Demand for Information and Asset Pricing*

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Abstract

Typically, academics rely on the supply of information that arrives to market (e.g., macroeconomic announcements, earnings reports, or news releases) to study how information affects asset prices. In this paper, we use measures of *demand* for information. We show that institutional demand is much more likely than information supply to be associated with a risk premium because it captures systematic information that spills over from other stocks and the macroeconomy. Consistent with this, the CAPM performs better when institutions demand information, and the positive effect of FOMC announcements on risk premia (Savor and Wilson, 2014) appears to be modulated by investor demand for information on individual stocks.

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1. Introduction

How information becomes incorporated into asset prices is one of the most fundamental issues in finance (e.g., Grossman and Stiglitz, 1976; Copeland, 1976). Despite its longstanding importance, however, there has been a recent rebirth of interest from academics as the arrival of information appears to be associated with a risk premium and the CAPM performs better on days when economic announcements occur (Savor and Wilson, 2013, 2014; Lucca and Moench, 2015). It is intuitive that risk premia should accrue on days when the arrival of information generates systematic price movements, and these results have been confirmed empirically (Patton and Verardo 2012; Savor and Wilson, 2016) and explored theoretically (Ai and Bansal, 2017; Andrei, Cujean, and Wilson, 2017).

To study the impact of information on individual stock prices, a natural place to start is with the *supply of information* that arrives to market, such as scheduled firm announcements, earnings reports, dividend announcements, or news releases (e.g., Beaver, 1968; Kalay and Loewenstein, 1985, among others). This is reasonable because market participants should update their beliefs about asset values when news arrives. But, many of these announcements are likely to convey idiosyncratic information that does not command a risk premium. Moreover, focusing on firm-specific announcements may overlook important information spillover from related firms and the macroeconomy, which is more systematic in nature. As such, the information supply proxies currently examined in the literature might understate the effects that new information has on asset prices and risk premia.

In this paper, we characterize how the *demand for information* on a stock affects its price. We posit that demand for information is more likely to be systematic in nature and capture value-relevant information that spills over from other stocks, conveying changes in firms in the same industry or about general economic conditions. In addition, while the supply of information may not guarantee investor attention, the demand for information generally does, and therefore facilitates timely information processing. As a result, this should imply that information actively demanded by investors is more likely to be associated with a risk premium and the CAPM should perform better when investors demand information.

We consider both institutional and retail demand for information, and how they interact with the supply of information in the market. We measure demand shocks from institutions by using data from Bloomberg queries and constructing an abnormal institutional attention variable (AIA; Ben-Rephael, Da, and Israelsen, 2017). We measure demand shocks from retail investors by analyzing Google search activity and constructing a similar variable that captures shocks to retail attention (DSVI; Da, Engelberg, and Gao, 2011).

We begin by analyzing what drives institutional demand for information. Naturally, we find that when news is released about a particular firm, AIA for that stock is more likely to be positive. But, demand for information about a particular stock commonly arises when no news about that firm has been released. Instead, institutional demand for information on individual stocks also appears to be triggered by industry- and other aggregate news events. We show that industry-level news, news about large firms, and macroeconomic news – especially Federal Open Market Committee (FOMC) announcements – are all positively correlated with greater institutional demand for information about individual stocks. Thus, AIA enables us to directly capture information spillovers and learning across stocks.

When general news arrives in the market, this is associated with increased demand for information about individual stocks and provides a channel through which systematic risk is transmitted across the market. Consistent with this, we show that the CAPM beta is roughly 16%

higher on days with institutional demand for information on that stock.[1] In contrast, after controlling for institutional demand for information, the supply of news has no positive, statistically significant effect on systematic risk. This suggests that demand for information by institutional investors is associated with more systematic risk than many existing information supply proxies. More precisely, AIA, compared to popular information supply proxies, better *identifies* the subset of all information events that are likely to be associated with a risk premium.

We then confirm that the demand for information from institutional investors is associated with a positive risk premium in a panel regression framework as in Engelberg, McLean, and Pontiff (2016). Days in which there is a spike in demand for information are associated with higher average returns, even after controlling for both earnings announcement days and other news days. In fact, the average daily risk premium that accrues on positive AIA days is much larger than on days with a spike in the supply of information (14 vs. 4 basis points). Strikingly, these results are almost identical when we compare days with a demand shock with no supply of information to days with news, but no demand (12 vs. 4 basis points), confirming that demand for information more likely coincides with systematic information. Returns are about 12 basis points higher on earnings announcement days. However, once we control for the demand for information, this number drops to 4 basis points, which is no longer statistically significant.

Consistent with our risk premium conjecture, we find that high beta stocks carry larger premiums on days with high institutional demand for information than low beta stocks. In formal tests of the Capital Asset Pricing Model (CAPM), we find evidence of a significant daily market

[1] This is also consistent with Peng and Xiong (2006) who show that limited investor attention leads to category-learning behavior, i.e., investors tend to process more market and sector-wide information than firm-specific information. Consequently, demand for firm-specific information likely coincides with that of aggregate information and carries systematic implications.

risk premium for observations associated with institutional demand for information. By contrast, we find that the CAPM performs poorly when there is low institutional information demand.

We also confirm the findings of Savor and Wilson (2014) that the CAPM works on the set of days with important macroeconomic announcements. However, we find that this result is conditional on institutional demand. More specifically, the estimated market risk premium on days with FOMC announcements is about 18 basis points. On these days, the estimated CAPM risk premium is 50 basis points when we focus on stocks with institutional demand shocks, and not statistically significant for stocks with no demand shocks, suggesting institutional investor information demand is a necessary condition.

While spikes in retail information demand are associated with a statistically significant average daily risk premium, the magnitude is much lower (about 2 basis point). We further investigate the interaction of institutional and retail demand for information and find that retail demand has very little incremental impact on asset prices. On days when AIA is absent, retail demand for information is not associated with a risk premium. It is only when AIA is present that there is a relationship. This provides evidence that retail participation in the market has little permanent effect on prices, and certainly does not provide a countervailing effect in the market.

We carry out additional robustness tests to confirm that the positive return associated with AIA days is consistent with our risk premium explanation. First, we find that returns are higher during the first quarter of the year, compared to quarters 2-4. Importantly, this is not driven by the January effect and seems to be related to the nature of information being released during the earnings season. In particular, the first quarter is when the 10-K is released. Comparing the 10-K with the 10-Q, our findings are consistent with the notion that the 10-K carries more fundamental information of higher quality, and thus else being equal, results in a higher premium.[2]

Next, we focus on two cases in which demand for information is potentially more systematic in nature. Specifically, we explore how demand for information arises in small firms within industries and on firms that are late announcers in the quarterly earnings announcement cycle. We find that for both types of firms, institutional demand responds more to industry- and aggregate news and industry- and aggregate earnings announcements. Consistent with the dissemination of systematic information, on days when these firms have a spike in institutional demand (i.e., AIA=1), betas are higher and consequently, risk premiums are higher.

Finally, we verify that both the positive increase in beta and positive return on *AIA* days are not driven by temporary price pressure (e.g., Barber and Odean 2008) as we do not observe subsequent reversals. Moreover, using daily cross-sectional regressions, we verify that the premium earned on *AIA* days is robust to the methodology used. Interestingly, since the number of reporting firms is not evenly distributed within the earnings cycle, the return earned on earnings days is not significant using the cross-sectional methodology.

The remainder of the paper is organized as follows. In Section 2, we describe the data and provide sample statistics. In Section 3, we analyze the determinants of the demand for information, and how demand and supply affect trading volume, price movements, betas, and risk premia. In Section 4, we provide additional tests and robustness checks that support our risk premium conjecture. We conclude in Section 5.

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[2] This is due to the fact the entire annual information is being consolidated, and due to higher accounting standards required in the annual report. In particular, the accounting firm's professional obligation differs between the 10-K (annual) and the 10-Q (quarterly) reports. While both are being audited by an accounting firm, the firm issues a "review report" for the 10-Q filings and an "audit report" for the 10-K, where an audit report is the highest level of financial statement service a CPA can provide, and which entails greater responsibility.

2. Data and Sample Statistics

2.1 Sample Construction

Bloomberg provides data that include transformed measures of news reading and news searching activity on Bloomberg's terminals. The majority of Bloomberg terminal users are likely to be institutional investors who have both the incentives and financial resources to quickly react to important news about a firm (Ben-Rephael, Da, and Israelsen, 2017). Based on data availability, our sample period ranges from February 2010-December 2015.[3] Following Da, Engelberg, and Gao (2011), we begin with the sample of Russell 3000 stocks. We then require stocks in our sample to satisfy the following conditions: (1) have measures of news-searching and news-reading activity on Bloomberg terminals and the Google search engine; (2) have a share code of 10 or 11 in the Center for Research in Securities Prices (CRSP) database; (3) have stock prices greater than or equal to $5 at the end of the previous month; (4) have book-to-market information for the DGTW risk adjustment (Daniel, Grinblatt, Titman, and Wermers, 1997). After applying these conditions, we end up with 2,549 stocks and 1,949,960 day-stock observations.

2.2 Measures of the Demand for Information

Our two measures of demand for information are based on institutional and retail attention. In order to construct their own measure of attention, Bloomberg records the number of times news articles on a particular stock are read by its terminal users and the number of times users actively search for news about a specific stock. Searching for news requires users to actively type the firm's stock ticker symbol followed by the function "CN" (Company News). In contrast, users may read

[3] Bloomberg's historical attention measures begin on 2/17/2010. Historical data are missing for the periods of 12/6/2010 – 1/7/2011 and 8/17/2011 – 11/2/2011.

an article without initially realizing it refers to a specific firm. In order to place more emphasis on active demand for information for a specific firm, Bloomberg assigns a score of 10 when users search for news and 1 when users read a news article. Hence, even when there is no supply of information, this will capture demand. These numbers are then aggregated into hourly counts. Using the hourly counts, Bloomberg then creates a numerical attention score each hour by comparing the average hourly count during the previous 8 hours to all hourly counts over the previous month for the same stock. They assign a score of 0 if the rolling average is in the lowest 80% of the hourly counts over the previous 30 days. Similarly, Bloomberg assigns a score of 1, 2, 3 or 4 if the average is between 80% and 90%, 90% and 94%, 94% and 96%, or greater than 96% of the previous 30 days' hourly counts, respectively. Finally, Bloomberg aggregates up to the daily frequency by taking a maximum of all hourly scores throughout the calendar day. Bloomberg provides these latter transformed scores, but does not provide the raw hourly counts or scores.

The data appendix for Ben-Rephael, Da, and Israelsen (2017) contains detailed instructions explaining how to download the data from the Bloomberg terminal.[4] Since we are interested in abnormal attention, and not just the level of attention, our abnormal institutional attention measure (*AIA*) measure is a dummy variable that takes a value of 1 if Bloomberg's daily maximum is 3 or 4, and 0 otherwise. This captures the right tail of the measure's distribution. In other words, an *AIA* equal to one indicates the existence of institutional investor attention shock on that stock during that day. The dummy variable allows easier interpretation of the differential impact of high vs. low institutional attention shocks on economic outcomes. Ben-Rephael et al. (2017) provide evidence that *AIA* facilitates the incorporation of information into prices.

[4] Please see the online data appendix at the authors' websites for detailed instructions on downloading the Bloomberg search data: http://kelley.iu.edu/abenreph/ , http://www3.nd.edu/~zda/ or http://ryan.israelsen.com

Following Da et al. (2011), retail attention is measured using the daily Google Search Volume Index (*DSVI*). Abnormal *DSVI* (*ADSVI*) is calculated as the natural log of the ratio of *DSVI* to the average of *DSVI* over the previous month. To facilitate the comparison with *AIA* which is a dummy variable, we also create a dummy variable version of *ADSVI* following Bloomberg's methodology (*DADSVI*). Specifically, we assign *DSVI* on day *t* one of the potential 0, 1, 2, 3, or 4 scores using the firm's past 30 trading day *DSVI* values. For example, if *DSVI* on day *t* is in the lowest 80% of past *DSVI* values, it receives the score 0. Then, on day *t*, the dummy variable *DADSVI* is set to one if the score is 3 or 4, and 0 otherwise. In other words, a *DADSVI* of one indicates a spike in retail attention on that day.

2.3 Measures of the Supply of Information

Our three measures of the supply of information are based on general news, earnings announcements and macroeconomic announcements. We obtain news coverage of our sample stocks from RavenPack. To facilitate the economical comparison with *AIA* and *DADSVI*, we construct a dummy variable, denoted as *NDAY*, which is equal to one for stock *i* if a news article about the firm is published on the Dow Jones Newswire on day *t* and zero otherwise. Because we want to distinguish earnings announcements from other news, we set *NDAY* equal to zero on earnings announcement days. We obtain earning announcements dates from I/B/E/S. Similar to *NDAY*, we construct a dummy variable, denoted as *EDAY*, which is equal to one for stock *i* on days when the firm announces earnings and zero otherwise.

For each firm we calculate the value-weighted averages of *NDAY* and *EDAY* for other firms in the same (Fama French 48) industry, which we call *FF48_NDAY* and *FF48_EDAY*, respectively. In addition, we create two similar variables, *AGG_NDAY*, and *AGG_EDAY*, which capture the value-weighted averages of *NDAY* and *EDAY* using all firms in the sample on a given day.

Finally, we include several measures based on important macroeconomic news announcements. Because there are macroeconomic announcements almost every day, we limit ourselves to those that draw the most attention from institutional investors on Bloomberg terminals.[5] Those include announcements of nonfarm payroll (which we denote as *NFP*), the producer price index (*PPI*), the Federal Open Market Committee rate decision (*FOMC*), the "advance" forecast of the U.S. Gross Domestic Product (*GDP*), and the Institute for Supply Management Manufacturing Index (*ISM*). Announcement dates and times are all from Bloomberg. For each of these five announcements, we create dummy variables equal to one on announcement days and zero on other days. In addition to the five individual dummy variables, we also create the dummy variable *MACRO* which is set equal to one on days when at least one of the five announcement dummies is equal to one and zero otherwise.

In terms of timing, *NDAY* and *EDAY* are defined based on market trading hours. In particular, day *t* is a news day for firm *i* if the timestamp of the news article is between 4 p.m. on day *t*-1 and 4 p.m. on day *t*. Similarly, day *t* is an earnings announcement day for firm *i* if the firm announces its earnings during the period from 4 p.m. on day *t*-1 to 4 p.m. on day *t*. The time stamps associated with earnings announcements are obtained from I/B/E/S.[6]

Other variables used in our analysis are constructed from Compustat and CRSP. Table 1 defines all of the variables used in this paper.

[5] For macro announcements, attention is measured based on Bloomberg's "relevance score" which represents the number of "alerts" set on Bloomberg Terminals for an economic event relative to all alerts set for the 130 macro events in the U.S. Users can choose to be alerted to different types of announcement events.

[6] According to Michaely, Rubin, and Vedrashko (2014), these time stamps are very accurate and should result in very few misclassification errors at a daily frequency. Stock returns on day *t* are measured from the market close (4 p.m.) on day *t*-1 to the market close (4 p.m.) on day *t*. *AIA* and *DADSVI* on day *t* are measured during the 24 hours on that calendar day.

Insert Table 1 about here.

2.4 Summary Statistics

Panel A of Table 2 provides summary statistics. The average frequency of *AIA* across stocks is 0.088 in the full sample suggesting that the average stock in our sample experiences an information demand shock from institutional investors on 8.8% of all trading days. The average frequency of information demand shocks by retail investors is similar at 0.087.

Insert Table 2 about here.

Exploring the supply of information variables, for a typical firm in our sample, about one day out of four is a news day on average. Not surprisingly, firms have an average of four earnings announcement days per year.

The average (median) size is around 7.1 (1.4) billion. On average, $60 million dollars' worth of shares are traded per day for a given stock. Finally, the mean (median) daily return in our sample is 4.3 (5.7) basis points.

Panel B of Table 2 provides cross-tabulations for each pair of the four information supply and demand based on percentages of all day-stock observations as well as cross-tabulations including the dummy variables *DEMAND*, and *SUPPLY* which are set equal to 1 at least one of the corresponding demand or supply measures is equal to 1, and 0 otherwise. The bottom right cross tab shows that for a given stock, there is a demand shock on about 20% of all days and a supply shock on about 28% of all days. About 40% of the day-stock observations include either a supply or demand shock.

The four cross-tabs on the left examine *AIA.* There is a slightly positive relation between *AIA* and *DADSVI*. The correlation coefficient of *AIA* and *DADSVI* is only 3.2% and only 1.4% of day-stock observations include demand shocks by both institutional and retail investors. By contrast, the relation between *AIA* and information supply is stronger with correlation coefficients with *NDAY* and *EDAY* of 11% and 23%, respectively. This is consistent with the notion that institutions respond immediately to both firm-specific news and sector- or market-wide news while retail investors respond to news with a delay.

The second cross-tab on the left side shows that institutional demand shocks are more likely to come on days without (non-earnings-announcement) news and only about 16% (= 4.3 / 26.3) of news days draw abnormal attention. The third cross tab on the left side shows that about 2/3 (= 1 / 1.5) of earnings days coincide with institutional demand shocks. In the next section, we examine how each of these sub-cases is related to the risk premium.

The final cross-tab on the left shows that days with institutional demand shocks are split evenly between days with and without supply shocks.

The right column of cross tabs-examine pairs of the remaining three measures. There is a weak, positive relation between *DADSVI* and the supply measures. By construction, earnings days are orthogonal to news days.

3. Demand for Information, Systematic Risk, and the Risk Premium

3.1 Information Demand and Supply

We examine the relation between the demand for information and the risk premium. We first examine what drives institutional demand shocks. In Table 3, we regress *AIA* on measures of information supply at the firm, industry and macroeconomic level. Our firm-level measures are *NDAY* and *EDAY*. To capture important news at the industry level, we include the variables *FF48_NDAY* and *FF48_EDAY*. The variables *AGG_NDAY* and *AGG_EDAY* capture aggregate news and earnings announcements, placing more importance on larger firms. We also include either our five macroeconomic announcement dummy variables, *NFP*, *PPI*, *FOMC*, *GDP*, and *ISM*, or the combined *MACRO* dummy variable. Additionally, we include day-of-the-week dummies to capture seasonality in attention that been previously documented (DellaVigna and Pollet, 2009; Liu and Peng, 2015; and Ben-Rephael et al. 2017), and the retail attention measure, *DADSVI*. Finally, we include combinations of firm level characteristics and *AbsRet*. The table presents the results of these Logit panel regressions.

Insert Table 3 about here.

In general, we find firm- and industry-level news and earnings announcements to be related to greater institutional demand for information. The results suggest that in periods with more firm-level news and news about firms in the industry or the entire market, institutional investors are more likely to demand information for a stock. This is intuitive given that news about firms in an industry may have important implications for other firms in the industry.

Additionally, we find that when there is more news about large firms in the wider market, demand for information is more likely to be high. News about large firms may have systematic implications for other stocks, even when these firms are in different industries. Also, we find that institutional ownership is positively correlated with shocks to information demand, which is consistent with Bai, Philippon and Savov (2016), who find that the financial market has become more informative since 1960 due to growing institutional ownership. Finally, in all cases, earnings news is more important for information demand than other news. Note, however, that the frequency of earnings announcements is significantly lower.

Focusing on macro news, the first three specifications include the *MACRO* dummy variable, while the final three include dummy variables for the five individual macroeconomic announcements. These events generally coincide with institutional demand shocks. The FOMC rate announcements seem to draw the most attention.

In sum, the collective evidence suggests that when there is news about other important firms in the industry, news about large firms in general, or macroeconomic news, institutional investors are more likely to demand information for a given stock. Hence, shocks in investor demand are related to news that is systematic in nature. This response of institutional demand to information provides a channel through which systematic risk is transmitted across the market. [7]

3.2 Demand for Information, Trading Volume, Price Volatility and Betas

In Table 4, we examine the relation between both information supply and information demand and trading volume and price movement. In particular, we expect information demand shocks to be associated with higher trading volume and larger price movements. We acknowledge that these associations do not necessarily imply causality but serve as necessary conditions for the relevance of information demand in asset pricing. The key point is to compare the economic magnitude across the different measures.

[7] Both Patton and Verardo (2012) and Savor and Wilson (2016) discuss how investors learn about the common component of firm-level news across firms.

The first set of columns present coefficients from panel regressions of four abnormal volume measures on *AIA*, *DADSVI*, *NDAY* and *EDAY*. The first measure – *AbnVol* – measures the stock's abnormal trading volume calculated following Barber and Odean (2008) as the stock's daily volume divided by the previous 252-day average trading volume, respectively. The second measure of abnormal trading volume, *DAVOL*, is a dummy variable that is equal to one if trading volume is abnormal and 0 otherwise. The measure is calculated using the same methodology used to create *DADSVI.* Included in the regressions are 10 lags each of returns, squared returns, volume and news as well as day fixed effects. The inclusion of day fixed effects prevents us from examining macroeconomic announcements in this section. We study them in the subsequent section 4.2 in the context of the CAPM.

For both measures, earnings announcement days are associated with the most abnormal trading volume. Coefficients are about 3 times as large as those on *AIA*. However, since days with abnormal institutional investor demand are 6 times as common as earnings announcement days (see Table 2), *AIA* is associated with more aggregate abnormal trading volume for a given firm. Days with news and days with abnormal retail demand are also associated with higher abnormal volume, though the economic magnitude is relatively small.

Insert Table 4 about here.

The final three columns of the table measure the impact of information supply and demand shocks on price movement. We examine absolute returns (*AbsRet*), absolute DGTW adjusted returns (*AbsDGTW*), and squared returns (*Ret^2*). As was the case with abnormal volume, earnings announcement days see the largest price movements. On days with an information demand shock by institutional investors, prices move by an additional 91 basis points. For all three measures, the next most important event is the supply of news. Finally, retail demand is also associated with more absolute price movement, though the economic magnitude is small, around 8-9 basis points.

We next examine whether systematic risk is higher on days with information demand shocks or information supply shocks. Specifically, we estimate a time varying factor loading CAPM beta model using variations of the following model:

$$ERet_{it} = \alpha_i + \beta_1 \times AIA_{it} + \beta_2 \times DADSVI_{it} + \beta_3 \times NDAY_{it} + \beta_4 \times EDAY_{it}$$
$$+ \beta_5 \times MKTRF_t + \beta_6 \times MKTRF_t \times AIA_{it} + \beta_7 \times MKTRF_t \times DADSVI_{it}$$
$$+ \beta_8 \times MKTRF_t \times NDAY_{it} + \beta_9 \times MKTRF_t \times EDAY_{it} + \varepsilon_{it}$$

where *ERet* is the stock return minus the risk free rate (in basis points), and *MKTRF* is the market return minus the risk free rate (in basis points).

Insert Table 5 about here.

The first four specifications in Table 5 report the coefficients from panel regressions controlling for the four information supply and demand measures individually. Stock fixed effects are included in each regression. To conserve space, the direct effects (i.e., $\beta_1 - \beta_4$) are not reported and instead examined in the next subsection. In addition, we confirm that coefficients on interaction terms are qualitatively similar even if we remove the direct effects from the regressions.

The first specification indicates that CAPM betas on days with institutional demand shocks are about 0.16 higher than on days with no shocks. The second specification indicates an increase in betas of about 0.04 on days with retail demand shocks. Specifications 3 and 4 examine the impact of news and earnings announcements, respectively, on betas. Betas are about 0.10 higher on days with earnings announcements, which is consistent with Patton and Verardo (2012). By contrast, general firm-level news appears to have no impact on betas, suggesting that this news is either not as important or not systematic in nature.

Specification 5 includes all four measures as interactions with market returns. The impact of both *AIA* and *DADSVI* are slightly smaller than when they are included individually. *NDAY* has a negative and marginally significant coefficient, thought the magnitude is close to zero. Strikingly, once we control for institutional and retail demand, earnings announcements appear to have no significant impact on betas.

While *NDAY* and *EDAY* are orthogonal to each other, the same is not true of other measures. In particular, as shown in Tables 2 and 3, earnings announcements tend to draw institutional demand. That could explain why the impact of *EDAY* on betas disappears once we control for *AIA*. More generally, because there may be abnormal supply and demand on the same day (i.e., investors tend to demand information when there is news), we next examine the incremental impact of the four measures of supply and demand independent of each other. Because *AIA* appears to have the biggest impact on the betas, we explore the interaction of *AIA* with the other three variables, *DADSVI*, *NDAY*, and *EDAY*. Recall that all four are dummy variables. Thus, we focus on cases where one variable is equal to 1 and the other is equal to 0 and when both are equal to 1. The relative frequencies of each of these cases can be seen in Panel B of Table 2. Specifications 6-8 of Table 5 examine beta estimates based on the interactions between *AIA* and the three other variables. Specification 6 examines how beta is affected by the interaction between institutional and retail demand. The coefficient on *MKTRF*AIA0_DADSVI1* indicates that in the absence of institutional demand, retail demand has no impact on systematic risk. By contrast, the positive and significant coefficients on *MKTRF*AIA1_DADSVI0* and *MKTRF*AIA1_DADSVI1* of 0.122 and 0.170, respectively, suggest that institutional demand has a positive impact on betas, regardless of whether there is retail demand for information. Moreover, the latter result indicates that the positive coefficient on *MKTRF*DADSVI* from the first specification is driven by cases in which both retail and institutional demand is high.

Specifications 7 and 8 examine the interactions between *AIA* and *NDAY*, and *EDAY*, respectively. We find that when general news is unaccompanied by institutional demand, betas are no different than those on days with no news. Days with institutional demand shocks, on the other hand, are associated with higher betas, regardless of whether there is news. Finally, we find that betas are 0.177 higher on days with earnings announcements, but no institutional demand shocks, 0.160 higher on days with institutional demand shocks, but no earnings announcements, and 0.138 higher on days with both earnings announcements and high institutional demand for information.

Overall, we confirm that not only is there more abnormal trading and absolute price movement on days with information demand shocks, there is also more systematic risk. This is true whether or not there is retail demand, general news, or an earnings announcement.

3.3 Demand for Information and the Risk Premium

Having established that AIA is associated with higher trading volume, price movement and betas, we next explore whether days with AIA shocks are associated with a risk premium.

Insert Table 6 about here.

To examine this, in Table 6, we run panel regressions of daily stock returns on information supply and demand measures as well as various control variables, including 10 lags each of returns, squared returns, trading volume, and *NDAY* as well as day fixed effects. The first two specifications of Panel A present results using the information supply variables. News days are associated with an (additional) risk premium of about 5 basis points. This number is statistically significant at the 1% level and can be compared to an untabulated baseline premium of about 12 or 13 basis points on days with no news. We find a statically significant premium on days with earnings announcements of about 12 basis points. This is qualitatively similar to results in Engelberg et al. (2016).

In specifications 3 and 4, we examine the two information demand measures. We find that days with abnormal demand for information by institutional investors are associated with an additional risk premium of about 14-15 basis points per day. Based on the baseline risk premium, that suggests that an overall risk premium of about 27 basis points on these days. Interestingly, days with abnormal demand from retail investors are also associated with a positive return; however, the magnitude is only around 1.5 basis points.

Specifications 5 and 6 include all four measures of supply and demand. Once we account for all four measures, we confirm that days with information demand by institutional investors are associated with the highest risk premium. Moreover, the coefficient on *EDAY* drops from about 12 basis points to about 4 and is no longer statistically significant.

We next examine the incremental impact of the four measures of supply and demand independent of each other. Because *AIA* appears to have the biggest impact on the risk premium, we further explore the interaction of *AIA* with the other three variables, *DADSVI*, *NDAY*, and *EDAY*.

We report the results in Panel B, where we extend Panel A's analysis by including the interaction terms. The first two columns of Panel B examine the impact of the interplay between institutional and retail demand for information on the risk premium. As can be seen by the coefficients on the three interaction dummies, when there is abnormal institutional demand for information, but no abnormal retail demand, the risk premium is about 13 basis points higher. By contrast, when there is no abnormal demand for information by institutional investors, but there is a retail demand shock, there is no additional risk premium. Only when abnormal retail demand is accompanied by institutional demand is there an additional premium of about 20 basis points per day. These results are consistent with the beta tests from Table 5, Panel B.

Specifications 3 and 4 examine the interplay between institutional demand and the supply of news. When there is the supply of information, but no institutional demand shock, the risk premium is about 3-4 basis points higher. Strikingly, when there is abnormal demand for information by institutional investors, but no news, the risk premium is still 12 basis points higher and statistically significant. Moreover, the coefficient on *AIA1_NDAY1* indicates that when there is both the supply of news and institutional demand, the additional risk premium even larger, at 19 to 20 basis points. However, this number is not statistically different from the case with only the institutional demand shock.

The final two specifications show that the additional risk premium accruing on days with abnormal institutional demand is not simply driven by earnings announcements. In fact, the risk premium is higher than the baseline for days with earnings announcements but no demand shock a days with demand shocks but no earnings announcement.

4. Demand for Information – Additional Tests and Robustness

We argue that the positive relation between demand for information and stock returns documented in Table 6 represents a risk premium. In this section, we provide additional evidence that supports our conjecture.

We first explore the relation between demand for information and the risk premium using subsamples based on beta. The intuition is straightforward: the risk premium should be higher for firms with higher betas (a simple CAPM argument). We then carry out more formal tests of the CAPM for various subsamples of observations based on stock-days with supply or demand for information.

We next examine differences across 10-K and 10-Q reporting quarters. Comparing the information being released in the 10-K and 10-Q filings, all else equal, the information being released in the 10-K is arguably more substantial and of higher quality, and if so, should carry a higher premium.

Next, we focus on two cases in which demand for information is potentially more systematic in nature. Specifically, we explore how demand for information arises in small firms within a given industry and firms that are late announcers in the quarterly earnings announcement cycle. In our final set of tests, we explore the robustness of our findings using Fama-MacBeth (1973) cross sectional regressions.

4.1 *Demand for Information and the Risk Premium – Stock Beta*

Table 7 reports results from panel regressions conditioning on betas. In particular, every day we rank firms by their pre-estimated betas using the previous 252 trading days, split the sample based the cross-sectional median, and repeat the analysis conducted in Table 6.

Insert Table 7 about here.

The results support our conjecture. Focusing on Specifications 1 and 5, we can clearly see that the magnitude of the return associated with AIA is much larger for higher beta stocks (19.9 vs. 7.5 basis points), and the difference is statistically significant. We also observe that *EDAY* only carries an additional premium for high beta stocks. The premium on *NDAY* for high beta stocks is also higher at 5.5 basis points compared to 3 basis points for low beta stocks. Interestingly, the impact of *DADSVI* does not differ based on beta, but the magnitude is very small. Finally, all interaction terms confirm that these premiums are higher for high beta stocks.

4.2 *Demand for Information and the CAPM*

Having shown that high beta stocks carry higher premiums on days with institutional demand for information than low beta stocks, we turn to a more formal test of the CAPM. Savor and Wilson (2014) show that CAPM performs well on macroeconomic (FOMC, unemployment, and inflation) announcement days, and fails on other days. In the same spirit, we partition stock-day observations based on measures of information supply and demand and carry out our tests. Each day, we run a cross sectional regression of excess stock returns on CAPM betas. Table 8 examines time series means of these Fama-MacBeth (1973) regressions.

Insert Table 8 about here.

The first row of the table proves the intercept and risk premium estimate (in basis points) for the full sample of observations. The intercept is positive and statistically significant while the risk premium on the market factor is not significantly different from zero, consistent with the well-documented failure of the CAPM in explaining the cross-sectional variation of stock returns. The next two rows provide estimates for observations with *AIA* = 0 and *AIA* = 1, respectively. Using the sample of observations with normal levels of demand, the estimates look similar to the full sample. By contrast, when *AIA* = 1, the intercept is no longer significant and the CAPM risk premium is about 20 basis points per day and highly significant. Thus, when institutional investors demand information, the CAPM appears to work well.

Insert Figure 1 about here.

Figure 1.A illustrates the result graphically. Each day, within AIA = 1 and AIA = 0 subsamples, we sort stocks into decile portfolios based on their CAPM betas estimated over the previous 252 trading days using the same decile cutoffs for all stocks. Figure 1.A plots the average portfolio daily excess returns (over the risk-free rate) against their average CAPM betas, separately for these two subsamples. The figure confirms that the CAPM works well among AIA = 1 stocks. There is a positive relation between the average excess return and the CAPM beta among stocks that institutional investors demand information. Among AIA = 0 stocks, the relation is in fact slightly negative.

We next turn to other measures of information supply and demand. The subsequent three rows of the table show that the CAPM fails to hold among stocks receiving retail investor demand for information, firm-level news, and earnings announcements.

Given the evidence provided by Savor and Wilson (2014), we next investigate whether the AIA results are distinct from what has already been documented. We begin by examining days with macroeconomic announcements (i.e., *MACRO* = 1). Table 8 shows that while the point estimate of the risk premium is positive (about 7 basis points), it is not statistically significant. This result may differ from Savor and Wilson because we have a shorter sample period and a slightly different set of announcements in our measure. While we both capture *FOMC* announcements and *PPI* announcements, we have a different employment announcement and include two additional events. Within these events, we next focus on *FOMC* announcements which have been shown to be associated with a risk premium (Lucca and Moench, 2015).[8] Here, we find a positive and significant market risk premium of about 18 basis points and an intercept that is statistically indistinguishable from zero.

In the final three rows of the table, we examine the interaction between *AIA* and *FOMC*. We first examine *FOMC* announcements unaccompanied by institutional demand for specific stocks (AIA0_FOMC1). While the estimated risk premium is still positive (13 basis points), statistical significance is low. Next, we examine stock-days with institutional demand but no *FOMC* announcement (*AIA*1_*FOMC*0) and verify that the result from the third row is independent from *FOMC* announcements. Finally, we examine days with *FOMC* announcements as well as demand for information about specific stocks. Here, we find the largest risk premium – about 50 basis points. Hence, when there is supply of systematically important information *and* institutional demand for information, stocks earn high risk premiums and the CAPM equation performs the best.

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[8] In untabulated results, we find that CAPM fails in subsamples associated with the four other macroeconomic announcements included in the variable *MACRO*.

Figure 1.B illustrates the result graphically. We observe the strongest positive relation between the average excess return and the CAPM beta among AIA = 1 stocks on FOMC announcement dates. On these dates, the relation between average excess returns and CAPM betas is positive even among AIA = 0 stocks. Nevertheless, the impact of the FOMC announcement seems similar to that of institutional demand for information. For example, we observe a similar positive risk-return relation among AIA = 1 stocks even on days without FOMC announcements.[9]

Overall, when there is supply of systematically important information *or* institutional demand for information, stocks earn high risk premiums and the CAPM equation performs well.

4.3 *Demand for Information and the Risk Premium – 10-K and 10-Q Quarters*

Next, we explore whether the risk premium earned by the supply of, and demand for information depends on the amount and the quality of the fundamental information being released. In particular, comparing the 10-K and 10-Q reports, one can argue that all else equal, the 10-K should convey richer and thus more fundamental information than the 10-Q. Consequently, if the risk premium is earned when uncertainty is being resolved via information processing, it should be larger in the first quarter.

Insert Table 9 about here.

[9] Since April 2011, the Chair of the Board of Governors holds a press conference following half of the FOMC announcements. Recent evidence suggests that after this change, most of the market response is concentrated on announcement days with a press conference (Boguth, Gregoire and Martineau, 2016). Focusing on the subset of FOMC announcements with a press conference, we find consistent results. In particular, we find a positive and significant intercept (26 bps) and a positive and significant premium of 23 bps for AIA=0 stocks; and a non-significant intercept (4 bps) and a positive premium of 78 bps for AIA=1 stocks.

Table 9 reports the results. We split the sample based on the first quarter (the 10-K season, Specifications 1-4) and quarters 2-4 (the 10-Q season, Specifications 5-8). Comparing Specifications 1 and 5, we find that the risk premium is generally larger during the first quarter of the year. Interestingly, the earnings announcement premium (*EDAY*) only exists in the first quarter. The premium drops from 18.5 basis points to -1.2 basis points, and the difference is statistically significant. In contrast, AIA seems to carry a premium during both periods, where the premium is 26.2 basis points in the first quarter and 9.4 basis points in other quarters. Focusing on firm news, the premium for news days is stable across the two samples with a magnitude of 4 basis points.[10]

Focusing on the dummy interaction terms, the interaction terms of AIA with the other variables during the first quarter consistently produce higher premiums then the premium in quarters 2-4.

4.4 *Demand for Systematic Information by Smaller Firms within Industry and Late Announcers*

In this section, we further explore how systematic risk is disseminated across firms. In particular, we focus on two dimensions that can reveal demand for information that is more systematic in nature: (1) the relative size of a firm within a given industry. The idea is that firms that are relatively larger within their industry are more influential, and consequently, provide information that is more systematic in nature for the smaller firms in the same industry. Thus, we expect that the demand for information - for relatively smaller firms - to be more responsive to industry- and aggregate news and earnings announcements; (2) the timing of the firm's earnings announcement in the earnings cycle. The idea is similar; firms that are early announcers provide

[10] The premium during the first quarter is not driven the January effect. *AIA* premium is similar across January-March. *EDAY* premium, on the other hand, is consistent with the earnings cycle, where it is highest when the majority of the firms report their earnings: the premium during January, February, and March are 9, 36, and -3.5 basis points, respectively.

information that is more systematic in nature to firms that announce later (e.g., Savor and Wilson, 2016). Consequently, we expect that the demand for information - for firms that are late announcers - to be more responsive to systematic information.

We repeat the analysis conducted in Table 3 (Panel 10.A), Table 5 (Panel 10.B), and Table 6.A (Panel 10.C) where we split the coefficients estimates by: (1) firms below and above median firm size within (Fama French 48) industry; and (2) firms below and above the median announcement order in the earnings cycle. Across all panels, in Specifications 1-3, we rank firms based on their relative size within industry. To alleviate noise, we keep only industries with at least five firms in our sample. We then define "Dum" as a dummy variable that receives the value of 1 if a firm is below the median industry size and 0 otherwise. Thus, in Specifications 1-3, Dum = 1 captures smaller firms in the industry. In a similar manner, in Specifications 4-6, we rank firms based on their announcement order in the earnings cycle. We then redefine "Dum" as a dummy variable that receives the value of 1 if a firm is above the median of the reporting cycle and 0 otherwise. Thus, in Specifications 4-6, Dum = 1 captures firms that are late announcers.

Insert Table 10 about here.

Consistent with our intuition, the results reported in Panel 10.A confirm that institutional demand for information responds more to industry- and aggregate news and industry- and aggregate earnings announcements when the firm is either smaller or a late announcer. Interestingly, in these cases institutional investors also pay less attention to "firm specific" earnings information.

Consistent with the dissemination of systematic information, we find that when institutional investors are paying attention, these firms have higher betas (Panel 10.B) and the associated risk premiums are higher (Panel 10.C). For example, focusing on firms below median industry size, on days with a spike in institutional demand (i.e., AIA = 1), betas are higher by 19% and risk premium are higher by 22 basis points, relative to firms above the median.

4.5 *Demand for Information and the Risk Premium – Robustness Testes*

4.5.1 – Testing for Price Pressure

An alternative explanation for the increase in beta (Table 5) and positive returns associated with AIA (Table 6) is temporary price pressure (e.g., Barber and Odean 2008). Specifically, given that it is more costly to short than to buy, attention may be associated with buying, on average, which may lead to an eventual reversal. To rule out this explanation, we repeat the main analysis conducted in Tables 5 and 6, and replace day t returns with day t+1 to t+5 cumulative returns.

Insert Table 11 about here.

As the table shows, there is no evidence of price pressure from institutional investors, consistent with the findings in Ben-Rephael, Da, and Israelsen (2017) that institutional demand for information is associated with permanent price impact. Given the lack of any sort of reversal in Panel A, the 0.15 increase in betas is not simply a result of institutional investors pushing prices of high beta stocks too high (low) on days with high (low) market returns. Similarly, Panel B shows no evidence of a reversal in the premium accruing on days with institutional demand shocks.

On the other hand, there is some evidence of reversals following retail demand shocks in both panels. This is consistent with Da, Engelberg, and Gao (2011) who provide evidence that attention by retail investors is associated with temporary price pressure that eventually reverts.[11]

4.5.2 – Cross Sectional Analysis

In our final set of tests, we explore the robustness of our findings using daily cross sectional Fama-MacBeth (1973) regression.[12]

Insert Table 12 about here.

Table 12 report the results. Consider for example Specification 3. We can immediately observe that the premium associated with AIA is qualitatively and quantitatively similar to the results found using panel regressions. In sharp contrast, the premium on *EDAY*, is not significant and even negative in the cross section. The insignificant premium on *EDAY* is likely driven by the fact that the number of reporting firms is not evenly distributed within the earnings cycle.[13] Importantly, this is not the case for *AIA*, which reveals that on average, demand for information carries a premium on any given day.

5. Conclusion

[11] We find similar results for both AIA and DADSVI when we extend the cumulative return period, but most of the action takes place in 5 days.
[12] Note that when using panel regressions, each observation receives the same weight. This is in contrast to using daily cross-sectional regressions, where each day receives the same weight.
[13] Following footnote 9, when estimating the coefficient on *EDAY*, the cross sectional methodology gives equal weight to each day. That means that each earnings announcement on days when few firms report earnings are (i.e., the "tails" of the earning season) are overweighted relative to earnings announcements on days when many firms report their earnings (i.e., the “active season”).

Understanding the relation between information and asset pricing is fundamentally important. Recent evidence suggests that the arrival of information is associated with a risk premium (Savor and Wilson, 2013, 2014; and Lucca and Moench, 2015). We argue that only considering the supply of information on individual stocks might understate the effects that new information has on asset prices. Consequently, we explore the effect of investor demand for information by using Ben-Rephael, Da, and Israelsen (2017)'s abnormal institutional attention measure (AIA), which captures demand shocks from institutions from search queries on Bloomberg Terminals.

We find that AIA responds to both firm-level news and important industry- and market-level news. Thus, AIA enables us to observe information spillovers and learning across stocks, which provides an intuitive link between the demand for information at the stock level and systematic risk. Consistent with that, we find that AIA is associated with higher trading volume, more price volatility and higher CAPM betas. We find that the demand for information is associated with a risk premium and that this relation is much stronger than the supply of information. Additionally, the CAPM performs better when institutional demand for information is higher and AIA appears to modulate the positive effect of FOMC announcements on risk premia, as previously documented by Savor and Wilson (2014).

In sum, then, our paper makes several contributions to the asset pricing literature. First, we show that demand for information plays an important role in determining when risk premia are earned. Second, the demand for information is a channel through which systematic risk is transmitted across the market. Finally, models of risk and return appear to perform better when we account for information demand.

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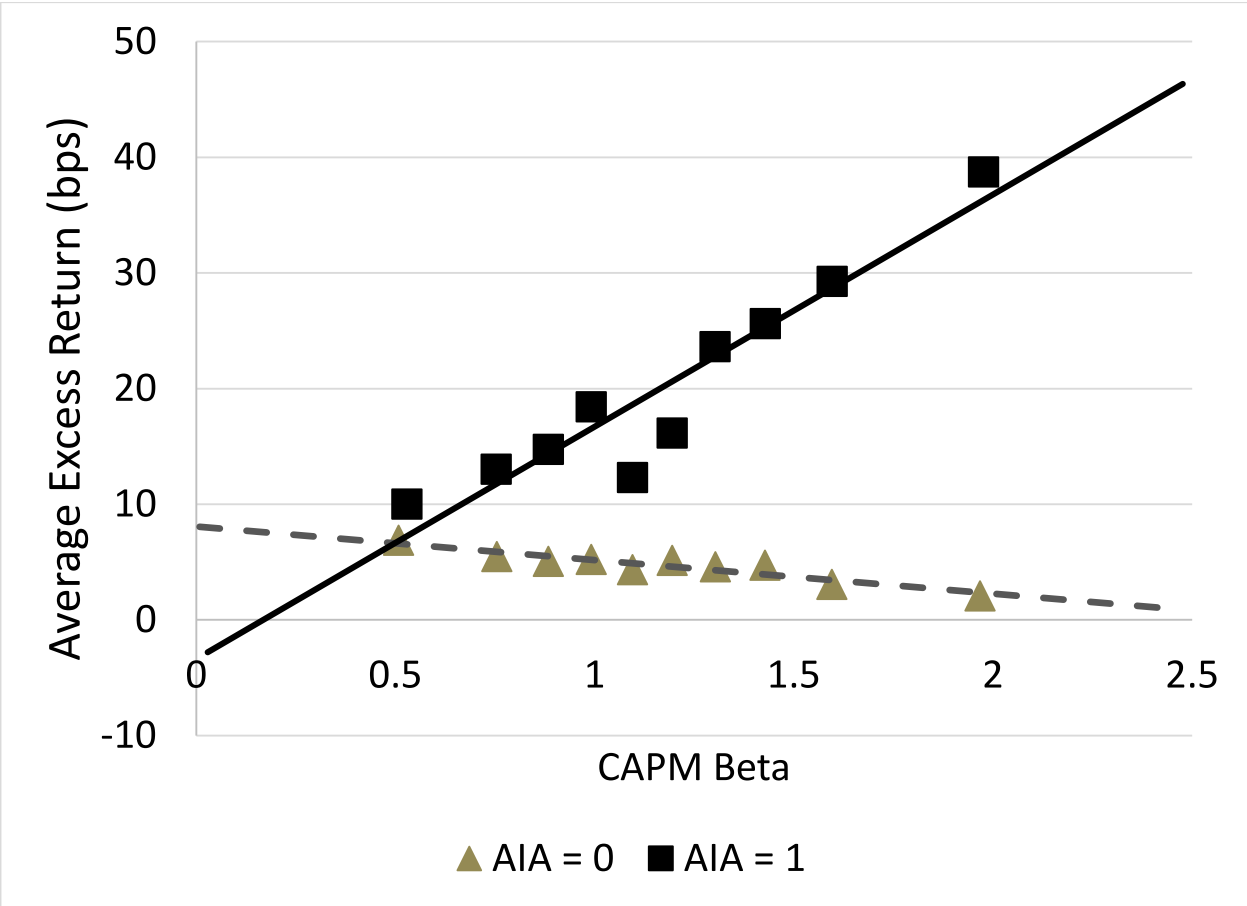
Figure 1. CAPM in Various Subsamples

Each day, we partition stocks in our sample into ten decile portfolios based on their CAPM betas which are estimated using the previous 252 trading days. Then, for each decile, we create two subsamples based on whether their AIAs equal 1 or 0 on that day. Panel A plots the average portfolio daily excess returns (over the risk-free rate) against their average CAPM betas, separately for AIA = 1 and AIA = 0 subsamples. In Panel B, we plot the average portfolio daily excess returns against their average CAPM betas separately for (1) AIA = 1 stocks over FOMC announcement dates (AIA = 1 & FOMC = 1); (2) AIA = 0 stocks over FOMC announcement dates (AIA = 0 & FOMC = 1); (3) AIA = 1 stocks over non-FOMC announcement dates (AIA = 1 & FOMC = 0).

Graph 1.A – Excess Returns and CAPM Betas: AIA = 0 and AIA = 1 Subsamples



Graph 1.B – Excess Returns and CAPM Betas: FOMC / AIA Subsamples

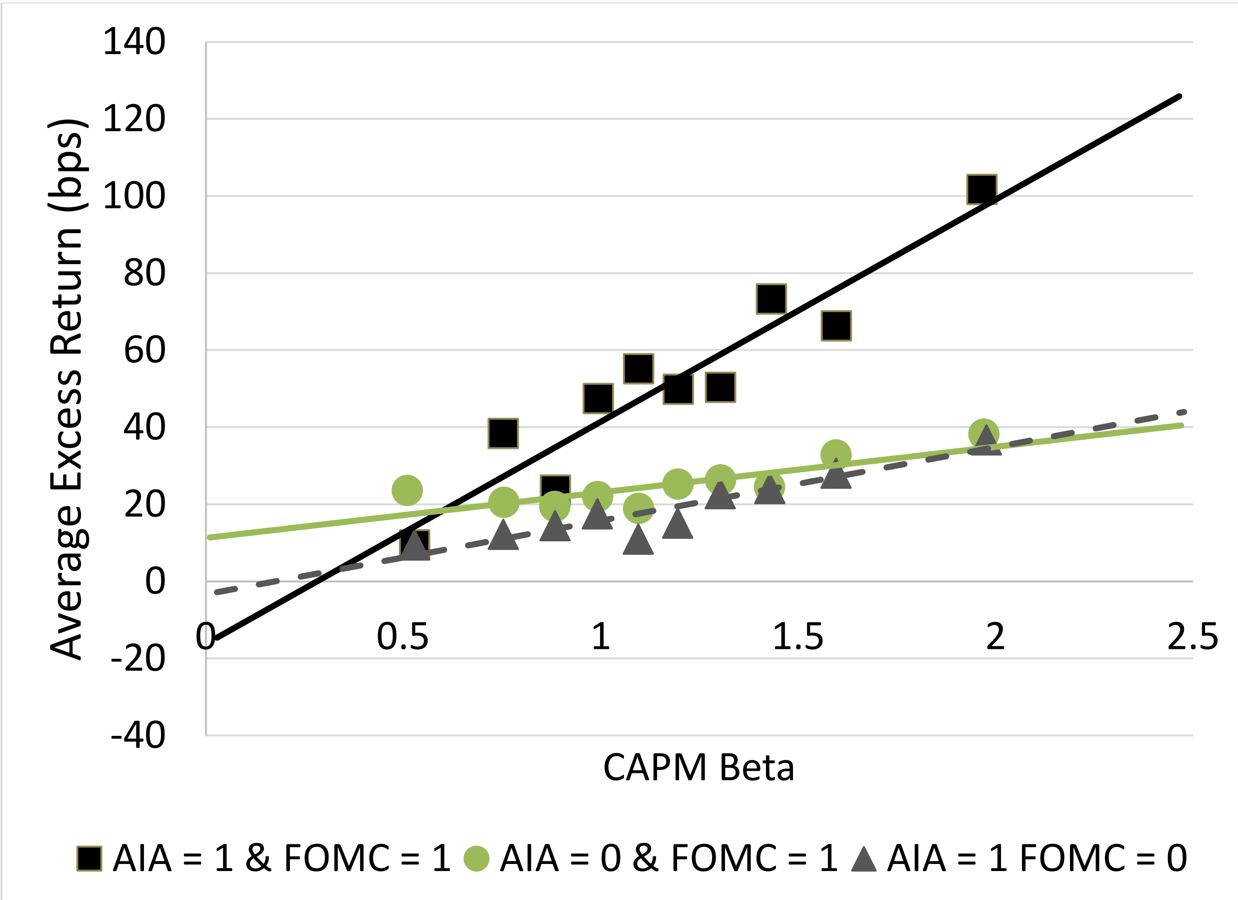


Table 1. Variable Definitions

Variable	Definition
Information Supply Variables	
NDAY	Dummy variable equal to one on news days for firm *i* and zero otherwise. News days are those on which an article about the firm appears on the Dow Jones Newswire, excluding earnings announcement days. News data are from RavenPack.
EDAY	Dummy variable equal to one on earnings announcement days for firm *i* and zero otherwise. Earnings announcement data are from I/B/E/S.
FF48_NDAY	The value-weighted average of *NDAY* for all other firms in the same Fama French 48 industry as firm *i*. Fama French 48 industry definitions are from Ken French's website. Value weights based on market capitalization are from CRSP.
FF48_EDAY	The value-weighted average of *EDAY* for all firms in the same Fama French 48 industry as firm *i*. Fama French 48 industry definitions are from Ken French's website. Value weights based on market capitalization are from CRSP.
AGG_NDAY	The value-weighted average of *NDAY* for all firms in the sample on day *t*. Value weights based on market capitalization are from CRSP.
AGG_EDAY	The value-weighted average of *EDAY* for all firms in the sample on day *t*. Value weights based on market capitalization are from CRSP.
NFP	Dummy variable equal to one on days with an announcement of the U.S. nonfarm payroll statistics by the Department of Labor, and zero otherwise. Announcement dates are from Bloomberg.
PPI	Dummy variable equal to one on days with an announcement of the U.S. Producer Price Index numbers by the Bureau of Labor Statistics, and zero otherwise. Announcement dates are from Bloomberg.
FOMC	Dummy variable equal to one on days with an announcement of the Federal Open Market Committee rate decision, and zero otherwise. Announcement dates are from Bloomberg.
GDP	Dummy variable equal to one on days with an announcement of the "advance" estimate of quarterly U.S. Gross Domestic Product by the Bureau of Economic Analysis, and zero otherwise. Announcement dates are from Bloomberg.
ISM	Dummy variable equal to one on days with an announcement of the Institute for Supply Management Manufacturing statistics by Bureau of Labor Statistics, and zero otherwise. Announcement dates are from Bloomberg.
MACRO	Dummy variable equal to one if at least one of *NFP*, *PPI*, *FOMC*, *GDP*, and *ISM* is equal to one, and zero otherwise.

Information Demand Variables

AIA Bloomberg records the number of times news articles on a particular stock are read by its terminal users and the number of times users actively search for news for a specific stock. Bloomberg then assigns a value of 1 for each article read and 10 for each news search. These numbers are then aggregated into an hourly count. Using the hourly count, Bloomberg then creates a numerical attention score each hour by comparing past 8-hour average count to all hourly counts over the previous month for the same stock. They assign a value of 0 if the rolling average is in the lowest 80% of the hourly counts over the previous 30 days. Similarly, Bloomberg assigns a score of 1, 2, 3 or 4 if the average is between 80% and 90%, 90% and 94%, 94% and 96%, or greater than 96% of the previous 30 days' hourly counts, respectively. Finally, Bloomberg aggregates up to the daily frequency by taking a maximum of all hourly scores throughout the day. These are the data provided to us by Bloomberg. Since we are interested in abnormal attention, our *AIA* measure is a dummy variable that receives a value of 1 if Bloomberg's score is 3 or 4, and 0 otherwise. This captures the right tail of the measure's distribution.

ISM Dummy variable equal to one on days with an announcement of the Institute for Supply Management Manufacturing statistics by Bureau of Labor Statistics, and zero otherwise. Announcement dates are from Bloomberg.

DADSVI We follow Bloomberg's methodology and assign Google's daily search volume index (*DSVI*) on day *t* one of the potential 0, 1, 2, 3, or 4 scores using the firm's past 30 trading day *DSVI* values. For example, if *DSVI* on day *t* is in the lowest 80% of past *DSVI* values, it receives the score 0. *DADSVI* is equal to one on day *t* if the score is 3 or 4, and 0 otherwise.

Other Variables

Ret CRSP's daily stock return, reported in basis points (i.e., times 10,000) for ease of presentation.

AbsRet Absolute value of *Ret*.

Ret^2 *Ret* squared.

DGTW CRSP's daily stock return minus the stock's benchmark portfolio daily return following Daniel, Grinblatt, Titman and Wermers (1997), reported in basis points.

AbsDGTW Absolute value of *DGTW*.

AbnVol The stock's abnormal trading volume calculated following Barber and Odean (2008) as the stock's daily volume divided by the previous 252-day average trading volume.

DolVol The daily dollar trading volume in millions of dollars.

DAVOL We follow Bloomberg's methodology and assign the daily trading volume (Vol) on day *t* one of the potential 0, 1, 2, 3, or 4 scores using the firm's past 30 trading day trading volume

	values. For example, if *Vol* on day *t* is in the lowest 80% of past *Vol* values, it receives the score 0. *DAVOL* is equal to one on day *t* if the score is 3 or 4, and 0 otherwise.
InstOwn	The percentage of shares held by institutional investors obtained from the Thomson Reuters CDA/Spectrum institutional holdings' (S34) database.
SizeInM	Stock's market capitalization, rebalanced every June, in millions of dollars.
LnSize	The log of the stock's average size in millions of dollars from day *t-27* to *t-6.*
LnBM	The natural logarithm of the firm's book-to-market ratio rebalanced every June following Fama-French (1992).
RF	The risk free rate of return from Ken French's website, reported in basis points.
ERet	The stock's daily return *(Ret)* in excess of the risk free rate (*RF*), reported in basis points.
MKTRF	The market return in excess of the risk free rate, reported in basis points, from Ken French's website.
Momentum	A continuous variable ranging between -1 and 1, indicating the relative ranking at the end of month t-1of the cumulative returns from month t-12 to month t-2. Firms are sorted and ranked based on past returns and rankings are rescaled such that the firm with the highest (lowest) past return has a Momentum value of 1 (-1). Stock returns are from CRSP.
Reversal	A continuous variable ranging between -1 and 1, indicating the relative ranking at the end of month t-1of the cumulative returns from month t-60 to month t-13. Firms are sorted and ranked based on past returns and rankings are rescaled such that the firm with the lowest (highest) past return has a Reversal value of 1 (-1).

Table 2. Summary Statistics

The table reports the summary statistics of our Abnormal Institutional Attention measure (*AIA*) and other selected variables from February 2010-December 2015. Our sample includes Russell 3,000 stocks with CRSP Share Codes 10 and 11, *AIA* and Google daily search volume data, book-to-market information, and end of previous month price of at least $5. This results in 1,949,960 day-stock observations across 2,549 unique stocks. All variables are defined in Table 1. In Panel A, *Num Firms* reports the number of unique firms. Mean, Median, and SD refer to the cross-sectional average, median, and standard deviation of the firms' time series averages. Panel B presents cross-tabulations between the four measures of information supply and demand as well as the measure *SUPPLY* which is equal to 1 if either *EDAY* or *NDAY* is 1, or zero otherwise, and the dummy variable *DEMAND*, which is equal to 1 if either *AIA* or DADSVI is 1, or zero otherwise. Percentages of the total number of day-stock observations are reported.

Panel 2.A – Mean, Median and Standard Deviation

Variable	Mean	Median	SD
Num Firms	2,549		
AIA	0.088	0.066	0.089
DADSVI	0.087	0.094	0.040
NDAY	0.235	0.239	0.138
EDAY	0.015	0.016	0.005
Ret (in basis points)	4.25	5.69	24.03
DolVol	60.17	12.96	203.31
BM	0.607	0.520	0.795
LnBM	-0.820	-0.664	0.850
SizeInM	7,135	1,391	23,848
LnSize	7.381	7.197	1.534
InstOwn	0.602	0.637	0.189

Panel 2.B – Cross Tabulations (Percentages of Day-Stock Observations)

	AIA = 1		
DADSVI = 1	No	Yes	Total
No	80.5%	9.1%	89.6%
Yes	9.0%	1.4%	10.4%
Total	89.5%	10.5%	

	DADSVI = 1		
NDAY = 1	No	Yes	Total
No	66.0%	7.6%	73.7%
Yes	23.5%	2.8%	26.3%
Total	89.6%	10.4%	

	AIA = 1		
NDAY = 1	No	Yes	Total
No	67.5%	6.2%	73.7%
Yes	22.0%	4.3%	26.3%
Total	89.6%	10.4%	

	DADSVI = 1		
EDAY = 1	No	Yes	Total
No	88.3%	10.2%	98.5%
Yes	1.3%	0.3%	1.5%
Total	89.6%	10.4%	

	AIA = 1		
EDAY = 1	No	Yes	Total
No	89.0%	9.4%	98.5%
Yes	0.5%	1.0%	1.5%
Total	89.5%	10.5%	

	NDAY = 1		
EDAY = 1	No	Yes	Total
No	72.1%	26.3%	98.5%
Yes	1.5%	0.0%	1.5%
Total	73.7%	26.3%	

	AIA = 1		
SUPPLY = 1	No	Yes	Total
No	67.0%	5.1%	72.1%
Yes	22.6%	5.3%	27.9%
Total	89.6%	10.4%	

	DEMAND = 1		
SUPPLY = 1	No	Yes	Total
No	60.2%	11.9%	72.1%
Yes	20.3%	7.6%	27.9%
Total	80.5%	19.5%	

Table 3. Determinants of Institutional Demand

The table reports results from Logit panel regressions of the Abnormal Institutional Attention measure (*AIA*) from Bloomberg on information demand by retail investors (*DADSVI*), various measures of information supply and additional control variables. All variables are defined in Table 1. *DADSVI* is based on Google's daily Search Volume Index. The information supply measures include a news day dummy (*NDAY*) and an earnings announcement day dummy (*EDAY*). Also included are the value weighted average of *NDAY* for firm *i*''s (Fama French 48) industry (excluding firm *i*) (*FF48_NDAY*), and a similar measure using earnings announcements (*FF48_ENDAY*) as well as value weighted measures at the market level for news (*AGG_NDAY*) and earnings announcements (*AGG_EDAY)*. The first three specifications include a dummy variable indicating that that there was at least one of five major macroeconomic news announcements that day (*MACRO*). The last three specifications include individual dummy variables for each of the five macroeconomic news announcements: Nonfarm Payroll (*NFP*), Producer Price Index (*PPI*), the FOMC rate announcement (*FOMC*), the advance estimate for GDP (*GDP*), and the ISM Manufacturing index (*ISM*). Macroeconomic announcement dates are from Bloomberg. Additional control variables include the natural logarithm of the firm's market capitalization (*LnSize*); the natural logarithm of the firm's book-to-market ratio (*LnBM*); the stock's level of institutional ownership (*InstOwn*); the absolute return of the stock (*AbsRet*); and day-of-the week dummy variables *Tuesday*, *Wednesday*, *Thursday*, and *Friday*. Standard errors, clustered by stock, are reported in parentheses. Statistical significance at the 10%, 5%, and 1% level is indicated with *, **, and ***, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-2.847 (0.037) ***	-3.096 (0.037) ***	-7.766 (0.115) ***	-2.847 (0.037) ***	-3.095 (0.037) ***	-7.765 (0.115) ***
DADSVI	0.242 (0.014) ***	0.219 (0.014) ***	0.195 (0.014) ***	0.243 (0.014) ***	0.219 (0.014) ***	0.195 (0.014) ***
NDAY	0.896 (0.021) ***	0.898 (0.021) ***	0.484 (0.013) ***	0.896 (0.021) ***	0.898 (0.021) ***	0.484 (0.013) ***
EDAY	3.216 (0.027) ***	2.779 (0.029) ***	2.748 (0.030) ***	3.218 (0.027) ***	2.782 (0.029) ***	2.752 (0.030) ***
FF48_NDAY	0.218 (0.066) ***	0.227 (0.068) ***	-0.043 (0.042)	0.219 (0.066) ***	0.227 (0.068) ***	-0.043 (0.042)
FF48_EDAY	0.798 (0.075) ***	0.874 (0.076) ***	0.684 (0.076) ***	0.798 (0.075) ***	0.873 (0.076) ***	0.685 (0.076) ***
AGG_NDAY	0.758 (0.077) ***	0.667 (0.078) ***	0.946 (0.062) ***	0.760 (0.077) ***	0.669 (0.078) ***	0.948 (0.062) ***
AGG_EDAY	1.287 (0.212) ***	1.212 (0.214) ***	1.390 (0.223) ***	1.402 (0.211) ***	1.311 (0.212) ***	1.507 (0.222) ***
MACRO	0.043 (0.007) ***	0.012 (0.007)	0.000 (0.008)			
NFP				0.054 (0.016) ***	0.018 (0.017)	0.002 (0.017)
PPI				0.059 (0.012) ***	0.064 (0.012) ***	0.074 (0.013) ***
FOMC				0.100 (0.016) ***	0.054 (0.017) ***	0.034 (0.018) *
GDP				-0.092 (0.022) ***	-0.084 (0.023) ***	-0.101 (0.024) ***
ISM				0.030 (0.012) **	-0.016 (0.012)	-0.035 (0.013) ***
Tuesday	-0.152 (0.009) ***	-0.146 (0.009) ***	-0.168 (0.009) ***	-0.157 (0.009) ***	-0.152 (0.009) ***	-0.175 (0.009) ***
Wednesday	-0.253 (0.010) ***	-0.247 (0.010) ***	-0.278 (0.011) ***	-0.263 (0.010) ***	-0.258 (0.010) ***	-0.289 (0.011) ***
Thursday	-0.302 (0.012) ***	-0.300 (0.012) ***	-0.353 (0.012) ***	-0.304 (0.012) ***	-0.305 (0.012) ***	-0.360 (0.012) ***
Friday	-0.669 (0.011) ***	-0.657 (0.011) ***	-0.694 (0.011) ***	-0.670 (0.011) ***	-0.661 (0.011) ***	-0.699 (0.012) ***
AbsRet		0.002 (0.000) ***	0.003 (0.000) ***		0.002 (0.000) ***	0.003 (0.000) ***
LnSize			0.521 (0.009) ***			0.521 (0.009) ***
LnBM			0.059 (0.023) **			0.059 (0.023) **
InstOwn			0.598 (0.108) ***			0.597 (0.108) ***
N OBS	1,949,960	1,949,960	1,949,960	1,949,960	1,949,960	1,949,960
Pseudo R Squared	0.103	0.124	0.231	0.103	0.124	0.231

Table 4. Information Supply and Demand, Trading Volume, and Stock Price Movements

The table reports results from panel regressions of various measures of trading volume ("*Volume Measures*") and stock price movements ("*Price Measures*") on measures of information supply, information demand and additional control variables. All variables are defined in Table 1. The two information demand measures are the Abnormal Institutional Attention measure (*AIA*) from Bloomberg and the abnormal retail attention dummy (*DADSVI*) based on Google's daily Search Volume Index. The two information supply measures are a news day dummy (*NDAY*) and an earnings announcement day dummy (*EDAY*). Additional control variables include the natural logarithm of the firm's market capitalization (*LnSize*); the natural logarithm of the firm's book-to-market ratio (*LnBM*); Ten lags of returns, squared returns, and trading volume. Daily fixed effects are included in each specification and standard errors (in parentheses) are clustered by date. Statistical significance at the 10%, 5%, and 1% level is indicated with *, **, and ***, respectively.

	Volume Measures		*Price Measures*		
Variable	*AbnVol*	*DAVOL*	*Abs(Ret)*	*Abs(DGTW)*	*Ret^2*
AIA	0.476	0.182	91.385	84.426	9.371
	(0.011) ***	(0.002) ***	(1.126) ***	(0.963) ***	(0.361) ***
DADSVI	0.068	0.015	8.806	7.965	2.230
	(0.004) ***	(0.001) ***	(0.544) ***	(0.494) ***	(0.237) ***
NDAY	0.123	0.030	13.500	12.900	2.125
	(0.004) ***	(0.001) ***	(0.440) ***	(0.371) ***	(0.139) ***
EDAY	1.436	0.514	277.119	274.421	37.266
	(0.022) ***	(0.004) ***	(5.008) ***	(4.542) ***	(1.130) ***
LnSize	-0.044	-0.007	-21.037	-21.569	-1.664
	(0.002) ***	(0.000) ***	(0.277) ***	(0.172) ***	(0.049) ***
LnBM	-0.008	0.000	-9.001	-10.111	-0.922
	(0.002) ***	(0.000)	(0.355) ***	(0.268) ***	(0.067) ***
10 Lags of Returns?	Yes	Yes	Yes	Yes	Yes
10 Lags of Squared Returns?	Yes	Yes	Yes	Yes	Yes
10 Lags of Volume?	Yes	Yes	Yes	Yes	Yes
10 Lags of NDAY?	Yes	Yes	Yes	Yes	Yes
Day Fixed Effects?	Yes	Yes	Yes	Yes	Yes

Table 5. Information Supply and Demand and Betas

The table reports results from panel regressions of daily excess stock returns on excess market returns and on interactions of excess market returns with measures of information supply and information demand. All variables are defined in Table 1. Excess return (*ERet*) is measured relative to the risk free rate (*RF)*. Both the market excess return (MKTRF) and the risk free rate are from Ken French's website. The two information demand measures are the Abnormal Institutional Attention measure (*AIA*) from Bloomberg and the abnormal retail attention dummy (*DADSVI*) based on Google's daily Search Volume Index. The two information supply measures are a news day dummy (*NDAY*) and an earnings announcement day dummy (*EDAY*). Specifications 1-5 report the information the main effects. Specifications 6-8 include the interaction terms between *AIA* and *DADSVI*, *NDAY*, and *EDAY*, respectively. Consider, for example, the interaction between *AIA* and *NDAY*. We focus on the following three cases: *AIA is* equal to 0 and *NDAY* is equal to 1 (denoted as *AIA0_NDAY1*); *AIA* is equal to 1 and *NDAY* is equal to 0 (denoted as *AIA1_NDAY0*); and both *AIA* and *NDAY* are equal to 1 (denoted as *AIA1_NDAY1*). Firm fixed effects are included in each specification and standard errors (in parentheses) are clustered by date. Direct effects are not reported to conserve space. Statistical significance at the 10%, 5%, and 1% level is indicated with *, **, and ***, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MKTRF	1.136	1.132	1.151	1.149	1.120	1.142	1.118	1.120
	(0.012) ***	(0.014) ***	(0.013) ***	(0.012) ***	(0.016) ***	(0.013) ***	(0.016) ***	(0.016) ***
*MKTRF*AIA*	0.157				0.152			
	(0.017) ***				(0.017) ***			
*MKTRF*DADSVI*		0.035			0.029		0.029	0.029
		(0.008) ***			(0.008) ***		(0.008) ***	(0.008) ***
*MKTRF*NDAY*			0.000		-0.019	-0.008		-0.020
			(0.009)		(0.011) *	(0.009)		(0.011) *
*MKTRF*EDAY*				0.103	0.049	0.053	0.026	
				(0.041) **	(0.045)	(0.041)	(0.045)	
*MKTRF*AIA0_DADSVI1*						0.001		
						(0.008)		
*MKTRF*AIA1_DADSVI0*						0.122		
						(0.016) ***		
*MKTRF*AIA1_DADSVI1*						0.170		
						(0.036) ***		
*MKTRF*AIA0_NDAY1*							-0.008	
							(0.011)	
*MKTRF*AIA1_NDAY0*							0.190	
							(0.020) ***	
*MKTRF*AIA1_NDAY1*							0.089	
							(0.022) ***	
*MKTRF*AIA0_EDAY1*								0.177
								(0.056) ***
*MKTRF*AIA1_EDAY0*								0.160
								(0.017) ***
*MKTRF*AIA1_EDAY1*								0.138
								(0.063) **
Direct Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 6. Information Supply and Demand and the Risk Premium

The table reports results from panel regressions of daily returns on measures of information supply, information demand and additional control variables. All variables are defined in Table 1. The two information demand measures are the Abnormal Institutional Attention measure (*AIA*) from Bloomberg and the abnormal retail attention dummy (*DADSVI*) based on Google's daily Search Volume Index. The two information supply measures are a news day dummy (*NDAY*) and an earnings announcement day dummy (*EDAY*). Panel A reports the information supply and demand main effects. Panel B also includes the interaction terms between *AIA* and *DADSVI*, *NDAY*, and *EDAY*, respectively. Consider, for example, the interaction between *AIA* and *NDAY*. We focus on the following three cases: *AIA* is equal to 0 and the other dummy variable is equal to 1 (denoted as *AIA0_NDAY1*); *AIA* is equal to 1 and the other dummy variable is equal to 0 (denoted as *AIA1_NDAY0*); and both *AIA* and the other dummy variable are equalsto 1 (denoted as *AIA1_NDAY1*). Additional control variables include the natural logarithm of the firm's market capitalization (*LnSize*); the natural logarithm of the firm's book-to-market ratio (*LnBM*). When indicated, we also control for ten lags of returns, squared returns, and trading volume. Daily fixed effects are included in each specification and standard errors (in parentheses) are clustered by date. Statistical significance at the 10%, 5%, and 1% level is indicated with *, **, and ***, respectively.

Panel 6.A – Information Supply and Demand: Main Effects

Variable	(1)	(2)	(3)	(4)	(5)	(6)
AIA			14.463	14.640	13.737	13.859
			(1.452) ***	(1.434) ***	(1.412) ***	(1.390) ***
DADSVI			1.528	1.630	1.499	1.599
			(0.605) **	(0.604) ***	(0.601) **	(0.601) ***
NDAY	4.640	5.155			3.843	4.256
	(0.514) ***	(0.529) ***			(0.496) ***	(0.508) ***
EDAY	12.141	12.277			3.942	4.038
	(4.131) ***	(4.137) ***			(4.082)	(4.085)
LnSize	-0.931	-0.839	-1.285	-1.330	-1.493	-1.401
	(0.420) **	(0.458) *	(0.431) ***	(0.470) ***	(0.438) ***	(0.472) ***
LnBM	-0.570	-0.535	-0.586	-0.565	-0.622	-0.574
	(0.567)	(0.564)	(0.568)	(0.565)	(0.568)	(0.565)
10 Lags of Returns?	No	Yes	No	Yes	No	Yes
10 Lags of Squared Returns?	No	Yes	No	Yes	No	Yes
10 Lags of Volume?	No	Yes	No	Yes	No	Yes
10 Lags of NDAY?	No	Yes	No	Yes	No	Yes
Day Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes

Panel 6.B –Information Supply and Demand: Interaction Terms

Variable	(1)	(2)	(3)	(4)	(5)	(6)
DADSVI			1.494	1.594	1.560	1.659
			(0.601) **	(0.601) ***	(0.602) ***	(0.601) ***
AIA0_DADSVI1	0.670	0.633				
	(0.451)	(0.451)				
AIA1_DADSVI0	12.967	12.899				
	(1.366) ***	(1.386) ***				
AIA1_DADSVI1	20.844	20.241				
	(3.415) ***	(3.429) ***				
NDAY	4.254	3.840			3.698	4.102
	(0.508) ***	(0.496) ***			(0.494) ***	(0.507) ***
AIA0_NDAY1			3.393	3.820		
			(0.467) ***	(0.479) ***		
AIA1_NDAY0			12.279	12.445		
			(1.635) ***	(1.620) ***		
AIA1_NDAY1			19.205	19.706		
			(1.775) ***	(1.766) ***		
EDAY	3.772	3.694	4.802	4.871		
	(4.077)	(4.074)	(4.073)	(4.076)		
AIA0_EDAY1					26.038	26.010
					(6.300) ***	(6.302) ***
AIA1_EDAY0					15.070	15.192
					(1.409) ***	(1.386) ***
AIA1_EDAY1					6.761	7.034
					(5.392)	(5.400)
LnSize	-1.404	-1.497	-1.490	-1.388	-1.472	-1.375
	(0.472) ***	(0.438) ***	(0.438) ***	(0.472) ***	(0.438) ***	(0.472) ***
LnBM	-0.568	-0.617	-0.627	-0.576	-0.637	-0.586
	(0.565)	(0.568)	(0.568)	(0.565)	(0.568)	(0.565)
10 Lags of Returns?	No	Yes	No	Yes	No	Yes
10 Lags of Squared Returns?	No	Yes	No	Yes	No	Yes
10 Lags of Volume?	No	Yes	No	Yes	No	Yes
10 Lags of NDAY?	No	Yes	No	Yes	No	Yes
Day Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes

Table 7. Information Supply and Demand and the Risk Premium: High- vs. Low-Beta Stocks

The table repeats the main analysis conducted in Table 6 separately for High- and Low-Beta subsamples. Specifically, for each firm and each day, we estimate the betas using the previous 252 trading days. We then split the sample based on the daily cross-sectional bet estimation, where Low (High) is below (above) the medina. Stock controls include *LnSize*, LnBM. Daily fixed effects are included in each specification, and standard errors (in parentheses) are clustered by date. Statistical significance at the 10%, 5%, and 1% level is indicated with *, **, and ***, respectively.

	Beta							
	Low				High			
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AIA	7.474 (1.243) ***				19.891 (2.089) ***			
DADSVI	1.481 (0.690) **		1.476 (0.689) **	1.532 (0.689) **	1.665 (0.934) *		1.66 (0.934) *	1.734 (0.936) *
NDAY	2.98 (0.544) ***	2.978 (0.544) ***		2.825 (0.542) ***	5.481 (0.717) ***	5.478 (0.717) ***		5.327 (0.714) ***
EDAY	-4.456 (4.783)	-4.644 (4.777)	-3.631 (4.793)		12.207 (6.666) *	11.868 (6.662) *	13.27 (6.652) **	
AIA0_DADSVI1		0.814 (0.537)	.	.	.	0.499 (0.699)		
AIA1_DADSVI0		6.831 (1.222) ***				18.778 (2.062) ***		
AIA1_DADSVI1		12.864 (3.818) ***				28.255 (5.489) ***		
AIA0_NDAY1			2.579 (0.514) ***				4.881 (0.652) ***	
AIA1_NDAY0			6.083 (1.569) ***				18.077 (2.317) ***	
AIA1_NDAY1			11.872 (1.679) ***				27.617 (2.848) ***	
AIA0_EDAY1				16.43 (8.650) *				35.237 (10.047) ***
AIA1_EDAY0				8.735 (1.186) ***				21.295 (2.102) ***
AIA1_EDAY1				-7.28 (6.186)				20.684 (8.241) **
Stock Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Returns?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Squared Returns?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Volume?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of NDAY?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8. Information Supply and Demand and the CAPM

The table reports time-series average coefficients from Fama-MacBeth (1973) cross sectional regressions of daily excess return (*ERet*) on CAPM betas for various samples of stock-day observations based on measures of information supply and demand. All variables are defined in Table 1. The two information demand measures are the Abnormal Institutional Attention measure (*AIA*) from Bloomberg and the abnormal retail attention dummy (*DADSVI*) based on Google's daily Search Volume Index. The information supply measures are a news day dummy (*NDAY*) an earnings announcement day dummy (*EDAY* include and a dummy variable indicating that that there was at least one of five major macroeconomic news announcements that day (*MACRO*). Additionally, we examine days with an FOMC rate announcement (*FOMC*) as well as interaction terms between *AIA* and *FOMC*. We focus on the following three cases: *AIA* is equal to 0 and *FOMC* is equal to 1 (denoted as *AIA0_FOMC1*); *AIA* is equal to 1 and *FOMC* is equal 0 (denoted as *AIA1_FOMC0*); and both *AIA* and *FOMC* are equal to 1 (denoted as *AIA1_FOMC1*). CAPM betas used in the cross sectional regressions are estimated using a year of daily data ending on the last day of the previous month. Standard errors estimated using the Newey-West adjustment with 10 lags are reported in parentheses. Statistical significance at the 10%, 5%, and 1% level is indicated with *, **, and ***, respectively.

Sample	Intercept	Beta
FULL SAMPLE	6.908	-0.755
	(1.495) ***	(2.253)
AIA = 0	8.512	-3.396
	(1.400) ***	(2.042)
AIA = 1	-4.220	19.977
	(4.485)	(5.088) ***
DADSVI = 1	4.841	2.272
	(2.462) **	(2.970)
NDAY = 1	6.001	2.675
	(1.943) ***	(2.751)
EDAY = 1	379.134	-354.801
	(435.411)	(391.262)
MACRO = 1	3.360	6.937
	(4.339)	(8.029)
FOMC = 1	7.762	18.349
	(9.803)	(10.142) *
AIA0_FOMC1	10.799	12.828
	(10.426)	(9.838)
AIA1_FOMC0	-4.213	19.000
	(4.568)	(5.325) ***
AIA1_FOMC1	-4.460	49.675
	(14.303)	(16.583) ***

Table 9 - Information Supply and Demand and the Risk Premium – 10K and 10Q Quarters

The table repeats the main specifications from the analysis conducted in Table 6 after splitting the sample into 10-K and 10-Q quarters. In particular, the 10-K (10-Q) quarters includes all observations in January-March (April-December). Stock controls include *LnSize*, LnBM. Daily fixed effects are included in each specification, and standard errors (in parentheses) are clustered by date. Statistical significance at the 10%, 5%, and 1% level is indicated with *, **, and ***, respectively.

	10-K Quarter				10-Q Quarters			
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AIA	26.165				9.439			
	(2.358) ***				(1.657) ***			
DADSVI	4.392		4.392	4.464	0.554		0.548	0.605
	(1.200) ***		(1.200) ***	(1.200) ***	(0.686)		(0.686)	(0.686)
NDAY	4.025	4.017		3.911	4.314	4.313		4.146
	(0.846) ***	(0.847) ***		(0.839) ***	(0.617) ***	(0.617) ***		(0.616) ***
EDAY	18.446	17.647	18.716		-1.119	-1.211	-0.146	
	(7.019) ***	(6.985) **	(7.060) ***		(4.878)	(4.875)	(4.856)	
AIA0_DADSVI1		2.174				0.197		
		(0.877) **				(0.523)		
AIA1_DADSVI0		24.033				9.096		
		(2.346) ***				(1.628) ***		
AIA1_DADSVI1		42.213				12.147		
		(6.341) ***				(3.971) ***		
AIA0_NDAY1			3.880				3.808	
			(0.782) ***				(0.583) ***	
AIA1_NDAY0			25.697				7.801	
			(2.720) ***				(1.935) ***	
AIA1_NDAY1			30.687				15.634	
			(3.163) ***				(2.098) ***	
AIA0_EDAY1				33.777				23.030
				(11.763) ***				(7.446) ***
AIA1_EDAY0				27.114				10.894
				(2.363) ***				(1.651) ***
AIA1_EDAY1				36.650				-3.407
				(9.642) ***				(6.363)
Stock Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Returns?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Squared Returns?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Volume?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of NDAY?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 10 – Dissemination of Systematic Risk –Firm Size within Industry and Firm Earnings Announcement timing

The table repeats the analysis conducted in Table 3 (Panel 10.A), Table 5 (Panel 10.B), and Table 6.A (Panel 9.C) conditioning on firm relative size within (Fama French 48) industry and the order of the firm's earnings announcement in the earning cycle. Across all panels, in Specifications 1-3, we rank firms based on their relative size within industry. To alleviate noise, we keep only industries with at least five firms in our sample. We then define "Dum" as a dummy variable that receives the value of 1 if a firm is below the median industry size and 0 otherwise. Thus, in Specifications 1-3, Dum = 1 captures smaller firms in the industry. In a similar manner, in Specifications 4-6, we rank firms based on their announcement order in the earnings cycle. We then redefine "Dum" as a dummy variable that receives the value of 1 if a firm is above the median of the reporting cycle and 0 otherwise. Thus, in Specifications 4-6, Dum = 1 captures firms that are late announcers. For brevity, we only report the interaction coefficients, which estimate the additional effect of being a smaller firm in the industry (Specifications 1-3) or a late announcer (Specifications 4-6). For example, in panel 10.A, *AGG_EDAY_Dum* captures the additional effect of *AGG_EDAY* on institutional attention when a firm is smaller or a late announcer.

Panel 10.A – The additional Effect of Firm Size within Industry and Firm Earnings Announcement timing on the Determinants of Institutional Demand

	Dum = Smaller Firms in Industry			Dum = Late Announcers		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
DADSVI_Dum	-0.102	-0.105	-0.105	-0.011	-0.011	-0.011
	(0.027) ***	(0.027) ***	(0.027) ***	(0.029)	(0.029)	(0.029)
NDAY_Dum	0.137	0.162	0.146	0.014	0.043	0.015
	(0.032) ***	(0.031) ***	(0.031) ***	(0.028)	(0.028)	(0.028)
EDAY_Dum	-1.315	-1.357	-1.340	-0.477	-0.503	-0.496
	(0.062) ***	(0.062) ***	(0.062) ***	(0.068) ***	(0.069) ***	(0.070) ***
FF48_NDAY_Dum	0.552		0.312	0.421		0.343
	(0.090) ***		(0.104) ***	(0.076) ***		(0.087) ***
FF48_EDAY_Dum	0.337		-0.096	0.254		-0.137
	(0.153) **		(0.169)	(0.149) *		(0.160)
AGG_NDAY_Dum		0.976	0.720		0.448	0.168
		(0.113) ***	(0.136) ***		(0.103) ***	(0.122)
AGG_EDAY_Dum		1.798	1.861		1.523	1.678
		(0.395) ***	(0.433) ***		(0.391) ***	(0.423) ***
MACRO_Dum	-0.021	-0.028	-0.029	0.029	0.027	0.025
	(0.019)	(0.019)	(0.019)	(0.017) *	(0.016) *	(0.017)
Full Controls	YES	YES	YES	YES	YES	YES

Panel 10.B – The additional Effect of Firm Size within Industry and Firm Earnings Announcement timing on Betas

Variable	Dum = Smaller Firms in Industry (1)	(2)	(3)	Dum = Late Announcers (4)	(5)	(6)
MKTRF_Dum	0.053	0.053	0.053	0.000	-0.001	-0.001
	(0.017) ***	(0.017) ***	(0.017) ***	(0.008)	(0.008)	(0.008)
*MKTRF*AIA_Dum*	0.189	0.189	0.189	0.113	0.124	0.124
	(0.037) ***	(0.037) ***	(0.037) ***	(0.023) ***	(0.024) ***	(0.024) ***
*MKTRF*DADSVI_Dum*	0.044	0.044	0.044	0.009	0.008	0.008
	(0.014) ***	(0.014) ***	(0.014) ***	(0.013)	(0.014)	(0.014)
*MKTRF*NDAY_Dum*	0.053	0.054	0.054	-0.003	-0.003	-0.003
	(0.014) ***	(0.014) ***	(0.014) ***	(0.011)	(0.011)	(0.011)
*MKTRF*EDAY_Dum*	0.104	0.105	0.105	0.108	0.098	0.098
	(0.092)	(0.092)	(0.092)	(0.089)	(0.089)	(0.089)
LnSize		-0.002	-0.002		-0.002	-0.002
		(0.000) ***	(0.000) ***		(0.000) ***	(0.000) ***
LnBM		0.000	0.000		0.000	0.000
		(0.000)	(0.000)		(0.000)	(0.000)
CondDum			0.000			0.000
			(0.000)			(0.000)
Direct Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes

Panel 10.C – The additional Effect of Firm Size within Industry and Firm Earnings Announcement timing on the Risk Premium

Variable	Dum = Smaller Firms in Industry (1)	(2)	(3)	Dum = Late Announcers (4)	(5)	(6)
AIA_Dum	22.494	22.282	21.790	11.631	10.891	6.975
	(3.410) ***	(3.396) ***	(3.365) ***	(2.274) ***	(2.251) ***	(2.209) ***
DADSVI_Dum	1.417	1.389	1.386	-1.106	-1.222	-0.912
	(1.215)	(1.217)	(1.218)	(1.235)	(1.235)	(1.251)
NDAY_Dum	6.370	5.934	5.710	3.428	2.872	2.379
	(0.938) ***	(0.923) ***	(0.910) ***	(0.865) ***	(0.859) ***	(0.831) ***
EDAY_Dum	28.746	28.620	28.998	-24.257	-24.130	-17.308
	(8.319) ***	(8.318) ***	(8.319) ***	(8.488) ***	(8.488) ***	(8.491) **
Size LnBM Controls	NO	NO	Yes	NO	NO	Yes
10 Lags of Returns?	NO	Yes	Yes	NO	Yes	Yes
10 Lags of Squared Returns?	NO	Yes	Yes	NO	Yes	Yes
10 Lags of Volume?	NO	Yes	Yes	NO	Yes	Yes
10 Lags of NDAY?	NO	Yes	Yes	NO	Yes	Yes
Day Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes

Table 11 - Information Supply and Demand - Testing for Price Pressure

The table repeats the analysis conducted in Tables 5 and 6, replacing day *t* returns with cumulative returns from day *t*+1 through days *t*+1 to *t*+5. In particular, Panel 11.A re-estimates Specification 5 of Table 5 and Panel 11.B re-estimates Specification 6 of Table 6.A. For ease of comparison, the first column in each panel reports day *t* results from the original analyses.

Panel 11.A - Information Supply and Demand and Betas

	Return Period					
Variable	*t*	*t+1*	*t+1 - t+2*	*t+1 - t+3*	*t+1 - t+4*	*t+1 - t+5*
$MKTRF_t$	1.120	-0.051	0.019	-0.023	-0.090	-0.178
	(0.016) ***	(0.046)	(0.062)	(0.071)	(0.082)	(0.085) **
AIA_t x $MKTRF_t$	0.152	0.026	0.024	-0.016	0.000	0.023
	(0.017) ***	(0.021)	(0.029)	(0.037)	(0.041)	(0.043)
$DADSVI_t$ x $MKTRF_t$	0.029	-0.014	-0.016	-0.038	-0.055	-0.033
	(0.008) ***	(0.016)	(0.018)	(0.023) *	(0.026) **	(0.027)
$NDAY_t$ x $MKTRF_t$	-0.019	-0.041	-0.004	-0.021	0.009	-0.030
	(0.011) *	(0.022) *	(0.028)	(0.031)	(0.038)	(0.038)
$EDAY_t$ x $MKTRF_t$	0.049	0.024	0.170	0.160	0.222	0.151
	(0.045)	(0.062)	(0.160)	(0.098)	(0.165)	(0.121)
Direct Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes

Panel 11.B - Information Supply and Demand and the Risk Premium

	Return Period					
Variable	*t*	*t+1*	*t+1 - t+2*	*t+1 - t+3*	*t+1 - t+4*	*t+1 - t+5*
AIA_t	13.859	-0.538	-0.954	-0.503	-0.455	-1.203
	(1.390) ***	(0.932)	(1.211)	(1.463)	(1.654)	(1.817)
$DADSVI_t$	1.599	-0.202	-0.555	-0.734	-1.731	-2.540
	(0.601) ***	(0.499)	(0.710)	(0.840)	(0.933) *	(1.045) **
$NDAY_t$	4.256	-0.240	-0.480	-0.405	-0.334	-0.925
	(0.508) ***	(0.406)	(0.543)	(0.677)	(0.776)	(0.863)
$EDAY_t$	4.038	-3.819	-4.164	-1.283	1.138	3.711
	(4.085)	(1.894) **	(2.462) *	(2.757)	(3.133)	(3.526)
Stock Controls?	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Returns?	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Squared Returns	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Volume?	Yes	Yes	Yes	Yes	Yes	Yes
Day Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes

Table 12 - Information Supply and Demand and the Risk Premium – Daily Cross Sectional Analysis

The table repeats the main specifications from the analysis conducted in Table 6 using Fama-MacBeth (1973) cross-sectional regressions of daily returns. Stock controls include *LnSize* and *LnBM*. Standard errors estimated using the Newey-West adjustment with 10 lags are reported in parentheses. Statistical significance at the 10%, 5%, and 1% level is indicated with *, **, and ***, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	12.482	14.622	15.089	15.161	15.083	14.799
	(4.058) ***	(4.180) ***	(4.168) ***	(4.177) ***	(4.169) ***	(4.190) ***
AIA		15.948	14.986			
		(1.944) ***	(1.862) ***			
DADSVI		1.267	1.219		1.200	1.198
		(0.567) **	(0.552) **		(0.556) **	(0.551) **
NDAY	5.944		4.698	4.675		4.513
	(0.524) ***		(0.465) ***	(0.462) ***		(0.464) ***
EDAY	-1.430		-9.912	-10.266	-9.646	
	(8.298)		(8.216)	(8.250)	(8.189)	
AIA0_DADSVI1				0.483		
				(0.425)		
AIA1_DADSVI0				14.280		
				(1.799) ***		
AIA1_DADSVI1				19.618		
				(4.493) ***		
AIA0_NDAY1					4.391	
					(0.418) ***	
AIA1_NDAY0					14.347	
					(1.964) ***	
AIA1_NDAY1					20.617	
					(2.663) ***	
AIA0_EDAY1						16.069
						(9.730) *
AIA1_EDAY0						16.540
						(1.908) ***
AIA1_EDAY1						-5.119
						(10.033)
Stock Controls?	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Returns?	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Squared Returns?	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of Volume?	Yes	Yes	Yes	Yes	Yes	Yes
10 Lags of NDAY?	Yes	Yes	Yes	Yes	Yes	Yes