Retail Investors and Analysts

R. David McLean, Jeffrey Pontiff, and Christopher Reilly[Ψ]

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Abstract

Do retail investors respond to analysts' revisions? We consider revisions in recommendations, price targets, and EPS forecasts. Revisions in recommendations and price targets portend greater retail trading in the direction of the revision. Revisions in EPS forecasts create more retail trading, regardless of the direction of the revision. The effects of recommendation revisions are stronger with All-Star Analysts. Retail investors trade in anticipation of revisions in price targets and recommendations. Retail trades earn higher returns when aligned with analysts' revisions. Retail investors are one channel through which analysts' information is transmitted into prices.

We study how retail investors respond to analysts' revisions in recommendations, price target-implied return forecasts, and earnings per share (EPS) forecasts. Our paper aims to address unanswered questions in both the retail and analyst literatures. A growing literature on retail investors is largely concerned with individual investors' decision-making processes and investment performance (e.g., Barber and Odean (2013) and Boehmer, Jones, Zhang, and Zhang (2021)). Much of the literature on analysts is concerned with the relevance of the information that analysts produce and how this information gets impounded into prices. In a review of the analyst literature, Kothari, So, and Verdi (2016) conclude that "the specific mechanisms through which analysts influence asset prices, and expected returns in particular, are still not entirely clear." In this paper, we produce several novel findings regarding how retail investors make decisions, the profitability of retail trades, and how analysts' information influences stock prices.

We estimate retail trading via the methodology developed in Boehmer, Jones, Zhang, and Zhang (2021), which identifies retail market orders in TAQ data. We alter the Boehmer et al. (2021) method to address trade signing errors documented in Barber, Huang, Jorion, Odean, and Schwartz (2023). Using this corrected retail trading measure, we find that retail trades are responsive to revisions in changes in recommendations and price targets or "analysts' actionables."[1] When analysts increase a recommendation or price target-return forecast, there are significant increases in net retail buying. Net retail buying also declines following negative revisions in recommendations and price target-return forecasts. These effects are significant

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[1] Like Engelberg, McLean, and Pontiff (2020), we use the word "analysts' actionables" to describe recommendations and price targets. Recommendations and price targets explicitly communicate the investment prospects of a firm. This is in contrast to an EPS forecast or other financial forecast, which does not explicitly communicate whether a stock is likely to outperform.

even after excluding revisions that occur around earnings announcements and controlling for news, past daily returns at various horizons, return volatility, and turnover.

With EPS forecast revisions, retail investors increase net buying following both positive and negative revisions, but do so more following negative revisions. EPS forecasts are different from recommendations and price targets in that they not explicitly give an investment recommendation. Increasing a price target return-forecast by 15%, or moving a recommendation from a buy to a strong buy, gives the investor a clear course of action. In contrast, increasing a quarterly EPS forecast from $0.15 to $0.20 does not explicitly communicate an investment action. Our findings suggest that when the investment recommendation is explicit, retail investors respond accordingly.

We then study whether the aforementioned effects are stronger with All-Star analysts. With recommendations, we find that the retail trading in response to a revision from an All-Star analyst is 50% to almost twice as strong as the response to a non-All-Star analyst. These findings support the idea that retail investors who follow analysts are informed investors who pay attention not only to analysts' revisions but also to the quality of the analyst.

Next, we explore whether retail investors trade in a manner consistent with anticipating analyst revisions. We test if retail trades in the five days before analyst recommendation releases are predictive of the direction of analyst recommendation revisions. Prior literature, most notably Irvine, Lipson, and Puckett (2007), has utilized similar tests for institutional traders to present evidence of analyst "tipping" to preferred clients. Many financial advisors work at firms that employ sell-side analysts who can considerably influence which stock advisors recommend to their clients (Bradley, Gerken, and Willams (2021)). Although it is possible that some retail

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traders who utilize full-service brokers may be tipped by their broker, our retail trading measure identifies trades from online discount brokerages. Thus, any anticipation of analyst recommendations is likely the result of retail investors and analysts using the same information and retail investors responding quickly. We find strong evidence of retail investors trading in anticipation of price targets. We find weaker but still significant evidence with recommendation revisions. We do not find evidence with EPS forecast revisions.

We then examine the informativeness of analysts' revisions and retail trading. Like earlier studies, we find that both retail investors' trade imbalances and analysts' revisions predict stock returns in the intended direction.[2] With the revision variables, our results are completely out-of-sample relative to the earlier studies that document this predictability. McLean and Pontiff (2016) show that return-predictability for most predictors weakens out-of-sample, so it is important to document that revision variables predict returns in our sample. The return-predictability of retail trading and revisions are largely orthogonal to one another. This means that retail investors that buy shares following positive revisions can expect higher returns as compared to buying shares on regular days that do not follow revisions. Our findings support the idea that retail trades that follow revisions are more informative and earn greater abnormal returns than retail trades that do not follow revisions.

Our paper builds on several literatures. A literature beginning with Womack (1996) has shown that revisions predict stock returns. As mentioned above, Kothari, So, and Verdi (2016) point out that there is still much to be learned about how analysts' information gets impounded

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[2] For evidence that analysts' revisions have return-predictability, see Womack (1996), Barber, Lehavy, McNichols, and Trueman (2001), Brav and Lehavy (2003), Gleason and Lee (2003), and Asquith, Mikhail, and Au (2005).

into prices. We show that the information communicated in actionables, i.e., price targets and recommendations, is at least partly impounded into prices via retail investors. Schipper (1991), Bradshaw (2011), and Kothari et al. contend that analyst research is overly focused on EPS forecasts and has not given enough attention to recommendations and price targets. Our paper studies all three analyst variables and finds, consistent with this view, that recommendations and price targets are more important for retail investors. We also find that return-predictability stemming from revisions in price targets and recommendations is similar to the return-predictability stemming from EPS forecasts.

Many studies conclude that retail investors are uninformed and underperform (e.g., Odean (1999), Barber and Odean (2000), Grinblatt and Keloharju (2000), Hvidkjaer (2008), and Barber, Odean, and Zhu (2009a and 2009b), Barber and Odean (2013), and McLean, Pontiff, and Reilly (2023)). Our paper does not contradict this idea. Instead, our findings support the view that temporary spikes in retail trading are informative, even if the average retail trade is a poor one. We thus build on earlier studies, which find that retail trade imbalances are informative about stock returns over short horizons (e.g., Kaniel, Saar, and Titman (2008), Kaniel, Liu, Saar, and Titman (2012), Kelley and Tetlock (2012), Boehmer et al. (2021), McLean, Pontiff, and Reilly (2023)). We show that such informed retail trading is, in some cases, informed by analysts' revisions and that retail traders earn higher expected returns when their trades are in response to revisions.

Our paper builds on and contrasts with the findings of Mikhail, Walther, and Willis (2007) and Malmendier and Shanthikumar (2007), who examine large and small trades and their

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profitability following changes in analysts' recommendations.[3] Both papers find that both large

and small trades increase following positive recommendations. Both papers also conclude that

small trades in response to recommendations are uninformed and lead to worse investment

performance. In contrast, we find that retail trading following revisions is informed. If small

trades during Mikhail, Walther, and Willis (2007) and Malmendier and Shanthikumar (2007)

sample periods do indeed capture retail trades, then what could explain this difference?

Our sample is completely out of sample relative to both studies, as our ability to identify

retail trades begins in 2006. Regulatory changes, including Reg FD, the Sarbanes-Oxley Act, and

the Global Settlement, which were meant to reduce analysts' biases and level the playing field

for retail investors, could also explain the difference. Our sample is after these regulatory

changes, whereas both of the aforementioned studies have samples that are either completely

or mostly before the regulatory changes.

Finally, our paper provides a counterpoint to the findings in Irvine, Lipson, and Puckett

(2007), who find that institutional investors are "tipped" by sell-side analysts, as institutional

buying increases prior to an analyst initiating a "buy" or "strong buy" recommendation. Their

results suggest that retail investors should be trading in the opposite direction, i.e., if institutions

buy more before a bullish recommendation, then retail investors must be buying less.

What accounts for the difference in our findings and theirs? Lipson et al use Plexus data,

which represents a subset of institutions. Their sample also covers a 4-year sample period, which

ends in 2002, before our sample begins. We find an influx of retail trades that are net buys (sells)

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[3] Like us, Mikhail, Walther, and Willis (2007) find that small traders buy ore around EPS revisions, but their trading is uninformed in that they buy more regardless if the news is good or bad. Lee (1992) finds a similar effect with earnings news, i.e., small traders buy more regardless of the news is good or bad.

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before target price and recommendation increases (decreases). As mentioned above, our sample is after the many regulatory changes, all of which were passed in 2002 or earlier, that were meant to make things fairer for retail investors with respect to analysts. Irvine et al. also study coverage initiations, whereas we study revisions. We focus on revisions because they are more numerous than initiations, and we find in untabulated tests that the return-predictability stemming from initiations is insignificant during our sample.

1. Sample and Variables

1.1. Measuring Retail Trading

We estimate retail trading via the methodology developed in Boehmer, Jones, Zhang, and Zhang (2021), which identifies market orders originating from retail investors. Boehmer et. al. (2021) show that due to the rules of Regulation NMS (National Market System), one can identify retail orders based on the sub-penny pricing of the execution. Retail market orders are likely to be internalized and receive sub-penny price improvement such that the trade price falls slightly above or below a whole cent. Following Boehmer et al., we calculate the fraction of the penny associated with the transaction price: $Z_{it} \equiv 100 * \text{mod}(P_{it}, 0.01)$, where P_{it} is the transaction price in the stock. Trades reported to FINRA TRF (exchange code 'D') with a Z_{it} in the range of (0, 0.4) or (0.6, 1) are identified as retail trades. Like Boehmer et. Al., we do not identify trades with Z_{it} in the range of (0.4,0.6) as retail trades, since some advanced order types, such as pegged orders, can result in transaction prices at or near half pennies that do not involve retail traders.[4]

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[4] To our knowledge, this retail measure is the only viable retail measure that can be constructed from commercially available data. Methods based on trade size are no longer viable since the proliferation of market fragmentation and algorithmic trading prevent the identification of the original order size.

We depart from Boehmer, et al. (2021) in how we sign retail trades. Barber, Huang, Jorion, Odean, and Schwartz (2023) find that signing retail trades using extent quotes is more accurate than signing retail trades using Z_{it} alone. We thus compare the trade to the concurrent NBBO and sign retail trades that execute at prices greater than the midpoint of the national best bid or offer as retail buys and trades below the midpoint as sales. This refinement to the methodology of Boehmer et al. (2021) is also utilized in McLean, Pontiff, and Reilly (2023).

In order to construct our retail trading variable, we require that for every month during the relevant period, the stock must have at least one retail-initiated trade. This ensures that the stock was actively traded and was not newly listed or temporarily delisted. The identification of retail trade relies on Regulation NMS, which was codified in 2005, so our sample period begins in October 2006 and ends in 2022. We find the share of identified retail initiated trades begins to rise in October 2006. Boehmer et. al. (2021) validate this methodology using actual retail trade data from Kelley and Tetlock (2013) and with retail trades obtained from NASDAQ.

We construct two retail trading measures. The first is a trade imbalance measure, which is also used in Boehmer et al. (2021). This variable is net retail buys (retail buys – retail sells) scaled by total retail trading (retail buys + retail sells). We refer to this measure as *Retail Direction*, as it shows the direction in which retail traders trade, but not the magnitude relative to total trading. As an example, if buys are 10 and sells are 5, *Retail Direction* will equal 1/3. *Retail Direction* will also equal 1/3 if buys are 1,000 and sells are 500, or if buys are 1M and sells are 0.5M, and so on. *Retail Direction* therefore reflects the direction of the trading, but not the magnitude.

Our second measure aims to better reflect the magnitude of retail trading. This measure has the same numerator as *Retail Direction* (retail buys – retail sells), but the denominator is *total* trading volume, which reflects both institutions and retail investors. We refer to this variable as *Retail Magnitude*. As an example, assume retail investors buy 1,000 shares and sell 500, while total institutional trades equal 98,500 shares. In this case, *Retail Magnitude* will equal 5 basis points. If instead, total institutional trades were 198,500 shares, then *Retail Magnitude* would equal 2.5 basis points. In contrast, *Retail Direction* would be 1/3 in both cases. Hence, *Retail Magnitude* reflects the magnitude of net retail buying relative to total volume, whereas *Retail Direction* couches net retail buying in terms of total *retail* trading, but ignores whether these trade imbalances are large or small relative to the stock's total trading activity.

Panel A of Table 1 shows summary statistics for the two retail trading variables. *Retail Direction* has a mean of -3.27%, a median of zero, and a standard deviation of 0.44. Hence, on average, retail buys are about equal to retail sells. However, there is a good deal of variance in this variable. The 10th and 90th percentiles are -61% and 51%, respectively. *Retail Magnitude*, which is reported in basis points, has a mean of -25 basis points and a median of 2 basis points. Its standard deviation is 6.65%, and its 10th and 90th percentiles are -4.28% and 3.65%, respectively. *Retail Magnitude* is scaled by total trading volume, so we expect it to be several orders of magnitude smaller than *Retail Direction*, which is scaled by retail trading volume.

1.2. Analyst Variables

We obtain data on analysts' revisions for EPS forecasts, price targets, and recommendations from the IBES details database. We focus on revisions as we believe these to

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be most salient to investors, and all three of the revision variables described here predict returns in the intended direction in our sample, and thus are useful and informative to investors.[5]

We measure revisions in EPS forecasts by subtracting the old value from the new value, and scaling this difference by the stock price measured the day before the new value is announced. We measure recommendation revisions by simply the old recommendation from the new recommendation. We code recommendations such that a strong buy = 5 and a strong sell =1. For price targets, we first compute the implied return by scaling the 12-month price target by the previous day's closing stock price. We then compute the change in implied return, and use that as the revision variable.

We provide summary statistics for our revision variables in Panel B of Table 1. The EPS Forecast revisions variable averages -0.91%, so the average EPS forecast revision is a reduction in the EPS forecast. This variable has a standard deviation of 9.12%, and the 10th and 90th percentiles are -1.8% and 0.94%, respectively.

The price target-revision variable has average and median values of 0.15% and -0.09%. The 10th and 90th percentiles are -17.5% and 17.9%, which are sizeable changes, i.e., the 12-month return forecast increased or declined by about 18%. The standard deviation for this variable is 18.5%, so it varies a good deal.

The recommendations revisions average -0.10, or pretty close to zero. The median recommendation revision is zero. The 10th and 90th percentiles are -2 and 2, e.g., a

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[5] In untabulated results we find that initiations, or first-time recommendations, price targets, and EPS forecasts, do not predict returns in our sample.

recommendation falling from Strong Buy to Neutral, or a recommendation increasing from Neutral to Strong Buy. The standard deviation is 1.27.

1.3. News Variables

When testing whether retail traders respond to analyst recommendations a natural concern is that retail traders and analysts may be responding to the same event. To alleviate such a concern, we exclude recommendations that occur after earnings announcements, we control for stock returns that occur on the date recommendations are made, and we control for the quantity and sentiment of news that occurred when recommendations are made. In order to measure the quantity and sentiment of news, we utilize RavenPack's composite sentiment score (CSS). CSS takes that value of 100 for the most positive news articles and 0 for the most negative articles. We utilize the average CSS reported for Dow Jones and PR Newswire articles and the quantity of articles for Dow Jones and PR Newswire, as well as the respective interactions of these variables. When Dow Jones or PR Newswire have no articles released for a given stock on a given day, we assign an average CSS of 50, representing neutral sentiment.

2. Main Results

In this section of the paper, we discuss our main findings. Section 2.1 discusses some portfolio sorts, which are reported in Figure 1. Section 2.2 describes our tests that relate retail trading to analysts' revisions. These results are reported in Tables 3 and 4. We then ask whether retail investors respond more strongly to All-Star analysts' revisions. These findings are discussed in Section 2.3 and reported in Table 5. Section 2.4 discusses tipping and our tests of whether

retail investors trade ahead of revisions, which are reported in Table 6. Section 2.5 discusses how revisions and retail trading relate to future stock returns. We also explore whether retail trading in response to revisions predicts returns more strongly. These results are reported in Tables 7 and 8.

2.1. Univariate Results

We report results from univariate sorts in Figure 1. Figure 1.A was made using the *Retail Direction* variable, while Figure 1.B was made using the *Retail Magnitude* variable. In each figure, we display the average value of the retail trading variables, sorted into 3 groups. The three groups we form include: days when there was a revision in the 90th percentile or higher for the revision variable (*Up*), days when there was a revision in the 10th percentile or lower for the revision variable (*Down*), and the remaining days with small or no revisions. Before taking the averages within each group, we demean each firm-day observation by the firm's mean. We also exclude observations for which there was an earnings announcement over any of the three previous days, so that we can more cleanly relate trading to the revision.[6] Including earnings announcements does not change our findings.

The figures make several points very clear. First, retail investors' trading is highly responsive to recommendation revisions. Retail investors buy more following positive recommendation revisions and sell more following negative recommendation revisions. Recommendations are the most salient and perhaps widely-followed analyst actionable, i.e., a recommendation clearly tells investors what to do, so it makes sense that retail investors would

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[6] Kaniel, Saar, and Titman (2008) show that retail trading increases following earnings announcements.

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be most responsive to these revisions. Moreover, recommendation revisions predict returns in the intended direction, so it is wise for retail investors to trade this way.

Retail investors also respond positively to price target revisions; however, this is only the case for positive changes. For positive price target revisions, there is a large increase in retail net buying, even larger than that for positive recommendation revisions. However, for negative revisions, retail investors also increase net buying, although they do so less so than with positive revisions. Later, we will show in regressions with control variables that the effect around negative revisions is negative, but smaller in magnitude than the positive effect of positive revisions and only statistically significant when predicting *Retail Direction*. Note that a negative price target revision does not necessarily imply that investors should sell the stock. As an example, if the 12-month return forecast falls from 30% to 20%, this does not clearly imply that investors should sell. Additionally, a negative price target revision may represent a higher price target but lower implied return if the stock price has risen since the last recommendation.

Finally, the figures show that retail investors buy more shares in response to EPS forecast revisions, regardless of the direction of the revision. Individual investors purchase following 'stale' news stories (Tetlock (2011)) and when identified in Robinhood's "Top Movers" List (Barber, Huang, Odean and Schwarz (2022)). Increased retail buying regardless of direction of EPS forecast can be explained by increased attention due to analyst revisions. Additionally, investors buy more following negative revisions than positive ones. Retail investors may provide liquidity and trade against other investors such as institutional investors who place a greater emphasis on EPS revisions. Note that an EPS revision is not a clear investment signal, e.g.,

decreasing an EPS forecast from $0.20 to $0.15 is not the same thing as recommending that the stock should be sold.

Overall, the results suggest that retail investors pay attention to analysts, and in general buy more following analysts' positive revisions. This result is stronger with actionables, i.e., recommendations and price target-forecasts, where analysts are clearly telling investors how to trade. With EPS forecasts, which offer no such clear instruction, there is perhaps some confusion, with net retail buying increasing regardless of the direction of the revision. This could reflect the fact that retail investors are biased towards buying when non-actionable information is released about a security in a manner similar to reacting to stale news (Tetlock (2011)).

2.2. Retail Trading in Response to Revisions: Revision-Level Regressions

In this section of the paper, we discuss revision-level regressions. The unit of observation is an analysts' revision, and we regress daily retail trading on the revision variables and controls. Hence, these regressions ask whether across revisions, retail net buying increases with the positivity of the revision. We continue to exclude revisions that have an earnings announcement on the same day or in the 2 days prior, as in such cases both the analysts and the retail investors may be responding to the earnings announcement. Including revisions that follow earnings announcements makes our results stronger. We estimate regressions for revisions in EPS, recommendations, and price targets separately. In the subsequent tables, we put all three types of revisions into a single regression and report similar findings.

The regressions reported in Table 2 include firm and time fixed effects. The standard errors are clustered on firm and time. We regress day *t* retail trading on revisions reported on

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day *t-1*, along with the day *t-1* stock return, lagged weekly return, lagged monthly return, lagged 6-month return, day *t-1* return squared, lagged weekly return squared, lagged daily return variance over the last month, last month's turnover, and market capitalization. The lagged returns and volatility measures are meant to control for events that could impact both the revision variables and retail trading. In addition, we control for firm-day news stories. We use a news sentiment indicator, the number of articles, and an interaction between the sentiment indicators and the number of articles. We use news data from both Dow Jones and PR Newswire.

The first two columns report the results from regressions in which EPS revisions are the independent revisions variable. In the first column, *Retail Direction* is the dependent variable. In the second column, *Retail Magnitude* is the dependent variable. Recall that *Retail Direction* is equal to retail net buying (retail buys – retail sells) scaled by retail trading volume, while *Retail Magnitude* is equal to retail net buying scaled by total trading volume. The *Retail Magnitude* variable is always in basis points so that its coefficients are readable. The EPS revision coefficients in both specifications are negative and significant, showing that retail net buying increases more following a *decrease* in the EPS forecast.

Columns 3 and 4 report the results for price target revisions. The results here are very strong, and show that retail net buying increases significantly following increases in price targets. In the *Retail Direction* regression, the revision coefficient is 0.013 (*t*-statistic = 7.02), while in the *Retail Magnitude* regression, the coefficient (in basis points) is 6.789 (*t*-statistic = 5.17). Moving from the 10th to 90th percentile of the price target-return forecast revision variable yields an increase of 0.46% in *Retail Direction*. Moving from the 10th to 90th percentile of the return forecast revision yields an increase of 2.4 basis points in *Retail Magnitude*. *Retail Direction* has a

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standard deviation of 44%, while *Retail Magnitude* has a standard deviation of 6.7%, so the effect is much larger in economic terms for *Retail Direction*.

What does it mean if *Retail Direction* moves more than *Retail Magnitude*? It reflects the fact that the amount or magnitude of retail trading has not increased along with the directional change in trading. As an example, consider a stock for which on day *t*, retail buys equal 20 and retail sells equal 10. Now assume that on day *t+1*, buys increase to 210 and sells to 100. Assume institutional trading equals 1,000 shares traded on both days. *Retail Direction*, which scales by retail trading volume, would increase slightly from 0.33 to 0.35. In contrast *Retail Magnitude*, which scales by total volume, would increase from 0.009 to 0.840, a much larger increase, especially in percentage terms. Because it scales by retail volume, *Retail Direction* does not reflect how the magnitude of the retail trading increases.

In the final two columns we report the results for revisions in recommendations. The results here are also very strong, and show that retail investors increase their net buying in a stock if an analyst strengthens their recommendation. In the *Retail Direction* regression, the coefficient is 0.009 (t-statistic = 16.21). Thus, if a recommendation increases by 1 (e.g., from buy to strong buy), then *Retail Direction* increases by 0.9%. In the *Retail Magnitude* regression, the coefficient (in basis points) is 4.301 (t-statistic = 12.56), showing an increase in *Retail Magnitude* of 4.3 basis points. *Retail Direction* has a standard deviation of 43%, while *Retail Magnitude* has a standard deviation of 6.6%, so here again, the effect is larger in economic terms for *Retail Direction*, representing about 2% of a standard deviation. If we were to move from the 10th to 90th percentile of the recommendation revision variable (from -2 to 2), then the regression coefficient suggests an increase of 3.6% in *Retail Direction*, or 8.2% of its standard deviation.

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The control variables also reveal some interesting facts about retail trading. Retail traders are contrarian. The coefficients for returns measured over the last week, month, and 6-months are all negative and statistically significant. The return measured over the last day is positive and significant, reflecting that revisions that are more bullish, as measured by stock price reactions, receive even greater retail buying. Retail investors also buy more larger stocks and more stocks with higher turnover. These results are consistent with the findings reported in Boehmer et al. (2021).

Taken in their entirety, the results in Table 2 show that retail investors are responsive and informed with respect to revisions in analysts' actionables. Retail investors buy more shares when analysts increase price-target return forecasts or recommendations. With earnings forecasts, the results are the opposite. When EPS forecasts increase, retail investors buy fewer shares. This suggests that institutions are buying more shares. Overall, the findings suggest that institutions are more responsive to EPS forecasts, whereas retail investors are responsive to analysts' actionables, which clearly communicate a course of action.

An alternative explanation for the positive correlation between retail trading and analysts' recommendations is that retail traders and analysts respond to similar information rather than retail traders actively using analyst recommendations. Consistent with this alternative explanation, we later show retail trades are predictive of price target revisions. To address this concern, the estimation in Table 2 excludes recommendations following EPS releases and controls for the quantity of news, sentiment of that news, and past returns. This alternative story is unlikely to generate different results for analyst actionables versus unactionables. For example, if analysts and retail traders both respond to the same piece of positive information,

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analysts would likely raise EPS forecasts, price targets and recommendations resulting in positive correlations between retail trading and all analysts' disclosures. Instead, retail trades are only positively related to actionables that easily translate to an investment decision, consistent with retail investors actively utilizing analysts as an information source.

2.2.1 Retail Trading in Response to Revisions: Daily Specifications

In this section of the paper, we further explore the effects of revisions on retail trading but make two major changes relative to the specifications described in the last section. First, the unit of observation is firm-day, rather than revision. Most firm-day observations do not have revisions, in which case the revision variable is assigned a value of zero. Some firm-days have multiple revisions of the same type (e.g., EPS forecast), and in such cases we take a simple average. Second, we include all of the revision variables in the same regression. We continue to include the same control variables that we use in the previous tables. We also continue to exclude observations for which EPS was reported during any of the 3 previous days. Finally, we include a lagged value, day *t-2*, of the retail trading variable value. This is done to capture the fact that retail trading may be persistent. We choose day *t-2* so that the variable value does not reflect the revision announcement, which occurs on day *t-1*.

We report the results from these specifications in Table 3. The results are largely the same as those in Table 2, which are estimates at the revision level. With respect to EPS forecast revisions, the response of retail trading is still negative. That is, when analysts lower EPS forecasts, retail investors buy more of the stock. As we explained earlier, this may reflect the fact

that institutions respond more strongly to EPS revisions and retail investors tend to buy in light of non-actionable news.

The recommendation and price target revision variables continue to be associated with positive and significant reactions from retail traders. When analysts' revisions signal a more favorable outlook via recommendations or price targets, retail investors respond in kind by purchasing more shares. These effects are seen both with *Retail Direction* and with *Retail Magnitude*. Overall, the results remain consistent with the idea that revisions in analysts' actionables inform retail trading.

2.2.1 Retail Trading in Response to Revisions: Daily Specifications and Large Revision Dummies

In this section of the paper, we replace our continuous revision variables with dummy variables. For each revision variable, we create an *Up* dummy equal to 1 if there is a revision at or above the 90th percentile of the distribution of the revision variable, and zero otherwise. We also create a *Down* dummy equal to 1 if there is a revision at or below the 10th percentile for a revision variable and zero otherwise. We also create a *Change* dummy for minor revisions. It is equal to 1 if there is a revision not captured in the 10th or 90th percentiles, and zero if the revision is captured by the *Up* and *Down* dummies. Analysts sometimes reaffirm their prior forecasts and there is no change. In such cases, all of the dummies are equal to zero. We continue to use the firm-day sample that we used in the previous table, so most observations have values of zero for both the *Up* and *Down* dummies, as for most firms on most days, there are no revisions. We also continue to exclude observations for which EPS was reported during any of the 3 previous days. The sample and variables here mirror those used to create Figure 1.

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The results in Table 4 largely confirm the findings in the earlier tables and those in Figure 1 that were discussed earlier. Retail buying is significantly higher following positive revisions of analysts' actionables. However, negative revisions lead to more retail buying in the case of EPS revisions. With price target revisions, we see the effect of a negative revision is negative in all specifications. For recommendations, the *Up* coefficients are always positive and significant and the *Down* coefficients are always negative and significant. Hence, as in the other tables, the results in Table 4 show that retail investors are responsive to analysts' actionables.

In regression 2 *Retail Direction* is the dependent variable and all of the controls are included. The coefficients for *EPS Up* and *EPS Down* are both positive and the *EPS Down* coefficient is significant. The *Down* coefficient is larger, consistent with what is reported in Figure 1 and the previous tables. The *EPS Down* coefficient is 0.006 (*t*-statistic = 5.07), while the *EPS Up* coefficient is 0.001 (*t*-statistic = 1.29). *EPS Down* is significantly larger than *EPS Up* with an *F*-statistic of 9.7.

The *Target Up* coefficient in regression 2 is 0.010 (*t*-statistic = 8.23) in regression 2, while the *Target Down* coefficient is -0.003 (*t*-statistic = -2.08). *Target Up* coefficient is significantly larger than the *Target Down* coefficient with a *F*-statistic of 62.2. Thus, as shown in the earlier tables, retail investors tend to be responsive to price target revisions. Recall that *Target Down* can still involve a positive price target-return forecast, e.g., the return forecast could decline from 20% to 15%, but it is still a positive return forecast.

The coefficients in regression 2 again show that recommendations are where retail investors tend to pay the most attention. The *Rec. Up* and *Rec. Down* coefficients are both highly significant and signed such that retail investors are following the revisions. The *Rec. Up* coefficient

is 0.013 (*t*-statistic = 5.88), while the *Rec. Down* coefficient is -0.013 (*t*-statistic = -6.00). The difference in *Retail Direction* following positive and negative recommendations revisions is therefore about 0.026. This difference is statistically significant with a *F*-statistic of 83.1.

Regressions 3 and 4 use *Retail Magnitude* as the dependent variable, and tell a similar story. We report everything in basis points for readability. In regression 4, which has the full set of control variables, the *EPS Up* coefficient is 4.705 (*t*-statistic = 3.34) and the *EPS Down* coefficient is 7.141 (*t*-statistic = 4.43). So here again, retail investors buy more after all EPS revisions, yet do so more strongly after negative revisions.

The *Target Down* coefficient is -1.996 (*t*-statistic = -1.54), while the *Target Up* coefficient is 7.467 (*t*-statistic = 5.51), and the difference between the coefficients is statistically significant. The coefficients for the recommendation revisions are 6.021 (*t*-statistic = 3.47) for the *Rec. Up* and -9.379 (*t*-statistic = -5.15) for the *Rec. Down*. The difference between the *Rec. Up* and *Rec. Down* coefficients is statistically significant. The standard deviation for *Retail Magnitude* is 0.067. The coefficients are in basis points, so the difference between the *Rec. Up* and *Rec. Down* coefficients is 15.4 basis points, or 2.3% of a standard deviation of *Retail Magnitude*.

The findings in Table 4 agree with the findings in the earlier tables, and thus confirm that retail investors are responsive and informed with respect to revisions in analysts' actionables, especially recommendations, but not with EPS revisions. Our findings suggest that institutions may be more responsive to EPS revisions.

2.3 Retail Trading in Response to Revisions: The Effects of All-Star Analysts

In this section of the paper, we ask whether retail investors behave differently following revisions of "All-Star" analysts. Clarke, Khorana, Patel, and Rau (2007) argue that analysts determined by *Institutional Investor* magazine to be "All-Stars" may be more adept than typical analysts. An All-Star analyst is defined as an analyst denoted by *Institutional Investor* as an All-Star or a runner-up in the any November issue of the magazine. We have All-Star data for the years 2013-2017.

To test for the effects of All-Star status, we estimate the same revision-level regression as in Table 2, except we also include a dummy variable equal to 1 if the analyst is an All-Star and an interaction between the All-Star dummy and the revision variable. A positive and significant coefficient for the interaction term shows that retail net buying increases more for positive revisions if the revising analyst is an All-Star.

We report the findings from these tests in Table 5. For the regressions reported in the first two columns, the revision variable is the EPS forecast. In both regressions, the revision-All-Star interaction coefficient is negative. It is significant in the *Retail Magnitude* regression. In both regressions, the EPS forecast revision variable is negative and significant, as it is in Tables 2 and 3. We interpret the negative coefficients as showing that institutional investors are more responsive to changes in EPS forecasts than retail investors. The negative interaction with the All-Star dummy suggests that institutional investors pay more attention to revisions from All-Star analysts.

The next two columns report the results for revisions in price targets. In both specifications, the All-Star interaction is insignificant. The price target revision coefficient is

significant, consistent with Tables 2 and 3. Hence, retail investors trade in response to revisions in price targets but do so equally for All-Stars and non-All-Stars.

The regressions in columns 5 and 6 report the results for revisions in recommendations. The results show that retail investors are significantly more responsive to revisions from All-Star analysts. The revision variables and the revision-All-Star interactions are positive and significant in both regressions. In the *Retail Direction* regression, the revision and the All-Star interaction coefficients are 0.008 and 0.004, respectively. This shows that the effect of a revision on retail trading is fifty percent larger if the issuing analyst is an All-Star. In the *Retail Magnitude* regression, the revision coefficient is 3.828 and the All-Star interaction is 3.480, showing that if an All-Star analyst issues the revision, the effect is almost twice as large.

Overall, the results in Table 5 show that when analysts issue revisions in EPS forecasts, institutional investors trade more in the direction of the revision. For recommendations, retail investors trade more in the direction of the revision if the analyst is an All-Star. With price targets, retail investors seem to respond to All-Stars and non-All-Stars equally.

2.4. "Tipping" or Trading in Anticipation of Revisions

In this section of the paper, we ask whether retail investors trades anticipate analysts' revisions. Irvine, Lipson, and Puckett (2007) find that institutional investor trades foreshadow analyst recommendation initializations. They attribute this to sell-side analysts "tipping" institutions, thus enabling the institutions to profit. Similarly, Berkman, Koch, and Westerholm (2023) find that employees of financial institutions in Finland tend to buy (sell) the stock of a particular firm before the institution revises a recommendation upward (downward).

As we explain in the Introduction, our retail trading measure primarily identifies trades from online discount brokerages and thus is unlikely to identify a class of investors who would receive explicit tips from analysts. It is possible that clients of retail brokerage arms of investment banks may receive tips and receive price improved trade execution in a manner that would identify them as retail traders. Full-service brokers and independent or unaffiliated analysts have clear incentives to tip in the form of more fees from larger retail assets under management and more sales of analyst services, but they also face large litigation risk when tipping clients. Additionally, some individuals may receive information from personal or familial relationships with analysts and trade via separate online discount brokerages to reduce the chance of detection by regulators or employers. Ultimately, our tests answer whether retail traders are able to use any information, explicit tips, or simply conditioning on other public information to anticipate analyst revisions.

We report the results from our tipping tests in Table 6. The dependent variable is one of the revision variables (EPS forecast, price target-return forecast, or recommendations), and we regress this on lagged values of either *Retail Direction* or *Retail Magnitude* for each of the previous 5 trading days. We include lagged daily stock returns and lagged daily returns squared for the same 5 trading days, market capitalization, and turnover as controls. The regressions all have firm and time fixed effects, and standard errors that are clustered on firm and time. As in the other tables, we exclude revisions that follow an earnings announcement over any of the three previous days.

In the first two columns we report the results for EPS revisions. The retail trading coefficients are all insignificant in the regression that uses *Retail Direction*. In the regression

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reported in the second column the 2-day and 5-day lag *Retail Magnitude* coefficient is negative and significant, however the other *Retail Magnitude* coefficients are insignificant at the 5% threshold. Overall, the evidence here does not support the idea that retail investors are tipped or otherwise anticipate EPS revisions.

Columns 3 and 4 report the results for revisions in price targets. The results are consistent with retail investors somehow anticipating price target revisions. In column 3, all five of the coefficients for lagged values of *Retail Direction* are positive and statistically significant. The coefficient for *Retail Direction* at the 1-day lag is 0.008 (*t*-statistic = 10.55), so a 1-standard deviation increase in *Retail Direction* portends a higher value of about 0.35% in the revision of price target-implied returns. If we add up the effects from all 5 *Retail Direction* coefficients, then the effect is about a 1.18% higher revision in price target-implied returns. Column 4 shows similar results for *Retail Magnitude*. All 5 of the coefficients for the lagged values are positive, and 3 are significant. The 1-day lag coefficient has a value of 11.74 (*t*-statistic = 7.28), which alone suggests about a 0.78% higher revision in price target-implied return for a one standard deviation change in *Retail Magnitude*.

Columns 5 and 6 report the results for recommendation revisions. We find evidence of retail investors anticipating such revisions with *Retail Direction*, but not *Retail Magnitude*. In column 5, four of the five coefficients for lagged values of Retail Direction are positive, and the coefficient for the 1-day lag is significant. The coefficient for the 1-day lag suggests a 1.7% higher recommendation revision given a one standard deviation increase in *Retail Direction*.

Taken in their entirety, the findings in Table 6 are consistent with the idea that some retail investors are tipped or otherwise anticipate revisions in analysts' actionables, but not revisions

in EPS forecasts. Alternatively, it could be that analyst recommendations are partially driven by retail trading. If analysts seek to observe and mirror retail trader sentiment when making their revisions, it may appear that retail traders anticipate revisions when, in fact, they are responsible for driving recommendations. While we cannot rule out this possibility, we find it less likely since we know of no anecdotal evidence that analysts respond to retail sentiment and the difficult nature of observing retail trades during our sample period. This alternative explanation is also more plausible for institutional trades, which, as we explain above, have been linked to tipping by Irvine, Lipson, and Puckett (2007).

2.5 Retail Trading, Analysts' Revisions, and Stock Returns

In this section of the paper, we study how our analyst and retail trading variables relate to stock return predictability. Our results thus far show that retail investors follow revisions in actionables, and also follow EPS forecast revisions if the analyst making the revision is an All-Star. If such trading is "informed" or rational, then revisions should predict returns in the intended direction. As we mention in the Introduction, previous studies show that all three of our revision variables predict returns in the intended direction. However, McLean and Pontiff (2016) show that return-predictability is typically lower out-of-sample, possibly because of both data mining and informed trading. We, therefore, begin by testing whether such revision-predictability exists in our sample period. Boehmer et al. (2021) and McLean, Pontiff, and Reilly (2023) both show that retail trade imbalance measures (*Retail Direction*) predict returns in the intended direction. Our other retail trading variable, *Retail Magnitude*, however, has not been shown to predict stock returns, and we test whether it predicts returns here.

We report the results from our initial return-predictability regressions in Table 7. The dependent variable in each regression is stock returns measured over the subsequent 20 trading days. We multiply this variable by 100 so that the coefficients are easier to read. As in the earlier tables, we include controls for lagged returns, volatility, size, and turnover, and exclude observations with earnings announcements over the three previous days. The regressions have firm and time fixed effects and standard errors clustered on firm and time.

In the first regression, we include the three revision variables, but not the retail trading variables. The coefficients for each of the revision variables are positive and statistically significant. This means that when analysts become more bullish on a stock or raise its EPS forecast, returns over the month are significantly higher. This also shows that retail trading in the direction of the revisions, which we document in the previous tables for recommendations and price targets is informative. The revision variables' coefficients reflect increases in expected returns per standard deviation increase in the revision variable of 0.35%, 0.14%, and 0.20% for EPS forecasts, price target-return forecasts, and recommendations, respectively, so all three types of revisions result in statistically significant return predictability. The fact that retail investors follow revisions in actionables supports the idea of informed retail trading following analysts' revisions. The findings also show that institutional trading following EPS revisions is also informed and that retail investors are unable to process and benefit from the informativeness of EPS revisions.

The regressions reported in the second and third columns report the results for the retail trading variables. Both retail trading variables produce return predictability that is statistically significant. In column 2, the coefficient for *Retail Direction* suggests an increase in expected

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returns of 0.07% per month per standard deviation increase, while in column 3 the coefficient for *Retail Magnitude* suggests an expected return increase of 0.02% per month per standard deviation increase. The mean value of monthly return is 0.95% in our sample, so with both retail trading variables the effects are economically meaningful.

The final two columns in Table 7 include each of the retail trading variables along with the revision variables. The results show that the effect of retail trading does not impact the effect of revisions, and vice versa. The coefficients for the retail trading variables are virtually the same in these specifications as compared to the specifications that did not include the revision variables. Similarly, the coefficients for the revision variables are essentially the same as those reported in the specifications that do not include the retail trading variables. Retail trading in the direction of revisions is informative, i.e., a retail trader who buys shares following a positive revision earns a higher return than a retail trader who buys shares on a day with no revision.

2.5.1. The Informativeness of Retail Trading and Analysts' Revisions

In this section, we further explore whether retail trading that follows revisions is informative. We estimate regressions similar to those reported in Table 7, but we add interaction terms between the retail trading variables and the revision variables.

In the first regression, we include *Retail Direction*, the three revision variables, and interactions between each revision variable and *Retail Direction*. The interactions are all insignificant. The coefficients for *Retail Direction* and each of the revision variables are positive and significant. The insignificant interactions tell us that when retail investors trade on days following revisions, their returns tend to be higher. The expected return on these days is a

function of the retail trading coefficient and the revisions coefficient, both of which are positive and significant. On days with retail trading that do not follow revisions, the expected returns are influenced by the retail trading coefficient, but not the revision coefficient. For retail trading to not be more profitable following revisions, it needs to be the case that the interaction coefficient is negative and significant and large enough to offset the positive effect of the revision coefficient. Instead, we find that it is insignificant.

The second regression is like the first, but we replace *Retail Direction* with *Retail Magnitude*. The effects are the same. The interactions are all insignificant, while the coefficients for *Retail Magnitude* and each of the revision variables are positive and significant. Thus, retail trading is more profitable on days following revisions.

3. Conclusion

This paper studies whether and how retail investors respond to analysts' revisions in EPS forecasts, recommendations, and price targets. We produce several novel findings, which contribute to literatures on both retail investors and sell-side analysts.

We find that overall, retail investors follow revisions in analysts' actionables. That is, when analysts increase their recommendation or raise their price targets, retail investors buy more of the stock. With EPS forecasts, retail investors buy more following both positive and negative revisions, but the effect is stronger with negative revisions. This suggests that retail investors pay closer attention to analysts' actionables than to EPS forecasts. Actionables offer explicit guidance with respect to how to trade on the stock. EPS forecasts do not. The counter-trading with EPS

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forecast revisions on the part of retail investors could reflect an increase in institutional trading following EPS revisions.

We ask whether these effects are stronger if an All-Star analyst makes the revision. With recommendations, this is very much the case. Our estimates of the response in retail trading following an All-Star's recommendation revision are 50% to more than two times stronger as compared to a non-All-Star's revision. With price target revisions, we find no effect; retail investors respond similarly to revisions in price targets regardless of whether the analyst is an All-Star or not.

We find some evidence of retail traders anticipating and thus trading ahead of revisions. We find strong evidence of retail investors trading in anticipation of price target revisions. We find weaker but still significant evidence with recommendation revisions. We do not find evidence with EPS forecast revisions. Although the price target relation might be evidence of "tipping," in which analysts communicate upcoming revisions to brokers (and thus, their clients), we find this interpretation unlikely since our retail trading data occurs through discount brokers. More likely, retail traders and analysts respond to the same information that is not captured by our news and market reaction controls.

In the final part of our paper, we study how analysts' revisions and retail trading relate to stock return-predictability. This analysis produces several interesting insights. All three types of revisions predict returns in our sample. The predictability of retail trading and revisions are largely orthogonal to one another. Our findings show that retail trades that follow revisions earn higher returns.

Overall, our findings are consistent with the idea that spikes in retail trading reflect informed trading, and at least some of these trades are informed by analysts' revisions. Our research also shows that one channel through which analysts' information gets into prices is through retail investors.

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Figure 1: Retail Trading on and 0ff Days with Large Analysts' Revisions

This Figure displays average values for *Retail Direction* (Figure 1.A) and *Retail Magnitude* (Figure 1.B) on days following analysts' revisions. *Retail Direction* is equal to: (Retail Buy Volume – Retail Sell Volume) / (Retail Buy Volume + Retail Sell Volume). *Retail Magnitude* is equal to: (Retail Buy Volume – Retail Sell Volume) / Total Volume. *Retail Magnitude* is reported in basis points of daily volume such a retail trade imbalance representing 1% of total volume is expressed as 100. We demean each observation by its firm-level mean. We consider revisions in EPS forecasts, price targets, and recommendations. "Up" reflects days at or above the 90th percentile for the revision variable, "Down" reflects days at or below the 10th percentile for the revision variable, and "Small or No Revision" reflects days with no revision or revisions between the 10th and 90th percentiles of EPS forecasts or price target revisions. The revisions are measured on day *t-1*, and the trading is measured on day *t*. We exclude observations with an earnings announcement on days *t-1*, *t-2*, or *t-3*.

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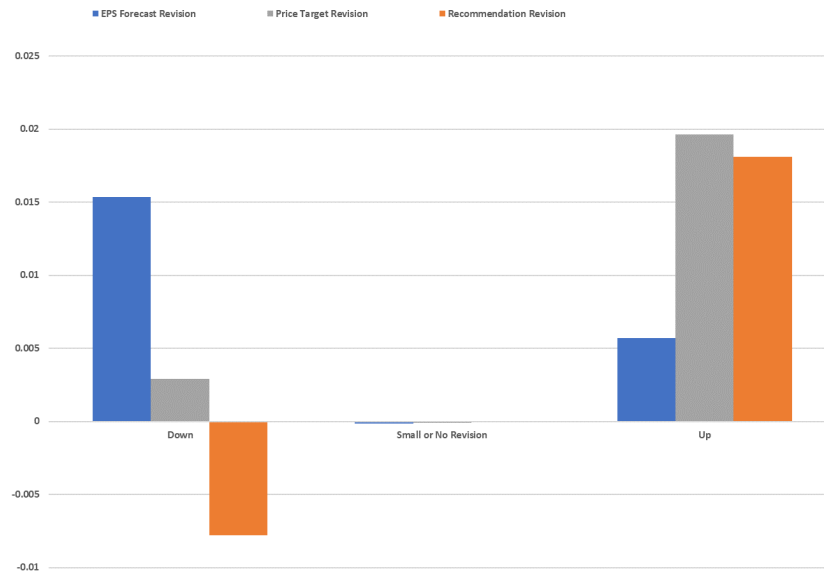**Figure 1.A: Retail Direction and Analysts' Revisions**

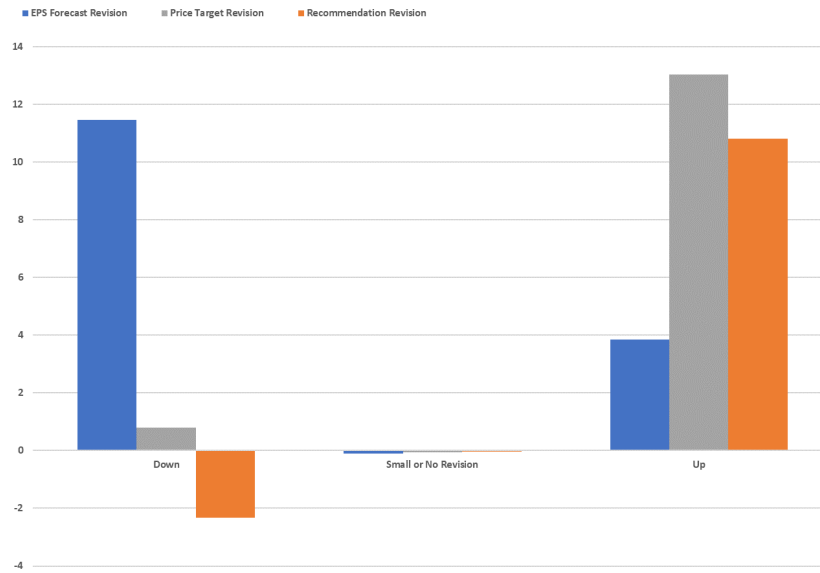**Figure 1.B: Retail Magnitude and Analysts' Revisions**

Table 1: Summary Statistics

This table presents summary statistics for the main variables used in this study. *Retail Direction* is equal to: (Retail Buy Volume – Retail Sell Volume) / (Retail Buy Volume + Retail Sell Volume). *Retail Magnitude* is equal to: (Retail Buy Volume – Retail Sell Volume) / Total Volume. *Retail Magnitude* is reported in basis points of daily volume such a retail trade imbalance representing 1% of total volume is expressed as 100. *Daily*, *Weekly*, *Monthly*, and *6-Month* returns are the total stock returns measured over the stated period. *Variance* is the variance of daily returns measured over previous 20 days. *Daily Return²* and *Weekly Return²* are the daily and weekly stock returns squared. *Market Cap.* is price x shares outstanding, reported in millions. *Turnover* is the average daily turnover (shares traded / shares outstanding) over the last 20 days. *DJ Article Count* and *PR Article Count* are the number of articles published to the Dow Jones or PR Newswire services as reported by RavenPack since the last trading date. *DJ Sentiment* and *PR Sentiment* are the average composite sentiment score (CSS) reported by RavenPack of those same articles. When no articles are published to a newswire, we assign a *DJ Sentiment* or *PR Sentiment* score of 50 representing neutral sentiment. The revision variables are measured at the analyst-level; they are not consensus variables. Each revision reflects a change for an individual analyst. *EPS Revision* is the new EPS forecast - the most recent EPS forecast, scaled by the stock price measured on the day before the previous EPS forecast. *Price Target Revision* is the new 12-month price target scaled by yesterday's stock price minus the previous 12-month price target scaled by stock price the day before it was announced. *Recommendation Revision* is the new recommendation minus the previous recommendation. The sample period begins in October 2006 and ends in December 2022.

Daily Variables	Mean	Median	Min	Max	10th%ile	90th%ile	Std. Dev.	N
Retail Direction	-0.0327	-0.0194	-1.0000	1.0000	-0.6134	0.5074	0.4385	18,822,568
Retail Magnitude	-24.5	-1.7	-4,005.6	4,160.1	-427.6	364.6	665.2	19,514,964
Daily Return	5.5	0.0	-9,652.5	123,651.6	-324.1	320.5	414.0	18,802,007
Weekly Return	24.6	6.6	-9,853.6	269,487.2	-726.0	731.8	899.3	18,783,707
Monthly Return	94.8	47.4	-9,989.3	324,239.1	-1,520.2	1,582.1	1,802.8	18,710,432
6-Month Return	598.3	259.0	-9,999.9	872,005.1	-3,738.6	4,438.6	5,069.6	18,282,670
Variance	0.0026	0.0003	0.0000	77.6115	0.0000	0.0042	0.0749	18,724,619
Daily Return²	0.0017	0.0002	0.0000	152.8971	0.0000	0.0025	0.0846	18,802,007
Weekly Return²	0.0081	0.0009	0.0000	726.2334	0.0000	0.0125	0.3236	18,783,707
Market Cap.	5,701,169	638,539	8.5941	2,970,000,000	49,492	9,862,757	31,100,000	19,524,791
Turnover	0.0063	0.0022	-920.7669	1,017.7820	-0.0006	0.0122	0.4819	18,810,732
DJ Sentiment	50.1609	50.0000	4.0000	100.0000	50.0000	52.0000	1.9039	19,528,576
DJ Article Count	3.1711	0.0000	0.0000	4,173.0000	0.0000	7.0000	19.6810	19,528,576
PR Sentiment	50.3495	50.0000	4.0000	100.0000	50.0000	52.0000	1.4056	19,528,576
PR Article Count	1.2041	0.0000	0.0000	2,239.0000	0.0000	2.0000	11.3024	19,528,576
Revision Variables								
EPS Rev.	-0.0091	0.0000	-0.6966	0.3228	-0.0178	0.0094	0.0912	2,011,960
Price Target. Rev.	0.0015	-0.0009	-0.6761	0.7147	-0.1748	0.1793	0.1852	1,059,479
Rec. Rev.	-0.1013	0.0000	-4.0000	4.0000	-2.0000	2.0000	1.2708	396,880

Table 2: Retail Trading in Response to Revisions: Revision-Level Regressions

In this table we regress daily retail trading on lagged values of analysts' revisions and controls. The unit of observation is a revision. The revisions are lagged one day relative to the retail trading. The retail trading variables are *Retail Direction* and *Retail Magnitude*. *Retail Direction* is equal to: (Retail Buy Volume – Retail Sell Volume) / (Retail Buy Volume + Retail Sell Volume). *Retail Magnitude* is equal to: (Retail Buy Volume – Retail Sell Volume) / Total Volume. *Retail Magnitude* is reported in basis points of daily volume such a retail trade imbalance representing 1% of total volume is expressed as 100. *EPS Revision* is the new EPS forecast minus the previous EPS forecast, scaled by the stock price measured on the day before the new EPS forecast. *Price Target Revision* is the new 12-month price target scaled by the day *t-1* stock price minus the previous price target scaled by its *t-1* stock price. *Recommendation Revision* is the new recommendation minus the previous recommendation. *Daily*, *Weekly*, *Monthly*, and *6-Month* returns are the total stock returns measured over the stated period. *Variance* is the variance of daily returns measured over previous 20 days. *Daily Return²* and *Weekly Return²* are the daily and weekly stock returns squared. *Market Cap.* is price x shares outstanding, reported in millions. *Turnover* is the average daily turnover (shares traded / shares outstanding) over the last 20 days. *DJ Article Count* and *PR Article Count* are the number of articles published to the Dow Jones or PR Newswire services as reported by RavenPack since the last trading date. *DJ Sentiment* and *PR Sentiment* are the average composite sentiment score (CSS) reported by RavenPack of those same articles. When no articles are published to a newswire, we assign a *DJ Sentiment* or *PR Sentiment* score of 50 representing neutral sentiment. The revision variables are measured at the analyst-level; they are not consensus variables. Each revision reflects a change for an individual analyst. We exclude retail trading observations for which there is an earnings announcement over any of the three previous days. The regressions include firm and time fixed effects and the standard errors are clustered on firm and time. The sample period begins in October 2006 and ends in December 2022.

	EPS Forecast Revisions		Price Target Revisions		Recommendation Revisions	
	Retail Direction	*Retail Magnitude*	*Retail Direction*	*Retail Magnitude*	*Retail Direction*	*Retail Magnitude*
Revision	-0.010***	-13.583***	0.013***	6.789***	0.009***	4.301***
	(-2.84)	(-3.52)	(7.02)	(5.17)	(16.21)	(12.56)
Daily Return	0.000***	0.016***	0.000***	0.017***	0.000***	0.008***
	(21.03)	(20.70)	(18.04)	(20.36)	(6.11)	(6.79)
Weekly Return	-0.000***	-0.006***	-0.000***	-0.007***	-0.000***	-0.005***
	(-18.72)	(-13.51)	(-17.13)	(-14.27)	(-12.79)	(-6.61)
Monthly Return	-0.000***	-0.004***	-0.000***	-0.003***	-0.000***	-0.003***
	(-18.14)	(-13.96)	(-14.24)	(-9.82)	(-10.62)	(-7.17)
6-Month Return	-0.000***	-0.000	0.000	0.000*	-0.000**	-0.000
	(-3.85)	(-1.48)	(1.28)	(1.92)	(-2.10)	(-0.54)
Variance	0.033**	27.475	0.110**	72.413	0.108	147.206*
	(2.43)	(1.57)	(2.02)	(1.41)	(1.31)	(1.88)
Daily Return^2	-0.081***	-60.679***	-0.115***	-90.792***	-0.058	-77.396**
	(-7.10)	(-5.39)	(-4.03)	(-3.46)	(-1.39)	(-1.97)
Weekly Return^2	0.057***	34.974***	0.045***	23.994***	0.024***	7.285***
	(7.44)	(6.07)	(7.16)	(5.87)	(8.34)	(4.02)
Market Cap.	0.005***	3.804***	0.002	2.119**	-0.001	-1.687
	(4.28)	(4.62)	(1.57)	(2.26)	(-1.07)	(-1.31)
Turnover	0.030***	13.530*	-0.175***	-71.460***	-0.042**	3.462
	(4.11)	(1.69)	(-8.29)	(-5.11)	(-2.25)	(0.47)
DJ Sentiment	0.001***	0.585***	0.001***	0.653***	0.001***	0.245
	(6.12)	(6.65)	(5.89)	(6.02)	(2.86)	(1.36)
DJ Article Count	0.001***	0.677***	0.001**	0.408	0.001	0.313
	(3.53)	(3.17)	(2.18)	(1.13)	(0.81)	(0.86)
*DJ Sentiment*Article Count*	-0.000***	-0.013***	-0.000**	-0.008	-0.000	-0.006
	(-3.45)	(-3.08)	(-2.10)	(-1.06)	(-0.75)	(-0.75)
PR Sentiment	0.000	0.043	0.000	0.039	0.001	0.190
	(1.62)	(0.35)	(1.30)	(0.25)	(1.59)	(0.83)
PR Article Count	0.002	-0.540	0.001	-0.340	-0.000	-1.072
	(0.91)	(-0.35)	(0.53)	(-0.17)	(-0.13)	(-0.53)
*PR Sentiment*Article Count*	-0.000	0.012	-0.000	0.009	0.000	0.023
	(-0.87)	(0.39)	(-0.47)	(0.22)	(0.18)	(0.57)
R^2	0.0494	0.0492	0.054	0.056	0.1043	0.1254
N	1,988,593	1,987,355	1,051,620	1,051,031	226,203	204,325

Table 3: Retail Trading in Response to Revisions: Daily Specifications

In this table we regress daily retail trading on lagged daily values of analysts' revisions and controls. The revisions are lagged one day relative to the trading. For days with no revisions, we set the revision value equal to zero. The retail trading variables are *Retail Direction* and *Retail Magnitude*. *Retail Direction* is equal to: (Retail Buy Volume – Retail Sell Volume) / (Retail Buy Volume + Retail Sell Volume). *Retail Magnitude* is equal to: (Retail Buy Volume – Retail Sell Volume) / Total Volume. *Retail Magnitude* is reported in basis points of daily volume such a retail trade imbalance representing 1% of total volume is expressed as 100. We include lagged values of the retail trading variables in each regression. The lagged trading variables are measured at day *t-2*, so as not to coincide with the revision variables, which are measured on day *t-1*. *EPS Revision* is the new EPS forecast minus the previous EPS forecast, scaled by the stock price measured on the day before the new EPS forecast. *Price Target Revision* is the new 12-month price target scaled by the previous day's stock price minus the previous 12-month stock price forecast scaled by its previous day stock price. *Recommendation Revision* is the new recommendation minus the previous recommendation. *Daily*, *Weekly*, *Monthly*, and *6-Month* returns are the total stock returns measured over the stated period. *Variance* is the variance of daily returns measured over the previous 20 days. *Daily Return^2* and *Weekly Return^2* are the daily and weekly stock returns squared. *Market Cap.* is price x shares outstanding, reported in millions. *Turnover* is the average daily turnover (shares traded / shares outstanding) over the last 20 days. *DJ Article Count* and *PR Article Count* are the number of articles published to the Dow Jones or PR Newswire services as reported by RavenPack since the last trading date. *DJ Sentiment* and *PR Sentiment* are the average composite sentiment score (CSS) reported by RavenPack of those same articles. When no articles are published to a newswire, we assign a *DJ Sentiment* or *PR Sentiment* score of 50 representing neutral sentiment. The revision variables are measured at the analyst-level; they are not consensus variables. Each revision reflects a change for an individual analyst. We exclude retail trading observations for which there is an earnings announcement over any of the three previous days. The regressions include firm and time fixed effects and the standard errors are clustered on firm and time. The sample period begins in October 2006 and ends in December 2022.

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	Retail Direction	Retail Direction	Retail Magnitude	Retail Magnitude
EPS Revision	-0.030***	-0.019***	-29.475***	-22.439***
	(-7.48)	(-5.15)	(-4.34)	(-3.33)
Price Tgt. Rev.	0.027***	0.018***	21.217***	13.248***
	(12.54)	(8.68)	(8.31)	(5.09)
Rec. Revision	0.007***	0.008***	3.559***	4.280***
	(12.54)	(13.92)	(7.45)	(8.91)
Lagged Retail	0.061***	0.060***	0.028***	0.027***
	(72.70)	(73.98)	(35.37)	(33.42)
Daily Return		0.000***		0.010***
		(22.59)		(10.97)
Weekly Return		-0.000***		-0.012***
		(-35.56)		(-25.49)
Monthly Return		-0.000***		-0.004***
		(-26.88)		(-18.32)
6-Month Return		-0.000***		-0.000***
		(-6.06)		(-2.76)
Variance		0.016***		26.799***
		(4.23)		(4.08)
Daily Return^2		-0.006**		-11.181**
		(-1.97)		(-2.23)
Weekly Return^2		0.012***		18.765***
		(3.89)		(3.82)
Market Cap.		0.006***		18.834***
		(9.54)		(21.01)
Turnover		0.001		1.807
		(1.39)		(1.44)
DJ Sentiment		0.001***		0.540***
		(13.04)		(6.90)
DJ Article Count		0.001***		1.766***
		(3.08)		(3.86)
DJ Sentiment*Article Count		-0.000***		-0.034***
		(-2.96)		(-3.80)
PR Sentiment		0.001***		1.672***
		(13.76)		(15.11)
PR Article Count		0.003*		5.060***
		(1.65)		(3.20)
PR Sentiment*Article Count		-0.000		-0.097***
		(-1.58)		(-3.17)
R^2	0.0229	0.0239	0.0096	0.0104
N	19,527,750	18,276,496	19,412,269	18,181,100

Table 4: Retail Trading in Response to Revisions: Daily Specifications and Revision Dummies

In this table we regress daily retail trading on lagged daily values of analysts' revisions and controls. The revisions are lagged one day relative to the trading. For days with no revisions, we set the revision value equal to zero. The retail trading variables are *Retail Direction* and *Retail Magnitude*. *Retail Direction* is equal to: (Retail Buy Volume – Retail Sell Volume) / (Retail Buy Volume + Retail Sell Volume). *Retail Magnitude* is equal to: (Retail Buy Volume – Retail Sell Volume) / Total Volume. *Retail Magnitude* is reported in basis points of daily volume such a retail trade imbalance representing 1% of total volume is expressed as 100. We include lagged values of the retail trading variables in each regression. The lagged trading variables are measured at day *t-2*, so as not to coincide with the revision variables, which are measured on day *t-1*. Up EPS (Down EPS) is equal to 1 if there is an EPS revision in the 90th (10th) percentile and zero otherwise. Up Target (Down Target) is equal to 1 if there is an price target revision in the 90th (10th) percentile and zero otherwise. Up Rec. (Down Rec.) is equal to 1 if *Recommendation Revision* is positive (negative) and zero otherwise. *Daily*, *Weekly*, *Monthly*, and *6-Month* returns are the total stock returns measured over the stated period. *Variance* is the variance of daily returns measured over the previous 20 days. *Daily Return²* and *Weekly Return²* are the daily and weekly stock returns squared. *Market Cap.* is price x shares outstanding, reported in millions. *Turnover* is the average daily turnover (shares traded / shares outstanding) over the last 20 days. *DJ Article Count* and *PR Article Count* are the number of articles published to the Dow Jones or PR Newswire services as reported by RavenPack since the last trading date. *DJ Sentiment* and *PR Sentiment* are the average composite sentiment score (CSS) reported by RavenPack of those same articles. When no articles are published to a newswire, we assign a *DJ Sentiment* or *PR Sentiment* score of 50 representing neutral sentiment. The revision variables are measured at the analyst-level; they are not consensus variables. Each revision reflects a change for an individual analyst. We exclude retail trading observations for which there is an earnings announcement over any of the three previous days. The regressions include firm and time fixed effects and the standard errors are clustered on firm and time. The coefficients in the *Retail Magnitude* regressions are multiplied by 100 for readability. The sample period begins in October 2006 and ends in December 2022.

	Retail Direction	Retail Direction	Retail Magnitude	Retail Magnitude
EPS Up	-0.002	0.001	0.044	4.705***
	(-1.57)	(1.29)	(0.03)	(3.34)
Target Up	0.014***	0.010***	9.979***	7.467***
	(10.34)	(8.23)	(7.48)	(5.51)
Rec. Up	0.012***	0.013***	4.483***	6.021***
	(5.44)	(5.88)	(2.59)	(3.47)
EPS Down	0.009***	0.006***	7.969***	7.141***
	(7.42)	(5.06)	(4.98)	(4.43)
Target Down	-0.005***	-0.003**	-4.461***	-1.996
	(-3.87)	(-2.08)	(-3.48)	(-1.54)
Rec. Down	-0.013***	-0.013***	-9.296***	-9.379***
	(-5.81)	(-6.00)	(-5.11)	(-5.15)
EPS Change	0.003***	0.002***	1.303***	-0.899**
	(7.37)	(5.72)	(3.15)	(-2.20)
Target Change	0.003***	0.003***	1.473***	1.369***
	(4.76)	(5.71)	(2.95)	(2.76)
Rec. Change	-0.000	-0.000	0.861	0.166
	(-0.01)	(-0.13)	(1.00)	(0.19)
Controls:	Lagged Retail, Daily Return, Weekly Return, Monthly Ret., 6-Month Ret., Variance, Daily Return^2, Weekly Ret^2, Market Cap., Turnover, DJ Sentiment, DJ Article Count, DJ Sentiment*Article Count, PR Sentiment, PR Article Count, PR Sentiment*Article Count			
R^2	0.0229	0.0239	0.0096	0.0104
N	19,527,750	18,276,496	19,412,269	18,181,100

Table 5: Retail Trading in Response to Revisions: The Effects of All-Star Analysts

In this table we regress daily retail trading on lagged values of analysts' revisions, revisions interacted with an All-Star Analyst dummy, and controls. The unit of observation is a revision. The revisions are lagged one day relative to the retail trading. The All-Star dummy equals 1 if the analyst was ever named an All-Star and zero otherwise. The retail trading variables are *Retail Direction* and *Retail Magnitude*. *Retail Direction* is equal to: (Retail Buy Volume – Retail Sell Volume) / (Retail Buy Volume + Retail Sell Volume). *Retail Magnitude* is equal to: (Retail Buy Volume – Retail Sell Volume) / Total Volume. *Retail Magnitude* is reported in basis points of daily volume such a retail trade imbalance representing 1% of total volume is expressed as 100. *EPS Revision* is the new EPS forecast minus the previous EPS forecast, scaled by the stock price measured on the day before the new EPS forecast. *Price Target Revision* is the new 12-month price target scaled by the day *t-1* stock price minus the previous price target scaled by its *t-1* stock price. *Recommendation Revision* is the new recommendation minus the previous recommendation. *Daily*, *Weekly*, *Monthly*, and *6-Month* returns are the total stock returns measured over the stated period. *Variance* is the variance of daily returns measured over previous do days. *Daily Return²* and *Weekly Return²* are the daily and weekly stock returns squared. *Market Cap.* is price x shares outstanding, reported in millions. *Turnover* is the average daily turnover (shares traded / shares outstanding) over the last 20 days. *DJ Article Count* and *PR Article Count* are the number of articles published to the Dow Jones or PR Newswire services as reported by RavenPack since the last trading date. *DJ Sentiment* and *PR Sentiment* are the average composite sentiment score (CSS) reported by RavenPack of those same articles. When no articles are published to a newswire, we assign a *DJ Sentiment* or *PR Sentiment* score of 50 representing neutral sentiment. The revision variables are measured at the analyst-level; they are not consensus variables. Each revision reflects a change for an individual analyst. We exclude retail trading observations for which there is an earnings announcement over any of the three previous days. The regressions include firm and time fixed effects and the standard errors are clustered on firm and time. The sample period begins in October 2006 and ends in December 2022.

Table 5: (Continued)

	EPS Forecast Revisions		Price Target Revisions		Recommendations Revisions	
	Retail Direction	*Retail Magnitude*	*Retail Direction*	*Retail Magnitude*	*Retail Direction*	*Retail Magnitude*
Revision	-0.010***	-13.585***	0.012***	6.342***	0.008***	3.828***
	(-2.84)	(-3.52)	(6.20)	(4.44)	(14.33)	(10.51)
*Revision * AS*	-0.000***	-0.000	0.004	2.989	0.004***	3.480***
	(-6.89)	(-1.44)	(0.94)	(1.14)	(3.59)	(4.62)
All-Star (AS)	0.001*	0.446	0.001	0.389	0.004**	1.261
	(1.69)	(1.44)	(0.94)	(1.02)	(2.51)	(1.22)
Daily Return	0.000***	0.016***	0.000***	0.017***	0.000***	0.008***
	(21.03)	(20.70)	(18.05)	(20.36)	(6.14)	(6.81)
Weekly Return	-0.000***	-0.006***	-0.000***	-0.007***	-0.000***	-0.005***
	(-18.72)	(-13.51)	(-17.13)	(-14.27)	(-12.84)	(-6.64)
Monthly Ret.	-0.000***	-0.004***	-0.000***	-0.003***	-0.000***	-0.003***
	(-18.14)	(-13.96)	(-14.24)	(-9.81)	(-10.64)	(-7.20)
6-Month Ret.	-0.000***	-0.000	0.000	0.000*	-0.000**	-0.000
	(-3.85)	(-1.48)	(1.28)	(1.92)	(-2.10)	(-0.55)
Variance	0.033**	27.468	0.110**	72.519	0.107	146.599*
	(2.43)	(1.57)	(2.02)	(1.41)	(1.29)	(1.88)
Daily Return^2	-0.081***	-60.677***	-0.115***	-90.812***	-0.058	-77.116*
	(-7.10)	(-5.39)	(-4.04)	(-3.46)	(-1.37)	(-1.96)
Weekly Ret^2	0.057***	34.976***	0.045***	23.982***	0.024***	7.331***
	(7.44)	(6.07)	(7.15)	(5.87)	(8.37)	(4.06)
Market Cap.	0.005***	3.803***	0.002	2.116**	-0.002	-1.698
	(4.28)	(4.62)	(1.57)	(2.26)	(-1.09)	(-1.32)
Turnover	0.030***	13.528*	-0.175***	-71.466***	-0.042**	3.188
	(4.11)	(1.69)	(-8.29)	(-5.11)	(-2.26)	(0.43)
DJ Sentiment	0.001***	0.585***	0.001***	0.653***	0.001***	0.245
	(6.12)	(6.65)	(5.89)	(6.02)	(2.86)	(1.36)
DJ Article Count	0.001***	0.677***	0.001**	0.409	0.001	0.319
	(3.53)	(3.17)	(2.18)	(1.13)	(0.82)	(0.87)
*DJ Sentiment*Article Count*	-0.000***	-0.013***	-0.000**	-0.008	-0.000	-0.006
	(-3.45)	(-3.08)	(-2.10)	(-1.06)	(-0.76)	(-0.76)
PR Sentiment	0.000	0.043	0.000	0.039	0.001	0.188
	(1.62)	(0.35)	(1.30)	(0.26)	(1.59)	(0.82)
PR Article Count	0.002	-0.538	0.001	-0.338	-0.000	-1.108
	(0.91)	(-0.34)	(0.53)	(-0.17)	(-0.14)	(-0.55)
*PR Sentiment*Article Count*	-0.000	0.012	-0.000	0.009	0.000	0.023
	(-0.87)	(0.39)	(-0.47)	(0.22)	(0.19)	(0.59)
R^2	0.0494	0.0492	0.054	0.0561	0.1044	0.1255
N	1,988,593	1,987,355	1,051,620	1,051,031	226,203	204,325

Table 6: "Tipping" or Trading in Anticipation of Revisions

The dependent variable in these regressions is one of the revision variables: EPS forecast, price target, or recommendations. We regress revisions on lagged values of either *Retail Direction* or *Retail Magnitude* for each of the previous 5 trading days. The retail trading variables are *Retail Direction* and *Retail Magnitude*. *Retail Direction* is equal to: (Retail Buy Volume – Retail Sell Volume) / (Retail Buy Volume + Retail Sell Volume). *Retail Magnitude* is equal to: (Retail Buy Volume – Retail Sell Volume) / Total Volume. For legibility, we divide our *Retail Magnitude* variable by one million such that a retail trade imbalance of 1% of total volume is represented as .0001. We include lagged daily stock returns for each of the past 5 days, and lagged daily returns squared for each of the past 5 days, market capitalization, and turnover as controls. For the sake of brevity, we do not report the control variables' coefficients. *Daily*, *Weekly*, *Monthly*, and *6-Month* returns are the total stock returns measured over the stated period. *Variance* is the variance of daily returns measured over the previous 20 days. *Daily Return^2* and *Weekly Return^2* are the daily and weekly stock returns squared. *Market Cap.* is price x shares outstanding, reported in millions. *Turnover* is the average daily turnover (shares traded / shares outstanding) over the last 20 days. *DJ Article Count* and *PR Article Count* are the number of articles published to the Dow Jones or PR Newswire services as reported by RavenPack since the last trading date. *DJ Sentiment* and *PR Sentiment* are the average composite sentiment score (CSS) reported by RavenPack of those same articles. When no articles are published to a newswire, we assign a *DJ Sentiment* or *PR Sentiment* score of 50 representing neutral sentiment. We exclude revisions that are on an earnings announcement day, or follow an earnings announcement over the previous 2 days. The regressions include firm and time fixed effects and the standard errors are clustered on firm and time. The sample period begins in October 2006 and ends in December 2022.

	EPS Revision		Price Target Revision		Recommendation Revision	
	Retail Direction	*Retail Magnitude*	*Retail Direction*	*Retail Magnitude*	*Retail Direction*	*Retail Magnitude*
Retail Trading$_{t-1}$	0.000	-1.005	0.008***	11.555***	0.039***	-6.561
	(0.62)	(-1.22)	(10.43)	(7.18)	(3.67)	(-0.37)
Retail Trading$_{t-2}$	-0.000	-1.884**	0.006***	8.174***	0.010	-5.530
	(-1.31)	(-2.45)	(7.79)	(5.16)	(0.95)	(-0.32)
Retail Trading$_{t-3}$	-0.000	0.188	0.004***	6.554***	-0.010	-28.476
	(-0.94)	(0.24)	(5.46)	(4.32)	(-0.95)	(-1.64)
Retail Trading$_{t-4}$	-0.001***	-1.904***	0.004***	3.542**	0.003	-22.583
	(-3.27)	(-2.64)	(5.22)	(2.23)	(0.24)	(-1.30)
Retail Trading$_{t-5}$	-0.001***	-1.816**	0.005***	6.136***	0.017*	-2.480
	(-3.02)	(-2.54)	(7.11)	(3.88)	(1.66)	(-0.15)
R^2	0.147	0.1473	0.0731	0.0733	0.0979	0.1007
N	2,004,700	2,001,864	1,057,933	1,056,635	233,345	204,911

Table 7: Retail Trading, Analysts' Revisions, and Stock Returns

This table reports Fama-Macbeth regression results of 20-day stock returns on lagged values of analysts' revisions, retail trading, and controls. Retail trading is measured on day *t-1*, while the revision variables are measured on day *t-2*. The control variables are all measured relative to day *t-2* as well. For days with no revisions, we set the revision value equal to zero. *Retail Direction* is equal to: (Retail Buy Volume – Retail Sell Volume) / (Retail Buy Volume + Retail Sell Volume). *Retail Magnitude* is equal to: (Retail Buy Volume – Retail Sell Volume) / Total Volume. *Retail Magnitude* is reported in basis points of daily volume such a retail trade imbalance representing 1% of total volume is expressed as 100. *EPS Revision* is the new EPS forecast minus the previous EPS forecast, scaled by the stock price measured on the day before the new EPS forecast. *Price Target Revision* is the new 12-month price target scaled by the previous day's stock price minus the previous EPS forecast scaled by its previous day's stock price. *Recommendation Revision* is the new recommendation minus the previous recommendation. *Daily*, *Weekly*, *Monthly*, and *6-Month* returns are the total stock returns measured over the stated period. *Variance* is the variance of daily returns measured over the previous 20 days. *Daily Return²* and *Weekly Return²* are the daily and weekly stock returns squared. *Market Cap.* is price x shares outstanding, reported in millions. *Turnover* is the average daily turnover (shares traded / shares outstanding) over the last 20 days. *DJ Article Count* and *PR Article Count* are the number of articles published to the Dow Jones or PR Newswire services as reported by RavenPack since the last trading date. *DJ Sentiment* and *PR Sentiment* are the average composite sentiment score (CSS) reported by RavenPack of those same articles. When no articles are published to a newswire, we assign a *DJ Sentiment* or *PR Sentiment* score of 50 representing neutral sentiment. The revision variables are measured at the analyst-level; they are not consensus variables. Each revision reflects a change for an individual analyst. We exclude observations with an earnings announcement over any of the three previous days. Standard errors are calculated using Newey West corrections with 22 lags. The sample period begins in October 2006 and ends in December 2022.

Retail Direction		17.051***		17.032***	
		(9.33)		(9.32)	
Retail Magnitude			24.578***		24.545***
			(3.73)		(3.73)
EPS Revision	383.107***			382.859***	382.041***
	(7.25)			(7.26)	(7.26)
Price Target Revision	75.585***			74.680***	75.350***
	(4.49)			(4.44)	(4.47)
Rec. Revision	15.929***			15.709***	15.567***
	(3.63)			(3.58)	(3.56)
Lagged Retail		14.301***	29.565***	14.282***	29.522***
		(7.78)	(4.55)	(7.77)	(4.55)
Daily Return	-0.012***	-0.011***	-0.009***	-0.013***	-0.011***
	(-3.69)	(-3.41)	(-2.74)	(-3.79)	(-3.12)
Weekly Return	-0.014***	-0.013***	-0.014***	-0.014***	-0.014***
	(-2.68)	(-2.65)	(-2.71)	(-2.67)	(-2.74)
Monthly Ret.	-0.011**	-0.011**	-0.011**	-0.011**	-0.011**
	(-2.46)	(-2.42)	(-2.43)	(-2.42)	(-2.43)
6-Month Ret.	0.003	0.003	0.003	0.003	0.003
	(0.92)	(0.93)	(0.94)	(0.92)	(0.93)
Variance	-1359.273***	-1352.574***	-1393.959***	-1357.935***	-1398.950***
	(-5.07)	(-5.04)	(-5.14)	(-5.07)	(-5.17)
Daily Return^2	-302.608*	-335.856**	-389.809**	-301.756*	-353.989**
	(-1.78)	(-1.98)	(-2.19)	(-1.78)	(-1.98)
Weekly Ret^2	-160.331	-162.173	-163.446	-161.558	-162.887
	(-1.31)	(-1.33)	(-1.36)	(-1.32)	(-1.35)
Market Cap.	-2.992	-2.989	-3.101	-2.977	-3.090
	(-0.98)	(-0.98)	(-0.99)	(-0.98)	(-0.98)
Turnover	-173.515***	-177.733***	-178.439***	-177.040***	-177.742***
	(-5.75)	(-5.92)	(-5.84)	(-5.89)	(-5.81)
DJ Sentiment	3.277***	3.293***	3.291***	3.265***	3.263***
	(4.89)	(4.90)	(4.85)	(4.89)	(4.84)
DJ Article Count	-11.461***	-11.488***	-11.512***	-11.337***	-11.367***
	(-4.98)	(-5.00)	(-5.02)	(-4.94)	(-4.96)
DJ Sentiment*Article Count	0.232***	0.232***	0.233***	0.229***	0.230***
	(5.06)	(5.08)	(5.10)	(5.02)	(5.04)
PR Sentiment	4.043***	4.106***	4.035***	4.096***	4.026***
	(3.20)	(3.24)	(3.16)	(3.24)	(3.16)
PR Article Count	7.577	7.531	7.198	7.755	7.434
	(0.59)	(0.58)	(0.56)	(0.60)	(0.58)
PR Sentiment*Article Count	-0.144	-0.143	-0.136	-0.147	-0.141
	(-0.58)	(-0.57)	(-0.54)	(-0.59)	(-0.57)
Avg. R^2	0.0383	0.0380	0.0382	0.0389	0.0391
N	25,976,805	25,976,805	25,534,203	25,976,805	25,534,203

Table 8: Retail Trading and Stock Returns On and Off Revision Days

This table reports Fama-Macbeth regression results of 20-day stock returns on lagged values of analysts' revisions, retail trading, the interaction between lagged values of analysts' revisions and retail trading, and controls. *Retail Direction* or *Retail Magnitude* are measured on day *t-1* relative to the 20-day future stock return, which is measured on day *t*. The revision and control variables are measure on or relative to day *t-2*. For the sake of brevity, we do not report the control variables' coefficients. *Retail Direction* is equal to: (Retail Buy Volume – Retail Sell Volume) / (Retail Buy Volume + Retail Sell Volume). *Retail Magnitude* is equal to: (Retail Buy Volume – Retail Sell Volume) / Total Volume. *Retail Magnitude* is reported in basis points of daily volume such a retail trade imbalance representing 1% of total volume is expressed as 100. *EPS Revision* is the new EPS forecast minus the previous EPS forecast, scaled by the stock price measured on the day before the new EPS forecast. *Price Target Revision* is the new 12-month price target scaled by the previous day's stock price minus the previous EPS forecast scaled by its previous day's stock price. *Recommendation Revision* is the new recommendation minus the previous recommendation. *Daily*, *Weekly*, *Monthly*, and *6-Month* returns are the total stock returns measured over the stated period. *Variance* is the variance of daily returns measured over the previous 20 days. *Daily Return^2* and *Weekly Return^2* are the daily and weekly stock returns squared. *Market Cap.* is price x shares outstanding, reported in millions. *Turnover* is the average daily turnover (shares traded / shares outstanding) over the last 20 days. *DJ Article Count* and *PR Article Count* are the number of articles published to the Dow Jones or PR Newswire services as reported by RavenPack since the last trading date. *DJ Sentiment* and *PR Sentiment* are the average composite sentiment score (CSS) reported by RavenPack of those same articles. When no articles are published to a newswire, we assign a *DJ Sentiment* or *PR Sentiment* score of 50 representing neutral sentiment. The revision variables are measured at the analyst-level; they are not consensus variables. Each revision reflects a change for an individual analyst. We exclude observations with an earnings announcement over any of the three previous days. Standard errors are calculated using Newey West corrections with 22 lags. The sample period begins in October 2006 and ends in December 2022.

Table 8: (Continued)

EPS Revision	380.516***	378.268***
	(6.62)	(6.58)
Price Target Revision	71.845***	69.044***
	(4.25)	(4.34)
Rec. Revision	16.583**	13.843**
	(2.41)	(2.22)
Retail Direction	16.999***	
	(9.33)	
*EPS Revision * Retail Direction*	-171.080	
	(-0.87)	
*Price Target Revision * Retail Direction*	2.729	
	(0.08)	
*Rec. Revision * Retail Direction*	-11.086	
	(-0.47)	
Retail Magnitude		24.343***
		(3.70)
*EPS Revision * Retail Magnitude*		-151.548
		(-0.07)
*Price Target Revision * Retail Magnitude*		328.690
		(0.51)
*Rec. Revision * Retail Magnitude*		-202.437
		(-0.54)
Controls:	*Lagged Retail, Daily Return, Weekly Return, Monthly Ret., 6-Month Ret., Variance, Daily Return^2, Weekly Ret^2, Market Cap., Turnover, DJ Sentiment, DJ Article Count, DJ Sentiment*Article Count, PR Sentiment, PR Article Count, PR Sentiment*Article Count*	
Avg. R^2	0.0395	0.0399
N	25,976,805	25,534,203