On the information role of stock recommendations

Oya Altınkılıç[a] and Robert S. Hansen[b*]

[a]*Joseph M. Katz Graduate School of Business, University of Pittsburgh, Pittsburgh, PA 15260*
[b]*A.B. Freeman School of Business, Tulane University, New Orleans, LA 70118*

Abstract

We examine the information role of stock recommendation changes, which are among the security analyst's most important outputs. Our robust findings show changes are associated with economically insignificant mean price reactions. They are quite inclined to follow recent news that appears to be allied with announcements of earnings related and other corporate events. Further results show the changes tend to be poor stock picks for future returns, and the picks agree more often with past returns. The evidence is generally consistent with the view that analyst recommendations are uninformative, and tend to piggyback on the news. The findings overturn the long-standing view that analyst recommendation changes play a central information role in security markets.

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[*]Corresponding author contact information: Tulane University, New Orleans, LA 70118
Tel.: 504-865-5624, E-mail: *rob.hansen@tulane.edu*.

1. Introduction

In an informationally perfect world stock prices reflect all available information, indicating to investors the highest expected return on their investments. As is often noted, however, information is not perfect and economic agents, incented by profit possibilities, play a central role by incurring costs to learn private information and incorporating it into security prices, improving market efficiency (Grossman, 1976; Grossman and Stiglitz, 1980; Grossman, 1995). Authors note security analysts are information agents and validate this view with the fact that brokerage firms annually spend millions of dollars on analyst research.[1] This study focuses on the information role of analyst stock recommendations, which indicate whether to buy, hold, or sell a stock. The mainstream view among researchers is that recommendations and their changes are among the primary products of analyst research, and they potentially incorporate a wide range of information in stock price. In support of this view, studies record that stock prices drop more than 2.5% when recommendations are downgraded and rise more than 1.5% when upgraded, on average.[2]

While the case for the recommendation information role has been influential, the role is also being questioned in several ways. Authors suggest recommendation changes are made to bolster brokerage-client relations (Francis and Philbrick, 1993), to boost brokerage trading revenues (Hayes, 1998; Irvine, 2003, 2004; Jackson, 2005; Jeurgens and Lindsey, 2006), to improve access to management information (Chen and Matsumoto, 2006), to raise investment

[1] Examples of other information agents include speculators and risk arbitrageurs (see Bekaert and Harvey, 2000; Shleifer, 2000; and Basak and Croitoru, 2005).

[2] See Elton, Gruber and Grossman (1986); Beneish (1991); Stickel (1995); Womack (1996); Francis and Soffer (1997); Ivkovic and Jegadeesh (2004); and Asquith, Mikhail and Au (2005).

banking fee revenues by promoting transactions like equity offerings (Lin and McNichols, 1998; Michaely and Womack, 1999), and to build-up analyst reputation for stock-picking as reflected in analyst rankings, like those compiled by *Institutional Investor* and *The Wall Street Journal* (Stickel 1992; Leone and Wu, 2002; Mikhail, Walther and Willis, 2005). Together, we call these and materially similar changes the marketing role, which is also validated by the large annual spending by brokerages for analyst research. Broadly speaking, there are two formal views of recommendation changes; the information role and the marketing role, where changes are informative in the former and need not be in the latter.

We bring new evidence to this literature from two perspectives on the recommendation information role. The returns perspective assumes analysts piggyback their changes promptly on news about the firm. One effect of piggybacking is that change return reactions measured over too long of a period can be contaminated with sizeable return reactions to the news. From this perspective, it is conceivable that change returns reported in earlier studies are confounded with prior news returns. By measuring the change return over the 40 minutes centered on the change announcement time, we provide a new test that both credibly isolates the prior returns and allows measurement of a far less contaminated change announcement return. For the isolation to be plausible the change announcement time must be reasonably accurate. For the announcement return to plausibly reveal if changes convey information, investors must quickly react to the announcement.

Two primary new results emerge from the returns perspective. First, the mean return reaction to changes is not economically significant; -0.05% for downgrades and 0.03% for upgrades. Second, there are economically large absolute mean returns in the pre-

announcement period (the day before plus the pre-announcement phase of the announcement day); a fall of 3.7% before downgrades and a rise of 1.1% before upgrades.

A concern is that these findings may be driven by a particular subset of brokerage firms, a class of followed firms, certain kinds of allied events, or an unusual year. However, similar pre-announcement and announcement returns are present in changes by top brokerage analysts and for analysts at the settlement banks. Qualitatively similar return patterns are also found for different allied events that include management earnings announcements and earnings forecasts (hereafter earnings forecasts). Moreover, they are present in each year of the 1997-2003 sample, in each month of the year, on each day of the week, and in each trading hour of the day.

The second perspective assumes changes are a form of stock picking. Authors regularly gauge change performance with portfolios built based on variations of the conventional stock picking rule, go short downgrades and long upgrades (Womack, 1996; Stickel, 1995; Mikhail, Walther and Willis 2003; Barber, Lehavy, McNichols and Trueman, 2001). A second new test therefore examines change stock picking success, where a pick is scored a success if it is clearly validated by the post-announcement return. We consider a one-day and a five day post-return. The stock-picking test assumes near-term prices absorb the change information.

The stock picking perspective also yields two key findings. First, correct picking is not the principal pattern in recommendation changes. Instead, incorrect changes outnumber correct changes by almost three-to-one, and possibly much more. Second, a significant majority of the classifiable picks agree with the pre-announcement return but not the post-announcement return. Qualitatively similar results are evident in each year of the sample period.

It may be the case that the conventional stock picking rule, to sell downgrades and buy upgrades, misclassifies analysts' intentions. For example, a change from a strong buy to a buy is a restatement of analyst transaction advice to buy the stock, albeit with less enthusiasm. A new investor to the market is unlikely to comprehend a sell message from this buy recommendation. Yet, the conventional view codes the downgrade as a sell. An upgrade from strong sell to sell can also be misclassified. Analysts may also intend that investors not transact, when the convention indicates transact. For example, a hold does not seem to advise a new investor to buy or to sell, yet convention codes it a sell when it is a change from a higher grade, and a buy when it is a change from a lower grade. We show that our findings are robust to these classification concerns.

The evidence from the returns view and from the stock picking view contradicts the view that recommendation changes play an economically important information role. The findings are instead consistent with two conclusions. First, analyst recommendation changes are predominantly uninformative as they do not impact stock prices nor are they shrewd stock picks. Second, the changes often piggyback on, and imply stock picks that follow, prior news.

A natural question raised by the new findings is, what causes so much news just before recommendations are changed? We document plenty of key events are made public in the pre-announcement period. Many events are also announced on the day of, but in the phase prior to, the change announcement. The most popular event, management's earnings announcement, is piggybacked in 21% of the changes and has a mean pre-announcement return of -3.7% for downgrades and 1.6% for upgrades. The second most popular event, management's earnings forecast, is piggybacked in 16% of the changes, and has a most striking mean pre-announcement return of -9.0% for numerous downgrades, and a modest

0.8% for upgrades. It thus appears that management trickles out good news, perhaps releasing it as it occurs, and harbors bad news in the hopes that it will go away or reverse, until the build-up must be revealed. Another 8.1% of the changes piggyback on news of corporate transactions (i.e., mergers and equity offerings). A search of Dow Jones Newswire confirms other newsy events are common in the pre-announcement period.

A second explanation for the pre-announcement news is that it is investor capitalization of analysts' private information that fuels the changes. Under this explanation the pre-announcement news is a measure of analyst information production. Maybe the information is leaked as brokerages internally harvest it in advance. Or, perhaps analysts systematically tip their information to certain investors (Irvine, Lipson and Puckett, 2007). Alternately, change announcement times may routinely be late. However, the pre-announcement return is found to be a weak predictor of recommendation changes. Several other test results reject anticipation theories.

The two perspectives reveal other new findings. First, piggybacking leads to a "pile-up" bias, as analyst changes tend to cumulate with bigger pre-announcement news. For example, in the case of downgrades, the mean pre-announcement return is -1.5% for a one change event; -3.5% for two changes; and -10.9% for changes by three or more analysts. Corresponding returns for upgrades are 0.5%, 1.5%, and 2.7%. Thus, bigger news tends to be counted multiple times, exaggerating the mean pre-recommendation return (and possibly change returns reported in earlier studies). We verify that our conclusions are not affected by pile-up bias. Second, there is modest post-recommendation drift (PRD) in the direction of the changes. Given the similarity and possible overlap of PRD with post-earnings announcement drift (PEAD), we examine the impact of two PEAD determinants on PRD; liquidity cost and

abnormal volume associated with the prior events. The determinants account for almost half of the PRD, which falls below 25 bps, and is overwhelmed by round-trip transaction costs. It is thus probably premature to ascribe analyst information to the drift.

The evidence from the new perspectives sidesteps a fundamental difficulty with past evidence that relies on daily change return reactions. Given analyst piggybacking, samples selected on the basis of screens for events or by change versus non-change-days, do not reliably isolate prior returns from the change return, when using daily returns. In effect, many events are invisible to researchers, as they are not widely available in machine readable form or in media reports. One example is the earnings forecast, a highly newsy event piggybacked frequently by changes, that is reliably available from very limited sources. Consequently, the finding that one-day or centered multi-day announcement returns agree with changes, even after controlling for a number of events, is an inconclusive finding because it agrees with both the information role and uninformative piggybacking. A contribution of this study is to avoid this kind of confounding returns problem.

We note three prospective economic implications that may emerge from our findings. First, the evidence raises the prospect that analysts quickly piggyback their other research outputs on prior news. For example, earnings forecast revisions may piggyback on stock returns. Second, while there is the perception in the literature that changes induce large trading volume (Barber and Loeffler, 1993; Womack, 1996; and Mikhail, Walther and Willis 2006), it may be that the events and returns that prompt the changes, cause much if not all of the large volume. The question of whether changes impact volume thus remains somewhat unresolved. Third, analysts may have discernable piggybacking patterns or habitats. Well-known or better-situated analysts may have a habit of piggybacking more on large news,

perhaps thinking they will appear more informed, while rookies and analysts at smaller brokerages may piggyback on both small and large news. Some analysts may also tend to piggyback on market returns or on industry news more than on firm specific events. Our data Examination of these implications is beyond this study as we focus on recommendation changes, not forecasts or recommendation continuations, and our data reveal the brokerage of the analyst, not the individual analyst, so we cannot pursue possible habitats.

Our findings may have implications for policy and legal debates that are related to analyst research. We find no obvious evidence showing that investors are harmed or misled by recommendation changes, which are part of the rationale for both Reg FD and the global research analyst settlement between the SEC and ten Wall Street brokerages. Nor do we find that changes have an economically significant impact on stock price. The results do not therefore reject the conclusion reached by others, that investors are not fooled by analyst recommendations or forecasts. That is, our findings t seem to agree with the conclusion that investors are aware of the implications of recommendation changes (Agrawal and Chadha, 2007; Jackson, 2005). The finding of no significant price reaction to the changes also supports the conclusion reached by Chen, Francis and Schipper (2006) that the fraud on the marketplace presumption, an important legal device in class-action securities litigation, does not apply to recommendations.

The balance of the paper proceeds as follows. Section two reviews related evidence. Section three describes the sample of changes. Section four examines daily returns and intraday returns around the changes. Section five examines changes from the stock-picking perspective. Section six examines the post announcement drift. The paper concludes with section seven.

2. Related research

The mainstream view that price reactions to recommendation changes uniquely gauge analysts' information production has a long history that is buttressed by widespread evidence from price reactions to sell-side analyst recommendation changes, some of which is summarized in Table 1. While the studies use various measures of changes and returns, most use a multi-day return centered on the change announcement date (hereafter, centered return), and all report big losses at downgrades and big gains at upgrades. The evidence is found in small samples like Beneish's (1991) changes from the *Wall Street Journal's* "Heard on the Street" column, and the Francis and Soffer (1997) changes from *Investext*. It is also found for elite sell-side analysts like Womack's (1996) extreme *First Call* changes at top brokerages, and the Asquith, Mikhail and Au (2005) changes by *Institutional Investor* First Team All-American analysts. The results are present in very large samples, like *Zacks* changes in Mikhail, Walther, and Willis (2004), and *I/B/E/S* changes in Ivkovic and Jegadeesh (2004). A pattern across the samples is that elite analysts downgrade less often while analysts in the huge samples downgrade more often.

Table 1 about here

A number of researchers recognize that other events may impact change return reactions and use various means to limit the impact. Two early studies control for the impact of earnings announcements on recommendation change returns. In regressions of centered returns Stickel (1995) controls using an earnings indicator variable. Womack (1996) controls by holding out cases allied with earnings news and finding qualitatively similar results.

Asquith, Mikhail and Au (2004) examine return reactions to analyst reports that can contain an earnings forecast, a recommendation change, or a price target, and identify over ten events from Dow Jones, Lexis-Nexus and finance websites. In centered return regressions for their event-free data downgrades are bad news and upgrades are good news (Table 5). However, this sample is small (193 observations) and has only a few dozen downgrades and upgrades (see their Table 1 fractions). Moreover, earnings forecasts are not in their events. Ivkovic and Jegadeesh (2004) focus on price reactions to analyst forecasts and recommendation changes around earnings announcements, while passing over other events. Chen, Francis and Schipper (2006) control for earnings announcements, earnings forecasts, and ex-dividend days, in their study of return reactions to analyst earnings forecasts, growth forecasts, and recommendations. They too pass over other events. They report large one-day absolute return reactions on both non-event and event change days (returns are larger in the latter). While all of the studies provide some control for various events, we suggest their resulting recommendation change returns are still confounded by prior news, due either to other unidentified events (e.g., management earnings forecasts) and to changes piggybacking on returns that may have no visible firm specific event.

That unusual stock returns may cause changes, as is maintained in this study, is often ignored in prior studies which generally presume the reverse causality; from changes to returns. In one exception, Stickel (1995) conjectured that earnings announcements may prompt recommendation changes (p. 30). However, he does not pursue this notion. With the aid of hindsight other pieces of evidence that show some agreement with changes following returns are evident in prior research. Ivkovic and Jegadeesh (2004) report many changes around earnings announcements, with far more soon after. Moreover, those soon before are

associated with significant multi-day abnormal returns, as if they are informed (alternately, as if analysts piggyback on likely forewarnings of earnings news) and those after are uninformative. Conrad, Cornell, Landsman and Roundtree (2006) examine very large absolute return events and find higher prior negative returns boost the chance of an upgrade, as if changes are directly related to returns. However, they report higher prior positive returns also reduce the chance of an upgrade, as if changes are inversely related to returns.

Drift after changes is a widely reported fact. Stickel (1995) finds positive abnormal returns after upgrades and negative abnormal returns after downgrades. Womack (1996) documents significant drift for a month and longer after changes. Studies of calendar time portfolios timed to exploit news of the changes also report statistically significant subsequent long-term drift in the direction of the changes (Barber, Lehavy, McNichols and Trueman 2001; Jegadeesh, Kim, Krische, and Lee 2004; Mikhail, Walther and Willis, 2004). However, the authors often note the portfolios call for frequent rebalancing, which necessitate overwhelming round-trip transaction costs. Since changes often follow earnings announcements it is plausible that PRD is at times the well known PEAD (e.g., Ball and Brown, 1968; Bernard and Thomas 1989, 1990; Fama, 1998), which also is bounded by transaction costs (Lesmond, Schill and Zhou, 2004; Mendenhall, 2004). Two PEAD determinants used to test this notion identified from the literature are liquidity and event-driven abnormal trading volume. Sadka (2006) shows liquidity risk explains from 40% to 80% of PEAD, not unlike Pástor and Stambaugh (2003) who show liquidity risk explains half the profits from winner-loser momentum portfolios, and Kyle (1985), who report returns are affected by liquidity driven by both informed and noise trading. Garfinkel and Sokobin (2006) contend that drift should follow a variety of corporate events because events often have the

effect of amplifying divergence of investor opinion about stock price. They show abnormal volume (a proxy for opinion divergence) is a significant PEAD determinant (see also Mendenhall, 2004; Chordia, Goyal, Sadka, Sadka and Shivakumar, 2006; Chordia and Shivakumar, 2005; Frazzini, 2007).

3. Data and methodology

Much of the focus of this study is on stock returns and prices around new recommendation announcements identified by First Call time stamps. First Call identifies the analyst's brokerage house but not the analyst. Daily stock prices are from the Center for Research in Security Prices (CRSP) and intraday stock prices are from the Transactions and Quotations file (TAQ). Information reported by Securities Data Company (SDC) is used to identify association with a merger or issuance of equity around the time of the change. The sample period is 1997 through 2003. Monetary variables are expressed in December 2003 dollars using the consumer price index.

Table 2 about here

Table 2 reports structural features of the recommendation changes. There are 112,475 changes (Panel A). While changes are equally divided between trading and non-trading hours, by construction the TAQ sample (Panel B) is only daytime changes, and comprises 64% of the entire daytime sample (= 35,803/55,626). Panel B also reports the frequency of change days, revealing that in about 20% of the sample more than one analysts makes a recommendation on the same stock on the same day. Downgrades are most common, making

up to 55% to 57% in each sample. Panel C reports the transition matrix, which shows the changes from the old recommendations to the new recommendations. About 94% of the changes are movements between strong buy, buy and hold. Overall, there is a drop from the strong buy (down to 25% from 33%) and buy (down from 36% to 33%) levels, much of which is taken up by an increase in the hold levels (from 26% to 36%). Not that there are no continuations in the sample because the sample contains only changes. While analysts may change a recommendation by more than one level, unless noted we follow the literature and focus on downgrades (a degradation of the recommendation) and upgrades (an improvement of the recommendation). Mean change amounts are similar for downgrades and upgrades (not reported).

Untabulated trends show the yearly number of followed firms falls from 3,298 to 2,338 (almost 30%) from 1997 to 2003, while the number of brokerages generally rises from 175 to 248. The market share of top brokerages (those with 1,000 or more changes) fell over the sample period from 43.4% to 28.7%, and investment bank share is usually less than 20% and declined over the sample period from 23.3% to 11.1%.

4. How valuable are recommendation changes?

Here we examine the information role from the perspective of the stock returns.

4.1. Daily return reactions

Table 3 reports mean and median daily abnormal returns for stocks with changes over the 11 trading days centered on the change announcement day ("day 0"). Because we use short return intervals that cause similar daily abnormal returns computed under various methods,

we report daily abnormal returns measured by the raw return less the same day market return (see Barclay and Litzenberger, 1988). We report value-weighted mean returns.

Table 3 about here

For downgrades the mean abnormal return is significantly negative on days -1 and 0, with the two-day total of -4.8%. For upgrades mean abnormal returns are significantly positive on each day and add to 2.05%. Median returns are qualitatively similar. A prominent take-away from these results is that recommendation changes are informative, downgrades are associated with falling value and upgrades with rising value. They resemble findings in Table 1.

4.2. Intraday returns

To examine stock returns more precisely the three-days centered on the announcement day are rearranged into three periods. The pre-announcement period is the day before and the phase of the change day that ends before the announcement period. The announcement period is the 40 minutes centered on the announcement time. The post-announcement period is the phase of the change day after the announcement plus the next day. The period returns are computed respectively as follows;

$$R(-1,0^{-}) = \frac{P(0^{-})}{P(-2)} - 1 \quad (1)$$

$$R(0^{-},0^{+}) = \frac{P(0^{+})}{P(0^{-})} - 1 \quad (2)$$

and

$$R(0^{+},+1) = \frac{P(+1)}{P(0^{+})} - 1 \quad (3)$$

where P(-2) and P(+1) are closing prices on days -2 and +1; $P(0^{-})$ is the mean price in the first five minutes in the announcement period (if missing, then the next five minute mean, etc.); and $P(0^{+})$ is the last five minute mean price (if missing, then the prior five minute mean, etc.).

Table 4 reports the mean returns for each period and their sum, for downgrades and upgrades, in various sample partitions. Consider first all observations in Panel A. For downgrades the pre-announcement return is economically and significantly negative, the announcement return is significantly different from zero but not economically significant, and the post-announcement return is significantly negative and marginally economically significant. For upgrades the pre-announcement return is large and significantly positive, the announcement return is significantly positive but not economically significant, and the post-announcement return is economically modest. Returns are also reported for all brokerage changes, top brokerage changes (those with more than 1,000 changes in the sample), and settlement bank changes (those that settled with the SEC in the global research analysts settlement). In each group the mean return pattern is qualitatively the same. Collectively, recommendation changes are made in the direction of prior returns, and their announcement

returns are not economically significant. Qualitatively similar results are evident in the medians, which also show a zero return during the announcement period, for all changes, for top broker changes, and for settlement bank changes, for both downgrades and upgrades. We examine the post-announcement return below after more results are available.

Table 4 about here

Panel B reports the mean returns by year. In each year there are large pre-returns, economically unimportant announcement returns, and small post-returns. A similar patter exists in Panel C in each calendar month; in Panel D for each weekday; and in Panel E for each trading hour of the day.

Table 4 reveals other inter-temporal patterns. Downgrades peak in 1998 which coincides with a sharp downturn in the stock market, bottom in 2000 and 2001, and climb thereafter. Upgrades also peak in 1998, bottom in 2000 and 2001, dropping more sharply than the downgrades, then climb after. While the impact of Reg FD and the settlement may have been to reduce the level and alter the mix of changes, in 2003 total changes score their third highest year and the download-to-upgrade ratio hit its third lowest year. Monthly, changes are more common in January, April, July, and October, which are usual earnings reporting months. Mondays and Tuesdays have slightly fewer changes, with little other difference over the rest of the week. Most changes occur in the morning. Downgrades exceed upgrades every year, month, week day, and hour.

Table 5 reports the mean "change-day" returns, which count each firm's returns once, for days of one change, two like changes, and three or more like changes. Since the change-day sample counts each change event once, it is 20% smaller than the full recommendations

sample, with downgrades falling 22% and upgrades falling 18%. Nonetheless, downgrade days are more common than upgrade days. As changes per day rise from one to three or more, the pre-announcement return falls monotonically for downgrade days, and rises monotonically for upgrade days. Consequently, changes by multiple analysts cause multiple weighting of more dramatic returns in recommendation change samples, causing a "pile-up" of bigger absolute returns, biasing the mean pre-announcement returns.[3] Panel C reports the mean returns when only the first change of each change day is counted, showing the extent of the pile-up bias.

Table 6 about here

Results from this examination of intraday returns show change announcements have little economic impact on stock prices, contrary to the mainstream view that analyst changes are highly informative. They show also that changes follow big news in the same direction. Further, they show that if a multi-day return is used to gauge the price impact of the change, then the changes will incorrectly appear to be highly informative.

4.3. Do events account for pre-announcement returns?

One explanation for the large pre-announcement returns is that they are driven by key events, which authors often recognize are allied with changes. To shed light on this notion we first identify three relatively accessible machine readable events; earnings announcements

[3] For example, suppose there are two downgrades and four recommendation changes; one change when the pre-return is -1.5%, and three changes when the pre-return is -10% (near the means in the table). The change-day mean pre-return is -5.75% [= (-10.0 -1.5)/2] and the recommendation change mean pre-return, biased downwards due to the pile-up pf three-changes, is -7.88% [= (-10.0x3 -1.5)/4].

(from *I/B/E/S*), management earnings forecasts (from First Call), and corporate transactions (merger and acquisition announcements and equity offerings from SDC).

Figure 1 about here

The frequencies of changes in the full sample that are around each of the three main event announcement dates are reported in Panels A thru C in Figure 1, which aligns the change in event time. The events are overwhelmingly earnings related; earnings announcements the most popular and corporate transactions are a distant third. Moreover, the changes appear to piggyback heavily on these events. Approximately 22% of the changes are announced on the event announcement day, while the vast majority is announced the day after. Changes seem to respond more promptly to media events, as they occur on the same day more often.

Table 6 about here

Table 6 reports the returns for the identified prior event samples. In general, all events are associated with economically large return reactions. For example, prior absolute returns when there is no easily identified event are large. Most notable is the drop in price in reaction to bad news earnings forecasts. Notice also the asymmetry in downgrades after earnings forecasts and earnings announcements, with 51% of for the former and 70% after the later. This asymmetry seems to reflect the asymmetry in the news conveyed by forecasts, which is tilted noticeably towards the bad. In any case, it is evident that investor reaction to changes is economically insignificant, regardless of the nature of the associated event. In other words, it

does not appear to be the case that piggybacking is more common for some major events than others.

To assess the presence of other events, we examined the DJNR for 2,000 observations lacking a major event, to identify how many have media announcements within one day before the change. Preliminary results chow clearly analyst recommendations in over 1,400 of these, analysts piggyback on other major events (still being tabulated).

4.4. Are the changes anticipated?

While there is strong evidence that recommendation changes follow corporate events, a mutually compatible explanation for the large absolute pre-returns is that they reflect investors' anticipation of analysts' information ahead of the change announcements, again and again. Maybe brokerages invariably "leak" the information by harvesting it before changes are announced. Perhaps analysts often "tip" their information to investors who then trade on it before the new recommendation is announced. In each case, informed selling drives prices down before downgrades and informed buying drives prices up before upgrades. Alternately, the time stamp is usually late, so change information is already public in the pre-announcement period. Under these anticipation scenarios, new recommendations could be based on private information as in the information role, but much of that information is incorporated into stock price before the announcement. In this section we provide results from a number of tests of the anticipation scenario.

4.4.1. Changes largely reflect prior returns

A Logit test of the power of pre-announcement returns to anticipate the direction of recommendation changes is reported in Panel A of Table 7. Conditional on knowing a change

will be made the dependent variable is one for upgrade and zero for downgrades. Column (1) shows that the prior return agrees with the direction of the change, which is consistent with both piggybacking and anticipation. The Column (2) findings continue to show this return impact, even after controlling for possible event types, top broker status, settlement bank status, and yearly fixed effects. However, the Logit model has very little explanatory power, with R-squares under 3%. This evidence indicates that the large absolute returns immediately before the changes are not indicative of new information that agrees with those changes. Column (3) reports mean Fama-MacBeth estimates from fitting the Logit model in each month of the sample period. Those estimates show the prior return is positively correlated with the change. However, most of the event variables are not significant.

However, from the anticipation hypothesis perspective, the pre-returns have low explanatory power, showing that anticipation can account, at best, for very little of the changes.

4.4.2. The surprise hypothesis

One interpretation of the Logit results is that the changes are partially anticipated. In this case, evidence may be found in the change announcement returns if investors partially anticipate the announcements in the pre-announcement period. When the actual change agrees with the predicted change then the announcement return should reinforce the pre-return reaction to the prediction, as the full return was partially anticipated in the pre-announcement period. When the actual change opposes the predicted change then the announcement return should react in opposite direction, perhaps more dramatically, reversing the partially anticipated return. Panel B of Table 7 reports announcement returns for downgrades and

upgrades, conditional on the anticipated recommendation change as predicted by the Logit model in Panel A. There is little consistent evidence of agreement between the sign of the announcement return and the predicted change, contradicting the anticipation hypothesis. Similar findings are reported in Panel C, which uses the sign of the prior return as a simple predictor of the change.

Table 7 about here

4.4.3. Small reaction hypothesis

Another anticipation test focuses on change return reactions after small pre-returns. Anticipation presumes investors often learn in advance information that warrants the downgrade (upgrade), reducing (increasing) pre-announcement prices. In this case, changes that are not anticipated will have an economically insignificant pre-returns and fuller announcement surprises. Under this view, all else the same, changes after inconsequential pre-returns are likely to be relatively more heavily populated by unanticipated changes, and their announcement should thus be more surprising, on average. Panel D of Table 7 reports returns for changes that follow small pre-announcement returns. Their announcement return is not significantly different from the return to the other change announcements, contrary to the anticipation hypothesis. Arguably, these changes are also anticipated but they have insignificant pre-returns because they are uninformative. However, this argument tosses out the premise that changes are informative.

4.4.4. Reactions in the absence of a major event

Another test for anticipation is possible if changes are better anticipated when they are allied to a major event. Fore example, since a change is more likely after a forecast or an earnings announcement, changes after such announcements should be better anticipated. This suggests that change announcement returns should be more informative when they follow less common events, all else the same. Panel D of Table 7 reports return reactions to downgrades and upgrades that do not follow a major event. The reactions do not appear to be more informative.

Taken together, the poor ability of pre-announcement returns to predict the change type coupled with the poor results from a number of anticipation tests, all contradict the anticipation hypothesis. In particular, they disagree with the notion that the pre-announcement returns are a significant reflection of analyst recommendation change information.

5. Are recommendations generally correct stock picks?

To further assess whether analyst recommendation changes are uninformative, we consider a second test that relies less directly on return measurement. Our second perspective on recommendation changes recognizes that the changes are a form of stock picking that should correctly be forward-looking, most of the time. This section reports evidence on the information role compiled in tests from stock picking perspective.

5.1. Classifying changes as stock picks

The central stock-picking test statistic is the fraction of correct changes, where a change is correct if it is validated by the post-recommendation return. The statistic requires classifying changes into one of five types. *Prophet* is an informed change and thus correctly agrees with the post-return (e.g., downgrade and the post-return falls). *Imitator* is a change that agrees with the pre-announcement return, and is thus uninformed. It is a piggybacking change (e.g., downgrade if the pre-return fell). *Unknown* can be a *Prophet* or an *Imitator* but the data won't reveal which (e.g., downgrade and both the pre- and post-return fall). *Mistaken* is neither *Prophet* nor *Imitator* (e.g., downgrade, and the pre- and post-return rise). To further classify the changes we assume that when types could clash between *Mistaken* and *Prophet* or *Imitator,* we assume *Prophet* and *Imitator* respectively prevail (e.g., downgrade when pre-return rose and post-return fell, is a *Prophet*).

5.2. The Correct Ratio

In estimating the Correct Ratio it is reasonable to score *Prophet* as correct and *Imitator* as incorrect. Moreover, *Mistakes* are incorrect picks. However, unambiguous inferences about correctness are not possible for *Unknown* changes, as they agree with both *Imitator* and *Prophet* [i.e., they are downgrades (upgrades) that both follow and precede negative (positive) post-returns]. If changes are largely correct picks, which is predicted by the information role, then correct picks should predominate; that is, *Prophets* should dominate the incorrect *Imitators* and *Mistakes*.

Columns (1) thru (4) in Panel A of Table 8 report frequencies of *Prophet*, *Imitator*, *Unknown* and *Mistaken* for the one-day post-announcement return. Across the first three distinguishable groups, changes are correct about 23% of the time [= 6,921/(8,350 + 6,921 + 5,479)]. The most popular group among those that can be classified is *Imitator*, with an expected 40% of all changes (as 26% are *Mistaken*). These results contradict the information role view of analyst recommendations. They indicate changes are correct less than 33% of the time.

5.3. Robustness

One robustness check is to evaluate the stock-picking advice using five-day post-announcement return. These results, reported in the first row of Table 8, in Columns (6) thru (10), are qualitatively the same as the one-day return results. Another robustness check focuses on scores for changes with pre-returns and post-returns noticeably away from 0%. In this case *Prophet* and *Imitator* will have fewer changes misclassified due to chance. The second row of Panel A reports the Correct Ratio for these changes is weaker, as only 32% are correct picks. *Imitators* again dominate *Prophets*.

The pervasiveness of these findings is evident in Panel B which reports scores by calendar year. In each year the Correct Ratio is below 35%. Thus, in no year are recommendation changes predominantly good picks. In every year *Imitators* make-up about 40% of all changes, and dominate *Prophets* (statistics not reported).

5.4. Pile-ups and alternative pick notions

A concern is that the stock-picking findings may be influenced by recommendation pile-ups. Moreover, while the Correct Ratio identifies upgrades as buy picks and downgrades as sell picks, analysts may not intend their change advice to correspond to this standard. This could be the case for changes that are essentially reiterations of prior transaction advice. For example, a change from a strong sell to a sell reiterates the analyst's transaction advice to sell the stock, albeit with less intensity. Yet, such new sell advice is an upgrade and scored a buy using the conventional view. Similarly, a downgrade from strong buy to buy is conventionally scored a sell, even though the new transaction advice is to buy. To address these concerns, pile-up changes and ambivalent changes (changes from a strong sell to a sell or from strong buy to a buy) are removed from the sample. Panel C reports the results for the remaining changes. Once again, there is little evidence of good picking based on the recommendation changes, as the Correct Ratio remains below 35%. Nor is there support for good stock picking for the changes with absolute pre-returns and post-returns above 1%, for either one-day or five-day post-announcement returns. Moreover, in all cases, *Imitators* dominate *Prophets*.

Analysts may also view a number of changes as advice to not transact, in which case the conventional classification may obscure evidence of good stock picking advice. For example, a hold may not be intended to advise buy or sell, yet, conventionally a change to a hold is classified a sell when it follows a downgrade and a buy when it follows an upgrade. When the sample is further reduced by removing all changes to a hold (Panel D), the results remain qualitatively the same, as the Correct Ratio remains below 35%.

Table 8 about here

Panel E reports stock-picking scores for top brokerages that are qualitatively similar to scores for the entire sample. Panel F reports settlement bank scores are also typically poor advice. Notice, however that the Correct Ratio tends to be slightly lower, reflecting a greater tendency for settlement bank changes to pile-up, *Imitating* more often when prior news is bigger.

While the results reveal that a large majority of the changes are not good stock picks, little more can be deduced from these classifications. In particular, the possibility that the Correct Ratio may be exaggerated cannot be assessed because the classifications cannot reveal whether true prophets are overly represented, due to classifying as *Prophet* the changes that are due to chance regardless of pre- and post-returns. To shed light on this concern we can appeal to the announcement return reactions. We expect *Mistaken* and *Imitator* to have insignificant return reactions since each should be uninformed. However, to the extent that *Prophet* changes are populated by changes that are based on privileged information, rather than by chance, they should have absolute return reactions that agree with the change. Similarly, *Unknown* changes should have announcement returns away from zero reflecting news from their *Prophet* component.

Panel G reports for all changes the mean announcement returns for each stock picking group, for changes with absolute pre-returns and post-returns above 1%, for both one-day and five-day post-announcement returns. The signs of the mean announcement-returns agree with the direction of the change. However, in every case the mean and median reactions are only a

few basis points and are thus economically insignificant. These results suggest that informed changes are not predominant even among *Prophets*.

The results thus indicate that the recommendation changes are lousy stock picking advice. Moreover, they indicate that a majority of the picks are in agreement with past returns rather than future returns.

6. Post-announcement drift

This section examines the post-announcement returns, which drift down after downgrades and drift up after upgrades.

6.1. A correspondence hypothesis

The drift appears to record a delayed investor reaction to changes and thus analyst information. We thus first test how well the direction of the change agrees with the sign of the drift. If the drift is delayed inclusion of analyst information then most downgrades (upgrades) should precede negative (positive) drift. Recall, however, the stock picking analyses shows that only the *Prophets* contribute to the drift and they make up less than 33% of the changes. Thus, over 65% of the changes disagree with the post-announcement return. This suggests that changes are not a major contributor to the drift.

6.2. Illiquidity and late price pressure effects

An alternative view is that the drift is, in part, delayed reaction to the prior news that also drives the analyst piggybacking change. For example, the drift may stem from corporate

earnings announcements, which is know to have significant post earnings announcement drift (PEAD). In this case, PRD may have returns in common with PEAD.[4]

To explore the possibility that PRD shares common determinants with PEAD, we thus consider two determinants identified to contribute to PEAD. The literature suggests illiquidity (Sadka, 2006). Following a newsy event stock price may continue to ease up or down with delay due to illiquidity. A second determinant is abnormal trading volume; due to new corporate events there is greater dispersion of opinion among investors (Garfinkel and Sokobin, 2006). These determinants are added to the post-return regression model in Panel A of Table 7, which includes the intercept dummy variable, POSTRETNEG, equal to one when the post-return is negative. Illiquidity is measured with Amihud's (1992) measure, the inverse of stock price, and denoted ILLIQUID. The illiquidity measure is also interacted with the sign of the post-return, ILLIQUID x POSTRETNEG. This allows illiquidity to separately contribute to rising prices and falling prices. Abnormal trading volume, denoted ANNVOLUME, is the proxy for information dispersion and it too also enters the regression with the interaction term, ANNVOLUME x POSTRETNEG. This specification allows the model to reflect extra dispersion among buyers to have a positive impact on price, and at the same time, extra dispersion from selling to have a negative impact of price.

Note the liquidity measure is a control that reflects the slowness of investor response to significant news, which could be the events before the changes, the changes, or some combination. However, the abnormal volume is measured before the recommendation change,

[4] PEAD remains an anomaly, as there is yet no widely accepted explanation for its occurrence. Selected contributions in the post-earnings announcement drift literature include, Bernard and Thomas (1989, 1990); Brandt, Kishore, Santa-Clara, and Venkatachalam (2006); Chordia, Goyal, Sadka, Sadka, and Shivakumar (2006); Chordia and Shivakumar, (2006); Frazzini (2006); Garfinkel and Sokobin (2006); Mendenhal and Batallio (2006); and Sadka (2006).

and is thus associated with prior events. A significant impact of volume on the drift thus agrees with PRD being driven by divergence of opinion that is caused by pre-change news, and not news of the change. Dispersion predicts ANNVOLUME will have a positive impact on the post-return when the return is rising and a negative impact when the post-return is falling. The model also includes dummy variables for each of the significant prior event, top brokers, and settlement banks, each interacted with POSTNEG, and fixed effect dummy variables for each year of the sample period.

The estimates also show that an unusually large portion of the variation in the drift (R-square over 50%) is explained in the regression model. This agrees with the notion that the post-recommendation drift is largely attributed to events and returns that have precipitated the changes, given analysts' propensity to piggyback their changes on returns and events.

Panel A of Table 7 reports results from the regression estimation. Greater illiquidity amplifies the upward drift for rising prices and the downward drift for falling prices. This agrees with findings in other studies showing that a significant component of drift is attributable to illiquidity. Greater pre-announcement volume also has a statistically significant impact on the drift, pushing drift up in the case of good news and down in the case of bad news. The results agree with volume effects as possible contributors to the drift. Note also the evidence is for volume prior to the changes, thus agreeing with the conclusion that the post recommendation drift is driven by pre-recommendation news and events. To address the concerns for robustness, Column (3) reports the mean of estimates that are obtained from fitting the regression model in each of the 77 months of the sample period. These results corroborate the Column (2) results.

To further consider the possible relationship between recommendation changes and PRD, after controlling prior returns for illiquidity and volume effects, the residuals from the fitted drift estimations, are reported in Panel B, for downgrades and upgrades. The estimates show that over 50% of the drift can be attributed to illiquidity and volume effects (Panel B). The resulting mean residual drift in the case of downgrades is 0.22% (median of 0.00%) and in the case of upgrades the mean is 0.24% (median of 0.00%). The resultant drift does not, therefore, appear to be economically large.

7. Conclusion

This study provides evidence from a new perspective on the role of the security analyst as a producer and processor of information. In that role it is widely thought that analysts often reveal a variety of private information that significantly impacts daily stock prices when they recommend stocks to buy, hold, or sell. Relying on return measures that are based on intraday prices, the central finding of this study is that the recommendation changes do not appear to have a significant impact on stock returns. We report recommendations are quickly changed in reaction to, and usually in the direction of prior returns. These findings are corroborated using returns based tests and stock-picking tests. These tests show that viewed as stock picking advice, changes generally provide incorrect advice, and often agree with immediate prior returns. The evidence disagrees with the mainstream view that analyst recommendation changes play an important information role in security markets. Instead, it points to the view that recommendation changes are not informative and piggyback on the returns. The widespread piggybacking behavior seems to have led to the exaggeration of the value of analyst information in earlier studies that rely on daily or multi-day return to measure the

reaction to recommendation changes. The findings contradict the view that recommendation changes play a significant information role.

It is of course premature to use the evidence in this study to reject the general notion that analysts are information agents in their other central activities, including forecasting earnings and setting price targets. Future study might shed light on the question of whether and by how much these and other key analyst products also piggyback on prior news both firm specific and market level, or are independently informative. Future study may also provide more evidence on the link between recommendation changes and trading volume, after isolating volume effects that may be driven by events and returns that precipitate recommendation changes.

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Table 1. Returns at recommendation changes reported in earlier studies. Reported are sample periods and stock return measures computed around downgrade and upgrade recommendation changes from selected studies (with recommendation sources). While downgrades (upgrades) are lowered (improvements) recommendations, not all samples involve simple downgrades or upgrades as in this study.[1]

Authors (*sample source*)	Sample period	Relative days	Downgrade		Upgrade	
			Returns (%)	N	Returns (%)	N
Davies and Canes (1978) (*Wall Street Journal*[2])	1970-1971	0	-2.37	188	0.92	597
Beneish (1991) (*Wall Street Journal*[3])	1978-1979	-2 to +1	-2.87	118	1.91	286
Stickel (1995) (*Zacks*)	1988-1991	-10 to +10	-1.86	8,167	1.55	8,970
Womack (1996) (*First Call*)	1989-1991	-1 to +1	-4.30	570	3.30	694
Francis and Soffer (1997) (*Investext*)	1988-1991	-1 to +1	-2.41	53	0.75	49
Mikhail, Walther and Willis (2004) (*Zacks*)	1985-1999	-2 to +2	-2.92	68,472	1.14	61,014
Ivkovic and Jegadeesh (2004) (*I/B/E/S*)	1990-2002	0 to +2	-6.20	53,542	3.80	42,971
Asquith, Mikhail and Au (2005) (*Institutional Investor*)	1997-1999	-2 to +2	-6.60	125	4.50	262

[1] For example, Davis and Canes (1978) focus on issuance of buy or sell. Womack (1996) examines extreme downgrades or upgrades. The table data are respectively from Davies and Canes (1978), Table 1; Beneish (1991), Table 2; Stickel (1995) Table 3; Womack (1996), Table 3; Francis and Soffer (1997), Table 2; Mikhail, Walther, and Willis (2004), Table 3; Ivkovic and Jegadeesh (2004) Table 5; and Asquith, Mikhail, and Au (2005), Table 1.

[2] The Davies and Canes (1978) and Beneish (1991) samples are built from information reported in *"Heard on the Street"*.

[3] The Asquith, Mikhail, and Au (2005) sample is built from *First Team All American* rankings in *Institutional Investor*.

Table 2. Sample structure. Reported are all stock recommendation change frequencies, and those in the daytime and in the nighttime, reported by First Call in Panel A and on TAQ in Panel B. Panel B also reports number of change days (days on which there is at least one change). Nighttime (daytime) changes occur after or before trading hours. Panel C reports the matrix of recommendation change transitions, showing the changes from prior recommendation levels to the new levels. In brackets is the fraction of all changes.

	All	Downgrades	Upgrades
A. All changes			
All	112,475	62,423	50,052
		[56%]	[44%]
Nighttime	56,849	31,199	25,650
		[55%]	[45%]
Daytime	55,626	31,224	24,402
		[56%]	[44%]
B. TAQ changes			
Daytime	35,803	20,300	15,503
		[57%]	[43%]
Change days	28,794	15,803	12,991
		[55%]	[45%]

New recommendation	Old recommendation: Strong buy	Buy	Hold	Sell	Strong sell
C. Transition matrix					
Strong buy	0	5,645	3,164	90	33
Buy	6,560	0	5,056	198	82
Hold	4,883	6,875	0	820	300
Sell	181	240	872	0	115
Strong sell	71	132	377	109	0

Table 3. Daily abnormal returns around recommendation changes. The sample is described in Table 1. Reported are value-weighted mean and the median daily abnormal returns, equal to the raw return less the market return reported by CRSP, over the ten days centered around the recommendation announcement day reported by First Call. Returns for all recommendation changes are reported. Downgrades (upgrades) are lowered (improvements) recommendations.

Relative day	Downgrades			Upgrades		
	N	Mean	Median	N	Mean	Median
-5	62,423	-0.05	-0.04	50,052	0.13	0.00
-4	62,423	-0.03	-0.01	50,052	-0.01	-0.09
-3	62,423	-0.15	-0.04	50,052	-0.07	-0.03
-2	62,423	-0.28	-0.14	50,052	-0.06	-0.06
-1	62,423	-1.24[1]	-0.58[1]	50,052	0.38[1]	0.34[1]
0	62,423	-3.51[1]	-1.66[1]	50,052	1.67[1]	1.14[1]
1	62,423	-0.25[1]	-0.28[1]	50,052	0.24[1]	0.19[1]
2	62,423	-0.10	-0.12	50,052	0.13	0.09
3	62,423	0.02	-0.01	50,052	0.05	0.00
4	62,414	-0.12	-0.09	50,046	0.05	0.00
5	62,407	-0.12	-0.08	50,043	0.06	0.00

[1] Statistically significantly different from 0.0 at the 0.01 level for two-sided Student *t*-statistic.

Table 4. Recommendation change results for all followed TAQ firms. The sample is described in Table 1. Reported are mean returns over the trading day before and until 20 minutes before the change, R(-1, 0^-); over the 40 minute interval centered on the recommendation change announcement, R(0^-, 0^+); starting 20 minutes after the change and ending at the close of trading the next trading day, R(0+,$^+$1), and the cumulative of all three returns over the full three days, R(-1, +1). Top brokerages have more than 1,000 recommendations in the sample. Settlement banks are among the ten parties that agreed with the SEC to the global analyst research settlement. Downgrades (upgrades) are lowered (improved) recommendations. Medians in parentheses.

	Downgrades					Upgrades				
	N	R(-1, 0^-)	R(0^-, 0^+)	R(0^+, +1)	R(-1, +1)	N	R(-1, 0^-)	R(0^-, 0^+)	R(0^+, +1)	R(-1, +1)
A. By brokerage type										
All brokerages	20,300	-3.70[1]	-0.02[1]	-0.70[1]	-4.45[1]	15,503	1.14[1]	0.03[1]	0.47[1]	1.64[1]
		(-1.21)	(0.00)	(-0.41)	(-1.62)		(1.16)	(0.00)	(0.19)	(1.35)
Top brokerages	9,147	-4.02[1]	-0.07[1]	-0.76[1]	-4.85[1]	6,826	1.20[1]	0.04[1]	0.38[1]	1.62[1]
		(-0.99)	(-0.00)	(-0.49)	(-1.48)		(0.57)	(0.00)	(0.32)	(0.89)
Settlement banks	3,332	-5.13[1]	-0.05[1]	-0.79[1]	-5.97[1]	2,430	1.71[1]	0.06[1]	0.93[1]	2.70[1]
		(-1.48)	(-0.01)	(-0.47)	(-1.96)		(0.90)	(0.00)	(0.49)	(1.39)
B. By announcement year										
1997	3,263	-2.34[1]	-0.02[1]	-0.52[1]	-2.88[1]	2,674	1.12[1]	0.02[1]	0.24[1]	1.38[1]
1998	3,960	-2.38[1]	0.01	-0.28[1]	-2.67[1]	2,751	0.70[1]	0.01	0.37[1]	1.08[1]
1999	2,624	-3.17[1]	-0.07[1]	-0.70[1]	-3.94[1]	2,467	1.09[1]	0.01	0.42[1]	1.52[1]
2000	2,440	-6.37[1]	-0.12[1]	-1.51[1]	-8.00[1]	1,557	1.15[1]	0.08[1]	0.70[1]	1.93[1]
2001	2,305	-4.84[1]	-0.01	-0.66[1]	-5.51[1]	1,503	1.27[1]	0.02[10]	0.34[1]	1.63[1]
2002	2,524	-4.71[1]	-0.05	-0.36[1]	-5.12[1]	1,979	0.77[1]	0.01	0.27[1]	1.05[1]
2003	3,184	-1.32[1]	-0.04	-0.65[1]	-2.01[1]	2,572	1.89[1]	0.03[1]	0.34[1]	2.26[1]

continued

Table 4 (cont.)

C. By announcement month									
January	3,263	-2.34[1]	-0.02[1]	-0.52[1]	-2.88[1]	2,674	1.12[1]	0.02[1]	0.24[1]	1.38[1]
February	3,960	-2.38[1]	0.01	-0.28[1]	-2.67[1]	2,751	0.70[1]	0.01	0.37[1]	1.08[1]
March	2,624	-3.17[1]	-0.07[1]	-0.70[1]	-3.94[1]	2,467	1.09[1]	0.01	0.42[1]	1.52[1]
April	2,440	-6.37[1]	-0.12[1]	-1.51[1]	-8.00[1]	1,557	1.15[1]	0.08[1]	0.70[1]	1.93[1]
May	2,305	-4.84[1]	-0.01	-0.66[1]	-5.51[1]	1,503	1.27[1]	0.02[10]	0.34[1]	1.63[1]
June	2,524	-4.71[1]	-0.05	-0.36[1]	-5.12[1]	1,979	0.77[1]	0.01	0.27[1]	1.05[1]
July	3,184	-1.32[1]	-0.04	-0.65[1]	-2.01[1]	2,572	1.89[1]	0.03[1]	0.34[1]	2.26[1]
August	3,184	-1.32[1]	-0.04	-0.65[1]	-2.01[1]	2,572	1.89[1]	0.03[1]	0.34[1]	2.26[1]
September	3,184	-1.32[1]	-0.04	-0.65[1]	-2.01[1]	2,572	1.89[1]	0.03[1]	0.34[1]	2.26[1]
October	3,184	-1.32[1]	-0.04	-0.65[1]	-2.01[1]	2,572	1.89[1]	0.03[1]	0.34[1]	2.26[1]
November	3,184	-1.32[1]	-0.04	-0.65[1]	-2.01[1]	2,572	1.89[1]	0.03[1]	0.34[1]	2.26[1]
December	3,184	-1.32[1]	-0.04	-0.65[1]	-2.01[1]	2,572	1.89[1]	0.03[1]	0.34[1]	2.26[1]
D. By announcement day										
Monday	3,263	-2.34[1]	-0.02[1]	-0.52[1]	-2.88[1]	2,674	1.12[1]	0.02[1]	0.24[1]	1.38[1]
Tuesday	3,960	-2.38[1]	0.01	-0.28[1]	-2.67[1]	2,751	0.70[1]	0.01	0.37[1]	1.08[1]
Wednesday	2,624	-3.17[1]	-0.07[1]	-0.70[1]	-3.94[1]	2,467	1.09[1]	0.01	0.42[1]	1.52[1]
Thursday	2,440	-6.37[1]	-0.12[1]	-1.51[1]	-8.00[1]	1,557	1.15[1]	0.08[1]	0.70[1]	1.93[1]
Friday	2,305	-4.84[1]	-0.01	-0.66[1]	-5.51[1]	1,503	1.27[1]	0.02[10]	0.34[1]	1.63[1]
E. By announcement hour										
Open to 10 am	3,263	-2.34[1]	-0.02[1]	-0.52[1]	-2.88[1]	2,674	1.12[1]	0.02[1]	0.24[1]	1.38[1]
10 to 11 am	3,960	-2.38[1]	0.01	-0.28[1]	-2.67[1]	2,751	0.70[1]	0.01	0.37[1]	1.08[1]
11 to noon	2,624	-3.17[1]	-0.07[1]	-0.70[1]	-3.94[1]	2,467	1.09[1]	0.01	0.42[1]	1.52[1]
Noon to 1 pm	2,440	-6.37[1]	-0.12[1]	-1.51[1]	-8.00[1]	1,557	1.15[1]	0.08[1]	0.70[1]	1.93[1]
1 to 2 pm	2,305	-4.84[1]	-0.01	-0.66[1]	-5.51[1]	1,503	1.27[1]	0.02[10]	0.34[1]	1.63[1]
2 to 3 pm	2,524	-4.71[1]	-0.05	-0.36[1]	-5.12[1]	1,979	0.77[1]	0.01	0.27[1]	1.05[1]
3 to close	3,184	-1.32[1]	-0.04	-0.65[1]	-2.01[1]	2,572	1.89[1]	0.03[1]	0.34[1]	2.26[1]

[1] Statistically significantly different from 0.0 at the 0.01 level for two-sided Student *t*-statistic.

Table 5. Recommendation changes by number of changes per change day. The sample is described in Table 1. Reported are mean returns over the trading day before and until 20 minutes before the change, R(-1, 0^-); over the 40 minute interval centered on the recommendation change announcement, R(0^-, 0^+); starting 20 minutes after the change and ending at the close of trading the next trading day, R($0+$,$^+1$), and the cumulative of all three returns over the full three days, R(-1, +1). Means are reported for all changes, and for change days having one, two, or three or more analyst recommendation changes on the same day. Downgrade (upgrade) days occur when all of the day's changes are downgrades (upgrades). Reported in Panel C are the corresponding mean returns for the TAQ sample, for the first downgrade (upgrade) of the day. Downgrades (upgrades) are lowered (improvements) recommendations.

	N	R(-1, 0^-)	R(0^-, 0^+)	R(0^+, +1)	R(-1, +1)
A. Downgrade days					
All	19,800	-3.98[1]	-0.03[1]	-0.49[1]	-4.50[1]
1 change	14,362	-1.35[1]	-0.02[1]	-0.68[1]	-2.05[1]
2 changes	2,632	-4.62[1]	-0.02[5]	-0.64[1]	-5.28[1]
3 or more changes	2,806	-10.88[1]	-0.14[1]	-0.95[1]	-11.97[1]
B. Upgrade days					
All	14,785	1.91[1]	0.03[1]	0.50[1]	2.44[1]
1 change	12,013	0.64[1]	0.02[1]	0.50[1]	1.16[1]
2 changes	1,693	2.63[1,a]	0.05[1]	0.54[1,a]	3.22[1,a]
3 or more changes	1,079	4.32[1,b]	0.08[1,b]	0.46[2,b]	4.88[1,b]
C. First change on TAQ day					
Downgrades	15,803	-1.68[1]	-0.02[1]	-0.37[1]	-2.07[1]
Upgrades	12,991	0.90[1]	0.02[1]	0.42[1]	1.34[1]

[1 (2; 3)] Statistically significantly different from 0.0 at the 0.01 (0.05; 0.10) level for two-sided Student t-statistic.
[a (b)] Statistically significantly different from the mean return for the corresponding 1 change (2 changes) at the 0.01 level for two-sided Student t-statistic.

Table 6. Recommendation change by event type. Results are reported for the daytime TAQ sample described in Table 1. Reported are mean returns over the trading day before and until 20 minutes before the change, R(-1, 0^-); over the 40 minute interval centered on the recommendation change announcement, R(0^-, 0^+); starting 20 minutes after the change and ending at the close of trading the next trading day, R($0+$,$^+1$), and the cumulative of all three returns over the full three days, R(-1, +1). Three main events are identified; corporate earnings announcements, their earnings forecast announcements, and their transactions-mergers and equity offerings, leaving the balance of observations with no main event. Downgrades (upgrades) are lowered (improvements) recommendations.

	N	R(-1, 0^-)	R(0^-, 0^+)	R(0^+, +1)	R(-1, +1)
A. Downgrades					
EPS	3,879	-3.67[1]	-0.18[1]	-0.25[1]	-4.10[1]
Earnings forecasts	4,115	-9.04[1]	0.03[1]	-1.05[1]	-10.12[1]
Transactions	1,610	-1.91[1]	0.01[5]	-0.52[1]	-2.48[1]
Remainder	10,696	-1.67[1]	-0.02[1]	-0.68[1]	-2.37[1]
B. Upgrades					
EPS	3,495	1.63[1]	0.03[1]	0.52[1]	2.18[1]
Earnings forecasts	1,780	0.84[1]	0.04[5]	0.65[1]	1.54[1]
Transactions	1,342	0.75[1]	0.07[1]	0.58[1]	1.40[1]
Remainder	8,886	0.96[1]	0.01[5]	0.35[1]	1.32[1]

[1 (2; 3)] Statistically significantly different from 0.0 at the 0.01 (0.05; 0.10) level for two-sided Student t-statistic.

Table 7. Recommendation anticipation tests. The sample is described in Table 1.Reported are Logistic regression of Upgrade, which equals 1 for upgrade and 0 otherwise. The independent variables are returns over the trading day before and until 20 minutes before the change, $R(-1, 0^-)$. Three event dummy variables are included; EARNINGS is one for earnings announcements, FORECAST is one for earnings forecasts announcements, and TRANSACTION is one for an announcement of a merger-related or equity financing-related event. TOPROKER is a dummy variable equal to one for top brokerages (those with over 1000 changes), and SETTLEMENTBANK is one for each of the en banks that reached settlement with the SEC in the global research analysts settlement. Fixed effects are dummy variables for each year of the sample period (excluding the last to avoid the dummy variable trap). Panels B through D report means for the return for the 40 minute interval centered on the recommendation change announcement, $R(0^-, 0^+)$, and for $R(0+,^+1)$. In Panel B E[downgrade[(E[upgrade]) are the predicted recommendation changes from Panel A. Panel C small price changes are when $R(-1, 0^-)$ is less than 1% in absolute value. The Panel C sample excludes observations for which $-1\% < R(-1,0^-) < 1\%$. Panel D sample is recommendation days for firms with no announced earnings, guidance or merger activity.

Independent variable	(1)	(2)	(3) Fama-MacBeth
A. Recommendation change predictions			
Intercept	-0.012[1]	-0.122[1]	-0.023
$R(-1, 0^-)$	10.711[1]	10.709[1]	15.562[1]
EARNINGS EVENT		0.177[1]	0.084
FORECAST EVENT		-0.032[1]	-0.268
TRANSACTION EVENT		0.148[1]	0.164
TOPBROKER		-0.057[1]	-0.085
SETTLEMENTBANK		0.037[1]	0.151
Fixed effects	yes	yes	yes
N	31,965	31,965	77
Pseudo R-Square	0.03	0.03	0.03

continued

Table 7 (cont.)

	Downgrade			Upgrade		
	N	$R(0^-, 0^+)$	$R(0^+, +1)$	N	$R(0^-, 0^+)$	$R(0^+, +1)$
B. By pre-announcement predicted recommendation change						
E[Downgrade]	11,602	-0.04[1]	-0.73[1]	5,921	0.02[1]	0.44[1]
E[Upgrade]	6,420	-0.05[1]	-0.53[1]	8,023	0.03[1]	0.55
C. By sign of pre-announcement return						
$R(-1, 0^-) < 0$	11,073	-0.05[1]	-0.73[1]	5,451	0.01[1]	0.42[1]
$R(-1, 0^-) > 0$	6,949	-0.03[1]	-0.55[1]	8,493	0.03[1]	0.54[1]

	N	$R(-1, 0^-)$	$R(0^-,0^+)$	$R(0^+,+1)$	$R(-1,+1)$
D. Changes after small pre-announcement price reactions					
Downgrades	3,459	-0.03	-0.03[1]	-0.52[1]	-0.58[1]
Upgrades	3,399	0.02	0.00	0.38[1]	0.40[1]
E. Changes without obvious events					
Downgrades	10,594	-1.47[1]	-0.02[1]	-0.70[1]	-1.48[1]
Upgrades	8,955	0.77[1]	0.01[1]	0.12[1]	0.90[1]

[1 (2; 3)] Statistically significantly different from 0.0 at the 0.01 (0.05; 0.10) level for two-sided Student *t*-statistic.

Table 8. Frequency of changes classified by return imitator, prophet, unclear, and wrong. The sample is described in Table 1. Reported are the frequency of changes sorted into four classification types, based on two measures of post-announcement returns; $R(0^+, +1)$ and then on $R(0^+, +5)$. *Prophet* is a change that agrees with the post-return. *Imitator* is a change that agrees with the pre-announcement return. *Unknown* can be a *Prophet* or an *Imitator* but the data won't reveal which. *Mistaken* is neither *Prophet* nor *Imitator*. When types could clash between *Mistaken* and *Prophet* or *Imitator*, *Prophet* and *Imitator* respectively prevail. Correct is the ratio of *Prophet* divided by the sum of all classes, except *Unknowns*, expressed in percent.

	Classification based on $R(0^+, +1)$					Classification based on $R(0^+, +5)$				
	Imitator	*Prophet*	*Unknown*	*Mistaken*	Correct (%)	*Imitator*	*Prophet*	*Unknown*	*Mistaken*	Correct (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
A. Frequencies for all changes										
All	8,350	6,921	11,216	5,479	33[1]	8,337	6,966	1,229	5,434	34[1]
$\|\| R(0^+, t) \|\| > 1\%$	6,902	5,092	9,313	4,130	32[1]	6,894	5,149	9,321	4,073	32[1]
B. Frequencies for all changes by year										
1997	1,488	1,259	1,847	909	33[1]	1,498	1,244	1,837	924	34[1]
1998	1,529	1,326	2,046	1,217	33[1]	1,478	1,344	2,097	1,199	34[1]
1999	1,191	995	772	1,608	33[1]	1227	1,038	1,572	729	34[1]
2000	941	728	1,298	587	33[1]	958	718	1,281	597	34[1]
2001	944	719	1,276	540	33[1]	873	704	1,347	555	34[1]
2002	1,031	804	1,417	676	33[1]	1,036	862	1,412	618	34[1]
2003	1,226	1,090	1,724	778	33[1]	1,267	1,056	1,683	812	34[1]

continued

Table 8 (cont.)

C. Frequencies for all changes after removing pile on and ambivalent cases										
All	5,378	4,287	7,364	3,323	33[1]	5,392	4,327	7,350	3,283	34[1]
$\|\| R(0^+, t) \|\| > 1\%$	4,454	3,083	6,144	2,463	33[1]	4,446	3,120	6,152	2,426	31[1]
D. Frequencies for all changes after removing pile on and ambivalent cases, and changes to hold										
All	2,413	1,928	3,303	1,521	32[1]	2,408	1,966	3,308	1,483	34[1]
$\|\| R(0^+, t) \|\| > 1\%$	1,946	1,348	2,713	1,093	31[1]	1,951	1,371	2,708	1,070	31[1]
E. Frequencies for all changes by top brokerages										
All	3,741	2,733	5,082	2,219	31[1]	3,731	2,767	5,092	2,185	32[1]
$\|\| R(0^+, t) \|\| > 1\%$	3,157	1,997	4,281	1,659	29[1]	3,131	2,056	4,307	1,600	30[1]
F. Frequencies for all changes by settlement banks										
All	1,361	843	1,872	740	29[1]	1,395	876	1,838	707	29[1]
$\|\| R(0^+, t) \|\| > 1\%$	1,164	594	1,590	542	26[1]	1,182	626	1,572	510	27[1]
G. Mean $R(0^-, 0^+)$ for all *Prophet* changes										
All										
Downgrade	-0.04	-0.04	-0.05	-0.05	33[1]	-0.05	-0.06	-0.04	-0.03	33[1]
Upgrade	0.01	0.05	0.04	0.02	34[1]	0.01	0.05	0.04	0.03	34[1]
$\|\| R(0^+, t) \|\| > 1\%$										
Downgrade	-0.04	-0.04	-0.05	-0.06	32[1]	-0.05	-0.06	-0.04	-0.03	32[1]
Upgrade	0.01	0.06	0.05	0.03	32[1]	0.02	0.06	0.04	0.02	32[1]

[1 (2; 3)] Statistically significantly less than 50% at the 0.01 level for Wilcoxin sign-ranked test.

Table 9. Drift tests. The sample is described in Table 1. Reported are linear regression the return from 20 minutes after the change to the end of trading the next day, $R(0^{+},+1)$, and Column (3) reports the mean estimates and R-Square from monthly estimates of the same regression model in Column (2). The independent variables are returns over the trading day before and until 20 minutes before the change, $R(-1, 0^{-})$; PREVOLUME is three-day abnormal trading volume before change day (on the recommendation change day and the day after). ILLIQUID is the inverse of the firm's stock price the day before the change is announced. POSTNEG is a dummy variable equal to one if the post-announcement return starting 20 minutes after the change and ending at the close of trading the next trading day is negative. Three event dummy variables are included; EARNINGS is one for earnings announcements, FORECAST is one for earnings forecasts announcements, and TRANSACTION is one for an announcement of a merger-related or equity financing-related event. TOPROKER is a dummy variable equal to one for top brokerages (those with over 1000 changes), and SETTLEMENTBANK is one for each of the en banks that reached settlement with the SEC in the global research analysts settlement. Fixed effects are dummy variables for each year of the sample period (excluding the last to avoid the dummy variable trap).

Independent variable	(1)	(2)	Fama MacBeth
A. Drift regressions			
Intercept	-0.001[1]	0.017[1]	0.016[1]
$R(-1, 0^{-})$	0.035[1]	0.017[1]	0.015[1]
POSTNEG		-0.036[1]	-0.034[1]
PREVOLUME		0.049[1]	0.001[1]
PREVOLUME x POSTNEG		-0.009[1]	-0.007[1]
ILLIQUID		0.151[1]	0.204[1]
ILLIQUID x POSTNEG		-0.297[1]	-0.368[1]
EARNINGS		0.004[1]	0.005[1]
EARNINGS x POSTNEG		-0.006[1]	-0.008[1]
FORECAST		0.004[1]	0.004[1]
FORECAST x POSTNEG		-0.009[1]	-0.013[1]
TRANSACTION		0.004[1]	0.006[5]
TRANSACTION x POSTNEG		-0.005[1]	-0.006[5]
TOPBROKER		0.125	-0.000
TOPBROKER x POSTNEG		0.004	0.001
SETTLEMENTBANK		0.048	0.012
SETTLEMENTBANK x POSTNEG		-0.162[5]	-0.010
Fixed effects	yes	yes	yes
N	31,965	31,965	77
Adjusted R-Square	0.005	0.522	0.516 (mean)

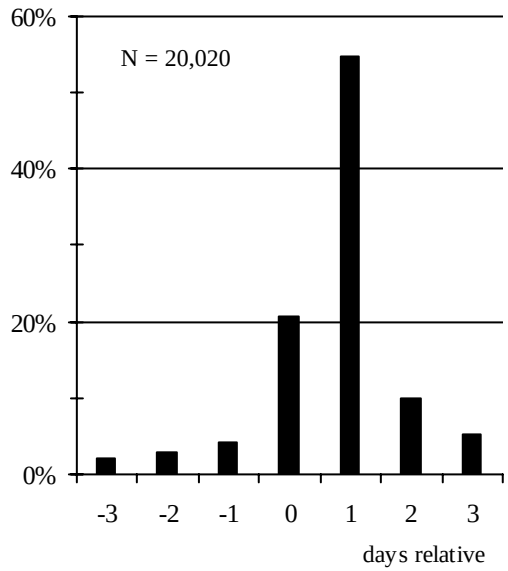
continued

Table 9 (cont.)

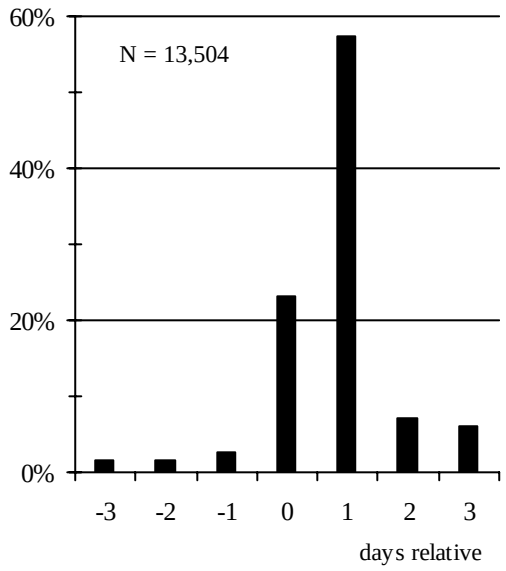
	Residual $R(0^{+}, +1)$	
	Mean	Median
B. Revised drift estimates		
Downgrades	-0.23	-0.09
Upgrades	0.24	0.14

Figure 1. Recommendation change dates and corporate events. Depicted are the daily fractions of the indicated number of recommendation downgrades and upgrades over the seven days centered on the day of the recommendation change, for identified key corporate announcements: earnings guidance, as reported by First Call, earnings per share, as reported by *I/B/E/S*, as reported by SDC, and for a sample of the remaining firms with changes, other events identified in the Dow Jones News.

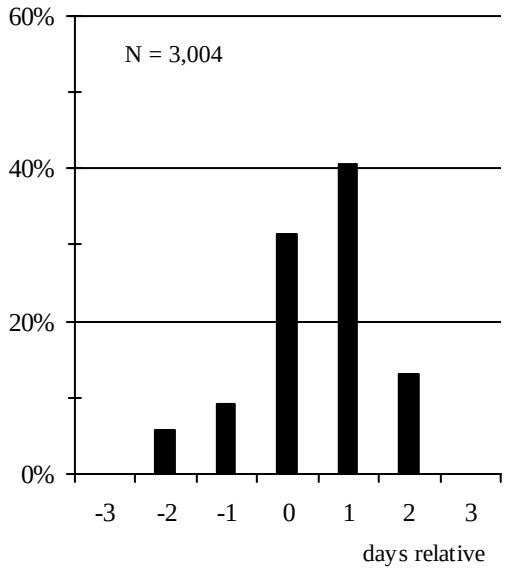
Panel A. Earnings announced



Panel B. Earning guidance announced



Panel C. Merger or acquisition announced



Panel D. Other announcement in the media