The Democratization of Investment Research:

Implications for Retail Investor Profitability and Firm Liquidity

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Abstract

We find evidence that crowdsourced investment research facilitates informed trading by retail investors and improves firm liquidity. Specifically, retail order imbalances are strongly correlated with the sentiment of Seeking Alpha articles, and the ability of retail order imbalances to predict returns is roughly twice as large on research article days. In addition, firms with exogenous reductions in Seeking Alpha coverage experience increases in bid-ask spreads and price impact, with the effect being stronger for firms with high retail ownership. Our findings suggest that technological innovations have helped democratize access to investment research with important implications for firm liquidity.

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1. Introduction

Information is a key ingredient for well-functioning financial markets. Without a broad base of investors with access to accurate information, pricing securities becomes difficult and markets can stagnate. At the same time, information with high investment value tends to be costly to produce, which has left individuals at a perennial disadvantage relative to institutional investors. In recent decades, improvements in technology have significantly reduced the cost of gathering and sharing investment information, and these developments have been lauded for their potential to help level the informational playing field.[1]

In this article, we examine the extent to which an important technology-enabled innovation, crowdsourced investment research, has led to improved individual investor decision-making and enhanced market liquidity. Few finance media sites exemplify the democratization of investment research better than Seeking Alpha (SA). Seeking Alpha attracts millions of visitors each month by providing curated investment research from thousands of individual research contributors.[2] The value of Seeking Alpha's investor-authored research is well documented. For example, Chen, et al. (2014) find that Seeking Alpha research articles predict future stock returns and earnings surprises. In our analysis, we examine whether individual investors benefit from Seeking Alpha research.

Individual investors have been traditionally viewed as unsophisticated "noise" traders who tend to spend less time on investment analysis, use different information sources from their professional counterparts, and underperform standard benchmarks (e.g., Kumar and Lee, 2006;

[1] For example, early in the internet era SEC Commissioner Laura Unger anticipated technology's potential and concluded a speech with "It looks as though investors stand to benefit greatly from the Information Revolution. The Internet has powered the revolution. It's also been a key element in the push for democratization of the flow of investment information." (June 2000) https://www.sec.gov/news/speech/spch387.htm

[2] https://seekingalpha.com/page/about_us

Barber and Odean, 2013 review the literature). In recent years, however, studies have uncovered evidence of informed trading by individuals, with retail order flow predicting stock returns and future earnings announcement surprises (Kaniel, Saar, and Titman, 2008; Kaniel et al., 2012; Kelley and Tetlock, 2013, 2017; Boehmer, Jones, and Zhang, 2017). Although the improved performance of individual investors over time could be associated with learning or changing demographics, a key driver that remains unexplored is better access to investment research.

We begin by documenting that Seeking Alpha's crowdsourced investor-authored research is distinct from traditional Wall Street brokerage research. We analyze over 140,000 research articles for 4,000 stocks and find that after controlling for other firm characteristics, Seeking Alpha coverage (number of articles) is higher among firms with low institutional ownership and greater breadth of ownership, whereas the opposite is true for brokerage research coverage. The differences highlight Seeking Alpha's emphasis on retail investor oriented research.

We find strong evidence that individual investors react to Seeking Alpha research. Using trade and quote data from NYSE TAQ and the method of Boehmer, Jones, and Zhang (2017) to identify retail investor trades, we find a significant increase in retail trading on days with Seeking Alpha articles. Individuals also account for a greater fraction of overall trading volume on article days, suggesting that individuals react to Seeking Alpha research more than institutional investors do. In addition, we find that retail order imbalances are strongly correlated with the sentiment of Seeking Alpha research articles, with individual investors in aggregate being more likely to purchase (sell) stock following positive (negative) articles.

More importantly, we find robust evidence that access to crowdsourced research enhances the profitability of retail investor trades. In particular, the relation between retail order flow and future stock returns is roughly twice as strong on days with Seeking Alpha research articles. For

example, a one standard deviation increase in daily retail order imbalance is associated with future ten-day returns that are 0.09% larger on average, and yet this return differential increases to 0.18% on days with Seeking Alpha articles and to 0.34% on days with articles written by high-skill research contributors. We find no evidence of a return reversal, which is consistent with individual investors becoming informed through their access to crowdsourced research.

We benchmark retail investor behavior on days with Seeking Alpha articles against their behavior on days with brokerage research. Although retail investors may have access to consensus recommendations or forecasts, their access to detailed reports and to the analysts themselves is less extensive than institutional investors. Accordingly, we find weaker evidence of increased retail trading around days with brokerage research revisions. Moreover, we find no evidence that retail investors trade profitably around brokerage research revision days, indicating the limited value of brokerage research to retail investors and highlighting the distinctiveness of crowdsourced investment research. We also find no evidence that retail investors trade more profitably following stock-focused media articles, further underscoring the investment value of Seeking Alpha.

Notably, we find the opposite pattern when examining how institutional investors trade following these events. In particular, we find that institutional order flow is more informed following brokerage research and media articles, consistent with superior access to sell-side research and a greater capacity for processing public information. On the other hand, we do not observe that institutional order flow is more informative following Seeking Alpha articles, suggesting that crowdsourced investment research provides unique information benefits to retail investors.

We next we explore the broader implications of crowdsourced research for the firm's information environment. We hypothesize that Seeking Alpha research reduces information

asymmetry among investors by decreasing the information advantage of institutional investors over retail investors, and we test whether the reduction in information asymmetry is significant enough to translate into improved liquidity for the firm. Our empirical strategy is to identify plausibly exogenous shocks to Seeking Alpha coverage (similar to Kelly and Ljungqvist, 2012). Specifically, we contend that when an individual contributor departs from the platform altogether, the resulting decline in Seeking Alpha coverage is exogenous, i.e. driven by a change in the contributor's personal circumstances rather than an expectation of a change in the firm's information environment. Consistent with the view that Seeking Alpha contributor departures are exogenous events, we find no evidence that firms that experience departures also experience reductions in coverage by non-departing Seeking Alpha contributors, brokerage firms, or the media.

We estimate the effects of an exogenous reduction in Seeking Alpha coverage on firm-level measures of liquidity in the year following the event using a difference-in-difference approach. Specifically, we define a firm as having experienced contributor departure when 20% or more of the firm's contributors depart Seeking Alpha in a given year, and we match each treated firm to control firms that are in the same size and book-to-market quintiles and experience no contributor departure. We find that bid-ask spreads and the Amihud (2002) illiquidity measure increase by 2.4% and 5.5%, respectively, for contributor-departure firms relative to control firms, which is consistent with the idea that reduced Seeking Alpha coverage results in lower liquidity. The effects of contributor departures on liquidity are stronger among small firms, those with greater retail ownership, and when the departing contributors possess greater skill.

Our study contributes to a nascent but fast-growing literature on the role of crowdsourced research in capital markets. We extend early studies that document the role of crowdsourced

research in predicting future returns and earnings (Chen et al., 2014; Jame et al., 2016; Avery, Chevalier, and Zeckhauser, 2016) by documenting its role as a source of information specifically for retail investors. Our findings that Seeking Alpha research encourages retail investor participation and helps retail investors become more informed are consistent with crowdsourced research levelling the informational playing field between institutional and retail investors.

Our analysis also adds to the literature that studies the performance of retail investors. Early studies find the trading performance of retail investors to be subpar due to behavioral biases, lack of sophistication, and poor access to information with high investment value (e.g., Barber and Odean, 2000, Kumar and Lee, 2006; Frazzini and Lamont, 2008; Hvidkjaer, 2008; Barber, Odean, and Zhu, 2009). On the other hand, more recent work finds that retail investors as a group exhibit stock picking ability and speculate that retail investors have valuable information gleaned from geographic proximity to firms, relations with employees, or insights into customer tastes (e.g. Kaniel, Liu, Saar, and Titman, 2012; Kelly and Tetlock, 2013, 2017; and Boehmer, Jones, and Zhang, 2017). Our study is distinguished by its focus on how retail investors become informed. We present results that link retail investors' trading performance to the availability of retail-oriented investment research and question the view that retail investors make investment decisions without requisite investment analysis.

A third stream of literature examines the use of technology by regulators to level the informational playing field between institutional investors and retail investors.[3] We complement these studies by examining the extent to which a technology-enabled market innovation, Seeking

[3] Examples are the launch of the Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) in 1993 (Asthana, Balsam, and Sankaraguruswamy, 2004; Gao and Huang, 2017), Regulation Fair Disclosure in 2000 (Eleswarapu, Thompson, and Venkataraman, 2004; Duarte, Han, Harford, and Young, 2008), and the mandated use of eXtensible Business Reporting Language (XBRL) in corporate filing in 2009 (Blankespoor, Miller, and White, 2014; Bhattacharya, Cho, and Kim, 2018).

Alpha, has democratized the flow of investment information. Our findings illustrate how technological change can enable new business models which improve retail investors' access to information and level the informational playing field among investors.

2. The Seeking Alpha Sample

Seeking Alpha (SA) is one of the largest investment-related social media websites in the US. In 2017, the site had more than 39 million monthly visits, with the average visit lasting roughly 20 minutes (Seeking Alpha, 2018). The website relies on a contributor network of over 15,000 individuals to publish opinion articles. Contributor testimonials suggests that some of the primary motivations for contributing articles include direct compensation from Seeking Alpha, feedback (via reader comments) on investment theses, and increased recognition and visibility which may lead to other professional opportunities.[4] Chen, et al. (2014) find that Seeking Alpha's crowdsourced investment research contains valuable information, with articles and user commentaries predicting future stock returns and earnings surprises.

We collect all opinion articles published between 2005 and 2017 on the Seeking Alpha website. For each article, we collect the following information: article ID (assigned by Seeking Alpha), title, main text, date of publication, author name, and ticker (or tickers) assigned to each article. Following Chen et al., (2014) we limit the sample to articles that are associated with one ticker. We further limit the sample to common stocks (share codes 10 and 11) with available data in the CRSP-Compustat merged database. Our final sample includes 156,513 single-ticker articles.

For each firm, we collect data on share price, shares outstanding, stock returns, volume and closing bid and ask prices from CRSP. We obtain book value of equity, book value of debt, book value of assets, the date of the initial public offering (IPO), earnings before interest taxes

[4] See: https://seekingalpha.com/page/testimonials.

depreciation and amortization (EBITDA), and total common shareholders from Compustat. We collect the number of shares held by institutions from the Thomson Reuters Institutional Holdings (S34) database. We obtain earnings announcement dates and sell-side analyst earnings forecast from the IBES unadjusted US detail history file, sell-side analyst recommendations from the IBES detail recommendation file, and earnings guidance from the IBES detail history guidance file. Data on traditional media coverage, defined as Dow Jones News Service articles, were graciously provided by Byoung-Hyoun Hwang for the period from 2005 to 2012 (as in Chen et al, 2014), and we collect the data for the period from 2012 to 2017.

Table 1 describes the remarkable increase in the breadth and depth of Seeking Alpha coverage over time. From 2005 to 2017, research coverage rose from 240 to 2,217; the number of research contributors grew from 38 to 1,995; and the number of research articles increased from 282 to 19,505. In an average year, 1,208 unique contributors publish 12,039 articles on 1,638 different companies. Conditional on having Seeking Alpha coverage, the average firm has roughly 6.6 articles per year, written by 4 different contributors.

3. Contrasting Seeking Alpha with Traditional Brokerage Research

In this section, we explore the attributes of Seeking Alpha research in relation to traditional Wall Street research. Seeking Alpha's business model is built on reaching a wide audience of do-it-yourself investors, and Seeking Alpha contributors are often individual investors. In contrast, prior survey evidence and empirical work suggests that brokerage analysts cater to institutional investors. For example, Brown et al. (2015) report that more than 80% of surveyed analysts view hedge funds and mutual fund clients as very important, while only 13% of these analysts view retail clients as important. Consistent with this survey evidence, several papers find that sell-side

research is strongly increasing in institutional ownership (see, e.g., Bhushan, 1989; Green et al., 2014).

We examine the determinants of Seeking Alpha coverage and sell-side coverage by estimating the following panel regression:

$$Coverage_{it} = \alpha + \beta_1 Institutional\ Ownrshp_{i,t-1} + \beta_2 Breadth\ of\ Ownrshp_{i,t-1} + \boldsymbol{\beta Chars} + Time_t + \varepsilon_{it}, \quad (1)$$

where *Coverage* is the natural log of 1 plus the total number of unique Seeking Alpha contributors writing at least one article for the stock during the calendar year (*SA Coverage*), or the natural log of 1 plus the total number of unique brokerage firms issuing at least one earnings forecast for the stock during the calendar year (*IBES Coverage*).

The two independent variables of primary interest are $Institutional\ Ownrshp_{i,t-1,}$ defined as the percentage of the firm's shares held by institutional investors in year *t*-1, and *Breadth of Ownrshp*, defined as the number of common shareholders (both in logs). The vector of firm characteristics, ***Chars****,* includes: market capitalization (*Size*), book to market (*BM*), return volatility (*Volatility*), share turnover *(Turnover)*, past one-year return (*Return*), past one-year profitability (*Profitability*), and the number of unique media articles mentioning the firm the prior year (*Media Coverage*). See the Appendix for detailed definitions. We log all continuous variables other than *Profitability* and *Return*, and standardize all variables to have zero mean and unit variance. We include year fixed effects and cluster standard errors by firm.

Specification 1 of Table 2 examines the determinants of *SA Coverage* without controlling for *IBES Coverage.* In general, *SA Coverage* is higher for larger firms, firms with more frequent media coverage, and those with greater trading volume. In addition, *SA Coverage* is positively related to volatility, past one-year returns, and profitability. Consistent with our conjecture that Seeking Alpha research is a retail investor rather than an institutional investor phenomenon, we

find a strong negative relation between *SA Coverage* and institutional ownership and a strong positive relation between *SA Coverage* and total common shareholders. In particular, a one standard deviation increase in *Institutional Ownership* (*Breadth of Ownership*) is associated with an 18% decline (3% increase) in *SA Coverage*. These findings are robust to controlling for *IBES Coverage*, which is positively correlated with *SA Coverage* (Specification 2).

Specifications 3 and 4 present analogous results for traditional coverage by sell-side brokerage firms (*IBES Coverage*). As expected and in sharp contrast to the *SA Coverage* patterns, *IBES Coverage* is strongly positively related to institutional ownership and strongly negatively related to breadth of ownership. Collectively, these results are consistent with the idea that Seeking Alpha tilts their research towards stocks with greater retail ownership and a larger investor base, while traditional brokerage research caters to institutional investors.

4. Do Retail Investors React to Seeking Alpha Research?

In this section, we examine two related predictions: 1) the dissemination of Seeking Alpha research generates disproportionately greater trading among retail investors (Section 4.1), and 2) the tone of the Seeking Alpha research article influences retail investor order imbalances (Section 4.2).

4.1 *Retail Trading Intensity around Seeking Alpha Research*

We identify retail trading using Boehmer, Jones, and Zhang's (2017) approach, which exploits two key institutional features of retail trading. First, most equity trades by retail investors take place off-exchange, either filled from the broker's own inventory or sold by the broker to wholesalers (Battalio, Cowin, and Jennings, 2016). TAQ classifies these types of trades with exchange code "D." Accordingly, we identify retail trades by limiting our analysis to trades executed on exchange code "D."

Second, retail traders typical receive a small fraction of a cent price improvement over the National Best Bid or Offer (NBBO) for market orders (ranging from 0.01 to 0.2 cents), while institutional orders tend to be executed at whole or half-cent increments. Thus, we follow Boehmer, Jones, and Zhang (2017) (BJZ) and identify trades as retail purchases (sales) if the trade took place at a price just below (above) a round penny.[5] The BJZ approach is conservative in the sense that it has a low type 1 error (i.e., trades classified as retail are very likely to be retail). While this approach does omit some retail trading including nonmarketable limit orders and retail traders that take place on registered exchanges, it "picks up a majority of overall retail trading activity" (BJZ page 6).[6]

We consider two complementary measures of retail trading intensity: *Retail Turnover*$_{it}$, which is the total trading volume in stock *i* on day *t* classified as retail, scaled by stock *i*'s shares outstanding, and *Percentage Retail Turnover*, which is the total trading volume in stock *i* on day *t* classified as retail, scaled by aggregate trading volume for stock *i* on day *t*. The turnover measure allows us to examine whether retail investors trade more following Seeking Alpha research than at other times, whereas the percentage turnover measure considers whether the increase in trading following SA research is larger for retail investors than for institutional investors. We estimate the effects of Seeking Alpha research on retail investor trading using the following daily panel regression:

$$Retail\ Trading_{it} = \alpha + \beta_1 SA_{it-1,t} + \beta_2 IBES_{it-1,t} + \beta_3 Media_{t-1,t} + \boldsymbol{\beta_4 Chars_{iy-1}} + Time_t + Firm_i + \varepsilon_{it}, \quad (2)$$

[5] This approach focuses on liquidity-demanding retail trading (market orders). Kelley and Tetlock (2013) find that while both aggressive and passive retail trading predicts returns, liquidity-demanding trading also predicts earnings surprises.

[6] BJZ also note that in a conference discussion of their work, Eric Kelley presented that the correlation between the BJZ order imbalance measure and imbalances calculated from Kelley and Tetlock (2013)'s proprietary retail data with observed trade directions is in the range of 0.345 to 0.507, with an average of 0.452.

where *Retail Trading* is *Retail Turnover* or *Percentage Retail Turnover*, SA_{it} is equal to one if Seeking Alpha issued a research report for firm *i* on day *t* or *t-1*,[7] and *IBES* and *Media* are defined similarly. ***Char*** includes *Size*, *book-to-market* (*BM*), *Institutional Ownership*, *Volatility*, *Turnover*, *Return*, *Profitability*, *IBES coverage*, and *Media Coverage*, all measured at the end of the previous year. Detailed variable descriptions are provided in the Appendix. All continuous independent variables are standardized to have mean zero and unit variance. *Time* and *Firm* indicate time (calendar day) and firm fixed effects. Standard errors are clustered by firm.

Our TAQ sample begins in 2007, and we consider all firm-years with Seeking Alpha coverage (at least one SA research report). We exclude Seeking Alpha research articles that coincide with earnings announcements or earnings guidance to reduce the likelihood that SA research is merely proxying for information contained in these information events. The resulting 2007-2017 sample comprises 3,925,070 firm-day observations.

Specifications 1 and 3 of Table 3 report the results prior to including firm fixed effects. The statistically significant positive coefficient on $SA_{t-1,t}$ in Specification 1 indicates that retail investors trade more following Seeking Alpha research than on other days. Moreover, the significant positive coefficient in Specification 3 confirms that the increase in trading for retail investors is greater than for institutional investors, with retail investors comprising a larger fraction of the daily turnover following Seeking Alpha research. The results also hold after including firm fixed effects in Specifications 2 and 4.

Table 3 also provides evidence that trading intensity is greater following the release of traditional brokerage research or media coverage, although the economic magnitudes are considerably smaller. For example, the coefficient on the *SA* indicator variable in Specification 3

[7] We include day *t*-1 to account for SA reports published after the close of trading on day *t*-1. We analyze trading days separately in Table 4.

(1.31%) is roughly 4 times larger than the coefficient on the *IBES* indicator (0.34%) and more than 50% larger than *Media* (0.69%), and the relative differences become even larger after controlling for firm fixed effects.

4.2 Retail Order Imbalances and Seeking Alpha Research Article Sentiment

To provide more direct evidence that retail investors read and react to Seeking Alpha research, we explore the relation between retail order imbalances and SA research sentiment. We consider two sentiment measures. The first is based on article tone: *Percent Negative*$_{it}$ (*Percent Positive*$_{it}$) is the average fraction of negative (positive) words across all single-ticker articles published on Seeking Alpha about company *i* on day *t* (Chen et al., 2014). We use the word list compiled by Loughran and McDonald (2011) to classify words as negative or positive. The second is based on a contributor's investment position, as disclosed in the article: *Short (Long) Position*$_{it}$ is one when a contributor discloses short (long) the stock (Campbell et al., 2016).[8] When several contributors disclose investment positions, we take a simple average.

For reference, we also examine the relation between retail order imbalances and brokerage research and traditional media coverage. We create indicator variables for *Long* (*Short*) brokerage research, defined as IBES recommendation upgrades (downgrades) or positive (negative) earnings forecast revisions. We also calculate the tone of traditional media articles using the *Percent Negative*$_{it}$ and *Percent Positive*$_{it}$ measures, as defined above.

For all firm-days with at least one event (i.e., Seeking Alpha article, IBES report, or media article) we estimate the following panel regression:

$$\begin{aligned} Retail\ OIB_{i,t+x} = \alpha + \beta_1 SA + \beta_2 SA \times Percent\ Negative_{it} + \beta_3 SA \times Percent\ Positive_{it} \\ + \beta_4 SA \times Short\ Position_{it} + \beta_5 SA \times Long\ Position_{it} + \beta_6 IBES \end{aligned} \quad (3)$$

[8] The site has mandated investment position disclosures since 2015.

$$+\beta_7 IBES\times Long + \beta_8 IBES\times Short + \beta_9 Media + \beta_{10} Media\times Percent\ Negative_{it}$$
$$+\beta_{11} Media\times Percent\ Positive_{it} + \beta_{12} Inst\ OIB_{it} + \boldsymbol{\beta_{13} Char_{iy-1}} + Time_t + \varepsilon_{it}.$$

As in Boehmer, Jones, and Zhang (2017), *Retail* $OIB_{i,t+x}$ is defined as the retail buy volume less the retail sell volume, scaled by the total retail trading volume for firm *i* on day $t+x$. We define day *t* as the event day (the day the Seeking Alpha article is published) and let *x* vary from -3 to +3. By focusing on a seven-day window around the event, we are able to examine the lead-lag relation between Seeking Alpha research and retail investor trading. To control for broad omitted factors that affect the order imbalances of all investors, we also include *Inst OIB*, which is defined as the total order imbalance across all TAQ trades less the retail order imbalance.[9] ***Char*** is a vector of firm characteristics (taken from BJZ) and includes past one-week returns (Ret_{w-1}), past one month returns (Ret_{m-1}), returns over the prior two to seven months ($Ret_{m-7,m-2}$), market capitalization (*Size*), monthly turnover (*Turnover*), monthly volatility of daily returns (*Volatility*), and book-to-market (*BM*). With the exception of returns, all control variables are measured at the end of the previous year and are in natural logs. To control for confounding events, we exclude Seeking Alpha articles that coincide with earnings announcements, earnings guidance, or brokerage (IBES) investment research (forecast revisions or recommendation changes).

Table 4 presents the results. We find robust evidence that Seeking Alpha article sentiment tone predicts retail order imbalances on event days 0 and +1. For example, a one-standard deviation increase in *SA Percent Negative Words* is associated with a 1.17 % and 1.05% decline in *Retail OIB* on days 0 and 1.[10] On these days, the incremental effect of short positions is a decline in *Retail OIB* of 6.75% and 6.41%, respectively, whereas the incremental effect of long positions is 3.83%

[9] Our trade-based classification approach provides an imperfect measure of all retail trading, and therefore calculating the total order imbalance less the retail order imbalance also provides an imperfect measure of all institutional trading.
[10] The absence of a relation between *Retail OIB* and *SA Percent Positive Words* is consistent with prior evidence that negative words are better at capturing variation in tone (e.g., Tetlock, 2007).

and 2.15%. Short position disclosures and negative SA tone continue to have a discernible effect on Retail OIB on days +2 and +3. We find no evidence that retail order imbalances on event days -3 or -2 predicts the sentiment of future Seeking Alpha articles, although there is some evidence that *Retail OIB* on day -1 is related to negative article tone and the disclosure of short positions.

We also find that retail investors react to IBES research and media coverage, yet the economic magnitudes of these effects are smaller than for Seeking Alpha research. For example, while the cumulative effects of *SA*×*Long* and SA×Short on *Retail OIB* in the two days surrounding the event are 5.98% and -13.16%, the corresponding estimates for *IBES*×*Long* and *IBES*×*Short* are 4.22% and -1.03%. Moreover, the effect of *SA Percent Negative* on retail order imbalances in the same event window is twice that of *Media Percent Negative* (-2.22 versus -1.19).

In summary, our findings thus far indicate that Seeking Alpha research is geared towards stocks that are owned by retail investors. Moreover, the publication of SA articles stimulates significant trading by retail investors that is directionally consistent with the tone of the article. Given the evidence that Seeking Alpha research tone is informative about future stock returns (Chen et al., 2014), these findings suggest that Seeking Alpha research may also facilitate more informed trading among retail investors. We explore this hypothesis next.

5. Does Seeking Alpha Research Help Retail Investors Become Better Informed?

Early work finds evidence that retail trading is at best uninformed, and at worst, a negative predictor of future stock returns, and the literature concludes that retail investors are noise traders that are influenced by behavioral biases (e.g., Barber and Odean, 2000; Frazzini and Lamont, 2008; Hvidkjaer, 2008; Barber, Odean, and Zhu, 2009). In contrast, several more recent studies find evidence consistent with retail investors trading being informed (e.g. Kaniel, Saar, and Titman,

2008; Kaniel, Liu, Saar, and Titman, 2012; Kelly and Tetlock, 2013, 2017; and Boehmer, Jones, and Zhang, 2017).

The improved performance of individual investors over time has been explained with learning or changing investor demographics. For example, Barber and Odean (2002) find evidence of detrimental overconfidence among early adopters of online trading, and Seru, Shumway, and Stoffman (2010) find evidence consistent with consistent with two types of learning: some investors get better at trading as they acquire more experience, others stop trading after realizing they lack trading skill. We conjecture that better access to investment information may also play a role in the increase in informativeness of retail investor trading over time. In this section, we explore whether the presence of crowdsourced, retail-oriented investment research influences the informativeness of retail investor trading.

5.1 Retail Order Imbalances and Stock Returns – Baseline Results

We examine the informativeness of retail order imbalances on days in which Seeking Alpha research is published by estimating the following panel regression:

$$\begin{aligned} Ret_{it,t+x} = \alpha + \beta_1 Retail\ OIB_{it} + \beta_2 Inst\ OIB_{it} + \beta_3 SA_{it} + \beta_4 Retail\ OIB \times SA_{it} \\ + \beta_5 Inst\ OIB_{it} \times SA_{it} + \beta_6 Media_{it} + \beta_7 Retail\ OIB \times Media_{it} \\ + \beta_8 Inst\ OIB \times Media_{it} + \beta_9 IBES_{it} + \beta_{10} Retail\ OIB \times IBES_{it} \\ + \beta_{11} Inst\ OIB \times IBES_{it} + \boldsymbol{\beta_{13} Char_{iy-1}} + Time_t + \varepsilon_{it}, \end{aligned} \quad (4)$$

where $Ret_{it+1,t+x}$ is the return on stock *i* from the close of day *t* to the close of day $t+x$, with *x* equal to 1, 5, or 10; *Retail OIB* is the total retail buy volume less the total retail sell volume, scaled by the total retail trading volume; *Inst OIB* is the total non-retail buy volume less the total non-retail sell volume, scaled by the total non-retail trading volume; and SA_{it} is equal to one if there is a SA research article on firm *i* on day t or *t-1*, and zero otherwise. Our primary variable of interest, *Retail OIB×SA*, captures the incremental informativeness of retail order imbalance on days with Seeking

Alpha research. *Institutional OIB×SA* captures the incremental informativeness of institutional trading on days with Seeking Alpha research. $Media_{it}$ is equal to one if there is a traditional media article for firm *i* on day t or *t-1*, and zero otherwise. Similarly constructed, $IBES_{it}$ indicates the distribution of sell-side research. ***Characteristics*** is the vector of firm characteristic described in Equation (3). We exclude firm-days that coincide with earnings announcements or earnings guidance and standardize all continuous variables, as in Section 4. We include time fixed effects and double cluster standard errors by date (calendar day) and firm.

Table 5 presents the results. Consistent with Boehmer, Jones, and Zhang (2017), we find that retail order imbalance is a strong positive predictor of future returns. Moreover, we find that retail trading is a stronger return predictor on days with Seeking Alpha research. For example, in Specification 3, a one standard deviation increase in retail order imbalance is associated with a 0.09% increase in 10-days returns on days without Seeking Alpha research and an increase of 0.18% (0.09% +0.09%) on days with Seeking Alpha research. In contrast, the coefficients on *Retail OIB×Media* and *Retail OIB×IBES* are always economically and statistically insignificant, which further highlights the unique role of Seeking Alpha research (relative to traditional media and brokerage research) in enhancing the informativeness of retail investor trades. We also find that when retail investor trading is more informed, institutional investor trading tends to be less informed. Specifically, *Institutional OIB* is a stronger predictor of future returns on days when traditional media articles and sell-side research are distributed but not on days when SA articles are published.

Finally, in Figure 1 we estimate Equation (3) for x=10, 20, and 60 and plot the estimates of *Retail, Retail OIB×SA, Retail OIB×Media,* and *Retail OIB×IBES.* Consistent with Boehmer, Jones, and Zhang (2017), we find that the informativeness of retail trading is concentrated over

relatively short holding periods. In each case, more than 50% of the 60-day returns accrue in the first ten days. The patterns are similar but economically smaller for non-event days and days with media articles or IBES research. The lack of reversal is inconsistent with the view that returns following retail trading reflect uninformed price pressure.

5.2 Retail Order Imbalances and Stock Returns: Robustness

In the Internet Appendix (Table IA.1), we confirm that the evidence regarding the incremental informativeness of retail order imbalances around Seeking Alpha research is robust to several alternative methodological choices including: (1) measuring retail order imbalances using number of trades instead of share volume; (2) including in the sample firm-days with earnings news (earnings announcements or earning guidance); (3) adding firm fixed effects to the panel regression; and (4) using Fama-MacBeth regressions to estimate Equation (4).[11]

We explore whether the results are stable over time by estimating Equation (4) each month (Specification 3 in Table 5) and we plot the cumulative coefficients on *Retail OIB*×*SA* in Figure IA.1. We observe a jump in the second half of 2008, consistent with SA research being particularly valuable during the financial crisis, and a fairly stable and positive drift over the full sample period. To confirm that our results are not driven by the financial crisis period, we re-estimate the model after excluding the second half of 2008, and continue to find that the coefficient on Retail OIB × SA is statistically significant at a 5% level.

5.3 Conditioning on Firm Size and Contributor Skill

We examine whether Seeking Alpha research is more useful to retail investors for smaller stocks, which are known to be less informationally efficient. Specifically, we sort firms into two

[11] In estimating Fama-Macbeth regressions, we limit the sample to days with at least 10 firms with Seeking Alpha research, and we calculate Newey West standard errors with 1, 5, and 10-day lags depending on the return horizon.

groups based on the median breakpoint of market capitalization (measured at the end of the previous year). We then repeat Specification 3 of Table 5 for each size group separately. Panel A of Table 6 reports the coefficient on *Retail OIB*×*SA* for each size subgroup. Among smaller stocks, the incremental profitability of retail order flow associated with Seeking Alpha research is 0.17 % over a 10-day holding period and statistically significant, compared to the 0.09% coefficient on *Retail OIB* (unreported). In contrast, among larger stocks the incremental informativeness of retail trading on days with Seeking Alpha research is considerably smaller. For example, the coefficient on *Retail OIB* over a 10-day horizon is 0.02% and the coefficient on *Retail OIB*×*SA* is 0.04%, neither of which is statistically different from zero. The findings suggest that the impact of Seeking Alpha research on the informativeness of retail trading is concentrated among smaller stocks.

We suggest that retail investors will benefit more from research written by skilled Seeking Alpha contributors. Motivated by the idea that research by skilled individuals has greater market impact, we proxy for contributor skill by averaging the two-day (0, 1) absolute market-adjusted returns across the last five articles written by the contributor. We partition the sample into high versus low skill based on the median breakpoint of contributor skill, and we use indicator variables to separate event days where the fraction of articles written by high skill contributors is greater than 50% (*High Skill*) from those where it is less than or equal to 50% (*Low Skill*).

The results are presented in Panel B of Table 6. The coefficients on *Retail OIB*×*SA High Skill* are highly significant, ranging from 0.11% for a one-day event window to 0.25% for the 10-day window. In contrast, the coefficients on *Retail OIB*×*SA Low Skill* are small and statistically insignificant. Furthermore, across all holding periods, the difference between the two estimates is significantly different from zero. The link between contributor skill and the extent to which retail

order imbalance is informative about future returns is consistent with more informed investment research leading to more informed retail trading.

6. Seeking Alpha Research, Information Asymmetry, and Firm Liquidity

The evidence in the previous section suggests that Seeking Alpha disseminates investment information to retail investors who would not otherwise have access to the information. If crowdsourced investment research leads to a material reduction in the level of information asymmetry between institutions and individuals, then Seeking Alpha coverage should improve firm liquidity. In this section, we explore the broader implications of crowdsourced research for the firm's information environment. Our approach focuses on exogenous shocks to Seeking Alpha coverage, and we study the effects of declines in coverage on measures of firm liquidity.

6.1 Identifying Exogenous Shocks to Seeking Alpha Coverage

Studying the effects of Seeking Alpha coverage on firm liquidity is difficult because SA contributors choose which stocks to cover, and the choice to cover a stock is likely influenced by many firm characteristics including liquidity itself. We attempt to circumvent this challenge by identifying changes in Seeking Alpha coverage that are unlikely to be driven by firm characteristics. Specifically, our identification strategy focuses on the departure of a Seeking Alpha contributor from Seeking Alpha. Our underlying assumption is that when a contributor leaves the platform, the resulting decline in SA coverage of a firm is exogenous, i.e., unrelated to contributor's expectation of how the firm's environment will change.

We define a Seeking Alpha contributor as departing if she covered at least five stocks in year *t* and no stocks subsequently. We require that contributors cover at least 5 stocks to reduce the likelihood that the departure is related to the fundamentals of the firms being covered. Of the 5,756 Seeking Alpha contributors covering at least five stocks from 2004-2016, roughly 21%

(1,201) depart Seeking Alpha. The average departing contributor writes 22 articles for 16 unique stocks in the year prior to their departure.

A firm experiences a *Contributor Departure*$_{it}$ in year *t* if at least 20% of its existing contributors leave in year *t*.[12] We compare treated firms to candidate control firms that did not experience any departures using a difference-in-difference approach, and we require that both treated and controls firms have had coverage on Seeking Alpha for at least three years. Panel A of Table 7 reports summary statistics. The sample consists of 1,900 firms-years with contributor departures and 8,408 control firms-years. For both groups, we report the *ΔLog* (*SA Coverage*) in year *t*, defined as *Log* (*1+SA Coverage*$_{it}$) – *Log* (*1+SA Coverage*$_{it-1}$). We observe that control firms experience a roughly 14% increase in coverage on average, whereas firms experiencing contributor departure experience a roughly 20% decline in Seeking Alpha coverage. Firms experiencing contributor departure also tend to be slightly larger and more growth-oriented than control firms.

If the choice to depart Seeking Alpha is unrelated to firm *i*'s informational environment, then we should not observe a decline in the coverage of firm *i* by remaining Seeking Alpha contributors, sell-side analysts, or the media. To help validate the assumption that Seeking Alpha contributor departures are exogenous, we examine the relation between contributor departures and changes in total SA coverage (*SA Coverage)*, coverage by remaining SA contributors (*Non-Departing SA Coverage*), sell-side analyst coverage (*IBES Coverage*), and media coverage (*Media Coverage*), the latter defined as the total number of traditional media articles in a year.

We estimate the following panel regression:

$$\Delta(Log\ Coverage_{it}) = \alpha + \beta_1 ContributorDeparture_{it} + \boldsymbol{\beta Characteristics_{i,t-1}} + Time \times Style_{it} + \varepsilon_{it}, \quad (5)$$

[12] Our results are similar if we change the cutoff for treated firms to 10%, 15%, or 25%.

where Δ denotes the change from year t-1 to t, and ***Characteristics*** is the vector of firm characteristics included in Equation (1), with each variable standardized to have zero mean and unit variance. $Time \times Style_{it}$ is a vector of time × style indicator variables, where the style indicators are the 25 size and book-to-market groups as constructed in Daniel et al. (1997). Specifically, we first sort stocks into five quintiles based on NYSE breakpoints, and then within each size quintile, we further sort stocks into quintiles based on book-to-market. By including Time×Style indicator variables, we effectively follow the approach of Kelly and Ljungqvist (2012) which matches treated firms to control firms in the same year, size quintile, and book-to-market quintile.[13] Standard errors are clustered by firm and time.

In Specification 1 in Panel B of Table 7, we find that firms with Seeking Alpha contributor departures experience an economically and statistically significant 35% decline in SA coverage relative to matched control firms, validating the relevance of the *Contributor Departure* instrument. On the other hand, in Specification 2 we observe that treated firms experience a significant *increase* in coverage by non-departing SA contributors, inconsistent with the idea that departures are related to firm conditions. In addition, Specifications 3-4 show no significant change in *IBES Coverage* or *Media Coverage* following Seeking Alpha contributor departures. The evidence in Panel B helps validate the key assumption that contributor departures are exogenous to the information environment of the firm.

6.2 Seeking Alpha Coverage and Firm Liquidity

We examine the relation between Seeking Alpha coverage and information asymmetry using the following panel regression:

$$\Delta\ Illiquidity_{it} = \alpha + \beta_1 ContributorDeparture_{it} + \beta 2 \Delta Log\ (Non\text{-}Departing\ SA\ Coverage_{it}) \quad (6)$$

[13] We find similar after including only time fixed effects.

$$+ \beta 3 \Delta Log\ (IBES\ Coverage_{it}) + \beta 3 \Delta Log\ (Media\ Coverage) + \boldsymbol{\beta Char} + Time \times Style_{it} + \varepsilon_{it.}$$

where *Illiquidity* is the percentage bid-ask spread (*Bid-Ask*) or the Amihud (2002) illiquidity ratio (*Amihud Illiquidity*), both measured in natural logs and at the monthly frequency (by averaging all daily observations in the month).[14] We define $\Delta Illiquidity_{it}$ as the difference between $Illiquidity_{it}$ and $Illiquidity_{it-12}$. Δ*Contributor Departure, Characteristics*, and *Time×Style* are defined as in Equation (5). Δ*Log (Non-Departing SA Coverage*), Δ *Log (IBES Coverage*), and Δ *Log (Media Coverage*) are proxies for changes in investor interest, defined in the Appendix. Standard errors are clustered by firm and time.

Specifications 1 and 2 of Table 8 report the difference-in-difference estimates for bid-ask spreads. The coefficient on *Contributor Departure* in Specification 1 indicates that relative to a portfolio of control firms matched on size, book-to-market, and year, firms with departing contributors experience a 3.45% increase in bid-ask spreads. The estimate is statistically significant at the 1% level and economically meaningful, translating into roughly 7% of the cross-sectional standard deviation of the change in bid-ask spreads (50%). Specification 2 confirms that the results are robust to controlling for changes in investor interest and firm characteristics. Specifications 3 and 4 present analogous results for the *Amihud* illiquidity measure. After including all the controls, we find a difference-in-difference of 5.15% for the *Amihud* illiquidity measure. The change in illiquidity is roughly 6% of its cross-sectional standard deviation of 87%.

We next examine the relation between contributor departures and changes in firm liquidity in event time. Specifically, we re-estimate Specifications 2 and 4 of Table 8, varying the timing of *Contributor Departure* from $Contributor\ Departure_{i,t-2}$ to $Contributor\ Departure_{i,t+2}$. That is, we examine the results in event time from year -2 to +2, where year 0 is the baseline Specification

[14] Results are similar if we aggregate illiquidity to an annual frequency.

reported in Table 8. Figure 2 reports the results for *Bid-Ask* and *Amihud Illiquidity*, respectively. We find no significant changes in *Bid-Ask* or *Amihud Illiquidity* in the two years prior to the event, in support of the parallels trends assumption. As shown in Table 8, both liquidity measures significantly decline in year 0 (the first year after the departure of Seeking Alpha contributors), and year 1. The two-year cumulative increase in *Bid-Ask Spread* (*Amihud Illiquidity*) is 4.84% (10.27%), which suggests that the decline in coverage has long-lived consequences for firm liquidity. Finally, we find that the change in illiquidity for both measures is small and statistically insignificant in event year 2.

6.3 Conditioning on Firm Size, Retail Ownership, and Contributor Skill

In this section, we explore whether the effect of Seeking Alpha coverage on liquidity depends on firm and contributor characteristics. The evidence in Table 6 is consistent with Seeking Alpha research being particularly valuable among smaller stocks and when the research is written by more skilled contributors. We suggest that the effect of contributor departure is more pronounced among stocks with greater retail ownership, where Seeking Alpha is likely a relatively more important information source, and when the departing contributor has greater skill.

Panel A of Table 9 examines whether the effect of departing contributors on liquidity varies with retail ownership by splitting the sample into two groups based on the median breakpoint of institutional ownership. Among firms with low institutional ownership, we estimate that firms with *Contributor Departures* experience a 5.26% increase in *Bid-Ask Spreads* and a 12.27% increase in the *Amihud* illiquidity measure, both of which are highly significant. In contrast, among firms in the bottom half of retail ownership, the coefficients on *Contributor Departure* for both illiquidity measures are statistically insignificant and economically small. Furthermore, the coefficient estimates across the two samples are significantly different from each other. These

findings support our conjecture that the effects of Seeking Alpha on information asymmetry are much stronger among stocks heavily owned by retail investors.

Panel B splits the sample into two groups based on the median breakpoint of market capitalization. We find consistent evidence of a liquidity decline for small firms. In particular, there is a marginally significant 3.95% increase in bid-ask spreads ($p < 0.10$) and a highly significant 9.28% increase in *Amihud* illiquidity for small firms, with no evidence of a decline in liquidity for large firms.

Finally, Panel C sorts firms into two groups based on contributor skill as in Table 6. We find economically large and statistically significant increases in bid-ask spreads and Amihud liquidity when departing contributors have high skill. The results are weaker when departing contributors have low skill, and the differences in coefficient estimates between the two groups are significant at the 10% level. Collectively, the results in Table 9 confirm our conjecture that exogenous departures of Seeking Alpha contributors have a greater effect on firm liquidity for firms with greater retail ownership, smaller firms, and when a large fraction of departing contributors are highly skilled.

7. Conclusion

Individual investors are typically at an information disadvantage relative to professional investors. In recent years, innovations in technology have helped spur the democratization of investment research, with the popular provider of informative crowdsourced research Seeking Alpha playing a central role (Chen et al., 2014). In this article, we explore the extent to which crowdsourced investment research has helped level the information playing field by studying the effects of Seeking Alpha investment research on investor decision-making and the information environment of the firm.

We confirm anecdotal evidence that Seeking Alpha research is geared towards retail investors, finding that Seeking Alpha coverage is significantly negatively related to institutional ownership and positively related to number of shareholders. We find significant increases in trading activity by retail investors on days with Seeking Alpha articles, with retail order imbalances being significantly related to the tone of research articles. More importantly, we find that Seeking Alpha research enhances the profitability of retail investor trades. In particular, the relation between retail order flow and future stock returns is roughly twice as strong on days with Seeking Alpha research articles. In contrast, we find no evidence that the informativeness of retail order flow strengthens on days when brokerage research is distributed, which is consistent with retail investors having more limited access to traditional Wall Street research. We also find no evidence that retail investors trade more profitably on days with media articles, highlighting the value of Seeking Alpha as a source of investment research.

We find that the democratization of investment research has helped improve market liquidity, which is consistent with a reduction in information asymmetry between retail investors and institutional investors. Our identification strategy relies on the idea that the departure of a Seeking Alpha contributor from the platform represents a plausibly exogenous shock to Seeking Alpha research coverage. Using a difference-in-difference approach, we find that the bid-ask spreads and the Amihud (2002) illiquidity measure increase by 2.4% and 5.5% in the year after contributor departures. These results are stronger among small firms, those with greater retail ownership, and when the departing contributors possess greater skill.

We conclude that a recent technology-induced innovation, the crowdsourcing of investment research, has helped to level the informational playing field between retail and institutional investors. We acknowledge, however, that not all innovations in information access

work to level the information playing field. Many new sources of information target professional investors, and active portfolio managers expend tremendous resources to acquire investment information from Fin Tech companies (e.g. Grennan and Michaely, 2018). While Zhu (2018) finds evidence that these new sources of information help institutional investors better monitor company management, they may also work to increase information asymmetry between individuals and institutions.

Appendix A: Variable Definitions:

A.1 Seeking Alpha Variables

- *SA Coverage* – the number of unique Seeking Alpha contributors writing an opinion article for a firm during the calendar year (Source: Seeking Alpha).
- *SA Articles* – the total number of Seeking Alpha opinion articles written for a firm during the calendar year (Source: Seeking Alpha).
- *Contributor Departure* – an indicator variable equal to one if a firm has lost 20% or more of its existing coverage due to *plausibly exogenous departures* from Seeking Alpha. (Source: Seeking Alpha).
  - We consider dropped coverage for firm *i* in year *t* to be plausibly exogenous if 1) the departing contributor was covering at least five firms (including firm *i*) in year *t-1* and 2) the contributor never issues research for any firms on *Seeking Alpha* at any point after year *t-1*.
- *Non-Departing SA Coverage* – defined as *SA Coverage* less the total number of contributors who dropped coverage due to plausible exogenous departures (as defined above).
- *SA* – a dummy variable equal to one if a Seeking Alpha opinion article was written about firm *i* on day *t* or day *t-1* (Source: Seeking Alpha).
- *Percent Negative (Positive)* – the average fraction of negative (positive) words across all single-ticker articles published on Seeking Alpha about firm *i* on day *t.* (Source: Seeking Alpha). The list of negative and positive words is taken from Loughran and McDonald (2011).
- *Short (Long) Position* – a dummy variable equal to one if the author discloses a short (long) position about the company discussed in the article. This measure is average across all single-ticker articles published about firm *i* on day *t*.
- *Contributor Skill* – the two day absolute market-adjusted return averaged across the past five articles written by the contributor. (Source: Seeking Alpha/CRSP).

A.2 Liquidity Measures

- *Retail Turnover* – average daily retail turnover (i.e., retail share volume scaled by shares outstanding) during the calendar year. Retail trading is classified using the approach outlined in Boehmer, Jones, and Zhang (2017). (Source: TAQ and CRSP).
- *Percent Retail Turnover* – retail share volume scaled by total share volume. Retail trading is classified using the approach outlined in Boehmer, Jones, and Zhang (2017). (Source: TAQ and CRSP).
- *Amihud* - the Amihud (2002) illiquidity measure computed using all daily data available in the calendar year.
- *Bid-Ask Spread* – the average daily bid-ask spread computed as the difference between the (end of day) bid and ask price, divided by the midpoint. Winsorized at the 1st and 99th percentiles. (Source: CRSP).

A.3 Other Variables:

- *Size* – the market capitalization computed as share prices times total shares outstanding at the end of the year (Source: CRSP).
- *Book-to-Market (BM)* – the book-to-market ratio computed as the book value of equity during the calendar year scaled by the market capitalization at the end of the calendar year. Negative

values are deleted and positive values are winsorized at the 1st and 99th percentile. (Source: CRSP/Compustat).

- *Volatility* – the standard deviation of daily returns during the calendar year (Source: CRSP).
- *Age* – the number of years since the Initial Public Offering (Source: Compustat).
- *Profitability* – EBITDA scaled by book value of assets. Winsorized at the 1st and 99th percentiles (Source: Compustat).
- $Return_{t-1,\ t-12}$ – the buy-and-hold gross return over the prior 12 months. Alternative holding periods are labelled analogously (Source: CRSP).
- *Institutional Ownership* – the percentage of the firm's shares held by institutions at year end (Source: Thomson Reuters Institutional Holdings S34).
- *Retail Ownership* – 1 – *Institutional Ownership*.
- *Breadth of Ownership* – the total number of common shareholders (Source: Compustat).
- *IBES Coverage* – the number of unique brokerage houses issuing an earnings forecast for a firm during the calendar year (Source: IBES).
- *Media Coverage* – the total number of media articles about a firm during the calendar year (Source: Factiva and Chen et al., 2014)).
- *IBES* – an indicator variable equal to one if an IBES earnings forecast or IBES investment recommendation was issued for a firm on day *t* or day *t-1* (Source: IBES).
- *Media* – an indicator variable equal to one if a Media article was issued for a firm on day *t* or day *t-1*. (Source: Factiva and Chen et al., 2014).
- *Earnings Event* – an indicator variable equal to one if earnings or earnings guidance is announced for the firm for day *t* or day *t-1* (Source: IBES).
- *Retail OIB* – retail buy volume less retail sell volume, scaled by total retail trading volume. Retail trading is classified using the approach outlined in Boehmer, Jones, and Zhang (2017), and trades are signed using the Lee and Ready (1991) algorithm (Source: TAQ).
- *Institutional OIB* – the total (non-retail) share volume bought less the (non-retail) share volume sold, scaled by the total (non-retail) volume traded. Retail trading is classified using the approach outlined in Boehmer, Jones, and Zhang (2017), and trades are signed using the Lee and Ready (1991) algorithm (Source: TAQ).

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Table 1. Summary Statistics for the Seeking Alpha Research Article Sample

The table reports information on Seeking Alpha research articles by year. The sample includes 156,513 single-ticker research articles written by 8,463 unique contributors for which the referenced stock is available in the CRSP-Compustat merged database. Average in the bottom row denotes the average across years.

Year	Firms Covered by Seeking Alpha	Fraction of CRSP/Compustat Universe with Coverage	Seeking Alpha Articles	Seeking Alpha Contributors	Contributor-Firm Pairs	Articles per Contributor	Articles per Contributor-Firm Pair
2005	240	5.04%	828	38	325	3.45	1.35
2006	923	19.78%	3,130	245	2,192	3.39	2.37
2007	1,437	31.16%	7,368	561	4,448	5.13	3.10
2008	1,179	26.12%	5,120	704	3,321	4.34	2.82
2009	1,235	28.95%	7,373	746	4,176	5.97	3.38
2010	1,368	33.94%	7,007	743	4,209	5.12	3.08
2011	1,338	34.53%	7,093	945	4,700	5.30	3.51
2012	1,799	48.13%	18,905	1,582	11,278	10.51	6.27
2013	2,322	64.32%	17,550	1,982	11,683	7.56	5.03
2014	2,359	65.40%	21,498	2,087	13,260	9.11	5.62
2015	2,607	69.76%	22,414	2,059	13,734	8.60	5.27
2016	2,274	61.66%	18,722	2,015	10,982	8.23	4.83
2017	2,217	62.22%	19,505	1,995	11,545	8.80	5.21
Average	1,638	42.39%	12,039	1,208	7,373	6.58	3.99

Table 2: Determinants of Research Coverage by Seeking Alpha and IBES

The table presents the results from the following panel regression:

$$Coverage_{it} = \alpha + \beta_1 Institutional\ Ownership_{i,t-1} + \beta_2 Breadth\ of\ Ownership_{i,t-1} + \boldsymbol{\beta Characteristics} + Time_t + \varepsilon_{it.}$$

In Specifications 1 and 2, *Coverage* is defined as the natural log of 1 plus the total number of Seeking Alpha contributors who contribute at least one article for the stock during the calendar year (*SA Coverage*). In Specifications 3 and 4, it is the natural log of 1 plus the total number of brokerage firms that issue at least one earnings forecast for the stock during the calendar year (*IBES Coverage*). *Institutional Ownership*$_{i,t-1}$ is the percentage of the firm's shares held by institutional investors at the end of the previous year, and *Breadth of Ownership* is the number of common shareholders. ***Char***$_{i,t-1}$ is a vector of firm characteristic controls. Detailed descriptions of the variables are presented in Appendix A. The continuous variables with the exception of *Return* and *Profitability* are in natural logs, and all variables are standardized to have mean zero and unit variance. All specifications include year fixed effects and standard errors are clustered by firm, with t-statistics reported in parentheses below the corresponding coefficient estimates. The sample spans 2005-2017 and consists of 42,316 firm-year observations with 5,849 unique firm clusters.

	Log (SA Coverage)		*Log (IBES Coverage)*	
	[1]	[2]	[3]	[4]
Institutional Ownership	-0.18	-0.19	0.15	0.16
	(-16.27)	(-17.12)	(15.50)	(15.83)
Log (Breadth of Ownership)	0.03	0.03	-0.07	-0.07
	(3.13)	(3.52)	(-9.91)	(-10.05)
Log (Size)	0.35	0.31	0.67	0.66
	(20.29)	(15.85)	(49.26)	(46.84)
Log (BM)	-0.01	-0.01	0.00	0.00
	(-1.49)	(-1.80)	(-0.12)	(-0.05)
Log (Vol)	0.14	0.14	0.05	0.04
	(13.19)	(13.06)	(5.41)	(4.92)
Log (Turn)	0.08	0.06	0.31	0.30
	(7.75)	(5.90)	(24.40)	(24.21)
Return	0.01	0.01	0.04	0.04
	(2.44)	(2.29)	(4.30)	(4.19)
Profitability	0.03	0.04	-0.04	-0.04
	(5.06)	(5.45)	(-6.71)	(-6.96)
Log (Media Coverage)	0.30	0.29	0.04	0.03
	(25.46)	(25.12)	(7.26)	(5.45)
Log (IBES Coverage)		0.07	-0.04	
		(5.32)	(-4.35)	
Log (SA Coverage)				0.03
				(5.36)
Fixed Effects	Time	Time	Time	Time
R-squared	45.69	45.81	76.79	76.85

Table 3: Seeking Alpha Research Coverage and Retail Investor Trading

The table presents the results from the following daily panel regression:

$$Retail\ Trading_{it} = \alpha + \beta_1 SA_{it-1,t} + \beta_2 IBES_{it-1,t} + \beta_3 Media_{it-1,t+} \boldsymbol{\beta_4 Char} + Time_t + Firm_i + \varepsilon_{it.}$$

In Specifications 1 and 2, $Retail\ Trading_{it}$ denotes $Retail\ Turnover_{it}$, which is 1 plus the total retail trading volume in stock *i* on day *t*, scaled by stock *i*'s shares outstanding, measured in natural logs. In Specifications 3 and 4, it denotes *Percentage Retail Turnover*, which is the total retail trading volume in stock *i* on day *t*, scaled by the aggregate trading volume in stock *i* on day *t*. $SA_{it-1,t}$ is a dummy variable equal to one if Seeking Alpha issued a research report for firm *i* on day *t* or *t-1*. $IBES_{it-1,t}$ is a dummy variable equal to one if IBES issued a research report for firm *i* on day *t* or *t*-1, and $Media_{it-1,t}$ is a dummy variable equal to one if firm *i* was mentioned in traditional media article on day *t* or *t*-1. ***Char*** is a vector of firm characteristics measured at the end of the previous year. More details are available in the Appendix. All continuous independent variables are standardized to have mean zero and unit variance. *Time* and *Firm* indicate time (calendar day) and firm fixed effects. Standard errors are clustered by firm.

	Log (Retail Turnover)		*Percent Retail Turnover*	
	[1]	[2]	[3]	[4]
SA	0.15	0.13	1.09	0.62
	(15.07)	(24.09)	(14.77)	(20.39)
IBES	0.09	0.08	0.30	0.06
	(24.08)	(48.98)	(8.81)	(5.81)
Media	0.07	0.09	0.69	0.12
	(5.86)	(18.57)	(7.35)	(4.45)
Log (Size)	-0.10	-0.12	-2.91	-3.79
	(-7.61)	(-7.55)	(-21.09)	(-19.84)
Log (BM)	0.01	-0.03	-0.24	-0.16
	(1.33)	(-5.11)	(-3.71)	(-2.34)
Inst Ownership	-0.09	-0.01	-2.70	-0.95
	(-16.34)	(-1.75)	(-31.19)	(-10.14)
Log (Breadth of Ownership)	0.00	0.01	0.37	0.22
	(-0.54)	(1.30)	(6.08)	(1.65)
Log (Vol)	0.10	0.07	0.66	0.46
	(12.59)	(10.82)	(6.78)	(6.15)
Log (Turn)	0.17	0.12	0.70	0.22
	(8.15)	(12.93)	(5.63)	(2.23)
Return	0.01	0.01	-0.54	-0.36
	(2.04)	(2.12)	(-7.59)	(-5.96)
Profitability	-0.03	0.00	-0.70	0.02
	(-5.93)	(0.17)	(-11.94)	(0.23)
Log (IBES Coverage)	0.02	0.01	-0.04	0.01
	(1.00)	(1.56)	(-0.30)	(0.08)
Log (SA Coverage)	0.06	0.01	0.75	0.06
	(9.90)	(3.55)	(14.06)	(1.35)
Log (Media Coverage)	0.03	0.02	0.50	0.22
	(5.55)	(5.44)	(8.61)	(5.34)
Fixed Effects	Time	Time & Firm	Time	Time & Firm
Observations	3,925,070	3,925,070	3,676,764	3,676,764
R-squared	27.47	46.13	35.17	47.33

Table 4: Seeking Alpha Article Tone and Retail Investor Order Imbalance
This table presents results from the following regression:

$$Retail\ OIB_{i,t+x} = \alpha + \beta_1 SA_{it} + \beta_2 SA \times Percent\ Neg_{it} + \beta_3 SA \times Percent\ Pos_{it} + \beta_4 SA \times Short\ Position_{it} + \beta_5 SA \times Long\ Position_{it} + \beta_6 IBES_{it} + \beta_7 IBES \times Long + \beta_8 IBES \times Short + \beta_9 Media_{it} + \beta_{10} Media \times Percent\ Neg_t + \beta_{11} Media \times Percent\ Pos_{it} + \beta_{12} Inst\ OIB_{it} + \boldsymbol{\beta_{13} Char_{iy-1}} + Time_t + \varepsilon_{it}.$$

$Retail\ OIB_{i,t+x}$ is defined as retail buy volume less retail sell volume, scaled by total retail trading volume for firm *i* on day $t+x$, where *t* is the event day and *x* varies from -3 to 3. SA is a dummy equal to one if Seeking Alpha published an article for firm *i* on day *t*; *IBES and Media* are defined analogously. $Percent\ Neg_{it}$ (Pos_{it}) is the average fraction of negative (positive) words across SA (or media) articles about company *i* on day *t*. SA *Short* (*Long*) $Disclosure_{it}$ equals one if the SA author is short (long) the stock, IBES *Short* equals one if the IBES report is negative (i.e., a recommendation downgrade or negative forecast revision), and IBES *Long* equals one if the IBES report is positive. ***Chars*** is a vector of firm characteristics that includes *Turnover, Volatility*, *Size*, and *BM,* all measured at the end of the previous year, and *returns* measured over the past week, month, and past two to seven months. More details are available in the Appendix. All continuous independent variables are in natural logs (with the exception of returns) and standardized to have mean zero and unit variance. Each regression includes time (calendar day) fixed effects. Standard errors are clustered by firm, and *t*-statistics are reported in parentheses below the corresponding coefficient estimates. The sample includes 45,084 stock-day observations over the period 2007-2017.

	Retail Order Imbalance by Event Day						
	-3	-2	-1	0	1	2	3
SA	2.80%	4.35%	5.06%	6.52%	5.34%	2.39%	3.34%
	(2.20)	(4.05)	(4.96)	(6.06)	(5.00)	(1.77)	(2.45)
SA × Percent Negative	-0.34%	-0.26%	-0.41%	-1.17%	-1.05%	-0.40%	-0.50%
	(-1.62)	(-1.37)	(-2.18)	(-5.52)	(-4.97)	(-1.89)	(-2.38)
SA × Percent Positive	0.33%	-0.13%	0.03%	0.08%	0.35%	0.25%	-0.15%
	(1.29)	(-0.58)	(0.12)	(0.31)	(1.47)	(0.92)	(-0.55)
SA × Short Position	-0.85%	-3.08%	-4.14%	-6.75%	-6.41%	-4.33%	-2.94%
	(-0.49)	(-1.62)	(-2.21)	(-3.61)	(-3.41)	(-2.21)	(-1.65)
SA × Long Position	1.41%	0.59%	1.21%	3.83%	2.15%	1.52%	1.66%
	(1.58)	(0.69)	(1.24)	(3.91)	(2.30)	(1.67)	(1.77)
Media	1.45%	0.94%	2.41%	2.14%	2.23%	1.18%	0.29%
	(1.39)	(0.90)	(2.37)	(2.29)	(2.37)	(1.19)	(0.29)
Media × Percent Negative	-0.15%	-0.01%	-0.19%	-0.37%	-0.82%	-0.56%	-0.60%
	(-0.69)	(-0.03)	(-0.87)	(-1.84)	(-3.84)	(-2.43)	(-2.62)
Media × Percent Positive	-0.47%	-0.06%	-0.30%	0.12%	0.05%	-0.36%	0.32%
	(-2.29)	(-0.32)	(-1.48)	(0.65)	(0.27)	(-1.77)	(1.55)
IBES	1.51%	2.61%	2.27%	1.00%	1.65%	1.14%	1.67%
	(2.80)	(4.39)	(4.09)	(2.06)	(3.34)	(2.10)	(3.38)
IBES × Long	1.83%	-1.96%	-0.29%	2.59%	1.63%	0.87%	-0.62%
	(1.86)	(-2.04)	(-0.31)	(2.73)	(1.69)	(0.89)	(-0.65)
IBES × Short	1.38%	0.16%	0.75%	0.86%	-1.89%	-0.52%	-0.51%
	(1.44)	(0.16)	(0.74)	(0.93)	(-1.98)	(-0.54)	(-0.52)
Institutional OIB	8.90%	8.90%	8.69%	8.64%	9.11%	8.85%	8.76%
	(40.20)	(38.99)	(37.99)	(38.63)	(40.32)	(39.21)	(37.67)
Firm Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Time	Time	Time	Time	Time	Time	Time
R-squared	2.24	2.24	2.21	2.19	2.23	2.25	2.21

Table 5: The Informativeness of Retail Trading following Seeking Alpha Research
This table reports results from the panel regression:

$$Ret_{it,t+x} = \alpha + \beta_1 Retail\ OIB_{it} + \beta_2 Inst\ OIB_{it} + \beta_3 SA_{it} + \beta_4 Retail\ OIB \times SA_{it} + \beta_5 Inst\ OIB_{it} \times SA_{it} + \beta_6 Media_{it} + \beta_7 Retail\ OIB \times Media_{it} + \beta_5 Inst\ OIB_{it} \times SA_{it} + \beta_6 Media_{it} + \beta_7 Retail\ OIB \times Media_{it} + \beta_8 Inst\ OIB \times Media_{it} + \beta_9 IBES_{it} + \beta_{10} Retail\ OIB \times IBES_{it} + \beta_{11} Inst\ OIB \times IBES_{it} + \boldsymbol{\beta_{12} Char_{iy-1}} + Time_t + \varepsilon_{it}$$

$Ret_{it,t+x}$ is the return on the stock from the close of day t to the close of day $t+x$. $Retail\ OIB_{it}$ is the total retail buy volume less total retail sell volume, scaled by total retail trading volume for stock i on day t, and *Inst OIB* is defined analogously. SA_{it} is a dummy variable equal to one if a research report on firm i was published on Seeking Alpha on day t or $t-1$, and *IBES* and *Media* are defined analogously. $RetailOIB_{it} \times SA_{it}$ is an interaction terms that captures the incremental informativeness of retail order imbalances following Seeking Alpha articles. ***Chars*** is a vector of firm characteristics described in the Appendix. All continuous variables are standardized and all regressions include time (calendar day) fixed effects. Standard errors are double clustered by date and firm, and *t*-statistics are reported below each estimate. The sample spans 2007-2017 and is comprised of 4,102,574 firm-day observations.

	Holding Period		
	[1]	[1,5]	[1,10]
Retail OIB	0.02%	0.06%	0.09%
	(10.85)	(12.80)	(10.60)
Institutional OIB	-0.04%	-0.04%	-0.03%
	(-9.88)	(-4.93)	(-2.92)
SA	0.02%	0.04%	0.04%
	(2.26)	(1.28)	(0.71)
Retail OIB × SA	0.04%	0.04%	0.09%
	(4.19)	(1.49)	(2.58)
Institutional OIB × SA	0.02%	0.02%	-0.01%
	(2.02)	(0.62)	(-0.13)
Media	-0.01%	-0.01%	-0.01%
	(-1.38)	(-0.29)	(-0.15)
Retail OIB × Media	0.02%	0.04%	0.03%
	(1.24)	(1.24)	(0.85)
Institutional OIB × Media	0.07%	0.11%	0.09%
	(4.31)	(3.21)	(2.40)
IBES	-0.01%	0.00%	0.01%
	(-1.05)	(-0.08)	(0.12)
Retail OIB × IBES	0.00%	0.00%	-0.02%
	(-0.24)	(-0.31)	(-0.90)
Institutional OIB × IBES	0.02%	0.01%	0.04%
	(2.25)	(0.54)	(1.96)
Ret_{w-1}	-0.02%	-0.09%	-0.12%
	(-4.01)	(-3.77)	(-3.31)
Ret_{m-1}	-0.01%	-0.04%	-0.04%
	(-1.87)	(-1.23)	(-0.72)
$Ret_{m-7,m-2}$	0.00%	0.00%	0.00%
	(-0.50)	(-0.10)	(0.04)
$Turnover_{m-1}$	-0.01%	-0.06%	-0.12%
	(-2.37)	(-2.27)	(-2.52)
$Volatility_{m-1}$	0.01%	0.06%	0.09%
	(1.84)	(1.50)	(1.22)
Log (Size)	0.00%	-0.01%	-0.01%
	(-0.62)	(-0.32)	(-0.24)
Log (BM)	0.00%	0.01%	0.03%
	(0.39)	(0.50)	(0.52)
Fixed Effects	Time	Time	Time
R-squared	16.59%	15.81%	15.24%

Table 6. Retail Trading Informativeness Following Seeking Alpha Research: Size and Contributor Skill
The table repeats the analysis in Table 5 after partitioning the sample based on firm size and contributor skill. In Panel A, the sample is split into Small and Large firms based on median market capitalization at the end of the previous year. In Panel B, the research article sample is split into High and Low Skill contributors based on the median average two-day absolute market-adjusted return across the last five articles written by the contributor. Standard errors are double clustered by date and firm, and *t*-statistics are reported in parentheses below each estimate. The sample spans 2007-2017.

	Coefficient on *Retail OIB×SA*		
Panel A: Firm Size			
	Holding Period:		
	[1]	[1,5]	[1,10]
Small Firms	0.09%	0.10%	0.17%
	(4.49)	(2.33)	(2.78)
Large Firms	0.01%	-0.01%	0.04%
	(0.56)	(-0.42)	(1.08)
Difference in Coefficients	0.08%	0.12%	0.14%
	(3.62)	(2.10)	(1.95)
Panel B: Contributor Skill			
	Holding Period:		
	[1]	[1,5]	[1,10]
High Skill	0.11%	0.14%	0.25%
	(4.22)	(2.70)	(2.77)
Low Skill	0.01%	-0.08%	-0.07%
	(0.71)	(-1.87)	(-1.24)
Difference in Coefficients	0.09%	0.22%	0.32%
	(3.05)	(3.33)	(2.91)

Table 7: Departing Seeking Alpha Contributors: Validity Tests

The table reports the effects of departing Seeking Alpha contributors on research coverage. Firms experience *Contributor Departure* if at least 20% of the firm's existing contributors depart Seeking Alpha in the previous year. Control firms are firms with no departing Seeking Alpha contributors. Panel A reports univariate statistics for coverage and firm characteristics. *SA Coverage* is the total number of unique Seeking Alpha contributors writing at least one article for the stock during the calendar year, and *ΔLog (SA Coverage)* is defined as $Log(1+SA\ Coverage_{it})–Log(1+SA\ Coverage_{it-1})$. Panel B presents the estimates from regressing measures of changes in different measures of research *Coverage* on a *Contributor Departure* indicator variable. We include as controls a number of firm characteristics described in the appendix. The regressions also include time × style fixed effects, where the style dummies capture the 25 size and book-to-market portfolios, which effectively matches treated firms to control firms in the same year and size and book-to-market quintiles. Standard errors are clustered by firm and time, and *t*-statistics are reported in parentheses below each estimate. The sample covers 2005-2017.

Panel A: Summary Statistics for Control Firms and Contributor Departure Firms

	Observations	Percent Change Coverage	Log (Size)	Log (MB)
Control Firms	8,408	14.06%	13.60	0.78
Contributor Departure Firms	1,900	-19.61%	14.50	1.07

Panel B: Regression of Changes in Coverage on Contributor Departure

	Δ (Log SA Coverage)	*Δ (Log Non-Depart. SA Coverage)*	Δ (Log IBES Coverage)	Δ (Log Media Coverage)
	[1]	[2]	[3]	[4]
Contributor Departure	-35.40%	6.31%	-0.22%	4.02%
	(-16.15)	(2.60)	(-0.59)	(1.33)
Δ (Log Non-Depart. SA Coverage)			1.44%	4.94%
			(6.57)	(3.79)
Δ (Log IBES Coverage)	9.50%	9.63%		(0.01)
	(5.70)	(5.70)		(0.36)
Δ (Log Media Coverage)	11.18%	10.85%	0.22%	
	(7.69)	(7.30)	(0.36)	
Log (Size)	1.90%	0.57%	9.85%	12.38%
	(0.74)	(0.21)	(6.03)	(3.13)
Log (BM)	-3.10%	-3.09%	-0.21%	-0.58%
	(-2.22)	(-2.19)	(-0.20)	(-0.77)
Inst Ownership	0.18%	0.78%	1.40%	-1.56%
	(0.12)	(0.49)	(3.43)	(-1.50)
Log (Breadth of Ownership)	0.65%	0.67%	-1.01%	1.15%
	(0.97)	(0.92)	(-4.93)	(1.48)
Log (Vol)	1.09%	0.77%	1.74%	4.44%
	(0.65)	(0.46)	(2.61)	(2.48)
Log (Turn)	-2.54%	-3.04%	3.98%	-1.03%
	(-1.82)	(-1.96)	(2.66)	(-1.68)
Return	1.78%	1.79%	1.82%	0.11%
	(2.01)	(1.95)	(5.41)	(0.21)
Profitability	1.57%	1.51%	0.19%	0.28%
	(1.47)	(1.39)	(0.45)	(0.41)
Log (IBES Coverage)	2.93%	3.08%	-16.65%	1.43%
	(3.03)	(3.74)	(-9.73)	(1.06)
Log (Media Coverage)	4.52%	3.66%	0.07%	-21.58%
	(3.58)	(3.19)	(0.13)	(-5.08)
Fixed Effects	Time × Style	Time × Style	Time × Style	Time × Style
Total R-squared	16.01%	12.23%	18.21%	29.30%

Table 8: Departing Seeking Alpha Contributors: Effects on Firm Liquidity
The table reports the results from the following panel regression:

$$\Delta Illiquid_{it} = \alpha + \beta_1 ContrDepart_{it} + \beta 2 \Delta Log(Non\text{-}Depart\ SA\ Cov_{it}) + \beta 3 \Delta Log\ (IBESCov_{it}) + \boldsymbol{\beta Chars} + Tm \times Style_{it} + \varepsilon_{it},$$

where $Illiquid_{it}$ is the percentage bid-ask spread (*Bid-Ask*) in Specifications 1 and 2 and the Amihud (2002) illiquidity ratio (*Amihud*) in Specifications 3 and 4, both measured in natural logs. Both measures are calculated monthly using daily averages; change is defined as $Illiquid_{it}$ - $Illiquid_{it-12}$. Firm *i* experiences contributor departure ($ContrDepart_{it}$) if at least 20% of its existing contributors depart Seeking Alpha (i.e. issue research for at least five stocks in the calendar year prior to month *t*, and for no stocks in calendar year 0 onwards). *Non-Depart SA Cov*$_{it}$ ($IBESCov_{it}$) denotes the number of unique non-departing Seeking Alpha contributors (brokerage firms in IBES) that issue at least one research report research for the stock during calendar year *t*. ***Chars*** denotes a vector of firm characteristics that is defined in the Appendix. Each regression includes time×style fixed effects ($Tm \times Style_{it}$) based on the 25 size and book-to-market portfolios. Standard errors are clustered by firm and month, and *t*-statistics are reported below each estimate. The sample period spans 2005-2017 and is comprised of 123,645 firm-month observations.

	Δ Log (Bid-Ask)		*Δ Log (Amihud)*	
	[1]	[2]	[3]	[4]
Contributor Departure	3.45%	2.15%	7.51%	5.15%
	(2.98)	(2.47)	(7.02)	(5.72)
Log (Size)		-7.82%		-16.17%
		(-1.87)		(-3.69)
Log (BM)		1.28%		1.86%
		(1.57)		(1.09)
Institutional Ownership		-0.42%		-4.71%
		(-0.46)		(-3.07)
Log (Breadth of Ownership)		0.04%		-0.16%
		(0.12)		(-0.28)
Log (Vol)		-5.68%		-16.09%
		(-2.79)		(-4.08)
Log (Turnover)		6.06%		20.95%
		(6.57)		(10.00)
Return		-13.95%		-27.62%
		(-10.57)		(-10.56)
Profitability		-0.45%		-1.74%
		(-0.69)		(-2.17)
Log (IBES Coverage)		3.54%		-0.38%
		(2.59)		(-0.25)
Δ (Log Non-Departing SA Coverage)		0.54%		0.63%
		(0.72)		(0.80)
Δ (Log IBES Coverage)		-1.95%		-7.73%
		(-3.43)		(-7.05)
Δ (Log Media Coverage)		-11.77%		-28.02%
		(-3.91)		(-6.48)
Fixed Effects	Time × Style	Time × Style	Time × Style	Time × Style
R-squared	19.92%	27.86%	22.54%	34.60%

Table 9: Departing Seeking Alpha Contributors and Liquidity: Ownership, Size, and Contributor Skill
The table repeats the analysis in Table 8 after partitioning the sample based on institutional ownership, firm size, and contributor skill. In Panel A (B), the sample of firms is split into High and Low Institutional Ownership (Size) using the median value at the end of the previous year. In Panel C, the sample split is based on whether the fraction of departing contributors with high skill is greater than 50%. Contributor skill is measured as the average two-day market-adjusted return across the last five articles written by the contributor. For each partition, we estimate the panel regression:

$$\Delta Illiquid_{it} = \alpha + \beta_1 ContrDepart_{it} + \beta 2 \Delta Log(Non\text{-}Depart\ SA\ Cov_{it}) + \beta 3 \Delta Log\ (IBESCov_{it}) + \boldsymbol{\beta Chars} + Tm \times Style_{it} + \varepsilon_{it},$$

where $Illiquid_{it}$ is the percentage bid-ask spread (*Bid-Ask*) or the Amihud (2002) illiquidity ratio (*Amihud*), both measured in natural logs. The illiquidity measures are calculated monthly using daily averages, and $\Delta Illiquid_{it}$ is the illiquidity measure in month t less the measure in month t-12. Firms are classified as experiencing contributor departure ($ContrDepart_{it}$) if at least 20% of firm i's existing contributors depart Seeking Alpha (i.e. issue research for at least five stocks in calendar years -3 through -1 before month t, and for no stocks in calendar year 0 onwards). $Non\text{-}DepartSACov_{it}$ ($IBESCov_{it}$) denotes the number of unique non-departing Seeking Alpha contributors (brokerage firms in IBES) that issue at least one research report research for stock during calendar year 0. ***Chars*** denotes a vector of firm characteristics that is defined in the Appendix. Each regression includes time×style fixed effects ($Tm \times Style_{it}$) based on the 25 size and book-to-market portfolios. Standard errors are clustered by firm and time, and t-statistics are reported below each estimate. The sample period spans 2005-2017 and is comprised of 123,645 firm-month observations.

	Coefficient on *Contributor Departure*	
Panel A: Sorts on Institutional Ownership		
	Δ *Log (Bid-Ask)*	Δ *Log (Amihud)*
Low Institutional Ownership	5.26	12.27
	(3.08)	(5.40)
High Institutional Ownership	-0.06	-0.25
	(-0.07)	(-0.27)
Difference in Coefficients	5.32	12.52
	(2.68)	(4.35)
Panel B: Sorts on Firm Size		
	Δ *Log (Bid-Ask)*	Δ *Log (Amihud)*
Small Firms	3.95	9.28
	(1.67)	(4.99)
Large Firm	0.60	0.95
	(0.46)	(0.94)
Difference in Coefficients	3.35	8.33
	(1.04)	(3.47)
Panel C: Sorts on Departing Contributor Skill		
	Δ *Log (Bid-Ask)*	Δ *Log (Amihud)*
High Skill	3.95	7.25
	(3.54)	(5.21)
Low Skill	0.61	3.43
	(0.66)	(3.19)
Difference in Coefficients	3.34	3.82
	(2.26)	(1.90)

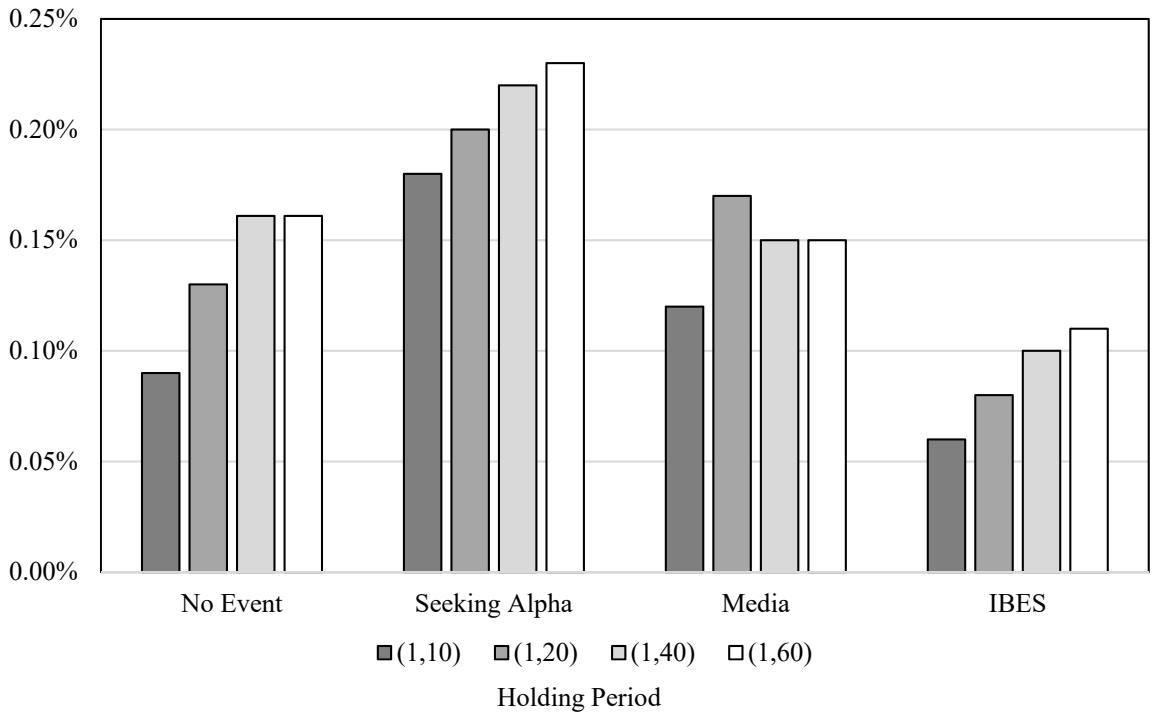
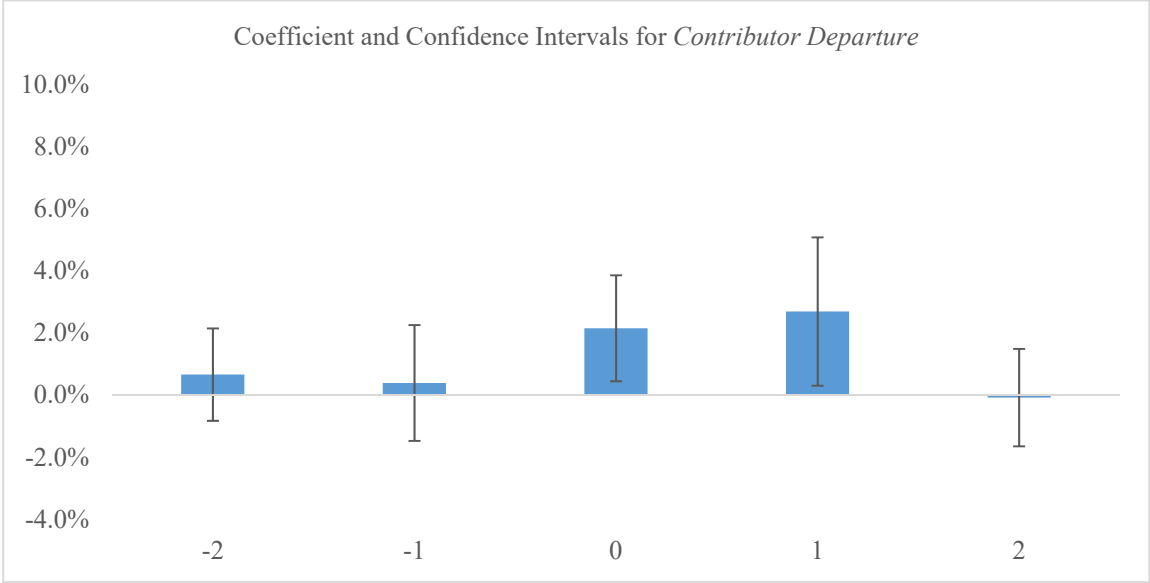


Figure 1. Informativeness of Retail Trading over Longer Horizons
This figure plots results from the panel regression of the form:

$Ret_{it,t+x} = \alpha + \beta_1 Retail\ OIB_{it} + \beta_2 Inst\ OIB_{it} + \beta_3 SA_{it} + \beta_4 Retail\ OIB \times SA_{it} + \beta_5 Inst\ OIB_{it} \times SA_{it} + \beta_6 Media_{it} + \beta_7 Retail\ OIB \times Media_{it} + \beta_5 Inst\ OIB_{it} \times SA_{it} + \beta_6 Media_{it} + \beta_7 Retail\ OIB \times Media_{it} + \beta_8 Inst\ OIB \times Media_{it} + \beta_9 IBES_{it} + \beta_{10} Retail\ OIB \times IBES_{it} + \beta_{11} Inst\ OIB \times IBES_{it} + \boldsymbol{\beta_{12} Char_{iy-1}} + Time_t + \varepsilon_{it}$

$Ret_{it,t+x}$ is the return on the stock from the close of day t to the close of day $t+x$. The figure reports estimates where x equals 10, 20, 40, or 60 days. All variables are defined as in Table 5. The figure plots the coefficient estimates around No Event (i.e., β_1), Seeking Alpha research ($\beta_1 + \beta_4$), Media articles ($\beta_1 + \beta_7$), and IBES research ($\beta_1 + \beta_{11}$). The sample spans 2007-2017 and is comprised of 4,102,574 firm-day observations.

Panel A: Dependent Variable is *ΔLog(Bid-Ask)*



Panel B: Dependent Variable is *ΔLog(Amihud)*

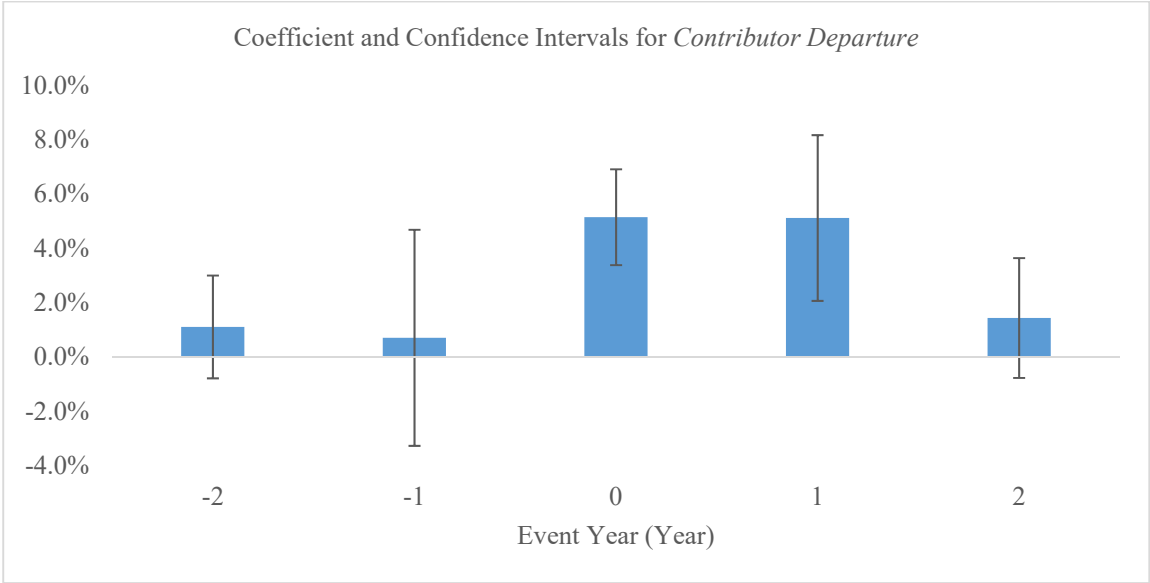


Figure 2. Dropped Seeking Alpha Coverage and Measures of Liquidity in Event Time
The figure repeats the analysis in Specifications 2 and 4 of Table 8 for different years around the event. We vary the timing of *Contributor Departure* from *Contributor Departure*$_{i,t-2}$ to *Contributor Departure*$_{i,t+2}$, where *Contributor Departure*$_{i,t}$ (i.e., event year = 0) represents the baseline results reported in Table 8. The vertical bars show the coefficients on *Contributor Departure* and the lines show the 95% confidence intervals for the estimates.

Internet Appendix for

The Democratization of Investment Research:

Implications for Retail Investor Profitability and Firm Liquidity

Mike Farrell, T. Clifton Green, Russell Jame, and Stan Markov [*]

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Table IA.1 The Informativeness of Retail Trading Following Seeking Alpha Research: Robustness Checks
The table repeats the analysis in Table 5 in alternative ways for robustness. The regressions include the full set of controls from Table 5, but for brevity, only the coefficient on *RetailOIB×SA* is tabulated. Specification 1 reports the Baseline Results from Table 5 as a benchmark. *CRSP Midpoint* refers to calculating returns using bid-ask midquote rather than closing transaction prices. *Trades Instead of Volume* refers to measuring retail order imbalances using the number of trades instead of trading volume. *Add Earnings Events* includes firm-days with earnings news on day *t* or *t*-1 (i.e., earnings announcements, earning guidance). *Add Firm Fixed Effects* add firm dummies to the baseline specification reported in Table 5. Fama MacBeth switches from a panel regression to a Fama MacBeth approach to estimate the coefficients. Specifically, we estimate the above equation cross-sectionally each day for which at least 10 firms had Seeking Alpha Articles (i.e. $SA_{it} = 1$). We then average the coefficients across regressions and calculate standard errors using Newey West with 1, 5, and 10 lags.

	Coefficient on *Retail OIB × SA*		
	Holding Period		
	[1]	[1,5]	[1,10]
Baseline Results	0.04%	0.04%	0.09%
	(4.19)	(1.49)	(2.58)
Trades Instead of Volume	0.07%	0.03%	0.08%
	(5.94)	(1.10)	(2.04)
Add Earnings Events	0.04%	0.04%	0.09%
	(3.79)	(1.46)	(2.62)
Add Firm Fixed Effects	0.05%	0.04%	0.10%
	(4.21)	(1.60)	(2.79)
Fama-Macbeth (>= 10 SA Obs.)	0.05%	0.06%	0.11%
	(3.83)	(1.59)	(2.49)

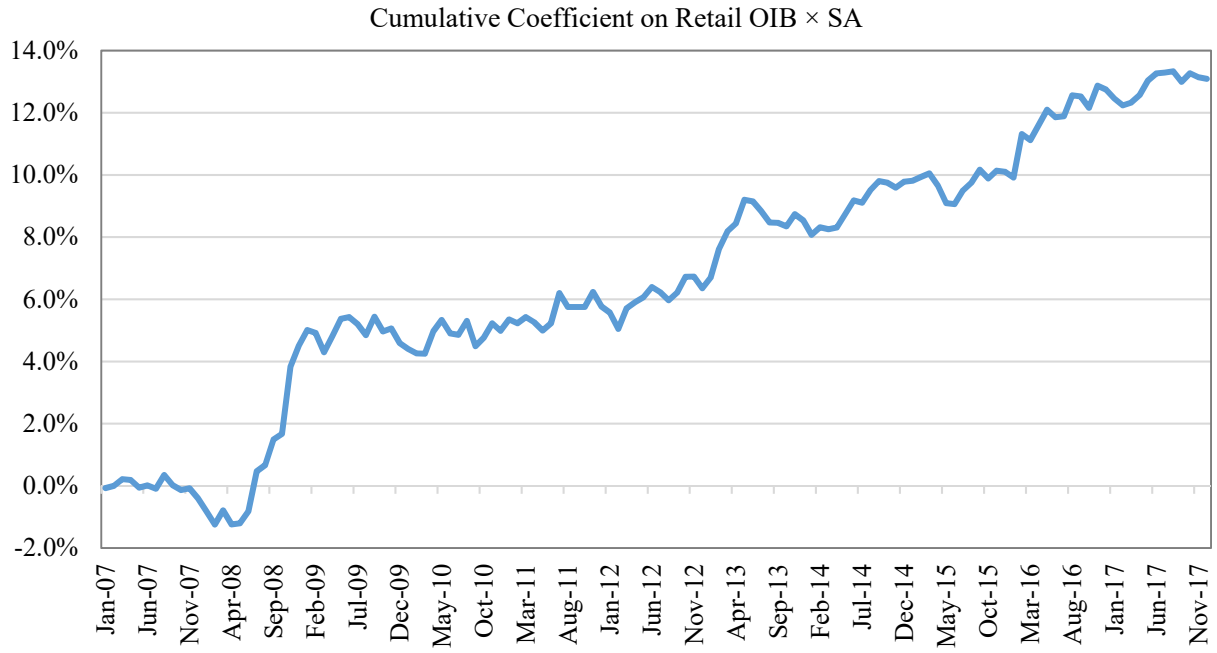

Figure IA.1: The Informativeness of Retail Trading Following Seeking Alpha Research over Time

Each month, we estimate the following panel regression:

$$Ret_{it,t+10} = \alpha + \beta_1 Retail\ OIB_{it} + \beta_2 Inst\ OIB_{it} + \beta_3 SA_{it} + \beta_4 Retail\ OIB \times SA_{it} + \beta_5 Inst\ OIB_{it} \times SA_{it} + \beta_6 Media_{it} + \beta_7 Retail\ OIB \times Media_{it} + \beta_5 Inst\ OIB_{it} \times SA_{it} + \beta_6 Media_{it} + \beta_7 Retail\ OIB \times Media_{it} + \beta_8 Inst\ OIB \times Media_{it} + \beta_9 IBES_{it} + \beta_{10} Retail\ OIB \times IBES_{it} + \beta_{11} Inst\ OIB \times IBES_{it} + \boldsymbol{\beta_{12} Char_{iy-1}} + Time_t + \varepsilon_{it}$$

The regression is identical to Specification 3 of Table 5 except that the regression is estimated separately each month. The figure plots the cumulative coefficient on *Retail OIB * SA* over the full-sample period.