Stock Price Impact of Analysts' Opinion and Their Reputation: Evidence from Online Dissemination of Analysts' Opinion

Joon Young Song

Abstract

This study presents that stock price reaction to the recommendation updates really matters with the recommendation issuing brokerage firms' reputation. Investors are believed to interpret the recommendation updates as more reliable information when the updates are made by more reputable brokerage firms. Firm size also influences the stock price reaction to the recommendation updates. The smaller cap stocks appear to be more sensitive to the recommendation updates than the larger cap stocks do. The impact of recommendation updates on subsequent stock price movements seems to depend on how the update information is disseminated. The impact appears to be more pronounced when the update information is disseminated via more easily accessible non-fee base online sources such as Yahoo!Finance. Finally, trading on the recommendation updates released via a publicly available financial website could make about 5 percent excess return over a short –term period of five weeks.

I. Introduction

Upgrade and downgrade in brokerage firms' recommendations are always of interest to individual investors and buy-side financial institutions because the information is believed to influence the stock price performance in the future. The issue under investigation then is whether or not brokerage firms' recommendations actually benefit investors by creating significant excess returns when they are publicly made available.

Although many empirical studies have researched on this issue, they investigated the impact of the recommendations which are available only to the users of fee-based databases or subscription-based publications or financial internet websites. For example, Lloyd Davies and Canes (1978) presented an evidence that there is significant average abnormal stock price performance on the day of publication of analysts' recommendations in the "Heard on the Street" column of the Wall Street Journal. Their argument has received support from more recent empirical studies by Copeland and Mayers (1982), Bjerring, Lakonishok, and Vermaelen (1983), and Beneish (1991). Also, Barber, Lehavy, McNicholas, and Trueman (2001) examined the impact of analyst recommendations from an internet based financial company. However, the recommendations are basically available to membership subscribers only.

This study is distinguished from prior work by the source and size of the sample recommendations. Unlike prior work, this study uses analysts opinion obtained from the

Joon young Song, Associate Professor of Finance, College of Business, The University of Findlay, Findlay, OH 45840, 419.434.4331(voice), song@findlay.edu.

Yahoo!Finance which is the most popular financial internet website and available to the public with no charge. The rapid growth of online investing more frequently leads investors being exposed to internet based information and to trade more actively on the information acquired online (Barber and Odean, 2002). Therefore, the information released online should have stronger impacts on the markets if the information is publicly available. It is conjectured that the abnormal returns subsequent to brokerage firms' recommendations released through the website of Yahoo!Finance may be more significant than the results from previous studies using the recommendations obtained from fee or subscription based databases or periodically released publications (*e.g.*, *The Wall Street Journal*, First Call, the Value-Line Investment, *etc*.). Also, a very large sample size is considered compared to prior work. More than 25,000 recommendations from almost 1,000 firms for a period of three years are collected from the website of Yahoo!Finance.

This study also departs from prior work by examining whether or not the reputation of the brokerage firms is really worth it. Brokerage firms' reputation is also compared with some typical type of technical variables such as past returns, trading volumes, and price variability that are known to be related to the stock price reaction to stock recommendations. Many studies documented that past returns, their variability, and trading volume are informative and play important roles in predicting the future expected return process.

This paper proceeds as follows. Section II introduces the data used in this study with descriptive statistics of the sample observations in the dataset. The stock price behavior after an event which in the release of recommendation updates in this study is measured over five weeks after the release day. The results are described in section III. In sections IV and V, I explore how historical stock returns, trading volumes, price variability and some firm-specific variables such as firm size, beta, profit margin, and PE ratio are related to post-event stock price behavior. Section VI incorporates all variables analyzed in earlier sections and brokerage firms' reputation together and investigates the impact of all variables on post-event stock price movements. Section VII concludes this paper.

II. Data

The brokerage firms' recommendation updates are collected from the section of 'Analyst Opinion" in Yahoo!Finance, one of financial internet websites. The menu of 'Analyst Opinion' in the website of Yahoo!Finance provides historical upgrades and downgrades of the stocks covered by various brokerage firms. Recommendations of the stocks with more than average daily trading volume of 500,000 are sampled from the recommendations posted during the three –year period from April 1998 when the data accumulation was initiated. The earliest available three year data from Yahoo!Finance is used because stock recommendation information just began to be disseminated through publicly accessible online finance web sites around in 1998 and has not been explicitly acknowledged in any prior study as far as I am aware. That is why

three-year sample period from 1998 was chosen. Thus, the impact of recommendation updates released from the website of Yahoo!Finance could be more meaningfully compared to the results from traditional fee-based online or offline databases.

According to the editor of Breifing.com, which provides Yahoo!Finance with brokerage firms' recommendations, the recommendations are acquired from the written and electronic reports issued by brokerage firms. The recommendations updates issued by the brokerage firms fall into two categories; upgrade or downgrade. An upgrade is defined as a change from a less favorable grade to a better, *e.g*., from 'strong sell' to 'sell' (or better), a downgrade is defined conversely, *e.g*., from 'strong buy' to 'buy' (or worse).

The total number of recommendation updates and initiates[2] is 26,705 from 987 stocks. 16,801 out of 26,075 recommendations are updates which consist of 7,840 of favorable updates (*i.e*., upgrade) and 8,961 of unfavorable updates (*i.e.,* downgrade). An event window of (-35 days, +35 days) is adopted to measure the impact of recommendation updates on stock price performance over five weeks before and after the release days of the updates. Recommendation updates are occasionally issued by brokerage firms on multiple dates within a very short period. Consequently, the impact of recommendation updates on a stock might be contaminated by other subsequent or preceding recommendation updates. Thus, it is very important to exclude the recommendation updates for a stock that occur multiple times within the event window from the dataset so that the impact of only the recommendation update(s) released once on a day within the event window can be measured.[3] In fact, this type of compounding effect of a series of the issuance of recommendation updates on post-event stock prices has not been controlled for and ignored in the previous related studies.

As the second filtering process, the stocks of the recommendation updates have less than 250 daily returns before and after the event dates. Finally, the sample dataset ends up with 811 recommendation updates of downgrade for 479 stocks and 943 recommendation updates of upgrade for 521 stocks. All price and trading volume data are obtained from the Center for Research in Stocks Prices (CRSP). Summary statistics of the sample observations are given in Table I.

Recommendations are usually issued on a five-point scale, 1(strong buy)~5(strong sell). However, it is difficult to classify all recommendations into a unified rating because every brokerage firm uses a little bit different rating system and expressions. Thus, I categorize all recommendations into a two-point scale, upgrade or downgrade. The values given in Table I are calculated based on recommendations, not based on firms. Therefore, a firm might be considered several times in the calculations of the values in the table.

[2] 'Initiate' means the first investment opinion of a stock is made by a specific brokerage firm.

[3] Actually, a wider event window ($\pm$ 37 day-event window) is used to make sure the recommendation updates for a stock that are released on multiple dates within $\pm$ 35 day-event window are dropped from the dataset.

The Carter-Manaster (C-M) reputation rankings are originally evaluated for IPO underwriters (Carter and Manaster, 1990). The C-M rankings evaluated over 1992-2000[4] is employed as a proxy for the degree of reliability of the recommendation updates. The IPO underwriters are evaluated on a 0-9 scale with 9 being most prestigious firms and 0 least prestigious firms. The reputations in the area of underwriting are expected to be very closely related to the reliability of the underwriting institutions' other business activities including recommendations. It is hypothesized that the C-M ranking could play as a proxy for the degree of reliability of recommendation updates and therefore would affect the impact of the updates on stock price performance. When multiple brokerage firms issue an upgrade or downgrade recommendation on the same day, the recommendation update would be believed to be more reliable. Thus, the C-M rankings of all brokerage firms related to a recommendation update are summated to represent an increasing reliability in proportion to the number of issuing brokerage firms. The sum of all issuing brokerage firms' C-M rankings is used as the reputation index.

III. STOCK PRICES PRIOR AND POST RECOMMENDATION UPDATES

Stock price behaviors are measured by daily abnormal returns (AR) and cumulative abnormal returns (CAR). Daily abnormal returns on a stock in a recommendation update *j* on day *t*, $AR_{j,t,}$ are calculated from the market model as follows:

(1) $$AR_{j,t} = R_{j,t} - (\hat{\alpha}_j + \hat{\beta}_j R_{m,t})$$

where $R_{j,t}$ is the return to the stock with a recommendation update *j* on day *t*, $R_{m,t}$ is the return on the value weighted CRSP market index on day *t*, and $\hat{\alpha}_j$ and $\hat{\beta}_j$ are the ordinary least squares (OLS) estimates for the stock's parameters. The market model is estimated over the period of 250 days within a time window between 286 days and 37 days before the released day of the recommendation updates. Cumulative abnormal returns (CARs) for the stock in a recommendation update *j* during a specific period around the event date, *day* 0~ p (post-event) or *t*=-1~q (pre-event) are calculated as follows:

(2) $$CAR_{j,p} = \sum_{t=0}^{p} AR_{j,t} \quad \text{for } p \geq 0, \qquad CAR_{j,q} = \sum_{t=-1}^{q} AR_{j,t} \quad \text{for } q \leq -1$$

$CAR_{j,p}$ is the cumulative abnormal return on the stock in a recommendation j from the event day (*t*=0) until *t*=p. $CAR_{j,q}$ is the cumulative abnormal return from *t*=q to one day before the event day (*t*=-1). Abnormal returns and cumulative returns are calculated over 250 days before and after the event date. Then, daily abnormal returns and cumulative abnormal returns of all

[4] The C-M rankings of IPO underwriters are available at http://bear.warrington.ufl.edu/Ritter/rank.pdf

recommendations updates in each group of recommendation upgrades and downgrades are averaged.

(3)
$$\overline{AR_t} = \frac{1}{N}\sum_{j=1}^{N} AR_{j,t}, \qquad \overline{CAR_t} = \frac{1}{N}\sum_{j=1}^{N} CAR_{j,t}$$

N = the numbers of recommendation upgrades or downgrades

Table II and Figures 1 and 2 show an interesting finding. The reaction of stock prices to the recommendation updates begins even a day prior to the release day of the updates. This finding strongly implies a kind of information leakage in the recommendation disseminating process. Table II also presents that the stocks of smaller firm size (market capitalization) tend to be more sensitive to the release of recommendation updates. For the recommendation updates, the average firm-size of the NYSE stocks is 3.56 times as large as that of the NASDAQ stocks. The average CAR of the NASDAQ stocks on the event day is 6.13 percent which is 2.3 times larger than 2.33 percent of the NYSE stocks. Similar pattern is observed from the recommendation downgrades.

Another interesting finding is that the impact of the recommendation updates on post-event stock price movements seems to be more significant when the updates are released via publicly accessible online media rather than when they are disseminated through fee-based online or offline media or databases. My results present that the mean abnormal return on the release day of upgrade recommendations is 3.87 percent. The mean cumulative abnormal return for five day period after the release day is almost 5 percent. The mean average abnormal return on the release day of downgrade recommendations is -5.38 percent and the mean cumulative abnormal return for five day period after the release day results in an abnormal return of –6.06 percent. The magnitudes of these abnormal returns are significantly larger than the results reported in the previous studies. Copeland and Myers (1982), utilizing data from fee-based Value Line, concluded that the changes in the analysts' recommendations are not associated with substantial abnormal returns. Similarly, Walker and Hatfield (1996) presented that individual investors experience inferior performance by following analysts' recommendations published in the "Market Highlights" of "USA Today".

Barber et al. (2001), using Zacks Investment Research's online database, documented a portfolio comprised of the most highly recommended stocks provides an average annual abnormal gross return of 4.13 percent whereas a portfolio of the least favorably recommended ones yields an average annual abnormal gross return of 4.91 percent. However, their results are not pronounced as much as the results from my study even though their cumulative abnormal returns are measured over a longer time period (one year) after the release day. On the contrary, Glezakos and Merika (2007), utilizing the data of Greek stocks from the same data source as used in Barber et al. (2001), found insignificant abnormal returns after the publication of

favorable recommendations that could be waved out by transaction costs. Thus, significant abnormal returns after the release of recommendation update in my study strongly support that the impact of brokerage firms' recommendation updates may be influenced by the way how the information of recommendation updates is delivered to investors.

IV. Impact Of Technical Variables:

Technical analysts believe that historical stock price and volume data are prophets of future price movements because markets are not efficient enough for current stock prices to impound all publicly available information.

Numerous papers investigate whether technical variables such as past returns, trading volume, and price variability are informative in predicting post-event stock price movements. Lo and MacKinlay (1988) found that weekly portfolio returns have large positive autocorrelations. Conrad, Kaul, and Nimalendran (1991) and Lehman (1990) showed significant autocorrelations in the returns of individual stocks. These studies imply the predictive power of past return-series. Chordia and Swaminathan (2000) examined the interaction between trading volume and the predictability of short-term stock returns. They argued that trading volume plays a significant role in disseminating market-wide information. Blume, Easley, and O'Hara (1994) presented a model in which traders can learn valuable information about a security by observing both past price and past volume.

More recently, Lo, Mamaysky, and Wang (2000) and Grinblatt and Han (2002) developed an algorithm to infer valuable information from the joint distribution of past prices and volume. Using autoregressive conditional heteroskedasticity process in which trading volume is incorporated, Lamoureaux and Lastrapers (1990) found that entering the level of trading volume for an individual stock into a variance function removes the evidence of GARCH effects. This means that trading volume may partly absorb the predictive power of volatility of returns in forecasting the return process. Westerfield (1977), Rogalski (1978), and Tauchen and Pitts (1983) argued that there exists a significant positive relationship between price variability and trading volume. Furthermore, Bollerslev and Jubinski (1998) explored long-run dependencies in the volume/ volatility relationship for 100 equities.

I examine how well the typical technical variables mentioned in many previous empirical studies explain post-event stock price movements under the event study framework.

Returns:
(4) Mean of Abnormal Returns for one week before the event day (T):

$$\text{MAR(-1 week)} = \sqrt[5]{\prod_{t=T-5}^{T-1}(1+\text{AR}_{j,t})} - 1$$

(5) Mean of Abnormal Returns for one year before the event day (T):

$$\text{MAR(-1 year)} = \sqrt[250]{\prod_{t=T-250}^{T-1}(1+\text{AR}_{j,t})} - 1$$

Variability:

(6) The standard deviation of the prices for one year before the event day (T):

$$VAR = \text{Std (prices) or } \square\square\text{price)}$$

Volumes:

(7) Mean Abnormal Volume for one week before the event day (T):[5]

$$MAV(\text{-1week}) = \frac{1}{5}\sum_{t=T-5}^{T-1}\frac{V_t - \frac{1}{250}\sum_{t=T-250}^{T-1}V_t}{\frac{1}{250}\sum_{t=T-250}^{T-1}V_t}$$

where $\frac{1}{250}\sum_{t=T-250}^{T-1}V_t$ is the average daily volume for 1 year berfore the event date(T)

(8) Mean Abnormal Volume for one year before the event day (=T):

$$MAV(\text{-1year}) = \frac{1}{250}\sum_{t=T-250}^{T-1}\frac{V_t - \frac{1}{250}\sum_{t=T-250}^{T-1}V_t}{\frac{1}{250}\sum_{t=T-250}^{T-1}V_t}$$

where $\frac{1}{250}\sum_{t=T-250}^{T-1}V_t$ is the average daily volume for 1 year berfore the event date(T)

(9) The Ordinary Least Squares (OLS) regression model for technical variables:

$$CAR_t = a + c_1 * MAR(\text{-1week}) + c_2 * MAR(\text{-1year}) + c_3 * VAR + c_4 * MAV(\text{-1week}) + c_5 * MAV(\text{-1year})$$

Table III presents the results of the regression of the CARs over five weeks after the event day (*i.e.,* release day of recommendation updates) on the technical variables described above. Some findings are worthy of note. First, the mean abnormal returns for one year before the event day (*i.e.,* MAR(-1year)) appear to be significantly related to the post-event price behaviors than any other technical variables such as mean abnormal returns for one week before the event day (*i.e.,* MAR(-1week), price variability (VAR), and trading volumes (*i.e*., MAV(-1year) and MAV(-1 week)). The estimated coefficients of MAR (-1 year) are negative for both upgrade and downgrade recommendations. For the stocks that experience a relatively better performance for one year before the event day, their prices tend to be less sensitive to the announcements of upgrade recommendation (good news) and more sensitive to the announcements of downgrade recommendation (bad news). If stocks have outperformed during the past one year period, the increase in the prices of the stocks would be less than that of the underperforming stocks when the information of upgrade recommendations arrives in the markets. Similarly, outperforming stocks before the event day would be likely to decrease more in response to the downgrade recommendations compared to underperforming stocks.

[5] The formula follows Conrad, Hameed, and Niden (1994).

The observations above are consistent with the evidence on the profitability of contrarian trading strategy. The results in Table III present a short-run profitable trading strategy when an unexpected news shock arrives in the markets. For the buyers, it would be better to buy a stock which has underperformed the markets for one year before good news about the stock is announced. It would be a profitable trading strategy to take a short position on a stock which has outperformed the markets when a bad news about the stock (downgrade recommendation) is announced.

Second, price variability (VAR) is positively related to the post-event price response to the announcements of upgrade recommendation, while it negatively affects the post-event price response to the announcements of downgrade recommendation. This finding implies that the stocks with greater price variability for one year before the event day tend to be more sensitive to the announcements of recommendation updates.

Third, the mean abnormal trading volumes for one week before the event day (*i.e.,* MAV (-1 week)) seems to be more related to the post-event price movements than the mean abnormal volume for one year before the event day (*i.e.,* MAV (-1 year)), at least, in the case of upgrade recommendations. The negative coefficients of the MAV (-1 week) indicate that the post-event prices of heavily traded stocks tend to increase less in response to the announcements of upgrade recommendation than those of lightly traded stocks. Unlike historical abnormal returns, only recent trading volume data are significantly informative in forecasting post-event price movements. In a nut shell, one year historical daily abnormal returns (MAV (-1 year)) and recent abnormal trading volumes (MAV (-1 week)) are more informative than recent daily abnormal returns (MAV (-1 week)) and one year daily historical abnormal trading volumes (MAV (-1 year)).

V. Impact Of Fundamental Variables

Additional firm-specific variables obtained from financial data are incorporated into this study to investigate how they are related to the post-event stock price behaviors. Typical firm-specific variables such as firm size (Size), profit margin (Profit Margin), and price/earning ratio (PE), and beta (Beta) are hypothesized to influence post-event price behaviors. The values of the variables are obtained from latest annual financial data of firms as of the release date of the recommendation updates. For convenience, those variables are named fundamental variables.

(10) The OLS regression model for fundamental variables:

$$CAR_t = b + d_1 * \text{Beta} + d_2 * \text{Size} + d_3 * \text{Profit Margin} + d_4 * \text{PE}$$

The results of the OLS regression are presented in Table IV. As a major finding from the OLS regression analysis of fundamental variables, firm size seems to be significantly related to the post-event stock price behaviors for the cases of both upgrade and downgrade recommendations. Firm size is positively related to cumulative abnormal returns (CARs) over five weeks after the release of upgrade recommendations whereas it is positively associated with CARs over five

weeks after the announcement of downgrade recommendations. This finding indicates that the smaller cap stocks tend to more elastically react to the recommendation updates.

VI. Brokerage Firms' Reputation

Now, all the aforementioned variables and brokerage firms' reputation are incorporated into the OLS regression model together to see how they are related to the future post-event stock price behaviors. As described in Section II, brokerage firms' reputation is measured by the Carter-Manaster (C-M) reputation rankings which are evaluated form IPO underwriters over the period of 1992-2000. When a recommendation update for a stock is released by multiple brokerage firms on the same date, the sum of all issuing brokerage firms' C-M rankings is used to represent a greater impact of the recommendation update. It is conjectured that the C-M rankings could influence the post-event stock price behaviors because investors tend to perceive the recommendation updates issued by more reputable brokerage firms as more reliable information. Table V summarizes the results of the regression by the OLS regression[6].

(11) The OLS regression model for all variables:

$$CAR_t = e + f_1 * \text{Beta} + f_2 * \text{Size} + f_3 * \text{Profit Margin} + f_4 * \text{PE} + f_5 * \text{MAR(-1week)} + f_6 * \text{MAR(-1 year)} + f_7 * \text{VAR} + f_8 * \text{MAV(-1 week)} + f_9 * \text{MAV(-1 year)} + f_{10} * \text{CM}$$

The results are very similar to those from the OLS regression models (9) and (10). Firm size is significantly related to the post-event stock price behaviors over five weeks after the release of recommendation updates. The negative coefficients of firm size for the case of upgrade recommendation and the positive coefficients for the case of downgrade recommendation indicate that smaller cap stocks tend to more elastically react to the release of recommendation updates. Profit margin is significantly related to the post-event stock prices over only short-term period of two-weeks. The prices of more profitable firms' stocks appear to more elastically react to the release of upgrade recommendations. On the contrary, more profitable firms tend to experience a deeper decline in their stock prices in response to the release of downgrade recommendations over two-week period.

Mean abnormal returns for one year before the release day of upgrade recommendations (MAR(-1 year)) seem to be significantly related to the post-event prices over the period of five weeks. Negative values of the coefficients imply that the stocks underperforming for one year before the event day significantly react to the release of upgrade recommendations. Unlike the results in the OLS regression model (9) with technical variables only, MAR (-1 year) does not significantly affect the post-event prices at least over two-week period. Price variability appears to significantly influence post-event stock price behaviors in response to the release of upgrade recommendations. The prices of more volatile stocks tend to increase more in response to

[6] The numbers of upgrade and downgrade recommendations in the original sample dataset are 943 and 811. But, the numbers are reduced to 622 and 506, respectively due to missing data of some variables in the OLS regression model.

upgrade recommendations. However, price variability does not seem to be significantly related to the post-event stock prices upon the release of downgrade recommendations. All other technical variables are not significantly related to the post-event stock prices over the period of five weeks.

More interesting finding is that brokerage firms' reputation strongly affects post-announcement price movements over five weeks after the release of the recommendation upgrades and downgrades. The stocks in the recommendation updates with greater sums of the C-M rankings tend to react more to the recommendation updates because investors are believed to interpret the recommendation updates issued by brokerage firms with greater of the C-M rankings as more reliable information. In general, the recommendation updates posted to the website of Yahoo!Finance do not disclose the reason for the changes in the recommendations. Accordingly, the strong relationship between the C-M rankings and post-announcement price movements implies that investors are more likely to perceive the impact of recommendation updates in the context of the issuing brokerage firms' reputation, rather than economic factors underlying the recommendation updates.

VI. Conclusion

This study documents that the impact of brokerage firms' recommendation updates on post-event stock prices is very significant at least over five weeks after the release day of the updates and the magnitude of the impact depends how the information of the recommendation updates is disseminated. Recommendation updates appear to affect more significantly when the update information is disseminated via more easily accessible non-fee base online sources such as the website of Yahoo!Finance.

Several technical and fundamental variables are considered to investigate how the variables affect the stock price reaction to the recommendation update. Among the variables, firm size and the reputation of the brokerage firms issuing the recommendation updates significantly matter with post-event stock price behaviors over at least five weeks after the release of the update information. The smaller cap stocks appear to be more sensitive to the recommendation updates than the larger cap stocks. The recommendation updates made by more reputable brokerage firms tend to affect more significantly the post-event stock price behaviors. The stock price reaction to favorable recommendation updates seems to be more pronounced when the stocks underperformed one year prior to the information release day and their one-year historical price variability is relatively high. However, this finding is not observed from the case of recommendation downgrades.

Finally, my findings from this study shed a light on a short-run profitable trading strategy when an unexpected recommendation update information arrives in the stock markets. If investors react in a timely manner to changes in brokerage firms' recommendations, they could make about 5 percent excess return over just five-week period by longing stocks on recommendation updates or shorting stocks on recommendation downgrades.

Table I. Descriptive Statistics

		Mean	Median	Std.	Max.	Min.		Mean	Median	Std	Max.	Min.
	Upgrade recommendations						Downgrade recommendations					
Firms	N=521						N=479					
Recommendations	N=943						N=811					
Market Capitalization	$millions	12,428	3,640	38,638	505,796	33	$millions	14,231	3,724	38,485	419,525	23
Carter-Manaster (C-M) Rankings[1]	0~9 scale	7.65	8	1.59	9	1	10(0~9) scales	7.82	8	1.42	9	1
Sum of C-M[2]		8.02	8	3.31	39	1		8.84	8	5.06	74	1
Recent 5 year growth rate	(%)	1.01	0.95	1.74	13.70	-3.80	(%)	0.90	0.90	1.50	5.40	-3.80
Average Recommendation[3]	5 scales (1~5)	2.13	2.10	0.42	3.50	1	5 scales (1~5)	2.21	2.20	0.43	4.00	1
Beta		1.04	0.93	0.68	3.94	-0.70		1.09	0.94	0.77	4.05	-0.32
Price a day prior to the release of	($)	38.72	33.44	26.50	216.63	0.81	($)	38.23	33.63	27.87	226.75	0.34

recommendation update ($)											
Standard deviation of prices during											
1 year prior to the release of											
recommendation update ($)	8.92	6.05	8.70	87.01	0.49	($)	9.28	6.02	9.81	113.83	0.95

[1]. Source: http://bear.warrington.ufl.edu/Ritter/rank.pdf, The Carter-Manaster Reputation Rankings between 1992-2000. 0-9 scale from 9 (most prestigious firms) to 0 (least prestigious firms)
[2]. Sum of the C-M rankings of all brokerage firms issuing recommendation updates on the same day.
[3]. Average of historical recommendations. 5 with being most favorable and 1least favorable.

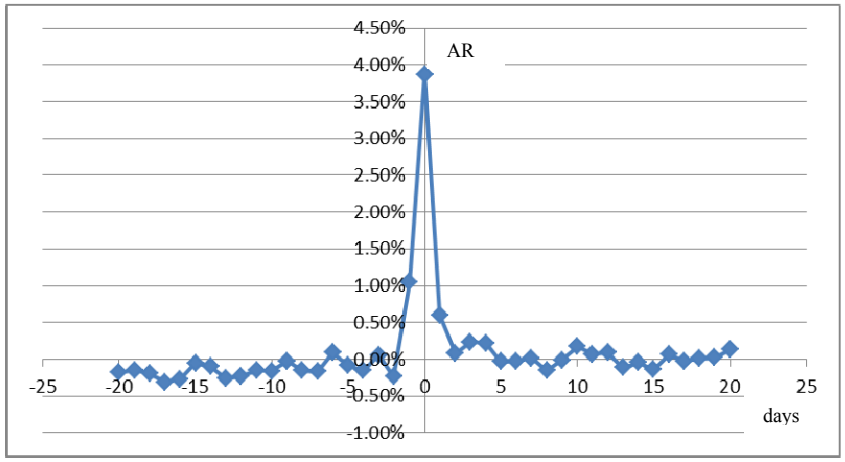
Table II. Average Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR) Around the Release Day of Recommendation Updates

Event Window (days)		Size[1]	-5	-4	-3	-2	-1	*0*	1	2	3	4	5	6	7	8	9	10	15	20	25
Panel A: Upgrade Recommendations																					
Overall	AR %		-0.08	-0.16	0.06	-0.23*	1.05***	*3.87***	0.61***	0.08	0.23*	0.23**	-0.03	-0.01	0.01	-0.15	-0.01	0.18	-0.14	0.14	
N=943	*t*-value		(-0.67)	(-1.25)	(0.44)	(-1.77)	(5.24)	*(15.61)*	(4.35)	(0.62)	(1.89)	(2.02)	(-0.3)1	(-0.12)	(0.1)	(-1.43)	(-0.1)	(1.57)	(-1.24)	(1.16)	
	CAR %							*3.87*	4.47	4.55	4.78	5.01	4.98	4.96	4.98	4.82	4.81	4.99	4.85	5.05	5.00
NYSE	AR %		-0.16	-0.01	0.14	-0.04	0.99***	*2.66***	0.44***	0.06	0.09	0.09	-0.05	0.00	0.23**	-0.14	-0.1	0.06	-0.1	0.15	
N=611	CAR %							*2.66*	3.11	3.17	3.26	3.35	3.30	3.30	3.53	3.39	3.29	3.35	3.39	3.46	3.56
		15.61																			
AMEX	AR %		0.12	0.82	-0.35	-0.73	2.21	*4.73*	0.03	-1.02	-1.01	-1.59	-2.08	1.12	0.49	-4.08	0.3	1.53	-1.53	-0.39	
N=8	CAR %							*4.73*	4.76	3.74	2.73	1.14	-0.94	0.18	0.67	-3.41	-3.11	-1.58	-2.62	-0.64	-0.66
		14.07																			
NASDAQ	AR %		0.04	-0.46*	-0.09	-0.58**	1.13**	*6.13***	0.91***	0.13	0.53*	0.53**	0.05	-0.09	-0.4*	-0.09	0.17	0.36	-0.18	0.11	
N=324	CAR %							*6.13*	7.04	7.18	7.71	8.24	8.30	8.21	7.81	7.71	7.88	8.24	7.80	8.22	7.87
		14.34																			
Panel B: Downgrade Recommendations	%																				
Overall	AR %		0.08	0.07	0.06	0.04	-0.59***	*-5.38***	-0.34**	-0.01	-0.08	-0.02	-0.25*	-0.02	0.12	0.00	-0.07	0.00	0.23	0.08	
N=811	*t*-value		(0.60)	(0.50)	(0.36)	(0.26)	(-3.07)	*(-16.14)*	(-2.11)	(-0.03)	(-0.47)	(-0.09)	(-1.75)	(-0.18)	(0.80)	(0.03)	(-0.48)	(0.00)	(1.62)	(0.54)	
	CAR %							*-5.38*	-5.71	-5.72	-5.80	-5.81	-6.06	-6.09	-5.97	-5.96	-6.03	-6.03	-5.17	-4.77	-4.49
NYSE	AR %		0.08	0.00	0.05	-0.09	-0.47***	*-3.02***	-0.35**	-0.02	-0.23**	0.03	-0.14	0.11	-0.07	-0.06	-0.21*	0.06	-0.05	-0.03	
N=516	CAR %							*-3.02*	-3.38	-3.39	-3.62	-3.59	-3.74	-3.63	-3.69	-3.75	-3.96	-3.90	-3.84	-3.81	-3.34
		15.70																			
AMEX	AR %		4.51	2.41	-0.56	-0.40	2.04	*-15.04***[2]	-0.76	-2.52*	0.88	2.29	-1.40	0.07	-2.54*	-0.84	-3.00	1.37	1.04	1.81	
N=5	CAR %							*-15.04*	-15.80	-18.32	-17.44	-15.15	-16.54	-16.48	-19.02	-19.86	-22.86	-21.48	-18.17	-13.02	-10.87
		13.11																			
NASDAQ	AR %		-0.02	0.16	0.08	0.28	-0.87*	*-9.40***	-0.3	0.05	0.18	-0.14	-0.42	-0.27	0.50	0.13	0.23	-0.13	0.72**	0.25	
N=290	CAR %							*-9.40*	-9.70	-9.64	-9.46	-9.60	-10.02	-10.29	-9.79	-9.66	-9.44	-9.56	-7.32	-6.33	-6.43
		14.30																			

1. Size=natural logarithm of market capitalization ($ million).

* indicates statistical significance at the 1% level ** indicates statistical significance at the 5% level *** indicates statistical significance at the 1% level

Figure 1. Average Abnormal Returns (AR) and Cumulative Abnormal Returns(CAR) Around the Release Day of Recommendation Upgrades



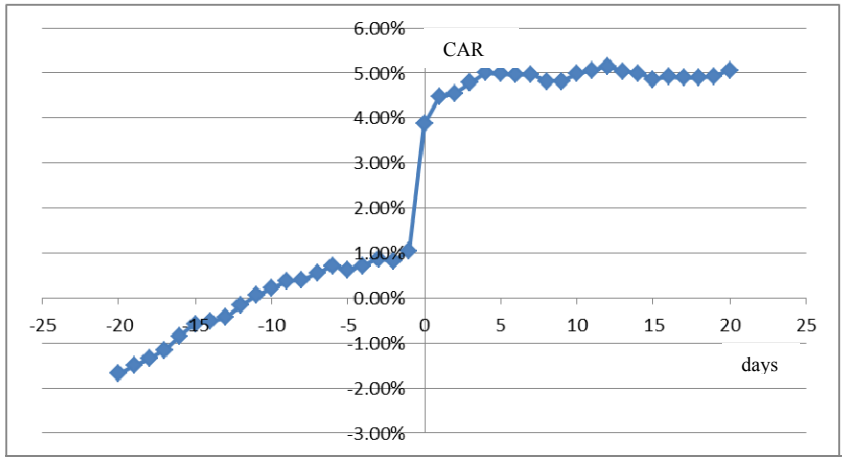
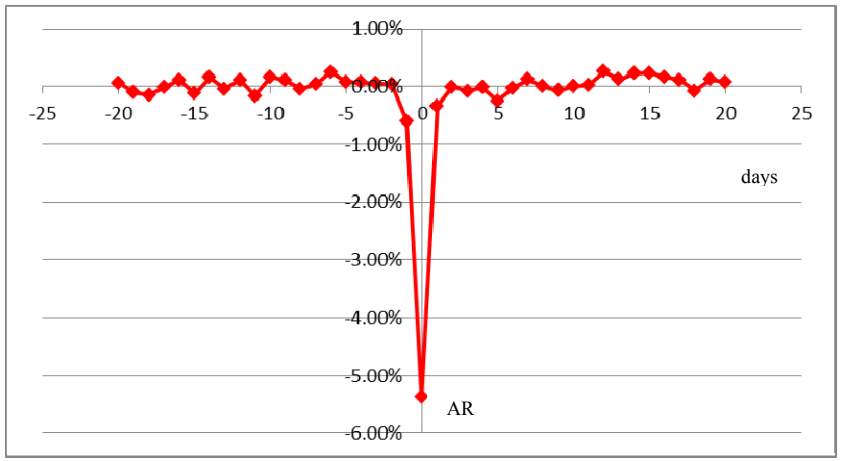


Figure 2. Average Abnormal Returns (AR) and Cumulative Abnormal Returns(CAR) Around Recommendation Downgrades



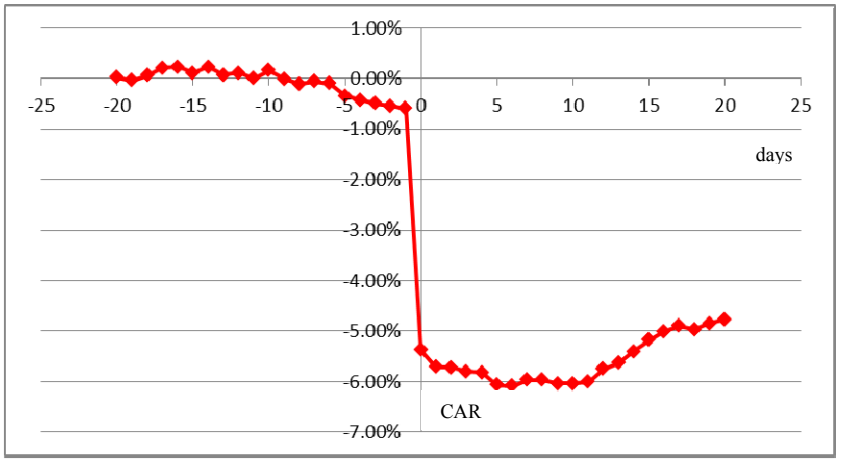


Table III. Impact of Technical Variables On the Post-Event CARs:Multiple Regression

Table shows the estimated coefficients and their *t*-values from the regression of technical variables on CARs. The regression model is as follow:
$CAR_t = a + c_1 * MAR(-1week) + c_2 * MAR(-1\ year) + c_3 * \sigma(prices) + c_4 * MAV(-1\ week) + c_5 * MAV(-1\ year)$

	t=0		+1 week		+2 weeks		+3 weeks		+4weeks		+5weeks	
Panel A: Upgrade Recommendations (N=943)												
MAR(-1 week)	0.02884		-0.01379		0.04183		0.04381		0.02502		0.05408	
	(1.18)		(-0.41)		(1.07)		(1.00)		(0.50)		(1.04)	
MAR(-1 year)	-0.00675	***	-0.0117	***	-0.013	***	-0.01796	***	-0.02226	***	-0.02789	***
	(-3.37)		(-4.21)		(-4.04)		(-4.98)		(-5.46)		(-6.51)	
Price Variability	0.00145	***	0.00155	***	0.00232	***	0.00146	**	0.00183	***	0.00185	***
	(4.59)		(3.53)		(4.57)		(2.56)		(2.84)		(2.74)	
MAV(-1 week)	-0.00279		-0.00987	*	-0.01563	**	-0.02242	***	-0.01503	*	-0.011	
	(-0.65)		(-1.67)		(-2.28)		(-2.92)		(-1.73)		(-1.21)	
MAV(-1 year)	0.00095744		0.00219		0.00236		0.00541	*	0.00303		0.00076428	
	(0.62)		(1.02)		(0.94)		(1.93)		(0.96)		(0.23)	
R^2	0.027		0.026		0.035		0.040		0.038		0.052	
Panel B: Downgrade Recommendations (N=811)												
MAR(-1 week)	0.04287		-0.10136	**	-0.16991	***	-0.17382	***	-0.23792	***	-0.22243	***
	(1.28)		(-2.28)		(-3.32)		(-3.17)		(-4.05)		(-3.49)	
MAR(-1 year)	-0.00592	**	-0.00789	**	-0.01908	***	-0.03414	***	-0.0443	***	-0.05468	***
	(-2.23)		(-2.24)		(-4.70)		(-7.83)		(-9.49)		(-10.79)	
Price Variability	-0.00124	***	-0.0011	**	-0.00109	**	-0.0008743		-0.0004006		0.000079	
	(-3.48)		(-2.32)		(-2.00)		(-1.49)		(-0.64)		(0.12)	
MAV(-1 week)	-0.00241		0.00898		0.01624		0.01459		0.01201		0.01211	
	(-0.36)		(1.00)		(1.57)		(1.32)		(1.01)		(0.94)	
MAV(-1 year)	0.0051	**	-0.000816		-0.00219		0.00115		0.00288		0.00167	
	(1.99)		(-0.24)		(-0.56)		(0.27)		(0.64)		(0.34)	
R^2	0.039		0.026		0.056		0.103		0.136		0.153	

* indicates statistical significance at the 1% level ** indicates statistical significance at the 5% level *** indicates statistical significance at the 1% level
The numbers in parentheses are *t*-statistics.

Table IV. Impact of Fundamental Variables on the Post-Event CARs: Multiple Regression

Table shows the estimated coefficients and their *t*-values from the regression of fundamental variables on CARs. The regression model is as follow:
$CAR_t = b + d_1 * Beta + d_2 * Size + d_3 * Profit\ Margin + d_4 * PE$

	t=0	+1 week	+2 weeks	+3 weeks	+4weeks	+5weeks
Panel A: Upgrade Recommendations (N=622)						
Beta	-0.00139	0.00276	-0.00126	0.00391	0.00419	0.00733
	(-0.42)	(0.56)	(-0.21)	(0.56)	(0.53)	(0.87)
Size	-0.0080 ***	-0.01355 ***	-0.01339 ***	-0.01495 ***	-0.01276 ***	-0.01373 ***
	(-4.93)	(-5.64)	(-4.51)	(-4.43)	(-3.34)	(-3.38)
Profit Margin	0.00034 **	0.00005	-0.00031	-0.00070 **	0.00028	0.00021
	(2.19)	(0.23)	('-1.08)	(-2.14)	(0.75)	(0.54)
PE	0.000002	0.00004 **	-0.00001	0.000003	-0.00002	-0.00004
	(0.12)	(2.01)	(-0.28)	(0.12)	(-0.79)	(-1.27)
R^2	0.049	0.061	0.033	0.037	0.021	0.023
Panel A: Downgrade Recommendations (N=506)						
Beta	-0.00841 *	-0.01307 **	-0.01227 ***	-0.02267 ***	-0.01679 **	-0.01239
	(-1.86)	(-2.39)	(-1.92)	(-3.15)	(-2.20)	(-1.38)
Size	0.0086 ***	0.00769 ***	0.00451	0.00282	-0.00182	-0.00339
	(3.72)	(2.75)	(1.38)	(0.77)	(-0.47)	(-0.74)
Profit Margin	-0.00006	-0.00107 ***	-0.00236 ***	-0.00106 *	-0.00065	-0.0005
	(-0.18)	(-2.59)	(-4.88)	(-1.95)	(-1.13)	(-0.74)
PE	-0.00003	-0.00003	0.00006 **	0.00005 *	0.000028	-0.00003
	(-1.41)	(-1.19)	(2.18)	(1.81)	(0.91)	(-0.90)
R^2	0.043	0.047	0.068	0.0363	0.014	0.007

* indicates statistical significance at the 1% level ** indicates statistical significance at the 5% level *** indicates statistical significance at the 1% level

The numbers in parentheses are *t*-statistics.

Table V. Impact of Fundamental and Technical Variables and Anaylsts' Reputation On the Post-Event CARs

Table shows the estimated coefficients and their *t*-values from the regression of all variables on CARs. The regression model is as follows:

$$CAR_t = e + f_1 * Beta + f_2 * Size + f_3 * Profit\ Margin + f_4 * PE + f_5 * MAR(-1week) + f_6 * MAR(-1\ year) + f_7 * VAR + f_8 * MAV(-1\ week) + f_9 * MAV(-1\ year) + f_{10} * CM$$

Panel A: Upgrade Recommendations N=622	t=0	+1 week	+2 weeks	+3 weeks	+4 weeks	+5 weeks
Fundamental Variables						
Beta	-0.0027	0.00274	-0.00231	0.0035	0.00278	0.00931
	(-.083)	(0.56)	(-0.38)	(0.50)	(0.35)	(1.10)
Size	-0.01134 ***	-0.01719 ***	-0.01811 ***	-0.01917 ***	-0.01742 ***	-0.01685 ***
	(-7.11)	(-7.17)	(-6.09)	(-5.60)	(-4.47)	(-4.05)
Profit margin	0.00040 ***	0.000185	-0.00019	-0.000567 *	0.00043	0.00039
	(2.64)	(0.81)	(-0.67)	(-1.75)	(1.18)	(1.00)
PE	0.0000001	0.000037 **	-0.00001	0.000001	-0.00003	-0.00004
	(0.01)	(2.01)	(-0.39)	(0.05)	(-0.85)	(-1.24)
Technical Variables						
MAR (-1 week)	-0.00846	-0.00667	0.03762	0.06782	0.04491	0.06749
	(-0.33)	(-0.17)	(0.79)	(1.24)	(0.72)	(1.01)
MAR (-1 year)	-0.0083 ***	-0.01598 ***	-0.01547 ***	-0.01567 ***	-0.01662 ***	-0.01911 ***
	(-4.36)	(-5.58)	(-4.35)	(-3.83)	(-3.57)	(-3.85)
Price Variability	0.00218 ***	0.00263 ***	0.00326 ***	0.00298 ***	0.00357 ***	0.00228 ***
	(6.90)	(5.52)	(5.52)	(4.39)	(4.62)	(2.76)
MAV (-1 week)	-0.00647 *	-0.0092	-0.01259 *	-0.01107	-0.00135	0.00807
	(-1.70)	(-1.61)	(-1.77)	(-1.35)	(-0.15)	(0.81)
MAV (-1 year)	0.00189	0.0047 *	0.00504 *	0.00464	0.00042	-0.00254
	(1.16)	(1.93)	(1.66)	(1.33)	(0.10)	(-0.60)
Quality of Issuing Brokerage Firms						
Reputation of Issuers	0.00311 ***	0.00292 ***	0.00405 ***	0.00348 *	0.00204	0.00229
(Carter-Manaster Rankings)	(4.87)	(3.04)	(3.40)	(2.54)	(1.31)	(1.38)
R^2	0.1525	0.1401	0.1065	0.0883	0.0629	0.0554

continued - Table V.

Panel B: Downgrade Recommendations N=506	t=0	+1 week	+2 weeks	+3 weeks	+4 weeks	+5 weeks
Fundamental Variables						
Beta	-0.00727 *	-0.01079 **	-0.00941	-0.0192 ***	-0.01301 *	-0.0081
	(-1.69)	(-1.98)	(-1.47)	(-2.67)	(-1.71)	(-0.91)
Size	0.01107 ***	0.01071 ***	0.00734 **	0.00635 *	0.00152	-0.00086
	(4.89)	(3.75)	(2.18)	(1.68)	(0.38)	(-0.18)
Profit margin	0.00004	-0.00099 **	-0.00227 ***	-0.00086	-0.00055	-0.0004
	(0.14)	(-2.42)	(-4.69)	(-1.58)	(-0.95)	(-0.59)
PE	-0.00003 *	-0.00003	0.00005 **	0.00005 *	0.00003	-0.00003
	(-1.66)	(-1.26)	(2.16)	(1.85)	(0.91)	(-0.90)
Technical Variables						
MAR (-1 week)	0.0996 **	-0.0015	-0.01467	0.02646	-0.08501	-0.13896
	(2.54)	(-0.03)	(-0.25)	(0.40)	(-1.23)	(-1.71)
MAR (-1 year)	-0.00285	-0.00804	-0.01303	-0.02464 ***	-0.02839 ***	-0.04266 ***
	(-0.55)	(-1.23)	(-1.70)	(-2.85)	(-3.10)	(-3.98)
Price Variability	-0.00067	-0.00128 **	-0.00129 *	-0.00118	-0.00108	-0.00043
	(-1.43)	(-2.17)	(-1.85)	(-1.50)	(-1.30)	(-0.44)
MAV (-1 week)	-0.00551	0.00355	0.00051	0.00646	0.00553	0.00348
	(-0.83)	(0.42)	(0.05)	(0.58)	(0.47)	(0.25)
MAV (-1 year)	0.00536 **	0.0011	0.00148	0.0025	-0.00038	-0.00049
	(2.12)	(0.34)	(0.39)	(0.59)	(-0.08)	(-0.09)
Quality of Issuing Brokerage Firms						
Reputation of Issuers	-0.00445 ***	-0.00345 ***	-0.00287 ***	-0.0024 **	-0.00297 ***	-0.00121
(Carter-Manaster Rankings)	(-7.51)	(-4.61)	(-3.26)	(-2.43)	(-2.83)	(-0.99)
R^2	0.166	0.0973	0.0988	0.0700	0.0549	0.0508

* indicates statistical significance at the 1% level ** indicates statistical significance at the 5% level *** indicates statistical significance at the 1% level
The numbers in parentheses are *t*-statistics.

References

Barber, B.M., R. Lehavy, M. McNichols, and B. Trueman, 2001, Can Investors Profit from the Prophets? Security Analyst Recommendations and Stock Returns, *Journal of Finance* 56, 531-563.
Barber, B.M., and T. Odean, 2002, Online Investors: Do the Slow Die First? *Review of Financial Studies Special* 15, 455-487.
Beneish, Messod D., 1991, Stock Prices and the Dissemination of Analysts ' Recommendations, *The Journal of Business*, Vol. 64, No.3, 393-416.
Bjerring, J. H., J. Lakonishok, and T. Vermaelen, 1983, Stock prices and financial analysts' recommendations. *Journal of Finance* 38, 187-204.
Blume, L., D. Easley, and M. O'Hara, 1994, Market Statistics and Technical Analysis: The Role of Volume, *Journal of Finance* 49, 153-181.
Bollerslev, T., and D. Jubinski, 1998, Equity Trading Volume and Volatility: Latent Information Arrivals and Common Long-Run Dependencies, *Journal of Business and Economic Statistics* 17, 9-21.
Carter, R., and S. Manaster, 1990, Initial Public Offerings and Underwriter Reputations, *Journal of Finance* 45, 1045-1068.
Chordia, T., and B. Swaminathan, 2000, Trading Volume and Cross-Autocorrelations in Stock Returns, *Journal of Finance* 55, 913-935.
Conrad J., A. Hameed, and C.Niden, 1994, Volume and Autocovariances in Short-Horizon Individual Security Returns, *Journal of Finance* 49, 1305-1329.
Conrad J., G. Kaul, and M. Nimalendran, 1991, Components of Short-Horizon Individual Security Returns, *Journal of Financial Economics* 29, 365-384.
Copeland, T. E., and D. Mayers, 1982, The Value Line enigma (1965-1978): A case study of performance evaluation issues. *Journal of Financial Economics* 10 (November), 289-321.
Glezakos, Michalis, and Anna Merika, 2007, The Impact of Analyst's Recommendations: Evidence From The Athens Stock Exchange, *The Journal of Applied Business Research*, Vol. 23, No. 2, 101-110.
Grinblatt, M., and B. Han, 2001, The Disposition Effect and Momentum, *Working Paper*, UCLA.
Lamoureux, C., and W. Lastrapes, 1990, Heteroskedasticity in Stock Return Data: Volume versus GARCH effects, *Journal of Finance* 45, 221-229.
Lehman, B., 1990, Fads, Martingales, and Market Efficiency, *Quarterly Journal of Economics* 105, 1-28.
Lloyd Davies, P., and J. Canes, 1978, Stock prices and the publication of second-hand information, *Journal of Business* 51 (November): 43-56.
Lo, A., and MacKinlay, 1988, Stock Market Prices Do Not Follow Random Walks: Evidence from a Simple Specification Test, *Review of Financial Studies* 1, 41-66.
Lo, A., H. Mamaysky, and J. Wang, 2000, Foundations of Technical Analysis: Computational Algorithms, Statistical Inference, and Empirical Implementation*, Journal of Finance* 55, 1705-1765.
Rogalski, R.J., 1978, The Dependence of Prices and Volume, *Review of Economics and Statistics* 60, 268-274.
Tauchen, G.E., and M.Pitts, 1983, The Price Variability-Volume Relationship on Speculative Markets, *Econometrica* 51, 485-505.

Walker, M.M., and G.B. Hartfield, 1996, Professional Stock Analysts' Recommendations: Implications for Indidual Investors, *Financial Services Review*, Vol.5, 13-29.
Westerfield, R., 1977, The Distribution of Common Stock Price Changes: An application of Transactions time and Subordinated Stochastic Models, *Journal of Financial and Quantitative Analysis* 12, 743-765.