]	242[b]	950	—	118[s]	1,409	7
5 Strong Sell	68[b]	42[b]	391	107	—	608	3
Total	5,201	6,571	7,016	1,735	864	21,387	—
Percent	25	30	33	8	4	—	100

[b] Assumed buy recommendation in subsequent tests.
[s] Assumed sell recommendation in subsequent tests.

Table 2. Buy and Sell Recommendation Sample Characteristics

Item	Buy Recommendations		Sell Recommendations	
	Number	Percent	Number	Percent
Stock exchange listing				
NYSE	8,523	97	7,892	97
Amex	267	3	275	3
Total	8,790	100	8,167	100
NYSE/Amex size decile				
4	131	1	129	2
5	240	3	267	3
6	473	5	466	6
7	716	8	660	8
8	1,199	14	1,223	15
9	2,238	26	2,137	26
10	3,793	43	3,285	40
Total	8,790	100	8,167	100

NYSE. As a consequence of analyst and investor interest, the sample is slanted toward large market value stocks; about 95 percent of the recommendations are for stocks in the top half of the distribution of NYSE/Amex firm size.

MEAN ABNORMAL RETURNS AROUND RECOMMENDATIONS

Abnormal returns are defined as market-adjusted returns minus the expected market-adjusted return, or

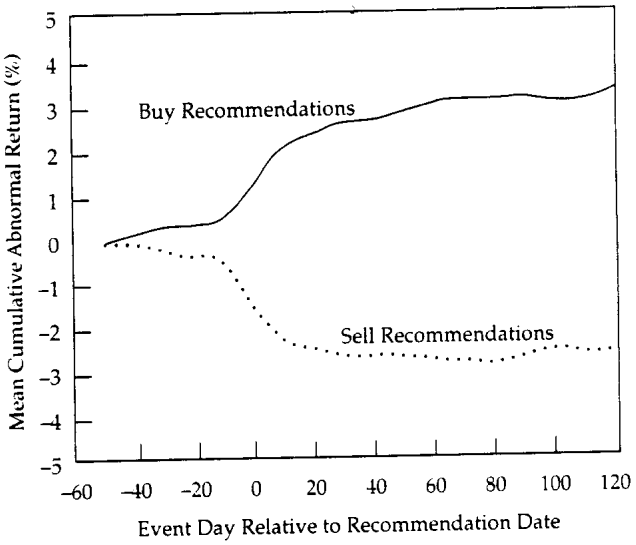
$$(R_{it} - R_{mt}) - E(R_i - R_m),$$

where R_{it} is the return to security i on day t and R_{mt} is the return to the equally weighted market index of NYSE/Amex stocks in the same firm-size decile.[6] The expected market-adjusted return is the mean market-adjusted return from the future benchmark period of Event Days +121 to +240. A future period was chosen for the benchmark because analysts may base changes in recommendation on past price performance. The conclusions of this study are generally insensitive to the definition of abnormal return.[7] Abnormal returns were multiplied by 100 to be stated in percentage terms. About 50 percent of the recommendation changes changed again within six months, and those stocks were dropped from the analysis when the subsequent change occurred.

Table 3 reports mean abnormal performance for Days −60 to +120 in ten-day increments.[8] Statistically significant abnormal returns were mostly confined to the Days −10 to +10 period. Nevertheless, buys generally had positive returns and sells generally had negative returns through Day +60.

Figure 1 plots mean cumulative abnormal returns (CARs) over Days −60 to +120. This figure suggests that the information in recommendations is assimilated by prices over a 60-day (three-month) period, with most of the price adjustment occurring within the 30-day period immediately following Day 0.

Figure 1. Mean Cumulative Abnormal Returns Surrounding Buy and Sell Recommendations, by Event Day



DETERMINANTS OF RECOMMENDATION PERFORMANCE

The determinants of the price performance of recommendations were investigated by cross-sectional

Table 3. Mean Abnormal Returns Around Buy and Sell Recommendations

	Buy Recommendations		Sell Recommendations	
Event Days	Mean (%)	*t*-Statistic[a]	Mean (%)	*t*-Statistic[a]
(−60, −51)	0.07	0.69	0.06	0.46
(−50, −41)	0.19	2.23*	−0.03	−0.20
(−40, −31)	0.17	1.90	−0.19	−1.18
(−30, −21)	0.04	0.41	−0.16	−1.20
(−20, −11)	0.14	1.12	−0.16	−1.21
(−10, −1)	0.65	3.65**	−1.06	−4.55**
(0, +10)	0.90	8.10**	−0.80	−4.19**
(+11, +20)	0.30	3.58**	−0.25	−1.70
(+21, +30)	0.25	2.29*	−0.15	−1.19
(+31, +40)	0.03	0.15	−0.01	−0.03
(+41, +50)	0.15	1.47	−0.04	−0.23
(+51, +60)	0.18	1.61	−0.09	−0.51
(+61, +70)	0.09	0.92	−0.09	−0.51
(+71, +80)	0.00	0.05	−0.02	−0.12
(+81, +90)	0.02	0.21	0.13	0.92
(+91, +100)	−0.07	−0.52	0.14	0.75
(+101, +110)	−0.05	−0.43	−0.06	−0.27
(+111, +120)	0.17	1.41	−0.06	−0.36

[a] *t*-statistics with an absolute value of 1.75, 2.13, and 2.95 indicate significance at the 0.10, 0.05, and 0.01 levels, respectively. * indicates statistical significance at less than the 0.05 level. ** indicates statistical significance at less than the 0.01 level.

regressions of abnormal returns on empirical proxies for hypothesized parameters representing strength of recommendation, magnitude of revision, analyst reputation, brokerage marketing ability, firm information environments, and forecast revisions.

Strength of Recommendation

A buy recommendation signals that the analyst believes the company is undervalued by the marketplace. A strong buy signals an even more greatly undervalued company. Thus, prices should react more to strong buys than to buys. Extending this reasoning, the negative signal associated with strong sells is stronger than that associated with sells, which in turn, is stronger than that associated with holds.

Hypothesis 1: *Upgrades to strong buy have greater positive price impact than upgrades to buy; downgrades to sell and strong sell have greater negative price impact than downgrades to hold.*

To test this hypothesis for buy recommendations, the dummy variable STRONG was set equal to 1 if the change in recommendation was to a strong buy and to zero otherwise (a buy). For sells, STRONG was set equal to 1 if the change was to a sell or strong sell and to zero otherwise (a hold). Because of the relatively small samples, sells and strong sells were combined for a comparison to downgrades to hold. To test the hypothesis that strong buys have greater positive influence and sells and strong sells have greater negative impact, in the cross-sectional regressions, the coefficients on these dummies were expected to be positive for buys and negative for sells.

Magnitude of the Revision in Recommendation

Revisions in recommendations that skip a rank were hypothesized as having greater price impact than other revisions because of the larger change in expectations. For example, a revision from hold to strong buy (3 to 1) was hypothesized as having greater impact than a revision from buy to strong buy (2 to 1) or hold to buy (3 to 2).

Hypothesis 2: *Revisions that skip a rank have greater price impact than revisions that do not skip a rank.*

This hypothesis was tested by setting the dummy variable SKIPRANK equal to 1 if the change in recommendation skips a rank or more (e.g., 3 to 1 or 1 to 3) and to zero otherwise. In the cross-sectional regressions, the coefficient on this dummy variable was expected to be positive for buys and negative for sells.

Analyst Reputation

The third hypothesis was that analysts with better reputations have greater influence than other analysts. Reputation was measured by position on the *II* magazine All-America Research Team. Each year, for its October issue, *II* asks about 2,000 money managers to evaluate analysts on the basis of stock picking, earnings forecasts, written reports, and overall service. Position on the All-America Research Team is an important determinant of analyst pay and reputation.[9] Stickel found that All-America analyst forecasts of EPS are more accurate than those of non-All-Americans and that All-American forecast revisions are more informative in terms of stock price impact.[10]

Hypothesis 3: *Buy or sell recommendations made by members of the* II *magazine All-America Research Team have greater price impact than recommendations made by non-All-Americans.*

To test this hypothesis, the dummy variable ALLAM1 was set equal to 1 if the analyst was a first-team All-American on the date of the recommendation and to zero otherwise; ALLAM2, ALLAM3, and ALLAM4 are dummies for second-teamers, third-teamers, and runners-up, respectively. The coefficients on these dummies were expected to be positive for buys and negative for sells.

Marketing Ability of the Brokerage House

The fourth hypothesis was that the price performance of a recommendation is an increasing function of the marketing effort of the brokerage house that issued the recommendation. Logue discussed the Elton, Gruber, and Grossman evidence and questioned whether the stock returns following changes in recommendations are attributable to "true forecasting ability or the strength of the marketing effort . . . . Are analysts really identifying altered company situations or are the salesmen simply convincing enough investors?"[11] According to this hypothesis, larger brokerage houses have more sales staff and therefore can generate greater price pressure.

Hypothesis 4: *Buy or sell recommendations from larger brokerage houses have greater price impact than recommendations from smaller brokerage houses.*

The size of the brokerage house was measured by the number of analysts who appear on the Zacks data base as being employed by the brokerage house in the year of the recommendation. The dummy variable BRSIZE1 was set equal to 1 if the broker size was in the smallest quintile and to zero otherwise. The coefficient on BRSIZE1 was hypothesized to be negative for buys and positive for sells; that is, small brokers have less influence than large brokers on prices.[12] The dummy variable BRSIZE5 was set equal to 1 if the broker's size was in the largest quintile and to zero otherwise. The coefficient on BRSIZE5 was hypothesized to be positive for buys and negative for sells; that is, larger brokers have greater influence on stock prices.

Differences in Firms' Information Environments

The fifth hypothesis tested for the well-known firm-size effect. The literature in this area links firm size, usually measured by the market value of common stock, with differences in firms' information environments. For example, Grant hypothesized that less interim information is available for OTC firms than for NYSE firms and found greater reaction to annual earnings announcements for OTC firms; Damodaran distinguished between the process by which economic events affect firm value and the process by which information about these events is collected and disseminated to investors; and Stickel discussed differences among companies in the amount of predisclosure information production and dissemination.[13] An implication of these studies is that if information about smaller firms is gathered and processed relatively infrequently, then the impact of any single information release increases. Stickel documented this firm-size effect for buy and sell recommendations by finding that smaller firms have a larger reaction to Value Line rank changes.

Hypothesis 5: *Smaller companies have greater price reaction to buy or sell recommendations than larger companies.*

The size of a firm was measured by common stock market value on Day 0. The dummy variable COSIZE1 was set equal to 1 if the firm's size was in the smallest quintile and to zero otherwise. The coefficient on COSIZE1 was hypothesized to be positive for buys and negative for sells; that is, recommendations have greater influence on smaller companies. COSIZE5 was set equal to 1 if the firm's size was in the largest quintile and to zero otherwise. The coefficient on COSIZE5 was hypothesized to be negative for buys and positive for sells; that is, recommendations have less influence on larger firms.[14]

Contemporaneous Earnings Forecast Revisions

Francis and Soffer examined the relative informativeness of stock recommendations and earnings forecast revisions. They found that recommendations and forecast revisions both affect stock prices and that price reactions to buy or sell recommendations are enhanced by same-sign evidence from a forecast revision. This result suggested the following hypothesis:

Hypothesis 6: *Buy or sell recommendations made contemporaneously with a same-sign earnings forecast revision have greater price impact than recommendations made in the absence of a same-sign earnings forecast revision.*

The dummy variable POSEPSREV was set equal to 1 if the buy or sell recommendation was accompanied by a positive revision of the earnings forecast for the current or next fiscal year and set equal to zero otherwise. The dummy NEGEPSREV captures the marginal effects of negative forecast revisions. The coefficient on POSEPSREV was expected to be positive, and the coefficient on NEGEPSREV was expected to be negative.[15]

CONTROL VARIABLES

Control variables were used to ensure that tests of the relation between recommendations and price changes were not confounded by the simultaneous issuance of recommendations and earnings announcements or by inaccurate dates for recommendations.

Contemporaneous Earnings Announcements

Earnings announcements trigger earnings forecast revisions.[16] Although it is beyond the scope of this study, a cursory review of the recommendation data suggested that earnings announcements also trigger buy and sell recommendations. If buy recommendations are generated by unexpectedly positive earnings announcements and sells by negative announcements, then tests of the relation between recommendations and price changes are confounded.

To control for the influence of earnings announcements, the dummy variable EPSDATE was set equal to 1 if a contemporaneous earnings announcement occurs within days −5 to +5, and it was set equal to zero otherwise. This variable captures the mean marginal effect of earnings announcements that are contemporaneous with recommendations. If unexpectedly positive earnings announcements generate buy recommendations and negative announcements generate sells, then the coefficient relating EPSDATE to price reaction was predicted to be positive for buys and negative for sells.

Recommendations from Periodic Reports

Brokerage houses sometimes disseminate recommendations and forecasts in periodic (summary) publications that are usually dated near the end of a calendar month. If analysts delay issuance of less-newsworthy recommendations until periodic reports, then recommendations from periodic reports should have a smaller impact than other recommendations. Also possible is that recommendations in periodic reports are disseminated earlier by other means and then summarized in a periodic report. In either case, little or no price reaction would be expected on the date of the periodic report.

The Zacks data base does not distinguish between recommendations from periodic reports and other recommendations, but the distribution of the recommendation dates shows a concentration of recommendations near the ends of calendar months. For the subsequent tests, recommendations were assumed to come from periodic reports if dated at month-end. The dummy variable MONTHEND was set equal to zero if the buy or sell recommendation was taken from a month-end report and was set equal to 1 otherwise.[17] The coefficient on this dummy was predicted to be positive for buys and negative for sells.

EXPERIMENT DESIGN AND RESULTS

The hypotheses were tested by cross-sectional regressions of abnormal returns on the empirical proxies for the hypothesized parameters and control variables. The following regression was estimated separately for buys and sells:

$$\begin{aligned} CAR_{(t,t+s)} = {} & \beta_0 + \beta_1\ \text{STRONG} + \beta_2\ \text{SKIPRANK} \\ & + \beta_3\ \text{ALLAM1} + \beta_4\ \text{ALLAM2} \\ & + \beta_5\ \text{ALLAM3} + \beta_6\ \text{ALLAM4} \\ & + \beta_7\ \text{BRSIZE1} + \beta_8\ \text{BRSIZE5} \\ & + \beta_9\ \text{COSIZE1} + \beta_{10}\ \text{COSIZE5} \\ & + \beta_{11}\ \text{POSEPSREV} + \beta_{12}\ \text{NEGEPSREV} \\ & + \beta_{13}\ \text{EPSDATE} + \beta_{14}\ \text{MONTHEND} \\ & + \epsilon, \end{aligned}$$

where $CAR_{(t,t+s)}$ is the cumulative abnormal return to the stock from event day t to $t + s$.

Although Day 0 is defined as the date on the Zacks data base, the prior discussion and empirical results suggested that earlier dissemination was probable. Therefore, the results reported are for

Table 4. Distributions of Dependent Variables Used in Cross-sectional Regressions

Variable[a]	Number of Observations	Mean	Minimum	First Quarter	Median	Third Quarter	Maximum
Buy recommendations							
$CAR_{(-5,+5)}$	8,790	1.16%	−59.36%	−2.36%	0.83%	4.46%	60.86%
$CAR_{(-5,+20)}$	8,180	1.80	−80.83	−3.39	1.45	6.83	67.99
$CAR_{(-5,+60)}$	6,251	2.60	−98.21	−6.72	2.12	11.23	106.98
$CAR_{(-5,+120)}$	4,354	3.57	−152.50	−10.92	2.37	17.79	140.80
Sell recommendations							
$CAR_{(-5,+5)}$	8,167	−1.28	−60.80	−4.83	−1.05	2.68	65.01
$CAR_{(-5,+20)}$	7,737	−1.66	−103.72	−7.05	−1.29	4.10	67.51
$CAR_{(-5,+60)}$	5,899	−1.81	−105.28	−11.17	−1.52	8.06	111.26
$CAR_{(-5,+120)}$	3,991	−2.11	−211.98	−17.00	−1.18	13.20	158.31

[a] $CAR_{(t,t+s)}$ = Cumulative abnormal return from event day t to event day $t + s$.

information content event windows that begin on Day −5. Short windows (e.g., Days −5 to +5) and long windows (e.g., Days −5 to +120) were both used to assess the temporary and the permanent effects of the determinants of price performance.[18]

Table 4 reports descriptive statistics for the dependent and independent variables used in the regressions. For buys, the means of $CAR_{(-5,+5)}$, $CAR_{(-5,+20)}$, $CAR_{(-5,+60)}$, and $CAR_{(-5,+120)}$ are 1.16 percent, 1.80 percent, 2.60 percent, and 3.57 percent, respectively; for sells, the means are −1.28 percent, −1.66 percent, −1.81 percent, and −2.11 percent, respectively. All means are significantly different from zero at less than the 0.01 level.

Table 5 shows that 59 percent of the buy recommendations were strong buys and 41 percent

Table 5. Distributions of Independent Dummy Variables

Variable[a]	Buy Recommendations		Sell Recommendations	
	0	1	0	1
STRONG	40.8%	59.2%	69.5%	30.5%
SKIPRANK	70.8	29.2	57.7	42.3
ALLAM1	95.2	4.8	95.2	4.8
ALLAM2	95.1	4.9	94.9	5.1
ALLAM3	87.6	12.4	86.5	13.5
ALLAM4	83.6	16.4	82.0	18.0
BRSIZE1	80.1	19.9	83.7	16.3
BRSIZE5	80.4	19.6	79.9	20.1
COSIZE1	80.5	19.5	79.6	20.4
COSIZE5	78.8	21.2	81.2	18.8
POSEPSREV	84.5	15.5	92.7	7.3
NEGEPSREV	86.8	13.2	71.8	28.2
EPSDATE	82.9	17.1	83.3	16.7
MONTHEND	26.8	73.2	26.2	73.8

Note: Total buy recommendations = 8,790; total sell recommendations = 8,167.

[a] *Definitions of variables:*

STRONG: For buys, equals 1 if the recommendation is a strong buy and zero otherwise (a buy); for sells, equals 1 if the recommendation is a strong sell or sell and zero otherwise (a hold).
SKIPRANK: Equals 1 if the change in recommendation skipped a rank and zero otherwise.
ALLAM1: Equals 1 if the analyst is a first-team All-American and zero otherwise.
ALLAM2: Equals 1 if the analyst is a second-team All-American and zero otherwise.
ALLAM3: Equals 1 if the analyst is a third-team All-American and zero otherwise.
ALLAM4: Equals 1 if the analyst is a runner-up All-American and zero otherwise.
BRSIZE1: Equals 1 if the number of analysts at the brokerage house is in the bottom quintile and zero otherwise.
BRSIZE5: Equals 1 if the number of analysts at the brokerage house is in the top quintile and zero otherwise.
COSIZE1: Equals 1 if the market capitalization of the firm is in the bottom quintile and zero otherwise.
COSIZE5: Equals 1 if the market capitalization of the firm is in the top quintile and zero otherwise.
POSEPSREV: Equals 1 if the analyst also revised up the EPS forecast of the current or next fiscal year and zero otherwise.
NEGEPSREV: Equals 1 if the analyst also revised down the EPS forecast of the current or next year and zero otherwise.
EPSDATE: Equals 1 if the recommendation occurred within five days of an EPS announcement and zero otherwise.
MONTHEND: Equals 1 if the recommendation is not month-end dated and zero otherwise.

Table 6. Determinants of Stock Price Performance of Buy and Sell Recommendations

Independent Dummy Variable[a]	Predicted Sign	$CAR_{(-5,+5)}$ Mean Coefficient	$CAR_{(-5,+5)}$ *t*-Statistic[b]	$CAR_{(-5,+20)}$ Mean Coefficient	$CAR_{(-5,+20)}$ *t*-Statistic[b]	$CAR_{(-5,+60)}$ Mean Coefficient	$CAR_{(-5,+60)}$ *t*-Statistic[b]	$CAR_{(-5,+120)}$ Mean Coefficient	$CAR_{(-5,+120)}$ *t*-Statistic[b]
Buy recommendations									
Intercept	?	0.37	1.25	1.19	3.01**	2.21	4.42**	1.71	1.49
STRONG	+	0.25	1.24	0.16	0.59	0.07	0.13	1.69	1.29
SKIPRANK	−	0.32	1.76	0.17	0.56	0.30	0.63	−0.51	−0.48
ALLAM1	−	1.18	2.55*	0.25	0.39	−0.20	−0.15	−0.88	−0.52
ALLAM2	−	0.62	1.76	0.26	0.44	−0.62	−0.61	−2.25	−1.65
ALLAM3	−	−0.17	−0.54	−0.16	−0.40	1.00	0.89	0.44	0.22
ALLAM4	−	−0.16	−0.69	−0.81	−2.76*	−1.59	−2.32*	−4.52	−2.71*
BRSIZE1	−	−0.28	−1.45	−0.42	−1.61	−0.95	−2.15*	−1.72	−1.83
BRSIZE5	+	0.13	0.52	0.05	0.14	−0.26	−0.44	1.69	1.95
COSIZE1	+	0.66	2.14*	1.48	2.91*	2.75	2.41*	4.79	2.53*
COSIZE5	−	−0.37	−2.69*	−0.49	−2.54*	−1.12	−2.53*	−1.15	−1.29
POSEPSREV	+	1.08	3.96**	1.94	4.83**	1.44	2.01	1.76	1.39
NEGEPSREV	−	−1.05	−5.51**	−1.73	−4.85**	−2.14	−3.32**	−3.92	−3.15**
EPSDATE	+	0.58	3.11**	0.75	2.18*	0.21	0.24	2.97	2.15*
MONTHEND	+	0.51	2.85*	0.31	1.46	0.26	0.61	0.95	1.05
Mean adjusted R^2		0.01		0.01		0.01		0.01	
Sell recommendations									
Intercept	?	−0.07	−0.25	−0.08	−0.20	0.66	0.66	0.28	0.13
STRONG	−	−0.66	−4.25**	−1.06	−4.90**	−1.65	−2.56*	−2.95	−1.94
SKIPRANK	−	−0.45	−2.19*	−0.29	−1.19	−0.09	−0.15	0.04	0.06
ALLAM1	−	−0.79	−1.41	−0.53	−0.68	−0.20	−0.13	−1.25	−0.42
ALLAM2	−	0.25	0.72	0.20	0.46	−1.38	−1.22	−1.95	−1.12
ALLAM3	−	0.23	0.66	0.20	0.46	−0.79	−0.93	−0.25	−0.16
ALLAM4	−	0.19	0.76	0.63	1.43	0.32	0.50	2.21	1.86
BRSIZE1	+	0.42	1.19	0.00	0.00	−1.86	−1.95	−0.97	−0.70
BRSIZE5	−	−0.84	−3.21**	−1.02	−2.72*	−0.74	−1.23	0.55	0.45
COSIZE1	−	−0.20	−0.72	−0.83	−2.18*	−1.25	−1.34	−2.89	−1.24
COSIZE5	+	0.58	2.00	0.23	0.50	−0.07	−0.08	1.18	0.59
POSEPSREV	+	0.96	3.42**	1.41	3.06**	1.90	1.99	2.79	1.31
NEGEPSREV	−	−1.47	−4.60**	−1.76	−4.21**	−1.50	−2.19*	−2.42	−1.63
EPSDATE	−	−0.65	−1.65	−0.42	−0.71	−0.55	−0.77	−0.77	−0.66
MONTHEND	−	−0.81	−2.92*	−1.01	−3.19**	−1.48	−2.01	−2.05	−1.99
Mean adjusted R^2		0.02		0.01		0.00		0.00	

[a] $CAR_{(t,t+s)}$ = Cumulative abnormal return from event day t to event day $t + s$. See Table 5 for definitions of variables.
[b] *t*-statistics with an absolute value of 1.75, 2.13, and 2.95 indicate significance at the 0.10, 0.05, and 0.01 levels, respectively. * indicates statistical significance at less than the 0.05 level. ** indicates statistical significance at less than the 0.01 level.

were upgrades to buy. Of the sell recommendations, 31 percent were sells or strong sells and 69 percent were downgrades to hold. About 29 percent of the buys skipped a rank, and 42 percent of the sells skipped a rank. More than 38 percent of the buys and 41 percent of the sells were issued by All-Americans. About 15 percent of the buys were accompanied by a positive forecast revision of current and/or next-year earnings, and 28 percent of the sells were issued with a negative forecast revision of current and/or next-year earnings. Interestingly, 13 percent of the buys were accompanied by a *negative* forecast revision of current and/or next-year earnings, and 7 percent of the sells were issued with a *positive* forecast revision of current and/or next-year earnings. About 17 percent of the recommendations were made within five days of an EPS announcement, and about 26 percent of the recommendations came from periodic (month-end) reports.

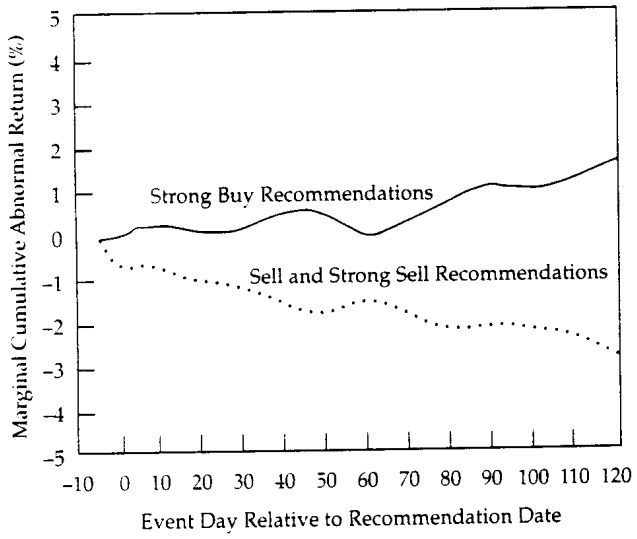
Table 6 reports mean coefficients from calendar quarter regressions that attempt to explain abnormal returns.[19] Results are reported separately for buy and sell recommendations. Although the tests of the hypotheses generally resulted in statistically significant evidence that is also economically important, the percentage of the variation in stock returns explained by these regressions is low. The mean adjusted R^2s are about 0.01, a result that is consistent with prior studies that have attempted to explain daily abnormal stock returns.

Strength of Recommendation

Downgrades to strong sell and sell have greater negative price impact than downgrades to hold. Downgrades to strong sell or sell are associated with a marginal −0.66 percent (*t*-statistic = −4.25) decrease in price during Days −5 to +5, relative to downgrades to hold (see Table 6). This result is consistent with the hypothesis that although a downgrade to hold signals an overvalued stock, a sell or strong sell signals an even more greatly overvalued stock. Upgrades to strong buy are associated with a marginal 0.25 percent (*t*-statistic = 1.24) increase in price during Days −5 to +5 relative to upgrades to buy (see Table 6). The coefficients from the longer event windows continue to be positive for buys and negative for sells, and they increase in absolute magnitude. By Day +120, approximately a six-month period, the marginal CAR associated with strong buys grows to 1.69 percent (*t*-statistic = 1.29) and with sells and strong sells grows to −2.95 percent (*t*-statistic = −1.94). The statistical significance of the coefficients generally diminishes as the event window is expanded, but this result is expected because of the added noise in longer windows.[20]

Figure 2 plots the time series of marginal CARs associated with STRONG, that is, the series of estimated coefficients on STRONG, as the information content window is expanded from $CAR_{(-5,-5)}$ to $CAR_{(-5,-120)}$. These plots use the estimated coefficients for STRONG on Table 6, as well as results from additional regressions using different-length windows that all begin on Day −5. Figure 2 illustrates that downgrades to sell and strong sell have greater negative impact than downgrades to hold. The evidence that the market distinguishes between buys and strong buys is weaker, however. The evidence over longer windows suggests that these effects are permanent.

Figure 2. Marginal Cumulative Abnormal Returns Associated with Strong Buys and with Sells and Strong Sells, by Event Day



Note: Returns are marginal to those associated with upgrades to buy and downgrades to hold. They are also marginal to the influence of all other explanatory variables.

Magnitude of the Revision in Recommendation

Buy recommendations that skip a rank have a marginal 0.32 percent (*t*-statistic = 1.76) effect on price over Days −5 to +5 and sell recommendations that skip have a marginal −0.45 percent (*t*-statistic = −2.19) effect. Over the longer windows, there is no evidence that recommendations that skip a rank have greater influence.

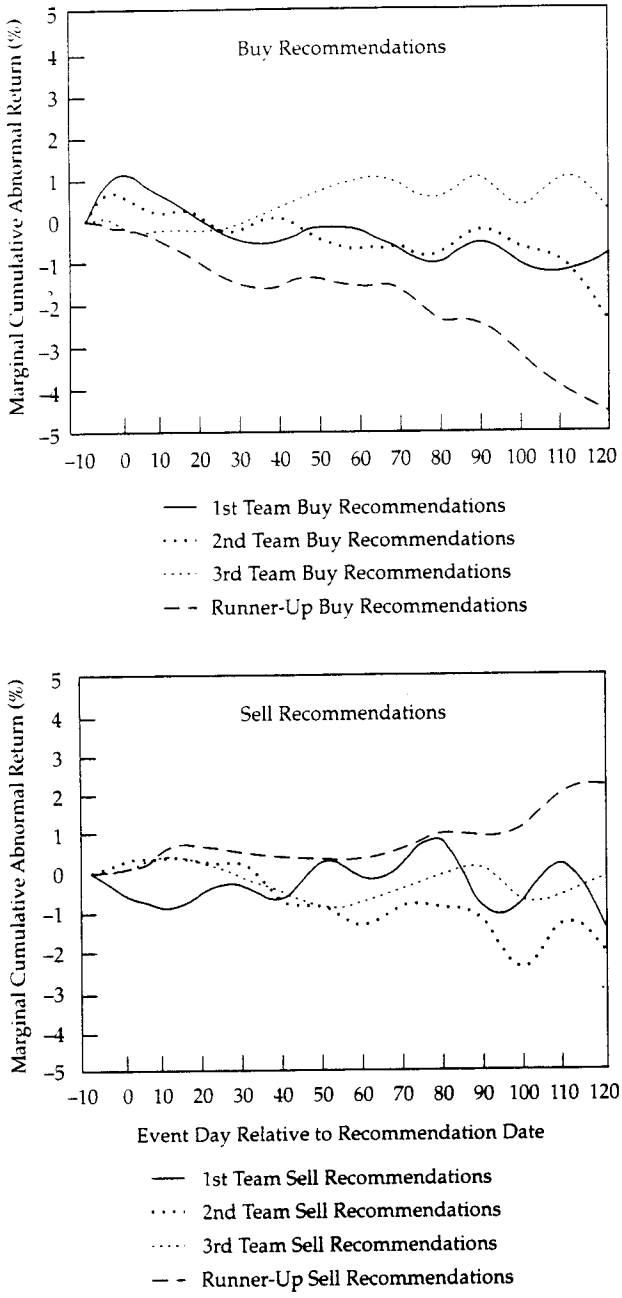
Analyst Reputation (All-America Analysts)

Buy recommendations from first-team and second-team All-America analysts are more influential than those from non-All-Americans. This result is consistent with a reputation effect: Analysts with better reputations have more influence than others on the market. First-team All-Americans have the largest effect on prices. If a first-teamer issues a buy recommendation, expect an additional 1.18 percent (*t*-statistic = 2.55) price increase during Days −5 to +5 beyond that associated with non-All-Americans. Second-teamers add 0.62 percent, but third-teamers and runners-up add −0.17 percent and −0.16 percent, respectively.

The reputation effect is not symmetric for sell recommendations. The marginal effect of first-teamers issuing sell recommendations is an additional −0.79 percent (*t*-statistic = −1.41) price decline during Days −5 to +5 beyond that associated with non-All-Americans. Sell recommendations issued by second-teamers, third-teamers, and runners-up do not have a negative mean marginal effect on price. The evidence using $CAR_{(-5,+20)}$ and longer windows suggests that the influence of All-Americans is only temporary.

The two panels of Figure 3 show the marginal CARs associated with All-American buy and sell recommendations. The figure illustrates the immediate impact that the first-teamers have but also suggests that the reputation effect is short-lived. By

Figure 3. Marginal Cumulative Abnormal Returns Associated with Recommendations from All-American Analysts, by Event Day



Note: Returns are marginal to those associated with non-All-American recommendations and to the influence of all other explanatory variables.

Day +30 the immediate impact has, on average, reversed. The relatively small sample sizes make interpretation of the longer window evidence tenuous; initially, there were only 425 first-team buy recommendations and 400 first-team sell recommendations, and stocks were removed from the portfolio upon another change in recommendation. Nevertheless, the evidence suggests that All-Americans have a temporary effect on price. The anomalous long-window evidence for runners-up is curious and unexplained.

Marketing Ability of the Brokerage House (Broker Size)

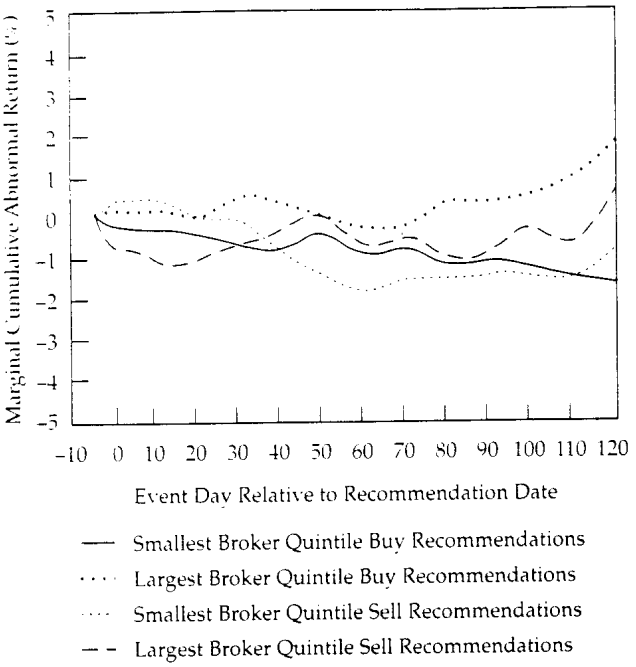
Larger brokerage houses, as measured by the number of analysts, have greater influence than smaller ones. This finding is consistent with a price pressure hypothesis: Larger brokerage houses have larger marketing staff, which generates price pressure. On average, the price increases that accompany buy recommendations are 0.13 percent (t-statistic = 0.52) higher during Days −5 to +5 when the issuing brokerage house is in the top size quintile, between 68 and 156 analysts. Price increases are less, −0.28 percent (t-statistic = −1.45), than for other brokers during Days −5 to +5 when the broker is in the bottom size quintile, between 1 and 17 analysts. Price decreases accompanying sell recommendations from brokerage houses in the top size quintile were −0.84 percent (t-statistic = −3.21) lower than those for other firms during Days −5 to +5. Price decreases accompanying sell recommendations from brokers in the bottom size quintile are 0.42 percent (t-statistic = 1.19) higher during Days −5 to +5.

Figure 4 plots the marginal CAR associated with buy and sell recommendations from large and small brokerage houses. The figure illustrates the larger immediate effect that larger brokers have on price. Over longer windows, the CAR differential is maintained for buys but not for sells.

Differences in Firms' Information Environments (Firm Size)

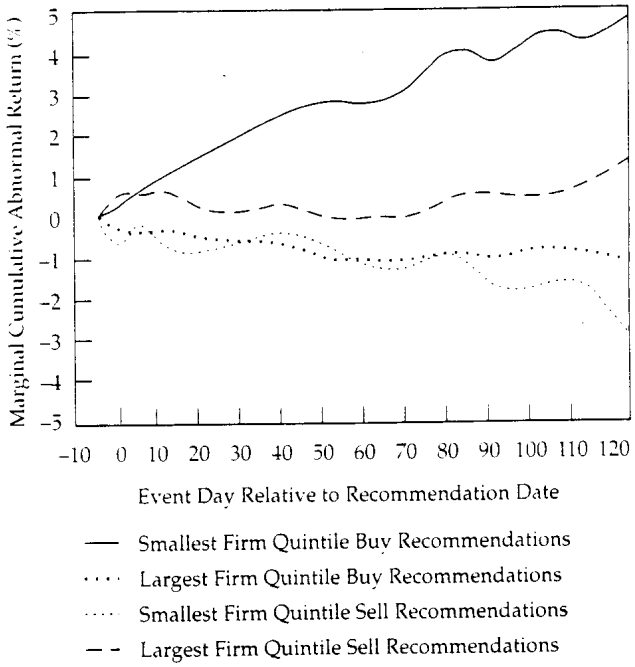
Stocks of smaller firms, as measured by market value, react more strongly than those of larger firms to broker recommendations. This result is consistent with differences in firms' information environments; information about smaller firms is reported less frequently, increasing the information content of any single report. For example, buy recommendations for firms with market capitalization in the smallest quintile ($46 million to $540 million) are associated with a price increase that is 0.66 percent (t-statistic = 2.14) higher than that of larger firms

Figure 4. Marginal Cumulative Abnormal Returns Associated with Large and Small Brokerage Houses, by Event Day



Note: Returns are marginal to those associated with brokers from the other size quintiles and to the influence of all other explanatory variables.

Figure 5. Marginal Cumulative Abnormal Returns Associated with Large and Small Companies, by Event Day



Note: Returns are marginal to those associated with firms from the other size quintiles and to the influence of all other explanatory variables.

during Days −5 to +5. Buy recommendations for firms in the largest quintile ($5,795 million to $452,739 million) are associated with a price increase that is −0.37 percent (*t*-statistic = −2.69) below that for other firms during Days −5 to +5. Sell recommendations for firms in the smallest quintile are associated with a price decrease during Days −5 to +5 that is −0.20 percent (*t*-statistic = −0.72) lower than for other firms. Sell recommendations for firms in the largest quintile are associated with a price decrease over days −5 to +5 that is 0.58 percent (*t*-statistic = 2.00) higher. Evidence for longer windows suggests that this firm-size effect is permanent.

Figure 5 plots the marginal CARs associated with the recommendations of large and small firms. Figure 5 illustrates the larger immediate effect that recommendations have on smaller firms. The figure suggests that the market is very slow to assimilate the information in buy recommendations for small firms. During the six-month period following a buy recommendation, small-firm abnormal returns cumulate to about 5 percent.

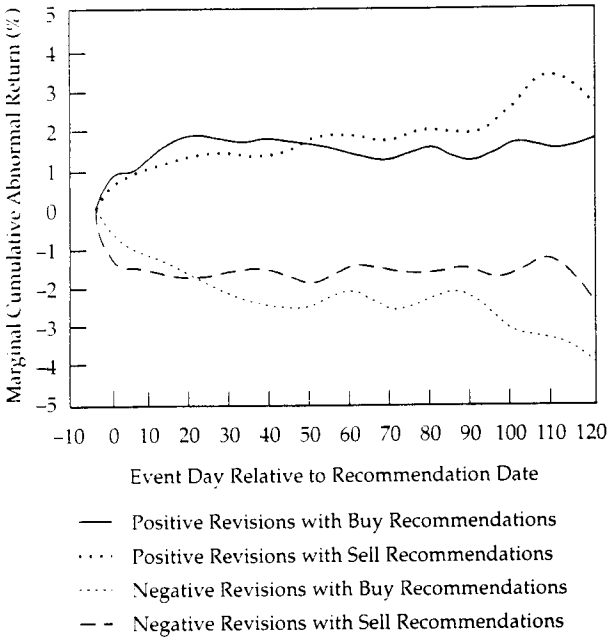
Contemporaneous Earnings Forecast Revisions

Recommendations have greater price impact if reinforced by a confirming earnings forecast revision. This finding corroborates the result in Francis and Soffer. For buys, a confirming positive earnings forecast revision adds 1.08 percent (*t*-statistic = 3.96) and a conflicting negative earnings forecast revision subtracts −1.05 percent (*t*-statistic = −5.11), on average, from stock price during Days −5 to +5. For sells, confirming negative earnings forecast revisions reduce price by a marginal −1.47 percent (*t*-statistic = −4.60) and conflicting positive earnings forecast revisions increase price by a marginal 0.96 percent (*t*-statistic = 3.42) during Days −5 to +5.

Figure 6 plots the marginal CARs associated with contemporaneous earnings forecast revisions. The figure illustrates that revisions have an immediate marginal impact, but the market is slow to assimilate all the information in a forecast revision. This result is consistent with Stickel, among others, who found that positive abnormal returns follow

positive earnings forecast revisions and negative abnormal returns follow negative forecast revisions for approximately six months.[21]

Figure 6. Marginal Cumulative Abnormal Returns Associated with Contemporaneous Earnings per Share Forecast Revisions, by Event Day



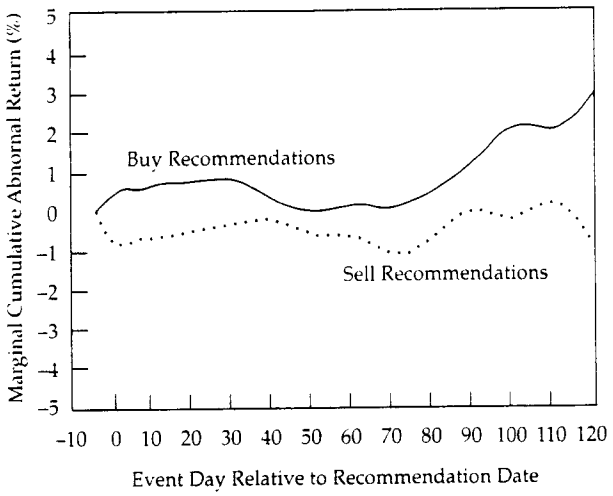
Note: Returns are marginal to those associated with recommendations without a forecast revision and to the influence of all other explanatory variables.

Contemporaneous Earnings Announcements

These findings are not caused by a tendency for brokerage houses to issue buy or sell recommendations immediately following earnings announcements. The design of the experiment allows segregation of the signals from recommendations that are confounded by earnings announcements. Sell recommendations coincidental with earnings announcements are associated with an incremental negative mean abnormal return of −0.65 percent (t-statistic = −1.65) during Days −5 to +5, which is consistent with the earnings announcement adding to the information in a sell recommendation. For buy recommendations, the incremental positive mean abnormal return during Days −5 to +5 is 0.58 percent (t-statistic = 3.11).

Figure 7 plots the marginal CARs associated with contemporaneous earnings announcement dates and illustrates that the market is slow to assimilate all the information in an earnings announcement. This finding is consistent with post-earnings announcement drift in stock price.[22]

Figure 7. Marginal Cumulative Abnormal Returns Associated with Contemporaneous Earnings per Share Announcements



Note: Returns are marginal to those associated with recommendations without an earnings per share announcement and to the influence of all other explanatory variables.

Recommendations from Periodic Reports

The evidence indicates that changes in recommendations taken from periodic (month-end) reports are less informative than those from other sources. Sell recommendations that are not end-of-month dated experience a marginal price decline of −0.81 percent (t-statistic = −2.92) during Days −5 to +5 as compared with end-of-month sell recommendations. Buy recommendations that are not at month-end increase a marginal 0.51 percent (t-statistic = 2.85) during Days −5 to +5 compared with end-of-month buy recommendations.

INTERPRETATIONS AND CONCLUSIONS

Buy recommendations issued by brokerage houses are associated with an average 1.16 percent price increase over the 11 business days centered on the date of the recommendation as recorded by Zacks. Sell recommendations are associated with an average −1.28 percent price decline. These averages are misleading, however, because they include the confounding effects of earnings forecast revisions and

earnings announcements, as well as less-informative, month-end-dated recommendations.

Averages also obscure the factors that influence price reaction. This analysis indicates that

- Downgrades to strong sell and sell have greater negative impact than downgrades to hold, and to a lesser extent, upgrades to strong buy have a greater positive impact than upgrades to buy. This result suggests that analysts are able to detect the extent to which a stock is overvalued or undervalued; these differences appear to be permanent, information effects.
- Changes in recommendations that skip a rank (e.g., 3 to 1) have a larger price effect than changes in recommendations that do not skip a rank; these differences appear to be temporary.
- Analysts on the *II* magazine first-team All-America list have the greatest influence on prices, which suggests that analysts who have better reputations have more influence; yet, the influence of All-Americans appears to be a temporary, price pressure effect.
- Larger brokerage houses have more impact on prices than do smaller brokers, which is consistent with larger houses having stronger marketing staff. This effect appears to be a temporary, price pressure effect.
- Smaller companies have larger reactions to recommendations than do larger firms, which is consistent with the existence of fewer alternative information sources about the value of smaller companies. This firm-size effect appears to be a permanent, information effect.
- Recommendation changes accompanied by same-sign revisions in earnings forecasts have greater impact than other changes. This earnings forecast revision effect appears to be a permanent, information effect.

The immediate impact of these factors is illustrated by noting that the average return to buy recommendations quadruples, going from 1.16 percent to 4.61 percent during Days −5 to +5, if it is a strong buy recommendation that skips a rank, is issued by a first-team All-American employed by a large brokerage house recommending a smaller company, and is accompanied by a positive revision in an earnings forecast.[23] Sell and strong sell recommendations with otherwise similar characteristics, except for a negative revision in an earnings forecast, are associated with an average −5.29 percent decrease during Days −5 to +5. These averages exclude the confounding effects of earnings announcements and exclude less-informative, periodic (month-end dated) recommendations.

Despite some success in identifying factors associated with stock returns subsequent to buy and sell recommendations, recommendations explain only a small amount of the cross-sectional variation in subsequent abnormal returns. The images coming from the crystal ball are rather cloudy, which is exactly what one should expect in an almost-efficient capital market.[24]

NOTES

1. Prior studies of stock returns after investment recommendations generally report mean results. See J. Bjerring, J. Lakonishok, and T. Vermaelen, "Stock Prices and Financial Analysts' Recommendations," *The Journal of Finance*, vol. 38, no. 1 (March 1983):187–204; E. Dimson and P. Marsh, "An Analysis of Brokers' and Analysts' Unpublished Forecasts of UK Stock Returns," *The Journal of Finance*, vol. 39, no. 5 (December 1984):1257–92; and E. Elton, M. Gruber, and S. Grossman, "Discrete Expectational Data and Portfolio Performance," *The Journal of Finance*, vol. 41, no. 3 (July 1986): 699–713. K. Womack, "Do Brokerage Analysts' Recommendations Have Value?" working paper, Dartmouth College (1995) is an interesting recent analysis.

   A few studies have cross-sectionally analyzed the impact of recommendations. Stickel, in "The Effect of Value Line Investment Survey Rank Changes on Common Stock Prices," *Journal of Financial Economics*, vol. 14, no. 1 (March 1985):121–43, found that small firms have greater reactions than large firms to Value Line rank changes, which can be interpreted as buy and sell recommendations. J. Francis and L. Soffer, in "The Relative Information Content of Analysts' Stock Recommendations and Earnings Forecast Revisions," working paper, University of Chicago (1993), examined the relative informativeness of stock recommendations and earnings forecast revisions using 1,310 brokerage house reports that followed extreme changes in reported earnings and contained a stock recommendation and/or an earnings forecast revision. They found that recommendations and forecast revisions both affect stock prices and that price reactions to buy and sell recommendations are enhanced by same-sign evidence from a forecast revision.
2. Additionally, requiring a preceding recommendation allows analysis of the influence of the change in recommendation. Requiring a following recommendation allows removal of the stock from the portfolio upon the subsequent change in recommendation.
3. Zacks' recommendation file associates recommendations with brokerage houses, not analysts. Nevertheless, recommendations can be linked to analysts through Zacks' earn-

ings forecast files because a single company is followed by only one analyst per brokerage house.

4. See R. Bhushan, "An Informational Efficiency Perspective on the Postearnings Announcement Drift," *Journal of Accounting and Economics*, vol. 18, no. 1 (July 1994):45–65. This requirement has little effect on the results because analysts generally do not follow small firms.
5. The signals from these changes are ambiguous. For example, a revision from 1 to 2 can be interpreted as negative, because of the downgrade, or as positive, because the buy rating indicates that the analyst still believes the stock is undervalued.
6. See S. Penman, "The Distribution of Earnings News Over Time and Seasonalities in Aggregate Stock Returns," *Journal of Financial Economics*, vol. 18, no. 2 (June 1987):199–228, for an earlier use of this design. This method adjusts for persistent differences between the return to security *i* and the same size-decile index return. Thus, persistent differences caused by, say, the price/book (market value/book value) anomaly or the price/earnings anomaly are eliminated.
7. See T. Copeland and D. Mayers, "The Value Line Enigma (1965–1978): A Case Study of Performance Evaluation Issues," *Journal of Financial Economics*, vol. 10, no. 3 (November 1982):289–321, for use of the future benchmark methodology. The alternative measures examined were market-adjusted returns, where market is defined as either the equally weighted market index of stocks in the same firm-size decile or the equally weighted market index of all NYSE/Amex stocks, and mean-adjusted returns using a future benchmark estimated from event days +121 to +240. The abnormal return metric reported is chosen to control for firm-size effects and because the abnormal returns over days +61 to +120 following both buy and sell recommendations are essentially zero, which is indicative of an unbiased benchmark return. Using size-decile index-adjusted returns, without the adjustment for mean excess market-adjusted returns over days +121 to +240, results in flat abnormal performance following buy recommendations and continually negative abnormal returns following sell recommendations but does not change any conclusions from the cross-sectional analysis.
8. To mitigate potential problems from calendar clustering, the sample was segregated into subsamples on the basis of the calendar quarter within which Day 0 falls, and mean results were computed by *subsample*. There were 16 (four years times four quarters a year) subsamples. This design subsumed any cross-sectional temporal dependence *within* subsamples and reduced any cross-sectional temporal dependence *between* subsamples. The significance of mean results from these 16 subsamples was determined by dividing the mean by its standard error, which is the estimated standard deviation of the 16 observations divided by the square root of 16. These procedures appeal to the central limit theorem. For buys, the number of recommendations per calendar quarter ranged from 420 in the fourth quarter of 1990 to 781 in the first calendar quarter of 1990. For sells, the number of recommendations ranged from 373 in the fourth quarter of 1991 to 622 in the first calendar quarter of 1991.
9. The "Heard on the Street" column from the October 29, 1991, *Wall Street Journal* reported that, at most firms, the three most important factors determining analyst pay are an evaluation of the analyst by the brokerage sales force, standing in the *II* poll, and job offers from competitors. Barbara Bent, an *II* editor, told me that analysts attempt to influence the poll by visiting money managers about the time they vote. This practice is confirmed by a research director quoted in the *Wall Street Journal* article as saying, "Most of the guys know that they'll be visiting for *II* in the spring. I'm a lonely guy in March and April shortly before the balloting."
10. See S. Stickel, "Reputation and Performance Among Security Analysts," *The Journal of Finance*, vol. 47, no. 5 (December 1992):1811–36.
11. E. Elton, M. Gruber, and S. Grossman, "Discrete Expectational Data and Portfolio Performance," *The Journal of Finance*, vol. 41, no. 3 (July 1986):699–713; D. Logue, "Discussion," *The Journal of Finance*, vol. 41, no. 3 (July 1986):713–14.
12. The influence of broker size was also tested using a continuous, rather than dummy, variable with no change in conclusions. Results are reported using the dummy variables to aid interpretation of the coefficients. Using dummy variables, the coefficients represent the marginal CAR associated with recommendations from a particular broker-size quintile for a particular event window. The marginal CAR over a longer period can be estimated by increasing the event window for CAR. Figure 4 illustrates the times series of this marginal CAR as the information content window is expanded from $CAR_{(-5,+5)}$ to $CAR_{(-5,+120)}$.
13. E. Grant, "Market Implications of Differential Amounts of Interim Information," *Journal of Accounting Research*, vol. 18, no. 1 (Spring 1980):255–68; A. Damodaran, "Economic Events, Information Structure, and the Return-Generating Process," *Journal of Financial and Quantitative Analysis*, vol. 20, no. 4 (December 1985):423–34; and S. Stickel, "The Effect of Value Line Investment Survey Rank Changes on Common Stock Prices," *Journal of Financial Economics*, vol. 14, no. 1 (March 1985):121–43.
14. As with broker size, the influence of firm size was also tested using a continuous variable, with no change in conclusions. Results are reported using the dummy variables to aid interpretation of the coefficients.
15. An alternative construct using the continuous explanatory variable new forecast minus the old forecast, scaled by price per share, changed no conclusions. The dichotomous explanatory variables were chosen, in part, because most recommendations were not accompanied by a contemporaneous revision of forecasted earnings for either the current or the next year.
16. See P. Brown, G. Foster, and E. Noreen, *Security Analyst Multi-Year Earnings Forecasts and the Capital Market* (Sarasota, FL: American Accounting Association, 1985). See also S. Stickel, "The Timing of and Incentives for Annual Earnings Forecasts Near Interim Earnings Announcements," *Journal of Accounting and Economics*, vol. 11, no. 2/3 (July 1989):275–92.
17. The dates of recommendations assumed to be taken from periodic reports are 1988: 1/28, 1/29, 2/29, 3/31, 4/29, 5/31, 6/30, 7/29, 8/31, 9/30, 10/31, 11/30, 12/30; 1989: 1/31, 2/28, 3/31, 4/28, 5/31, 6/30, 7/31, 8/31, 9/29, 10/27, 10/31, 11/30, 12/29; 1990: 1/26, 1/31, 2/2, 2/28, 3/30, 4/30, 5/31, 6/29, 6/30, 7/31, 8/31, 9/28, 9/30, 10/31, 11/30, 12/31; and 1991: 1/31, 2/28, 3/28, 4/30, 5/31, 6/28, 7/31, 8/30, 9/30, 10/31, 11/29, 12/31.
18. Abnormal performance prior to Day 0 could be caused by a leak of the recommendation, a delay in the report publicizing the recommendation, or some other firm-specific event that generates a recommendation. Thus, the potential confounding consequence of including prior abnormal returns is the possibility that the analyst's revision includes public

information revealed on or before Day 0. The use of EPS-DATE controls for one such firm-specific event, earnings announcements. Despite the possibility of other firm-specific events, there is no reason to expect that such events are systematically related to the hypothesized cross-sectional determinants of price reaction.

19. The sample is again segregated by the calendar quarter within which Day 0 falls. A regression was performed for each subsample, then mean coefficients were calculated. The significance of the mean coefficients from these calendar quarter regressions is determined by dividing the mean coefficient by its standard error, which is the estimated standard deviation of the coefficients divided by the square root of the number of calendar quarters. See E. Fama and J. MacBeth, "Risk, Return, and Equilibrium: Empirical Tests," *Journal of Political Economy*, vol. 81, no. 2 (May/June 1973): 607–36.
20. Taken together, these mean effects are statistically significant. A binomial test of the difference between the *t*-statistics on $CAR_{(-5,-5)}$ for buy and sell recommendations is

$$\frac{[1.29 - (-1.94)]/2}{[(0.5)(0.5)(2)]^{1/2}} = 2.28,$$

which indicates a significant difference.
21. See S. Stickel, "Common Stock Returns Surrounding Earnings Forecast Revisions: More Puzzling Evidence," *The Accounting Review*, vol. 66, no. 2 (April 1991):402–16.
22. For an example of the literature on postearnings announcement drift, see V. Bernard and J. Thomas, "Evidence That Stock Prices Do Not Fully Reflect the Implications of Current Earnings for Future Earnings," *Journal of Accounting and Economics*, vol. 13, no. 4 (December 1990):305–40.
23. Using the estimated coefficients from Table 6 for buys and $CAR_{(-5,-5)}$, the 4.61 percent is calculated as 4.61 = 0.37 + 0.25 + 0.32 + 1.18 + 0.13 + 0.66 + 1.08 + 0.51. The average price decrease for sell recommendations with otherwise similar characteristics is calculated as −5.29 = −0.07 − 0.66 − 0.45 − 0.79 − 0.84 − 0.20 − 1.47 − 0.81.
24. Funding for this research is provided by the Joseph Markmann Alumni Endowed Chair at LaSalle University. I would like to express my gratitude to Dave Stout, Rene Stulz, and workshop participants at George Washington, LaSalle, Lehigh, Purdue, and Villanova for helpful comments, and to Zacks Investment Research, Inc., for supplying the brokerage house buy and sell recommendations and earnings forecasts. This paper has also benefited from presentations at the November 1994 University of Chicago CRSP Conference, the January 1995 meeting of the American Finance Association, and the January 1995 luncheon sponsored by the Society of Quantitative Analysts in New York.