Famous Firms, Earnings Clusters, and the Stock Market

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We show that much of the market premium for the year occurs on a handful of days, identifiable well in advance, on which several of the market's most famous, high-media-attention firms simultaneously announce earnings after the market close. Puzzlingly, the market surges occur during the 24 hours *prior to* the earnings announcements, from close to close. Since there is no overlap between the price increase period and the information revelation, the high returns do not appear to represent a risk premium, and our tests seem to rule out information-leakage explanations. Deepening the puzzle, the market delivers high returns only prior to post-close earnings-announcement clusters, not in advance of clusters that occur in the pre-open period. In addition to being economically large and easily tradeable, the effect is statistically significant, and the results hold consistently throughout our sample. We argue that the best explanation for our findings is that of Miller (1977) as extended by Hong and Stein (2007): when over a short "attention" period difference of opinion combines with short-sale constraints, prices will rise as optimists buy while pessimists cannot sell.

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1 Introduction

One well-known thread in the finance literature demonstrates that individual firms perform well in the days around their earnings announcements.[1] Another strand shows that the market as a whole delivers unusually high returns around major macroeconomic announcements such as inflation, unemployment, and Federal Reserve Open Market Committee reports.[2] Thus a natural question arises: if a number of important companies announce their earnings on the same day, will the market behave as it does at other high-news times such as macro-announcement days?

The short answer is "yes" -- what we refer to as "earnings cluster days", days on which a significant number of large, important firms announce their earnings, see the market perform exceptionally well. Indeed, the effect is far larger than for macro announcements; on macro days the market delivers an excess return of around 10 to 20 bps/day (vs. a 2 bps average for all trading days). On earnings announcement cluster days the return is, for our main specification, 34 bps/day in excess of risk-free rate. This effect is quite distinct from the well-known effect whereby individual stocks perform well on their own announcement days; our 34 bps/day diminishes almost not at all if we remove the announcing firms from the market before computing its return for the announcement day. On its own this is an interesting confirmation and extension of a known effect. But earnings clusters provide a richer setting for exploring the possible causes of this potentially-anomalous behavior. Among other attractive features, the earnings announcements since 1999 almost all occur either before the U.S. market opens or after it closes, with about 2/3 in the morning and 1/3 after 4PM. Thus we can look to see *when* the market does well relative to the time of the earnings announcements, and how morning and afternoon announcements differ. The findings turn out to be wildly inconsistent with some explanations for the phenomenon, but not others. In particular, we identify the following anomalies:

1. The market performs spectacularly well in the 24 hour (close-to-close) period leading

[1] See e.g. Chari, Jagannathan, and Ofer (1988), Bernard and Thomas (1989), Ball and Kothari (1991), Cohen et al. (2007), Frazzini and Lamont (2007), Patton and Verardo (2012), Barth and So (2014), Savor and Wilson (2016), Johnson and So (2018), etc.

[2] See for example Savor and Wilson (2013), Savor and Wilson (2014), Lucca and Moench (2015), Bernile, Hu, and Tang (2016), Ai and Bansal (2018), Gilbert, Kurov, and Wolfe (2018), Cieslak, Morse, and Vissing-Jorgensen (2019), Hu et al. (2019), and others.

up to an earnings-cluster announcement. In our strongest specification, the market rises 34 bps/day on these days, about 17 times a typical market day, with volatility no greater than normal, so that the annualized Sharpe ratio on earnings cluster days is over 4.5. The individual stocks that make up the cluster perform even better, beating the market by around 27 bps for a total daily return of 61 bps, but the rest of the market also performs exceptionally, with lower returns than the market as a whole of course but not by enough to reduce the rounded performance below 34 bps/day.

2. The market price growth occurred primarily during the trading day prior to the announcement (23 bps) with an economically and statistically significant additional effect the evening before (close-to-open performance of 11 bps). Note that the entire 34 bps occurred prior to any of these afternoon post-close earnings announcements, so cannot be explained as compensation for the risk associated with the news in the announcements.

3. Moreover, there is little or no correlation between the market's performance in the pre-announcement period and the market response to the announcements themselves, while market volatility only spikes during the announcements, thus information leakage does not appear to explain the anomaly.

4. There is no such effect in pre-open earnings announcements, which make up approximately 2/3 of our sample. The market does not perform unusually well during the prior day's trading session.

5. The market performance on cluster days is strongly associated with excess volume and security lending utilization; that is, cluster days with high volume and more security lending tend to be the ones with the strongest market performance.

6. The effect is significant if we define earnings clusters based on number of companies announcing, total market capitalization of afternoon announcers, or other metrics. But the measure that is by far the most successful in forecasting strong market days is the "famous firm" effect -- it is the days where afternoon announcers consist of firms with the greatest amount of media coverage in the prior year that the market does best. By holding the market for just three days in each quarter, 12 days a year, one

would historically have received almost two thirds of the market's annual premium over Treasury bills, while bearing only a small fraction of the market's annual volatility.

The core findings -- enormous Sharpe ratios in an asset that can be very inexpensively traded, together with a total absence of the anomaly for stocks that announce in the morning rather than the afternoon -- constitute an interesting addition to the anomalies literature. But we believe the primary significance of this paper lies in what it tells us about potential explanations for this entire class of findings, with regard to both market-wide macro announcements and individual-firm earnings. We provide strong evidence for the theory first argued by Miller (1977) and with relevant theoretical contributions from Harris and Raviv (1993), Hong and Stein (1999, 2003) and Hong, Lim, and Stein (2000), among others. The theory was best encapsulated in Hong and Stein's 2007 JEP article which labelled it "Disagreement Theory".

Disagreement Theory is broad enough to offer explanations for a variety of market behaviors, e.g. crashes as in Hong and Stein (2003). But in this case the relevant claim is: suppose we have market participants who disagree about valuation, whose attention focuses on certain securities at certain times, and who are limited in their ability and/or willingness to sell short. In such a case, securities with strong disagreement among market participants who are temporarily paying attention will tend to have positive excess returns (which will revert, perhaps slowly, once investor attention wanes). The reason is simple, for clarity we'll embed it in the specific situation this paper explores. Suppose that Tuesday afternoon will be a big earnings-announcement time in the market, with Microsoft, Amazon, Exxon Mobil, and several other important firms putting out their numbers just after the close. Suppose We assume disagreement, a difference of opinion among market participants: Ollie the optimist has high expectations for these firms while Peggy the Pessimist holds a negative view. Because of our "attention" assumption, neither of them adjusted their portfolio before Tuesday; they weren't paying attention! Finally, due to short-sale constraints, Peggy cannot express her negative view unless she happens to hold these particular stocks, which, with high probability, she doesn't; meanwhile Ollie is free to buy. Consequently even though the average view of market participants is that the stocks are fairly priced, they rise on Tuesday because the Ollies of the world are all buying while only a modest fraction -- the small group that is open to short-selling, plus the small group that happens to own the stocks in question -- of the Peggys are selling. This theory is extremely consistent with our findings. It explains the high performance of the individual stocks announcing earnings on the cluster day.

And it explains our novel finding that the *whole market* performs well -- as disagreement about these famous, important stocks' earnings leads to disagreement about the market as a whole on the crucial days. Moreover, we are able to further verify the theory by showing that the market premium is indeed stronger during the clusters when more trading volume occurs and the short-sale constraint is more binding. As to why we don't see the effect in the morning clusters, it is because people aren't paying attention to them on the day before their earnings; one might imagine Ollie on Monday making the self-mocking joke "Microsoft and Exxon aren't announcing until tomorrow; they're Future Ollie's problem!"

The rest of the paper proceeds as follows: Section 2 explains our data and methodology. Section 3 reports the core results. Section 4 contains empirical robustness checks. Section 5 explains the Disagreement Theory in more depth and discusses how our results comport with it and with alternative explanations. Section 6 concludes.

2 Data

Our core data set consists of S&P 500 firms from 1/1/1999-12/31/2018. The time period covers the span in which almost all large firms announced their earnings outside of trading hours; prior to 1999 it was common for firms to announce in the middle of the trading day. We focus on S&P 500 firms because this is the sample for which we have accurate earnings-announcement timestamps,. The data limitation is not costly as our paper is focused on the effects of announcements by large, important firms, and almost all such firms are contained within the S&P 500 index.

The daily stock returns and the S&P 500 index constituents used in our study are obtained from CRSP. The high frequency minute-by-minute market return is computed from the trading prices of the E-mini S&P 500 futures, which is traded almost 24 hours a day.[3]

The accuracy of the timestamps of the earnings announcements is crucial to our study. Even though I/B/E/S offers a record of announcement timestamps, previous research in accounting and finance indicates that the I/B/E/S timestamps are often delayed.[4] Therefore, we collect our timestamps from three sources. We purchased the timestamps from Wall Street Horizon (WSH) for the sample since 1/1/2006. Wall Street Horizon is a private data vendor that specializes in collecting and analyzing corporate events data. They provide the most accurate earnings timestamps available, and a growing body of academic research has adopted their timestamps dataset.[5] For the sample prior to 1/1/2006, we collected the timestamps from Ravenpack News Analytics and Factiva. To proxy for investors' information set regarding the schedule of earnings announcements, we also purchased the earnings calendar snapshot dataset from WSH. The dataset contains the snapshots of the dates and times of the upcoming earnings announcements for a comprehensive cross section of firms taken at 4am everyday since 1/1/2006. It is the most accurate available earnings calendar time series without look-ahead bias.

To measure the media coverage of S&P 500 firms, we hand collected the count of earnings-related news articles from Factiva for each S&P 500 company in each calendar year during

[3]The E-mini S&P 500 futures is traded during Sunday - Friday 5:00pm - 4:00pm CT with a trading halt from 3:15pm - 3:30pm CT.

[4]See Michaely, Rubin, and Vedrashko (2014), Bradley et al. (2014), etc.

[5]See https://www.wallstreethorizon.com/news?cat=1 for the independent academic research utilizing the WSH data.

1998-2018.

To measure the bindingness of the short-sale constraint in the market, we obtained the security lending utilization data from Markit Group. For a particular stock, lending utilization is defined as the ratio between the value of outstanding security loans versus the total value of lendable security. We adopted the sample from 7/1/2006 when the wide coverage of the cross section of stocks became available.

3 Empirical Findings

3.1 Earnings Announcement Clusters and Pre-Announcement Drift

The identification of earnings announcement clusters -- EACs -- is based on two distinctive features of the data. First, earnings announcements are highly cyclical. US public firms are required to disclose quarterly earnings 4 times in a year. Figure 1 plots the daily time series of the number of announcers among the S&P 500 firms during 2016-2018. As the figure shows, there is high concentration of earnings in the first month of each quarter. The second feature is revealed by Figure 2. During our sample period from 1/1/1999 to 12/31/2018, almost every firm announced earnings outside of regular trading hours. Among S&P 500 firms, around two thirds choose to announce in the morning before 9:30am, and a third in the afternoon after 4:00pm.[6] Moreover, announcing firms rarely switch the sessions of their announcements.

Given these two observations, we pick the 3 days with the highest concentration of morning (afternoon) earnings announcements in every January, April, July and October as our AM (PM) earnings announcement clusters. The choice of 3 days is somewhat arbitrary; three days per quarter was selected for comparability with macro-announcement findings, as many macro announcements occur three times per quarter. Figure 4 shows that there is a monotonic relation between the average stock market return and the size of the PM news-weighted EACs, which supports our empirical discoveries and proposed mechanism as will be discussed in detail below.

The notion of announcement concentration depends on the weighting-scheme assigned to the firms. In our main specification, we weight firms by their media coverage to capture the "famous firm" effect. Media coverage is measured as the total number of Dow Jones news articles related to firms earnings published during the previous calendar year for the announcing firms. Table 1 and Figure 3 present the key findings of our paper. The first column in the table shows that the market on average realizes a premium of 34 bps with a t-stat of 4 during the close-to-close period prior to the PM news-weighted EACs, but there is no significant premium associated with the AM EACs. Our finding of the large EAC

[6] Lyle et al. (2017) suggests that around half of the firms announce in the morning and half announce in the afternoon. The discrepancy between our finding and theirs is due to the difference in the sample. We focus on the S&P 500 companies in our study, whereas they include the CRSP cross section of firms.

premium is not explained by the macro announcement premium that has been previously document by Savor and Wilson (2013) and others, which has an average of 11 bps in our sample. The earnings announcement literature has extensively documented the high average returns of individual stocks during earnings announcements.

To rule out the possibility that our finding on the market premium is mechanically generated by firm-level announcement premia, the second column presents the same regression with the market portfolio constructed with the non-announcing firms only. The result is virtually unchanged. This verifies that our finding is a market-wide phenomenon that is different from the previously documented firm-level earnings announcement premium.

Another concern with this regression is that the relative time window of the market performance is different for the PM and AM EACs. The window is from close-to-close ending at 4pm on the day of the EAC. Therefore, for the PM EACs, the regression examines market performance during the 24 hours prior to the announcements, whereas the AM EACs are in the middle of the time window. To account for such mismatch in timing, the third column replicates the same regression with the open-to-open market return. However, we are still unable to find any significant premium associated with the AM EACs.

Table 2 further decomposes the pre-announcement drift of the PM EACs into an overnight component and an intraday component. Out of the 34 bps total premium, around 11 bps is realized during the period from 4:00pm of the previous trading day to 9:30am on the morning of the announcement day and another 23 bps is realized from 9:30am to 4:00pm of the PM EAC day. And there is not much further drift or reversal on the days before and after. Moreover, there is a complete lack of premium around the AM EACs. Figure 5 plots the distributions of the weekdays of the EAC days. From the figure, the majority of the EAC days occur on Tuesdays, Wednesdays and Thursdays. The day-of-the-week distribution does not seem to be materially different for the PM EACs versus the AM EACs.

Table 3 further highlights the economic significance of our findings. The table presents the relevant statistics of the daily stock market return across the trading days in 4 non-overlapping categories: no-announcement days, macro-announcement days, PM EAC days and overlapping days. The first column documents the unconditional moments of the daily market return when all the trading days are included. Over our sample period, the daily market premium is around 2 bps, which translates into an annualized premium of 6.07%. The annualized Sharpe ratio is 0.32. The unconditional moments in our sample are thus

comparable to that of a longer sample since 1947.[7] The second column shows that the average daily market premium for no-announcement days is around -1 bps in our sample, which corresponds to an annualized premium of -1.80%, accounting for -29.57% of the total market premium. The third column shows that, consistent with previous findings, a large market premium is earned on the macro announcement days. Following Savor and Wilson (2013), our macro announcement days incorporate the following events announced by the US government: GDP, PPI, Unemployment and FOMC. During our sample, around 10 bps is earned on these days with macro announcements and there are about 42 macro announcement days in a year. So there is a total of 4.11% market premium attributable to macro announcements in a year, which account towards 67.78% of the total unconditional premium. Also consistent with previous findings, the market volatility on the macro announcement days is about the same as its unconditional level, so that the macro announcement days feature a high Sharpe ratio of 1.30 annualized. The remaining two columns present the moments of the market on days with the PM EACs only and with both the PM EACs and the macro announcements. The market returned an average premium of 29 bps on the EAC only days and 53 bps when both events occur. The volatility of the return is still comparable to the unconditional value, so that the annualized Sharpe ratios on these two types of trading days are at whopping levels of 4.14 and 6.32, respectively.

The table also shows that there is little overlap between the EAC days and the macro announcement days. By construction, we have 12 EAC days in a year, and on average only one EAC day overlaps with the macro announcements. These 12 trading days contribute to a shockingly high fraction of 61.79% of the total market premium in a year. To demonstrate the statistical significance of our findings, the table also presents the p-values computed from a bootstrap exercise that constructs the counterfactual return distributions by randomly selecting 12 trading days in each calendar year. The exercise shows that the risk premium and Sharpe ratio are statistically significant for both the macro announcement days and the EAC days. It also shows that higher moments (standard deviation, skewness and kurtosis) are not statistically different from their unconditional values.

[7] See Campbell (2017).

3.2 Alternative Weighting-Schemes and the "Famous Firm" Effect

To understand the underlying mechanism generating the large pre-announcement drift, we investigate the market performance during the EACs identified with alternative weight-schemes that intend to capture the resolution of "systematic" risks.

Table 4 presents the results when the EACs constructed with the announcing firms equal-weighted and value-weighted. The equal-weighting scheme treats all firms equally and defines the size of the EAC as the total number of announcers. The value-weighting scheme over-weights firms with large market capitalizations and defines the size of EAC as the total market capitalizations of the announcers. The table shows that the equal-weighted and value-weighted PM EACs are also associated with significant pre-announcement drift. However, the magnitudes are much weaker. Moreover, the table shows that the significance of the premium with the equal-weighted and value-weighted PM EACs are completely subsumed by the news-weighted EACs when they are also included in the regressions.

The performances of the bellwether firms have received considerable attention in the finance and accounting literature.[8] These are the firms whose earnings announcements are particularly informative about the conditions about their peer firms, their industries and the entire economy. To understand the impact of bellwether firms on the EAC pre-announcement drift. We consider two metrics proposed by Hameed et al. (2015) that intend to identify the bellwether firms in the economy: analyst coverage and partial correlation in fundamentals. Analyst coverage is the number of analysts predicting the earnings of a particular firm. Partial correlation in fundamentals is a metric constructed in Hameed et al. (2015) that measures the extent to which a firm's quarterly ROA can explain the ROA of its peer firms in the same industry. We construct the bellwether EACs by weighting announcing firms with these two metrics and present the findings in Table 5. We find that the bellwether EACs have even weaker pre-announcement drift than the equal-weighted and value-weighted EACs, and the effects again are completely subsumed when the news-weighted EACs are also included in the regressions.

The analysis thus shows that our finding of strong EAC pre-announcement drift is mostly driven by famous firms with high media attention instead of metrics measuring firms' expo-

[8]See, for example, Anilowski, Feng, and Skinner (2007), Shivakumar (2010), Aobdia, Caskey, and Ozel (2014), Barth and So (2014), Savor and Wilson (2016), etc.

sures to systematic risks.

3.3 Individual Famous Firms and Industry EACs

Figure 6 documents the performance of the market when individual famous firms announce. To compare with our main specification, we also pick 3 days in every January, April, July and October in the morning and in the afternoon, respectively. But instead of aggregating the announcements across firms, we simply pick the days when the top 3 firms with the most news articles announce their earnings. The table shows that a market premium of 22 bps is realized before a famous firm announces after 4:00pm. However, the premium induced by individual firm announcements is subsumed when the PM EAC is also included in the regression. The table thus shows that our finding of the large market premium is caused by the aggregation of announcements made by famous firms.

Table 7 applies our exercise to each of the Fama French 12 industries. We identify the earnings clusters with the firms in a particular industry only and measure the market performances during the industry EACs. Panel (a) shows the that the market premium is generally positive when a group of famous firms in each industry announce. However, Panel (b) shows that all of the individual industry EAC premium is subsumed by the EACs constructed from the full cross section when all firms are included to identify the earnings clusters. Therefore, the results show that our findings are not driven by certain individual industries.

3.4 Earnings Calendar and Trading Strategy

We have so far documented the strong market rally before the PM news-weighted EACs. We interpret our findings as the market response to firms' announcements rather than firms responding to market performance. The assumption underlying our interpretation is that most firms' earnings announcements are pre-scheduled and investors have the knowledge of the dates and times of the announcements in advance. We use information extracted from earnings calendar snapshots to verify our assumption in a subsample during 1/1/2006-12/31/2018 in this section.

To proxy for investors' information set regarding the schedule of earnings announcements, we acquired the earnings calendar snapshots dataset from WSH. As mentioned in the data

section, a snapshot of the schedule of the impending earnings announcements is taken every morning at 4:00am. Thus, WSH constructs a forward-looking daily time series of earnings calendar with no look-ahead bias.

We utilize the earnings calendar snapshots to project EACs by constructing an implementable trading strategy. On every day in January, April, July and October, our trading strategy performs the following steps:

1. Record the announcements that have already occurred in the current month.
2. Project the announcements yet to occur based on earnings calendar.
3. Construct the entire calendar for the month by combining 1&2.
4. Identify the top 3 dates with the highest concentration of announcements measured by the combined number of news articles about the announcers.
5. Decide to invest in the market tomorrow if tomorrow ranks in top 3.
6. Move to the next day, and repeat 1-5.

Table 8 presents the performance of our trading strategy. We obtained very similar results with the ex-ante EACs projected from the earnings calendar compared to the ex-post EACs constructed from the actual realizations of the announcements. The exercise thus rules out the reverse causality and verifies our interpretation of the findings as the market response to pre-scheduled earnings announcements.

4 Robustness checks: Eliminating some potential drivers of the findings

In addition to the fact that a large fraction of the market premium is realized on only a handful of trading days, there are two surprising features of the EAC premium. First, the entire premium is realize during the period before the announcements were made. Second, the large market premium associated with the PM EACs is in stark contrast with the complete lack of premium of the AM EACs. We show in this section that our findings are unlikely to be explained by rational channels by ruling out the possibility of information leakage and the hypothesis of the PM EACs posing more systematic risk.

4.1 Possibility of Information Leakage

We provide two pieces of evidence that are at odds with the hypothesis that the pre-announcement drift is caused by information leakage before the PM announcements. We first show that there is little or no correlation between the market return during the pre-announcement period when the premium is realized and the period when announcements are actually made. Moreover, we also show that the market volatility only spikes up during the announcement window, and is not statistically different from a normal day during the pre-announcement period. The combination of both of these two findings is inconsistent with the hypothesis that significant information leakage is responsible for the large pre-announcement drift prior to the PM earnings clusters.

Figure 6 is a scatter plot of the market return between 4:00pm and 6:00pm on the PM EAC day against the return from 9:30am to 4:00pm. The two time windows represent the periods during which the PM announcements are made and the EAC premium is realized, respectively. Figure 6 shows that the correlation between the market return from the two windows is statistically insignificant with a negative point estimate. The finding is wildly inconsistent with the prediction of the information leakage hypothesis, under which the announcement-period returns would be presaged by the market performance during trading hours.

Furthermore, Figure 7 compares the intraday high frequency volatility on the EAC day to its unconditional pattern. Panel (a) of the figure shows that the market volatility on the

announcement day is similar to a regular trading day during the trading hours from 9:30am to 4:00pm. However, the volatility on the PM EAC day is much higher than a normal day during 4:00pm-6:00pm, when the announcements are actually made. If the excess volatility on EAC days were in reality being resolved during the pre-announcement trading day, we would expect excess volatility during the day, not just in the after-market. Panel (b) and (c) of the figure examine the statistical significance of the difference in volatility with a bootstrap exercise. We randomly draw 12 trading days in each year and construct the counterfactual volatility distribution with such random sampling. Panel (b) compares the intraday return volatility of the EAC days to its counterfactual distribution and shows that the market volatility during the trading hours on the EAC days is statistically indistinguishable from a random trading day. Panel (c) shows, however, that the market volatility during the after hours on the EAC days is statistically higher than that of a normal trading day with a p-value of 0.0002. These findings suggest that information revelation does occur after the market close, when the earnings are broadcast to the market, and is again inconsistent with the information leakage story.

4.2 Comparison of Firm Characteristics

Our findings regarding the large pre–announcement drift before the PM EACs is similar to the well-known pre-FOMC announcement drift documented by Lucca and Moench (2015). On the other hand, compared with the pre-FOMC drift, our EAC premium has a unique, novel feature – it is only present for the PM EACs, but disappears for the AM EACs. We show in this section that the drastically different market behavior between the PM and AM EACs cannot be explained by the difference in the systematic risks that are posed by these two events.

Figure 8 plots the number of announcers within each EAC. Consistent with Figure 2, there are actually always more firms announcing during the AM EACs than the PM EACs. Throughout our sample, there are on average more than twice as many firms announcing in AM EACs than PM EACs. Table 9 compares the characteristics of the AM EAC announcers to the PM EAC announcers. The table shows that the PM announcers are younger than the AM announcers. They also have slightly higher market beta and are a little less profitable than the AM announcers. These findings are consistent with the anecdotal account

that PM announcers tend to be tech firms located on the west coast. However, these two groups of firms are very comparable along all the other observable dimensions. In particular, Table 9 shows that they have similar market capitalization, leverage, book-to-market ratio, investment rate and media coverage. The similarity in the characteristics between these two groups of firms combined with the fact that there are on average more than twice as many firms announcing in the morning than in the afternoon suggests that it is not that case that PM EACs pose significantly more systematic risks than the AM EACs.

5 The EAC effect and the Disagreement Theory

Our finding is a market-wide premium on cluster days, in which stocks that are *not* announcing earnings in the given afternoon nevertheless deliver a value-weight return well over 30 bps per PM EAC day. This distinguishes it from the well-documented firm-level earnings announcement premium, in that our findings regarding the EAC premium is a market-wide effect which reflects the aggregate implications of earnings announcements.

The identification of a large market premium prior to PM EACs contributes to the recent growing literature on macro announcement premia. In particular, Lucca and Moench (2015) made a similar finding on the sizable market drift prior to FOMC announcements. And Hu et al. (2019) later confirmed that the pre-announcement drift is prevalent and present in a number of macro announcements. We show that the pre-announcement drift is not limited to government announcements. More importantly, our study on EAC pre-announcement drift creates a setting for us to better investigate the mechanism underlying the empirical findings.

Our findings raise the hurdle for rational theories to explain the pre-announcement drift. In addition to the mismatch between the timing of the news release and premium realization, which constitutes the original pre-FOMC announcement puzzle, any attempt to reconcile the pre-announcement drift with a rational channel now has to also explain the drastic difference in the market performance before the PM and AM EACs. Moreover, echoing Ernst, Gilbert, and Hrdlicka (2019), the combination of the EAC and macro announcement premia accounts for more than 100% of the market premium. So the rational theory has to generate a negative equity premium on the approximately 80% of all trading days when there is no macro announcement or large afternoon earnings cluster. This constitutes a formidable challenge for any rational model.

By contrast, our findings fit within the predictions of the Disagreement Theory, which attributes the pre-announcement drift to the combination of investor disagreement and short-sale constraints.

The application of the Disagreement Theory to individual stocks on their earnings day is clear: any investor can purchase a stock they are optimistic about, but pessimists can only sell a stock if one of two conditions holds. Either the pessimistic investor must own that particular stock, or the pessimist must be able, in terms of regulatory situation, type

of account, comfort level, and in other ways, to sell the stock short. For any given stock there are likely a very significant fraction of potential investors who meet neither condition: they don't happen to own that particular company, and they are not interested in selling short. After all, the vast majority of both individual investors and mutual funds are either not allowed to sell short, or simply don't do it, and so for all intents and purposes they are constrained. Thus we get a very clean disagreement-theory story -- investors pay attention to the stock on the earnings day, there is difference of opinion on what will happen post-close, so the optimists buy while (some of) the pessimists cannot sell, leading to a trade imbalance and price increase in the short run (i.e. for that day).

For the market as a whole, the story is less obvious but still quite consistent with the core tenets of the Disagreement Theory. As shown in Figure 7, the volatility of the market spikes up during the 4pm-6pm period when the announcements actually take place on the PM EAC days. Therefore, the simultaneous announcements of a number of high-profile firms in a short time window constitute an important information event for stocks in the aggregate. Just as individual investors might disagree about how individual firms' announcements might realize, they might also disagree or speculate on how the market as a whole would move when PM EAC firms announce after the market close. So the same channel that applies to individual stocks could apply to the entire market. Admittedly, the short-sale constraint might be more binding for individual stocks than for the S&P 500. After all, it's much easier to take short positions on the market, for example via futures or inverse ETFs, than on individual stocks. On the other hand, the market might be much more inelastic to order imbalances than individual stocks. Gabaix and Koijen (2020) designed a "granular iv" methodology and estimated the macro inelasticity to be around 5, which is about 5 times larger than the consensus for micro inelasticity in the literature.[9] That is, a 1% capital flow into a stock on average raises the price by 1%, whereas a 1% capital inflow to the market generates a return of 5%. In our sample, the announcing stocks realized an average return of 61 bps on the PM EAC days and the market rose by 34 bps. So a back-of-the-envelope calculation suggests that an order imbalance of 0.6% is required to generate the rally of announcing stocks, but only 0.06% is needed for the market, smaller by a factor of 10. Therefore, even though the short-sale constraint on the entire market is only mildly binding, it may be able to generate a large

[9]See Shleifer (1986), Harris and Gurel (1986), Wurgler and Zhuravskaya (2002), Duffie (2010), Chang, Hong, and Liskovich (2015), Koijen and Yogo (2019), etc.

impact on market performance due to the high macro inelasticity. Perhaps more important, the short-sale constraint in Disagreement Theory need not be interpreted literally. The buy/sell asymmetry doesn't have to kick in only when the investor sells 100% of her stock holdings. Empirical evidence suggests that retail investors are more likely to buy than to sell during attention-grabbing events due to bounded rationality.[10] Even though the evidence is predominantly on individual stocks, the same effect might be present for investors' entire stock portfolios as well. One possible hypothesis is that buying is more likely to be driven by investors identifying attractive investment opportunities, while selling is more likely to be driven by liquidity need. Disagreement Theory is also consistent with the difference in the market performances between the PM and AM EACs, as it is intuitive that investors pay closer attention to imminent events as opposed to distant events happening after a (relatively) long break in trading. Hence, Disagreement Theory offers the most promising approach for explaining the EAC pre-announcement drift.

Our proposal of using Disagreement Theory to explain the EAC pre-announcement drift does not only stay as a conjecture. We are able to discover abundant evidence in the data to support the disagreement channel. In addition to showing that the EAC premium is attributable to a handful of attention-grabbing famous firms as opposed to firms with more systematic importance as presented in Section 4, we are able to make further observations regarding the influences of the market trading volume and the bindingness of the short-sale constraint on the EAC premium as predicted by the Disagreement Theory.

5.1 Trading Volume

As well summarized in Hong and Stein (2007), the implication of trading volume on asset prices is a distinctive feature of the Disagreement Theory. Table 10 presents the interaction between the EAC pre-announcement drift and market trading volume. Our measure of turnover on a particular date is defined as the total dollar trading volume divided by the total market capitalization of the S&P 500 firms on that date. Panel (a) of the table shows that the interaction between the market turnover and the PM EAC dummy is highly significant. The finding indicates that the EAC pre-announcement drift is more pronounced on days

[10] See Seasholes and Wu (2007), Barber and Odean (2008), Engelberg and Parsons (2011), **?**, Da, Engelberg, and Gao (2011) etc.

with more trading in the market. Panel (b) of the table replaces the market turnover on the day of the announcement with the average market turnover during the 5 trading days before the PM EAC. The interaction term becomes much weaker and less significant. The result suggests that the positive relation between the EAC premium and market turnover is associated with the turnover realized during the period of the pre-announcement drift rather than its persistent component which is present long before the announcement.

To explain our unique finding that large pre-announcement drift is only present for PM EACs, but totally absent for AM EACs, we posit that investors on a particular trading day pay more attention to the imminent earnings announcements occurring right after market close than the ones taking place the next morning. Table 11 provides evidence to support this claim. The table shows that market turnover increases during the periods leading up to both the PM and the AM EACs. But this effect is almost twice as strong for the PM EACs than the AM EACs. The annualized turnover increases by 12% during the trading day immediately before a PM EAC, while the increment is only 7% for an AM EAC.

5.2 Short-Sale Constraint

Short-sale constraint is an indispensable component of the Disagreement Theory. It is required to generate the price impact from investor disagreement. If the disagreement channel indeed drives our findings, one implication is that our EAC premium should be stronger during the episodes when the short-sale constraint is more binding.

To proxy for the bindingness of the short-sale constraint, we acquired the security lending utilization data from Markit Group. For a particular stock, utilization is defined as the ratio between the value of outstanding security loans versus the total value of lendable security. Since our findings are about market-wide effects, we aggregate up the stock-level lending utilization weighted by market capitalization so as to construct a metric of the bindingness of the short-sale constraint for the entire market. To the extent that it is harder to borrow an additional share of stock when utilization is high because there are fewer shares of lendable stocks remaining available, we should expect the market-wide utilization metric to be positively correlated with the PM EAC premium. This is exactly what we find in Table 12. The interaction term between the market lending utilization and the PM EAC dummy is highly significant. Interestingly, the interaction term with the AM EAC dummy

is insignificant, which is consistent with our hypothesis that the disagreement channel is not at play for AM EACs due to investors' inattention.

6 Conclusion

Most firms announce their earnings on Tuesdays, Wednesdays, and Thursdays in the first month of each quarter. Consequently, each quarter has a dozen or so days with the potential to have an impressive cluster of important firms announcing earnings more-or-less simultaneously in either the pre-open or post-close period. Each quarter we identify the three most impressive clusters for the morning, and the same for the afternoon. On the days leading up to post-close clusters, the market performs spectacularly (daily returns 17x the norm), delivering most of its excess return for the entire year on just a dozen days, without excess volatility, leading to extraordinary Sharpe ratios for these days. The individual stocks whose earnings are to be announced perform even better than the market as a whole, but by themselves explain only a tiny fraction of the market surge.

This paper establishes the above finding, one of the most economically and statistically significant effects we know of for an asset (S&P 500 index) that can be traded at de minimum cost. The remainder of the paper is dedicated to tests whose goal is to understand the cause. We believe we can reject explanations that rely on a risk-premium, both because the magnitude is so large and because the timing of the price change is inconsistent with such explanations. Once we enter the world of irrational or bounded-rational behavior, of course many explanations are possible. But one well-known hypothesis, the Disagreement Theory of Miller (1977) as well as Hong, Stein, and their co-authors, seems to fit the findings well. When investors pay attention only to the most imminent market phenomena, and differences of opinion among investors are very strong, then short-sale constraints can cause prices to rise, as optimists buy but pessimists are mostly unable to sell. Disagreement Theory predicts the general finding, as both investor attention and between-investor disagreements will be maximized on earnings-announcement days. Moreover, the theory predicts the morning-afternoon distinction, as investors on Tuesday pay attention much more to Tuesday-afternoon earnings announcements than to those that will occur Wednesday morning. The fact that market premium is stronger on cluster days with higher trading volume and a more binding short-sale constraint lends further support to the disagreement channel. And Disagreement Theory predicts that of all the characteristics that could be used to determine which clusters are most important, it is attention-based measures such as news stories, rather than market-based measures like capitalization or business-based measures

like bellwether status, that best identify the days when markets will trade up. No doubt many interrelated phenomena are at play, but we believe our findings provide meaningful support for the role of disagreement effects in the 21st-century U.S. stock market.

References

Ai, Hengjie and Ravi Bansal. 2018. "Risk preferences and the macroeconomic announcement premium." *Econometrica* 86 (4):1383–1430.

Anilowski, Carol, Mei Feng, and Douglas J Skinner. 2007. "Does earnings guidance affect market returns? The nature and information content of aggregate earnings guidance." *Journal of accounting and Economics* 44 (1-2):36–63.

Aobdia, Daniel, Judson Caskey, and N Bugra Ozel. 2014. "Inter-industry network structure and the cross-predictability of earnings and stock returns." *Review of Accounting Studies* 19 (3):1191–1224.

Ball, Ray and Stephen P Kothari. 1991. "Security returns around earnings announcements." *Accounting Review* :718–738.

Barber, Brad M, Emmanuel T De George, Reuven Lehavy, and Brett Trueman. 2013. "The earnings announcement premium around the globe." *Journal of Financial Economics* 108 (1):118–138.

Barber, Brad M and Terrance Odean. 2008. "All that glitters: The effect of attention and news on the buying behavior of individual and institutional investors." *The review of financial studies* 21 (2):785–818.

Barth, Mary E and Eric C So. 2014. "Non-diversifiable volatility risk and risk premiums at earnings announcements." *The Accounting Review* 89 (5):1579–1607.

Berkman, Henk, Valentin Dimitrov, Prem C Jain, Paul D Koch, and Sheri Tice. 2009. "Sell on the news: Differences of opinion, short-sales constraints, and returns around earnings announcements." *Journal of Financial Economics* 92 (3):376–399.

Bernard, Victor L and Jacob K Thomas. 1989. "Post-earnings-announcement drift: delayed price response or risk premium?" *Journal of Accounting research* 27:1–36.

Bernile, Gennaro, Jianfeng Hu, and Yuehua Tang. 2016. "Can information be locked up? Informed trading ahead of macro-news announcements." *Journal of Financial Economics* 121 (3):496–520.

Bradley, Daniel, Jonathan Clarke, Suzanne Lee, and Chayawat Ornthanalai. 2014. "Are analysts' recommendations informative? Intraday evidence on the impact of time stamp delays." *The Journal of Finance* 69 (2):645–673.

Campbell, John Y. 2017. *Financial decisions and markets: a course in asset pricing*. Princeton University Press.

Chang, Eric C, Joseph W Cheng, and Yinghui Yu. 2007. "Short-sales constraints and price discovery: Evidence from the Hong Kong market." *The Journal of Finance* 62 (5):2097–2121.

Chang, Yen-Cheng, Harrison Hong, and Inessa Liskovich. 2015. "Regression discontinuity and the price effects of stock market indexing." *The Review of Financial Studies* 28 (1):212–246.

Chari, Varadarajan V, Ravi Jagannathan, and Aharon R Ofer. 1988. "Seasonalities in security returns: The case of earnings announcements." *Journal of Financial Economics* 21 (1):101–121.

Cieslak, Anna, Adair Morse, and Annette Vissing-Jorgensen. 2019. "Stock returns over the FOMC cycle." *The Journal of Finance* 74 (5):2201–2248.

Cocoma, Paula. 2018. "Explaining the pre-announcement drift." *Available at SSRN 3014299* .

Cohen, Daniel A, Aiyesha Dey, Thomas Z Lys, and Shyam V Sunder. 2007. "Earnings announcement premia and the limits to arbitrage." *Journal of Accounting and Economics* 43 (2-3):153–180.

Cready, William M and Umit G Gurun. 2010. "Aggregate market reaction to earnings announcements." *Journal of Accounting Research* 48 (2):289–334.

Da, Zhi, Joseph Engelberg, and Pengjie Gao. 2011. "In search of attention." *The Journal of Finance* 66 (5):1461–1499.

Diether, Karl B, Christopher J Malloy, and Anna Scherbina. 2002. "Differences of opinion and the cross section of stock returns." *The Journal of Finance* 57 (5):2113–2141.

Duffie, Darrell. 2010. "Presidential address: Asset price dynamics with slow-moving capital." *The Journal of finance* 65 (4):1237–1267.

Engelberg, Joseph, R David McLean, and Jeffrey Pontiff. 2018. "Anomalies and news." *The Journal of Finance* 73 (5):1971–2001.

Engelberg, Joseph, Caroline Sasseville, and Jared Williams. 2012. "Market madness? The case of mad money." *Management Science* 58 (2):351–364.

Engelberg, Joseph E and Christopher A Parsons. 2011. "The causal impact of media in financial markets." *The Journal of Finance* 66 (1):67–97.

Ernst, Rory, Thomas Gilbert, and Christopher M Hrdlicka. 2019. "More than 100% of the equity premium: How much is really earned on macroeconomic announcement days?" *Available at SSRN 3469703* .

Frazzini, Andrea and Owen A Lamont. 2007. "The earnings announcement premium and trading volume." *NBER working paper* (w13090).

Gabaix, Xavier and Ralph SJ Koijen. 2020. "In Search of the Origins of Financial Fluctuations: The Inelastic Markets Hypothesis." *Available at SSRN* .

Gilbert, Thomas. 2011. "Information aggregation around macroeconomic announcements: Revisions matter." *Journal of Financial Economics* 101 (1):114–131.

Gilbert, Thomas, Alexander Kurov, and Marketa Wolfe. 2018. "The Disappearing Pre-FOMC Announcement Drift." Tech. rep.

Hameed, Allaudeen, Randall Morck, Jianfeng Shen, and Bernard Yeung. 2015. "Information, analysts, and stock return comovement." *The Review of Financial Studies* 28 (11):3153–3187.

Harris, Lawrence and Eitan Gurel. 1986. "Price and volume effects associated with changes in the S&P 500 list: New evidence for the existence of price pressures." *the Journal of Finance* 41 (4):815–829.

Harris, Milton and Artur Raviv. 1993. "Differences of opinion make a horse race." *The Review of Financial Studies* 6 (3):473–506.

Hong, Harrison, Terence Lim, and Jeremy C Stein. 2000. "Bad news travels slowly: Size, analyst coverage, and the profitability of momentum strategies." *The Journal of Finance* 55 (1):265–295.

Hong, Harrison, Jose Scheinkman, and Wei Xiong. 2006. "Asset float and speculative bubbles." *The journal of finance* 61 (3):1073–1117.

Hong, Harrison and Jeremy C Stein. 1999. "A unified theory of underreaction, momentum trading, and overreaction in asset markets." *The Journal of finance* 54 (6):2143–2184.

———. 2003. "Differences of opinion, short-sales constraints, and market crashes." *The Review of Financial Studies* 16 (2):487–525.

———. 2007. "Disagreement and the stock market." *Journal of Economic perspectives* 21 (2):109–128.

Hu, Grace Xing, Jun Pan, and Jiang Wang. 2017. "Early peek advantage? Efficient price discovery with tiered information disclosure." *Journal of Financial Economics* 126 (2):399–421.

Hu, Grace Xing, Jun Pan, Jiang Wang, and Haoxiang Zhu. 2019. *Premium for heightened uncertainty: Solving the fomc puzzle*. National Bureau of Economic Research.

Johnson, Travis L and Eric C So. 2018. "Asymmetric trading costs prior to earnings announcements: Implications for price discovery and returns." *Journal of Accounting Research* 56 (1):217–263.

Kaniel, Ron, Shuming Liu, Gideon Saar, and Sheridan Titman. 2012. "Individual investor trading and return patterns around earnings announcements." *The Journal of Finance* 67 (2):639–680.

Kim, Jaewoo, Bryce Schonberger, Charles E Wasley, and Yucheng John Yang. 2018. "What Drives Stock Market Volatility on Days Without Macroeconomic News Releases? The

Role of Aggregate Earnings News." In *29th Annual Conference on Financial Economics & Accounting*.

Koijen, Ralph SJ and Motohiro Yogo. 2019. "A demand system approach to asset pricing." *Journal of Political Economy* 127 (4):1475–1515.

Kothari, SP, Jonathan Lewellen, and Jerold B Warner. 2006. "Stock returns, aggregate earnings surprises, and behavioral finance." *Journal of Financial Economics* 79 (3):537–568.

Kurov, Alexander, Alessio Sancetta, Georg Strasser, and Marketa Halova Wolfe. 2019. "Price drift before US macroeconomic news: Private information about public announcements?" *Journal of Financial and Quantitative Analysis* 54 (1):449–479.

Laarits, Toomas. 2019. "Pre-announcement risk." *Available at SSRN 3443886* .

Linnainmaa, Juhani T and Conson Zhang. 2019. "The earnings announcement return cycle." *Available at SSRN 3183318* .

Lucca, David O and Emanuel Moench. 2015. "The pre-FOMC announcement drift." *The Journal of Finance* 70 (1):329–371.

Lyle, MR, C Rigsby, A Stephan, and TL Yohn. 2017. "The timing of earnings announcements and volatility." *Unpublished working paper. Northwestern University and Indiana University* .

Michaely, Roni, Amir Rubin, and Alexander Vedrashko. 2014. "Corporate governance and the timing of earnings announcements." *Review of Finance* 18 (6):2003–2044.

Miller, Edward M. 1977. "Risk, uncertainty, and divergence of opinion." *The Journal of finance* 32 (4):1151–1168.

Neuhierl, Andreas and Michael Weber. 2018. "Monetary momentum." Tech. rep., National Bureau of Economic Research.

Ofek, Eli and Matthew Richardson. 2003. "Dotcom mania: The rise and fall of internet stock prices." *The Journal of Finance* 58 (3):1113–1137.

Patton, Andrew J and Michela Verardo. 2012. "Does beta move with news? Firm-specific information flows and learning about profitability." *The Review of Financial Studies* 25 (9):2789–2839.

Peress, Joel. 2008. "Media coverage and investors' attention to earnings announcements." *Available at SSRN 2723916* .

Savor, Pavel and Mungo Wilson. 2013. "How much do investors care about macroeconomic risk? Evidence from scheduled economic announcements." *Journal of Financial and Quantitative Analysis* 48 (2):343–375.

———. 2014. "Asset pricing: A tale of two days." *Journal of Financial Economics* 113 (2):171–201.

———. 2016. "Earnings announcements and systematic risk." *The Journal of Finance* 71 (1):83–138.

Scheinkman, Jose A and Wei Xiong. 2003. "Overconfidence and speculative bubbles." *Journal of political Economy* 111 (6):1183–1220.

Seasholes, Mark S and Guojun Wu. 2007. "Predictable behavior, profits, and attention." *Journal of Empirical Finance* 14 (5):590–610.

Shivakumar, Lakshmanan. 2010. "Discussion of aggregate market reaction to earnings announcements." *Journal of Accounting Research* 48 (2):335–342.

Shleifer, Andrei. 1986. "Do demand curves for stocks slope down?" *The Journal of Finance* 41 (3):579–590.

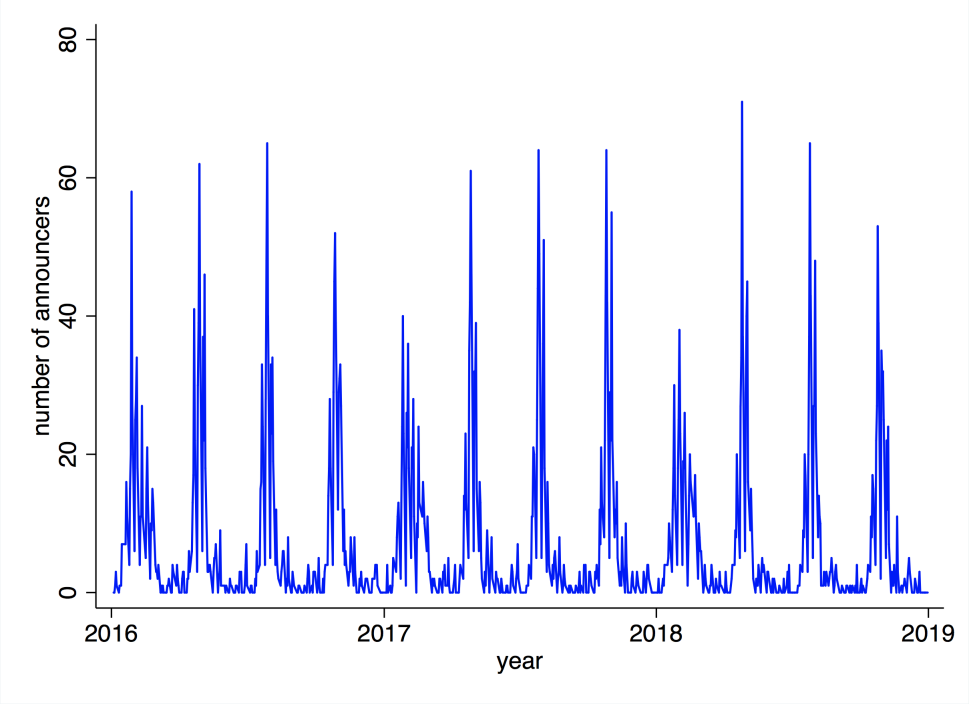
So, Eric C and Sean Wang. 2014. "News-driven return reversals: Liquidity provision ahead of earnings announcements." *Journal of Financial Economics* 114 (1):20–35.

Wachter, Jessica A and Yicheng Zhu. 2018. "The macroeconomic announcement premium." Tech. rep., National Bureau of Economic Research.

Wurgler, Jeffrey and Ekaterina Zhuravskaya. 2002. "Does arbitrage flatten demand curves for stocks?" *The Journal of Business* 75 (4):583–608.

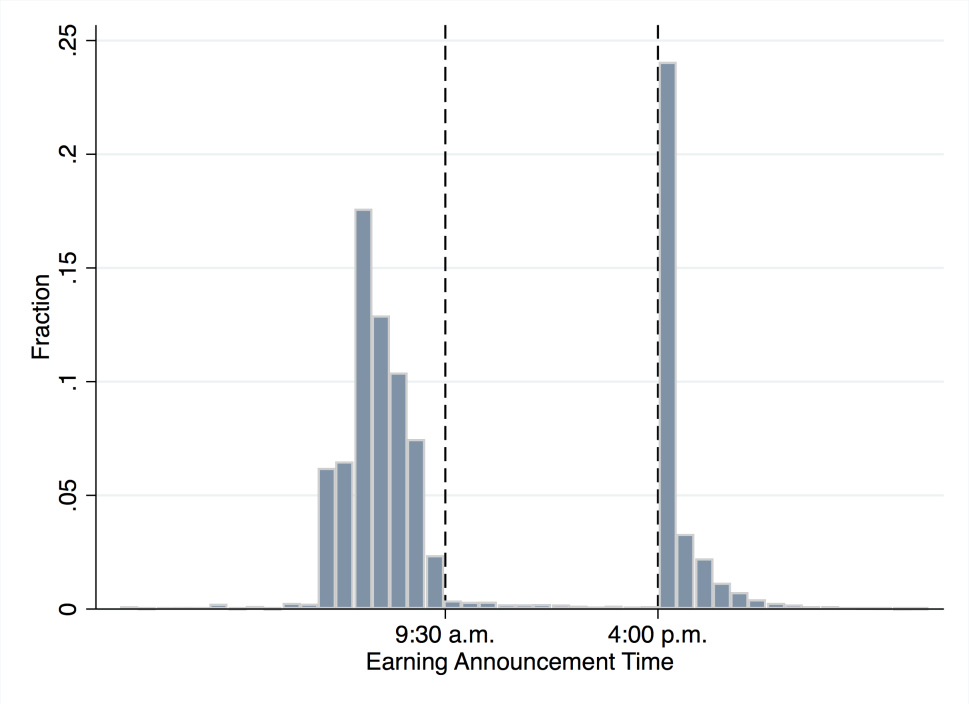
Figures

Figure 1: Daily Time Series of the Number of S&P 500 Earnings Announcers, 2016-2018



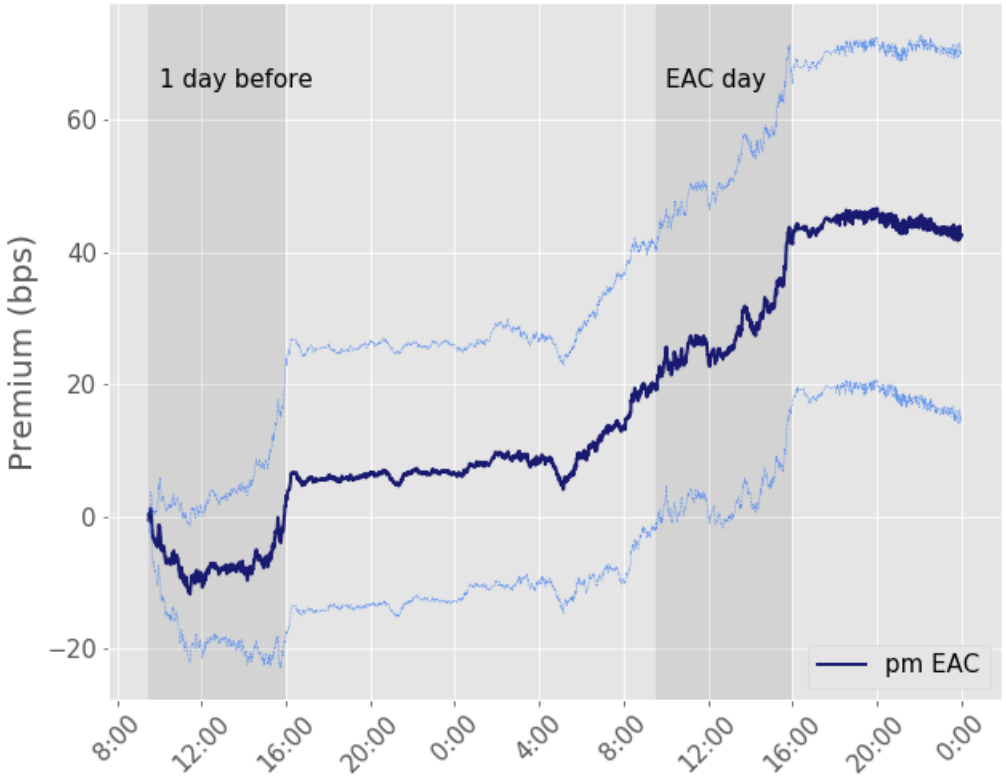
This figure plots the daily time series of the number of earnings announcers among the S&P 500 firms from 1/1/2016 to 12/31/2018.

Figure 2: Time Distribution of Earnings Announcements

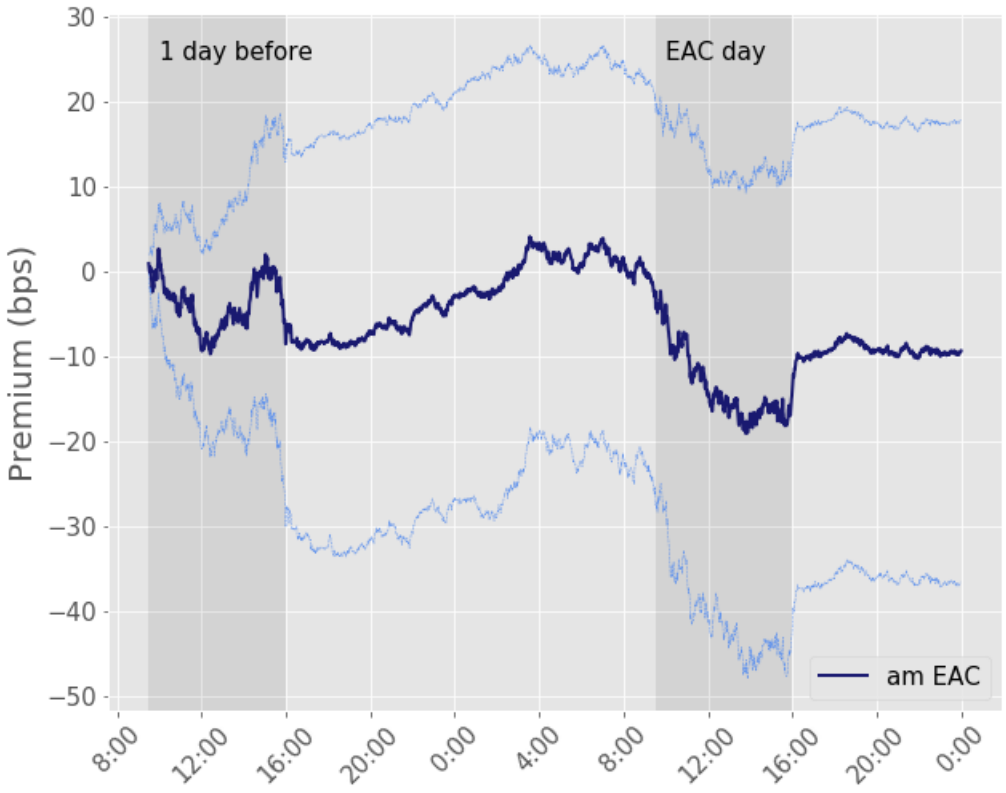


This figure plots the time distribution of the earnings announcements of S&P 500 firms from 1/1/1999 to 12/31/2018.

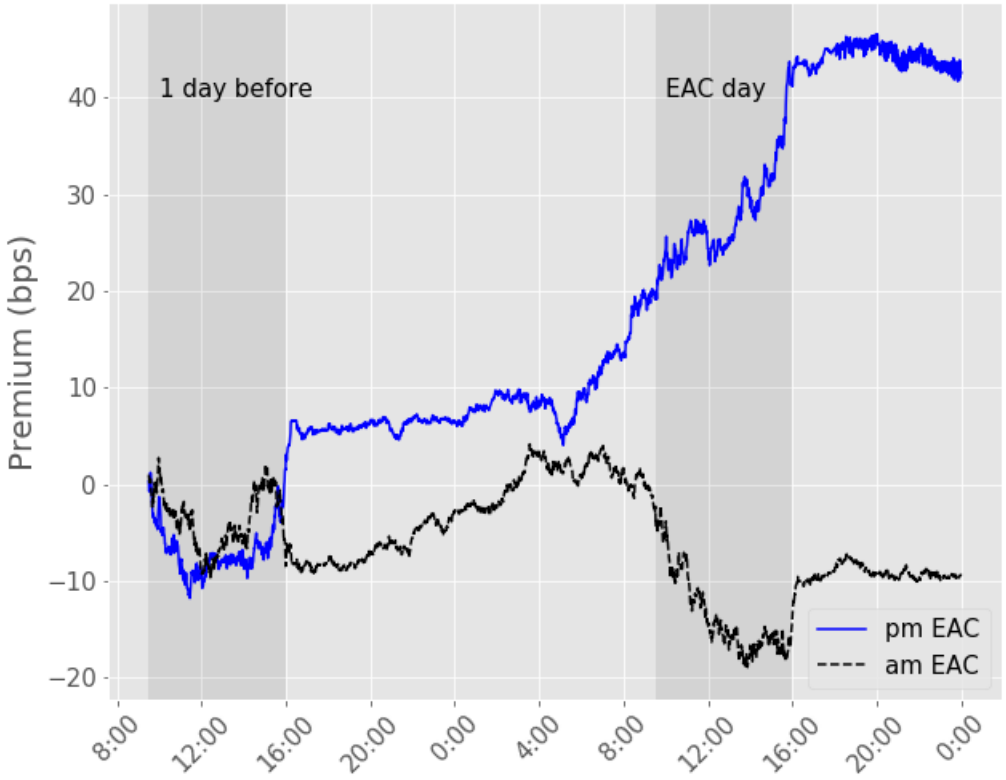
Figure 3: Average Cumulative Market Return Prior to Earnings Announcement Clusters



Panel (a) PM EAC



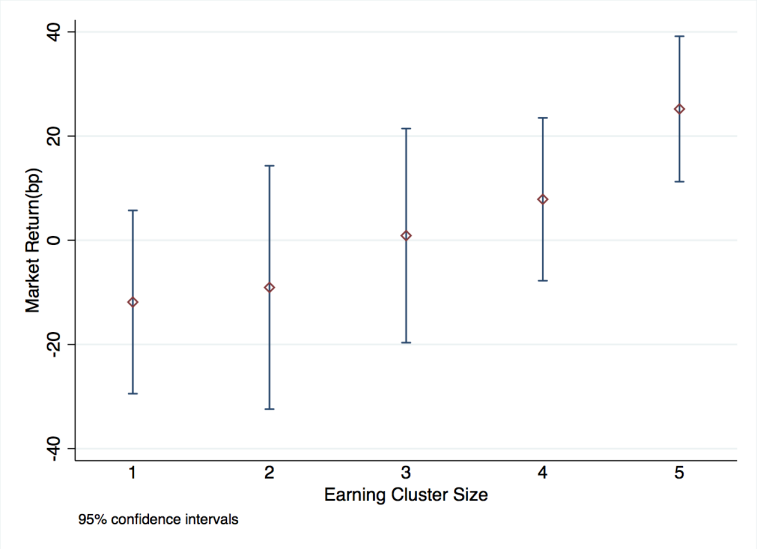
Panel (b) AM EAC



Panel (c) PM EAC VS AM EAC

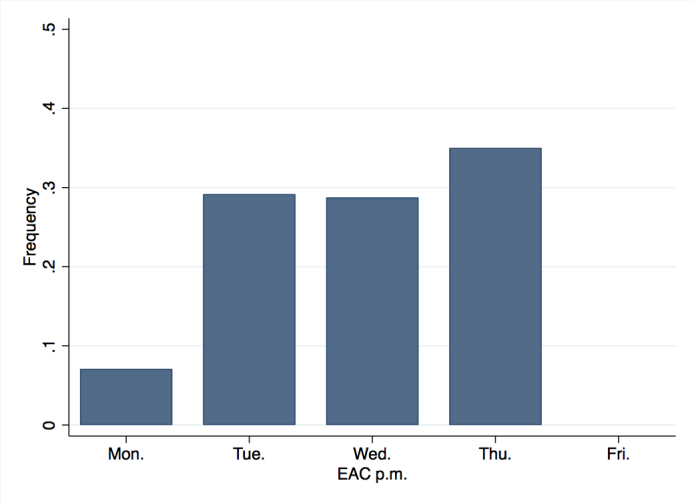
This panel of figures presents the average cumulative return of E-mini S&P 500 futures return around earnings announcement clusters. Panel (a) plots the cumulative market return prior to the PM EACs; Panel (b) plots the cumulative market return around the AM EACs; Panel (c) compares the performances of the market between the PM and AM EACs.

Figure 4: Relation between Average Market Return and PM EAC Size

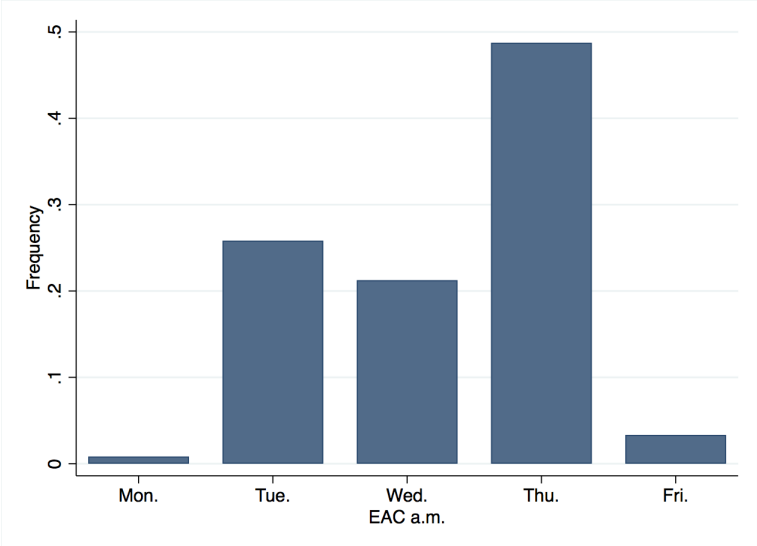


This figure demonstrates the relation between the average daily stock market return and the size of the PM earnings announcement cluster. The size of the PM EAC is defined as the total number of earnings related news articles of the announcers during the previous calendar year. The sample includes the top 11 trading days ranked by cluster size in every January, April, July and October from 1/1/1999 to 12/31/2018. The included trading days are then divided into 5 bins sorted by the EAC size. The average daily stock market return and the 95% confidence interval are plotted for each bin.

Figure 5: EAC Weekday Distribution



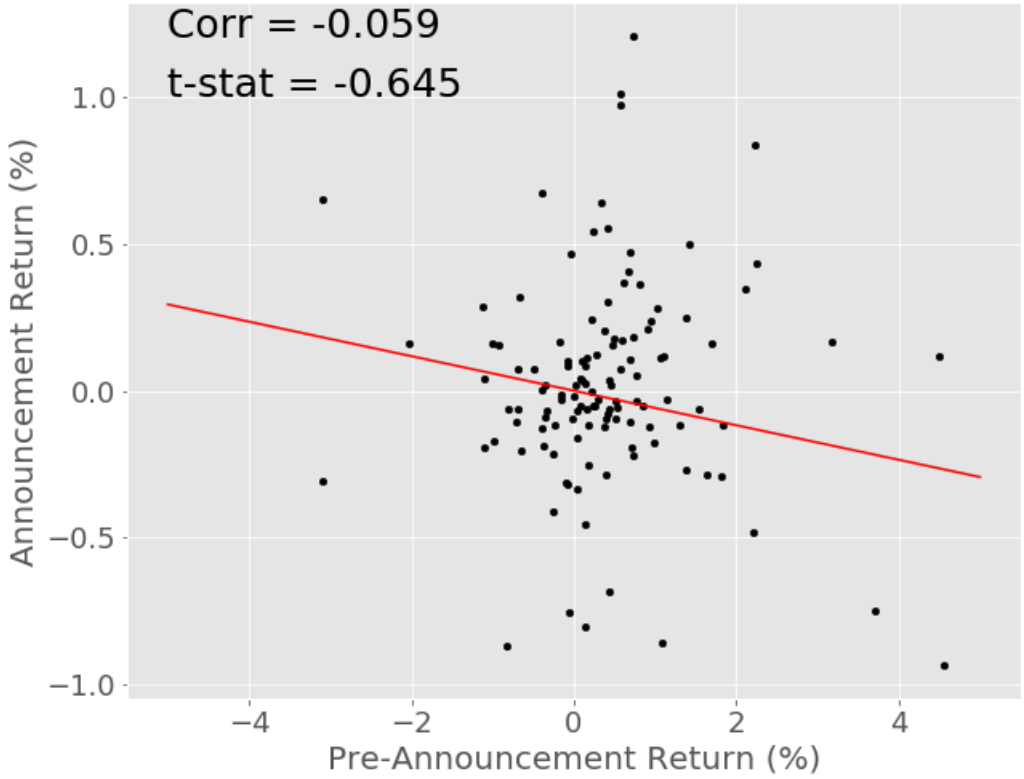
Panel (a) PM EAC



Panel (b) AM EAC

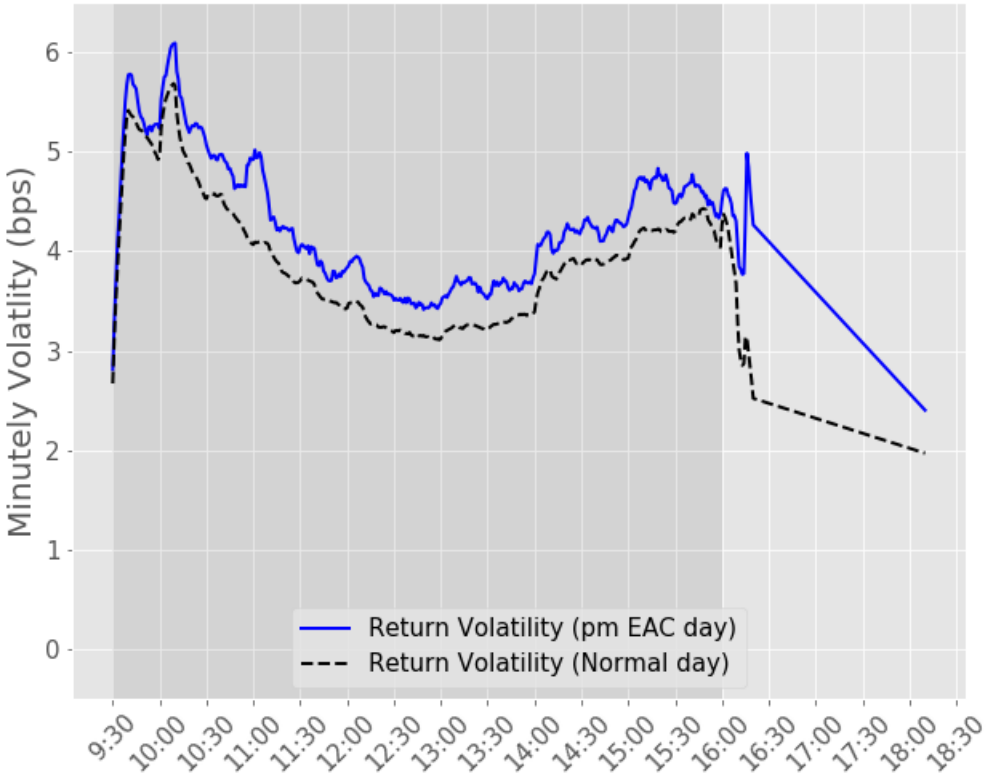
This figure plots the weekday distribution of the PM and AM EACs, respectively. Panel (a) is for the PM EACs; Panel (b) is for the AM EACs.

Figure 6: Intraday VS After-hour Return Correlation for PM EACs

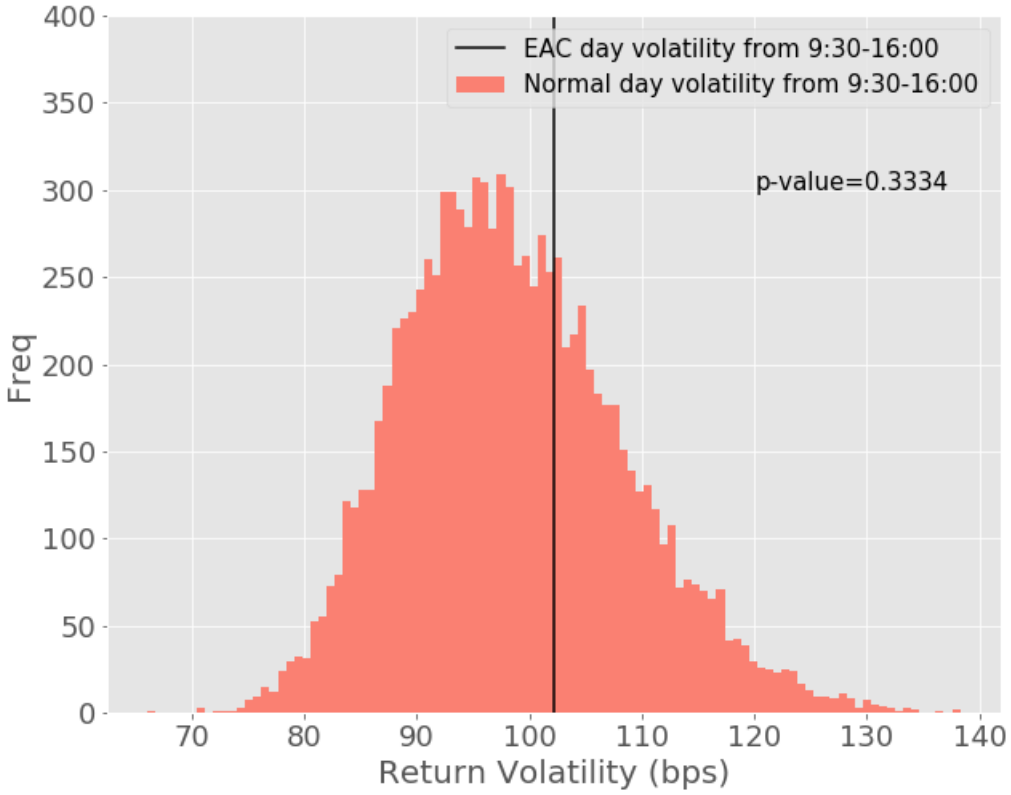


This is a scatter plot demonstrating the correlation between market returns during the trading hours (9:30am - 4:00pm) and after hours (4:00pm - 6:00pm) on the PM EAC days.

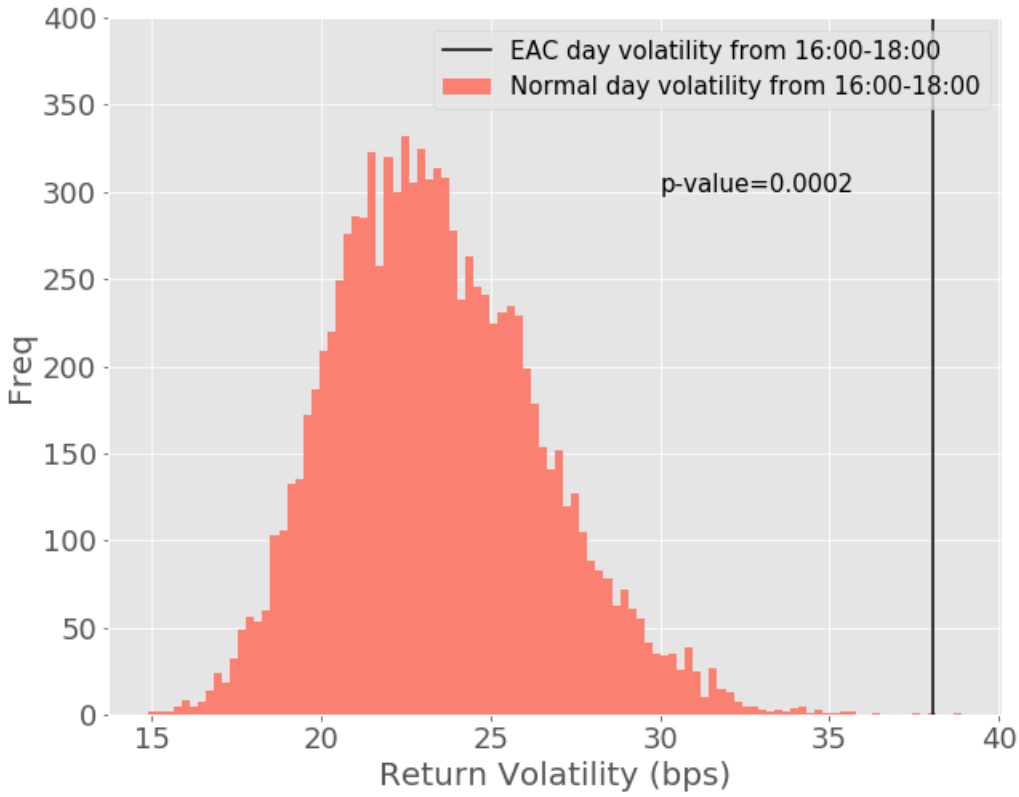
Figure 7: Market Volatility around PM EACs



Panel (a) PM EAC VS All Days



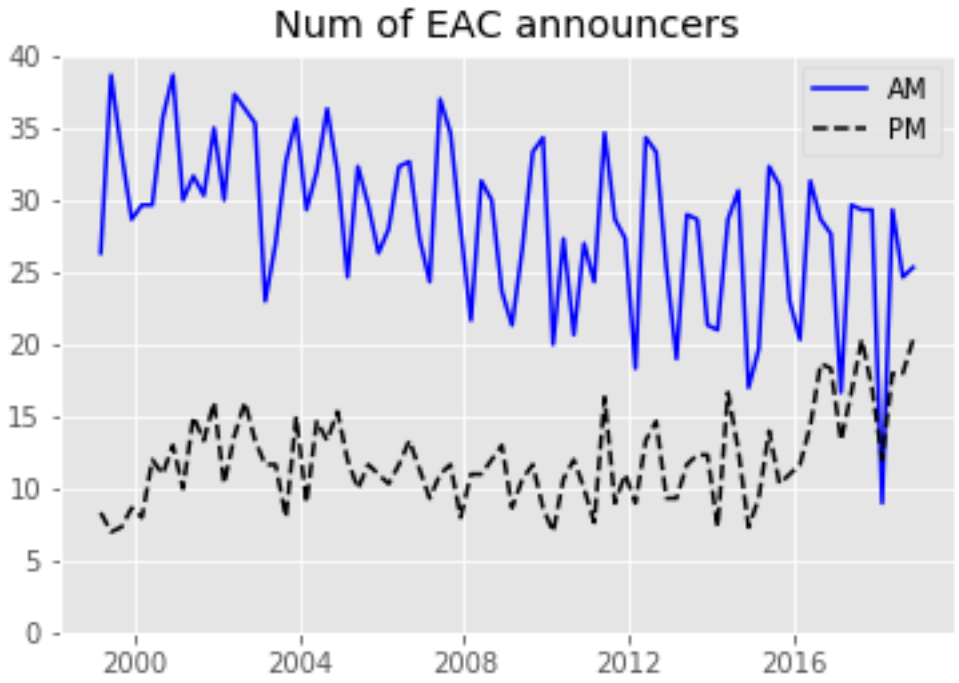
Panel (b) Bootstrap 9:30am - 4:00pm



Panel (c) Bootstrap 4:00pm - 6:00pm

This panel of figures illustrates the abnormal market return volatility during the after hours (4:00pm - 6:00pm) on the PM EAC days. Panel (a) compares the intraday volatility on a PM EAC day VS the unconditional average. Intraday volatility is computed from rolling windows of 10 minutes of S&P 500 E-mini futures returns. Panel (b) shows the result of a bootstrap exercise where the trading-hour (9:30am - 4:00pm) volatility of the market on the PM EAC days are compared with a counterfactual distribution of volatility. The counterfactual distribution is constructed by random sampling of 12 trading days in each calendar year. Panel (c) conducts the same exercise with the market volatility during the after hours (4:00pm - 6:00pm).

Figure 8: Number of EAC Announcers



This figure plots the number of earnings announcers in each news-weighted EAC.

Tables

Table 1: News-Weighted EAC Premium

	(1) mkt_t	(2) mkt_t^{nann}	(3) mkt_t^{o2o}
$EAC_t^{news,pm}$	34.25***	34.13***	16.10
	[4.01]	[4.07]	[1.59]
$EAC_t^{news,am}$	-6.40	-7.51	-3.21
	[-0.67]	[-0.80]	[-0.32]
MA_t	11.00**	9.13**	6.88
	[2.45]	[2.06]	[1.57]
mkt_{t-1}	-0.05**		
	[-2.19]		
mkt_{t-1}^{nann}		-0.07***	
		[-2.96]	
mkt_{t-1}^{o2o}			-0.06*
			[-1.80]
Constant	0.05	0.29	0.39
	[0.02]	[0.15]	[0.20]
Observations	5030	5030	5020

All return variables are in basis points. t statistics in brackets
* p<0.1, ** p<0.05, *** p<0.01

This table documents the market premium associated with the news-weighted earnings announcement clusters. In every January, April, July and October, three days with the highest earnings announcement concentration are identified as the earnings announcement clusters. The news-weighting scheme ranks the sizes of the clusters by the total number of news articles of the announcers published in the Dow Jones newswire during the previous calendar year. mkt_t denotes the close-to-close market return on date t. mkt_t^{nann} denotes the close-to-close market return constructed with the non-announcing firms on date t. mkt_t^{o2o} denotes the open-to-open market return on date t. MA_t is a dummy variable representing the macro announcements, including GDP, PPI, unemployment and FOMC.

Table 2: EAC Premium during Extended Periods

	(1) mkt_t^{c2o}	(2) mkt_t^{o2c}	(3) mkt_{t-1}	(4) mkt_{t+1}
$EAC_t^{news,pm}$	11.48**	22.96***	1.24	-9.54
	[2.13]	[3.17]	[0.11]	[-1.02]
$EAC_t^{news,am}$	3.65	-10.63	-3.95	7.77
	[0.70]	[-1.35]	[-0.35]	[0.87]
MA_t	4.85**	4.26	1.46	-6.20
	[2.01]	[1.13]	[0.33]	[-1.33]
mkt_{t-1}	-0.01	-0.05**		
	[-0.46]	[-2.49]		
Constant	0.57	-1.30	2.96	4.26**
	[0.55]	[-0.82]	[1.53]	[2.20]
Observations	5023	5023	5030	5030

All return variables are in basis points. t statistics in brackets
* p<0.1, ** p<0.05, *** p<0.01

This table documents the market premium associated with the news-weighted earnings announcement clusters during the overnight and intraday periods on the announcement day, as well as the premium during the trading day before and after the announcement.

Table 3: EAC Premium Statistics

	All	Non-MA/EAC	MA	EAC	Overlap
n	5031	3948	843	219	21
Risk premium(%)	0.02	-0.01	0.10**	0.29***	0.53**
p-value	.	.	0.04	0.00	0.03
Percentile 25	-0.50	-0.51	-0.49	-0.32	-0.50
Percentile 75	0.59	0.55	0.67	0.79	1.04
Stdev	1.21	1.22	1.19	1.12	1.33
p-value	.	.	0.61	0.76	0.25
Skewness	-0.07	-0.05	-0.32	0.48	0.79
p-value	.	.	0.62	0.22	0.15
Kurtosis	7.26	8.00	4.86	2.38	0.01
p-value	.	.	0.65	0.79	0.67
Sharpe ratio	0.32	-0.12	1.30**	4.14***	6.32**
p-value	.	.	0.04	0.00	0.05
Trading days	251.55	197.40	42.15	10.95	1.05
Ann. RP (%)	6.07	-1.80	4.11	3.19	0.56
Contribution to RP	100.00%	-29.57%	67.78%	52.63%	9.16%

* p<0.1, ** p<0.05, *** p<0.01

This table presents the statistics associated with the news-weighted earnings announcement clusters. Column "All" represents all the trading days during 1/1/1999 - 12/31/2018. The remaining four columns represent four sets of non-overlapping trading days: Column "Non-MA/EAC" represents the trading days without either macro announcements or earnings announcement clusters; Column "MA" represents the trading days with macro announcements but without earnings announcement clusters; Column "EAC" represents the trading days with earnings announcement clusters but without macro announcements; Column "Overlap" represents the trading days with both earnings announcement clusters and macro announcements. "p-value" is the rank of the point estimate in the counterfactual distribution constructed from randomly picking the same number of trading days in the same calendar year. "Sharpe ratio" is annualized.

Table 4: Value-Weighted and Equal-Weighted EAC Premium

	(1) mkt_t	(2) mkt_t	(3) mkt_t^{o2o}	(4) mkt_t	(5) mkt_t	(6) mkt_t^{o2o}
$EAC_t^{ew,pm}$	17.76*	0.34	25.71**			
	[1.86]	[0.03]	[2.38]			
$EAC_t^{ew,am}$	-3.83	-8.95	-7.11			
	[-0.41]	[-0.73]	[-0.62]			
$EAC_t^{vw,pm}$				17.61**	-20.87	10.96
				[1.97]	[-1.41]	[1.09]
$EAC_t^{vw,am}$				0.37	-2.78	2.12
				[0.04]	[-0.19]	[0.22]
$EAC_t^{news,pm}$		35.38***			50.75***	
		[3.78]			[3.68]	
$EAC_t^{news,am}$		-0.88			-2.81	
		[-0.07]			[-0.20]	
MA_t	10.29**	11.11**	6.63	10.71**	10.95**	6.84
	[2.30]	[2.47]	[1.52]	[2.39]	[2.45]	[1.56]
mkt_{t-1}	-0.05**	-0.05**		-0.05**	-0.05**	
	[-2.19]	[-2.19]		[-2.20]	[-2.18]	
mkt_{t-1}^{o2o}			-0.06*			-0.06*
			[-1.77]			[-1.81]
Constant	0.86	0.10	0.19	0.57	0.23	0.39
	[0.44]	[0.05]	[0.10]	[0.29]	[0.11]	[0.20]
Observations	5030	5030	5020	5030	5030	5020

All return variables are in basis points. t statistics in brackets

* p<0.1, ** p<0.05, *** p<0.01

This table documents the market premium associated with the value-weighted and equal-weighted earnings announcement clusters. In every January, April, July and October, three days with the highest earnings announcement concentration are identified as the earnings announcement clusters. The value-weighting scheme ranks the sizes of the clusters by the total market capitalization of the announcers, whereas the equal-weighting scheme ranks the sizes of the clusters by the total number of the announcers. mkt_t denotes the close-to-close market return on date t. mkt_t^{o2o} denotes the open-to-open market return on date t. MA_t is a dummy variable representing the macro announcements, including GDP, PPI, unemployment and FOMC.

Table 5: Bellwether EAC Premium

	(1) mkt_t	(2) mkt_t	(3) mkt_t^{o2o}	(4) mkt_t	(5) mkt_t	(6) mkt_t^{o2o}
$EAC_t^{anl,pm}$	14.83	-5.98	13.59			
	[1.48]	[-0.52]	[1.19]			
$EAC_t^{anl,am}$	-1.06	-8.25	1.49			
	[-0.11]	[-0.60]	[0.13]			
$EAC_t^{pcor,pm}$				3.30	-14.15	18.90*
				[0.32]	[-1.25]	[1.67]
$EAC_t^{pcor,am}$				7.98	5.42	-6.99
				[0.80]	[0.43]	[-0.57]
$EAC_t^{news,pm}$		38.54***			39.14***	
		[3.80]			[3.99]	
$EAC_t^{news,am}$		1.23			-5.00	
		[0.09]			[-0.41]	
MA_t	10.40**	11.14**	6.75	10.28**	11.02**	6.73
	[2.32]	[2.48]	[1.55]	[2.30]	[2.45]	[1.54]
mkt_{t-1}	-0.05**	-0.05**		-0.05**	-0.05**	
	[-2.19]	[-2.18]		[-2.19]	[-2.18]	
mkt_{t-1}^{o2o}			-0.06*			-0.06*
			[-1.80]			[-1.80]
Constant	0.82	0.13	0.31	0.96	0.16	0.46
	[0.42]	[0.07]	[0.16]	[0.49]	[0.08]	[0.24]
Observations	5030	5030	5020	5030	5030	5020

All return variables are in basis points. t statistics in brackets

* p<0.1, ** p<0.05, *** p<0.01

This table documents the market premium associated with the earnings announcement clusters constructed with the bellwether firms. In every January, April, July and October, three days with the highest earnings announcement concentration are identified as the earnings announcement clusters. The announcing firms are weighted by the two metrics identifying bellwether firms according to Hameed et al. (2015) – analyst coverage and partial correlation in fundamentals. mkt_t denotes the close-to-close market return on date t. mkt_t^{o2o} denotes the open-to-open market return on date t. MA_t is a dummy variable representing the macro announcements, including GDP, PPI, unemployment and FOMC.

Table 6: Single-Firm EAC Premium

	(1) mkt_t	(2) mkt_t	(3) mkt_t^{o2o}	(4) mkt_t^{o2o}
$EAC_t^{single,pm}$	22.30***	-6.22	11.76	0.18
	[2.81]	[-0.59]	[1.05]	[0.01]
$EAC_t^{single,am}$	-9.39	-13.03	-3.32	-4.24
	[-1.10]	[-1.40]	[-0.29]	[-0.34]
$EAC_t^{news,pm}$		38.88***		16.19
		[3.60]		[1.10]
$EAC_t^{news,am}$		-0.46		-1.42
		[-0.04]		[-0.13]
MA_t	10.47**	11.10**	6.68	6.90
	[2.33]	[2.48]	[1.53]	[1.58]
mkt_{t-1}	-0.05**	-0.05**		
	[-2.18]	[-2.18]		
mkt_{t-1}^{o2o}			-0.06*	-0.06*
			[-1.82]	[-1.81]
Constant	0.95	0.35	0.70	0.47
	[0.49]	[0.18]	[0.37]	[0.25]
Observations	5030	5030	5020	5020

All return variables are in basis points. t statistics in brackets
* p<0.1, ** p<0.05, *** p<0.01

This table documents the market premium during the earnings announcements of individual firms with high media coverage. In every January, April, July and October, the earnings days of the top three firms with the highest media coverage are identified and denoted as $EAC^{single,pm}$ and $EAC^{single,am}$ for the PM and AM announcers, respectively.

Table 7: Industry EAC Premium

	NoDur	Durbl	Manuf	Enrgy	Chems	BusEq	Telcm	Utils	Shops	Hlth	Money	Other
Panel (a)												
$EAC_t^{FFI,pm}$	7.62	4.17	8.59	11.80	-7.40	27.39***	8.66	14.03	5.75	19.93**	20.40***	7.49
	[0.72]	[0.36]	[0.81]	[1.38]	[-0.83]	[3.47]	[0.83]	[1.53]	[0.56]	[2.14]	[2.61]	[0.87]
$EAC_t^{FFI,am}$	3.66	6.71	-11.13	2.29	16.77**	-6.67	-4.32	-2.27	2.80	-1.51	-5.80	11.95
	[0.41]	[0.68]	[-1.28]	[0.28]	[2.04]	[-0.79]	[-0.45]	[-0.29]	[0.33]	[-0.18]	[-0.67]	[1.47]
MA_t	10.28**	10.33**	10.05**	10.10**	10.22**	10.76**	10.25**	10.17**	10.34**	10.67**	10.57**	10.52**
	[2.29]	[2.31]	[2.24]	[2.25]	[2.28]	[2.40]	[2.29]	[2.27]	[2.31]	[2.38]	[2.36]	[2.35]
mkt_{t-1}	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**
	[-2.19]	[-2.19]	[-2.19]	[-2.20]	[-2.20]	[-2.16]	[-2.20]	[-2.22]	[-2.19]	[-2.20]	[-2.21]	[-2.18]
Constant	1.17	1.05	1.68	1.01	0.93	0.43	1.37	1.11	1.13	0.57	0.75	0.54
	[0.60]	[0.54]	[0.86]	[0.52]	[0.47]	[0.22]	[0.70]	[0.57]	[0.58]	[0.29]	[0.38]	[0.28]
Observations	5030	5030	5030	5030	5030	5030	5030	5030	5030	5030	5030	5030

All return variables are in basis points. t statistics in brackets
* p<0.1, ** p<0.05, *** p<0.01

	NoDur	Durbl	Manuf	Enrgy	Chems	BusEq	Telcm	Utils	Shops	Hlth	Money	Other
Panel (b)												
$EAC_t^{FFI,pm}$	0.93	-6.00	1.14	3.21	-13.50	1.42	-1.61	8.71	-5.33	9.95	9.65	2.67
	[0.09]	[-0.51]	[0.11]	[0.36]	[-1.45]	[0.14]	[-0.15]	[0.96]	[-0.46]	[1.02]	[1.15]	[0.31]
$EAC_t^{FFI,am}$	-8.49	0.27	-24.47***	-0.23	10.96	-11.95	-6.97	-5.94	-2.98	-9.40	-11.00	4.93
	[-0.83]	[0.03]	[-2.75]	[-0.03]	[1.22]	[-1.29]	[-0.71]	[-0.73]	[-0.33]	[-0.94]	[-1.24]	[0.51]
$EAC_t^{all,pm}$	35.70***	35.01***	38.15***	33.40***	33.92***	35.26***	34.68***	33.36***	35.46***	32.91***	32.69***	32.53***
	[4.04]	[4.02]	[4.42]	[3.81]	[3.88]	[3.31]	[3.93]	[3.86]	[3.80]	[3.43]	[3.68]	[3.68]
$EAC_t^{all,am}$	-2.51	-4.60	3.39	-6.15	-6.55	-0.31	-2.47	-5.40	-3.64	-4.47	-5.42	-8.29
	[-0.24]	[-0.44]	[0.34]	[-0.61]	[-0.63]	[-0.03]	[-0.24]	[-0.54]	[-0.37]	[-0.44]	[-0.56]	[-0.79]
MA_t	11.05**	11.05**	10.70**	10.99**	10.96**	10.97**	11.09**	11.12**	10.98**	11.08**	11.06**	11.04**
	[2.47]	[2.46]	[2.38]	[2.44]	[2.44]	[2.45]	[2.47]	[2.47]	[2.45]	[2.47]	[2.47]	[2.46]
mkt_{t-1}	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**	-0.05**
	[-2.19]	[-2.19]	[-2.18]	[-2.19]	[-2.20]	[-2.17]	[-2.19]	[-2.21]	[-2.19]	[-2.20]	[-2.19]	[-2.19]
Constant	0.16	0.08	0.56	-0.02	-0.05	0.22	0.20	-0.02	0.22	-0.02	0.13	-0.14
	[0.08]	[0.04]	[0.28]	[-0.01]	[-0.02]	[0.11]	[0.10]	[-0.01]	[0.11]	[-0.01]	[0.06]	[-0.07]
Observations	5030	5030	5030	5030	5030	5030	5030	5030	5030	5030	5030	5030

All return variables are in basis points. t statistics in brackets
* p<0.1, ** p<0.05, *** p<0.01

This panel of tables documents the news-weighted EAC premium for individual industries. The cross section of S&P 500 firms are divided into 12 industries according to the Fama French industry classification. The PM and AM news-weighted EACs are then identified within each industry. EAC^{all} denotes the EACs identified with the full cross section of the S&P 500 firms. Panel (a) documents the industry EAC premia without controlling for the full-cross-section EACs; Panel (b) controls for the full-cross-section EACs.

Table 8: Premium of EACs Identified with Earnings Calendar

	(1) mkt_t	(2) mkt_t^{o2o}	(3) mkt_t	(4) mkt_t^{o2o}
$EAC_t^{news,pm}$	36.49***	15.28		
	[3.86]	[1.21]		
$EAC_t^{news,am}$	0.44	1.96		
	[0.04]	[0.17]		
$\widehat{EAC}_t^{news,pm}$			32.80***	10.74
			[3.32]	[0.84]
$\widehat{EAC}_t^{news,am}$			-0.44	12.97
			[-0.04]	[1.25]
MA_t	9.84*	5.07	9.61*	5.11
	[1.80]	[0.94]	[1.76]	[0.95]
mkt_{t-1}	-0.09***		-0.09***	
	[-2.78]		[-2.78]	
mkt_{t-1}^{o2o}		-0.06		-0.06
		[-1.29]		[-1.30]
Constant	-0.16	1.57	0.10	1.26
	[-0.07]	[0.65]	[0.04]	[0.52]
Observations	3263	3263	3263	3263

All return variables are in basis points. t statistics in brackets
* p<0.1, ** p<0.05, *** p<0.01

This table compares the premium of the news-weighted EACs identified with the ex-post announcement dates and time versus that of the EACs identified with the projected announcement dates and time from the earnings calendar. $EAC^{news,pm}$ and $EAC^{news,am}$ are the EACs identified with the ex-post announcement dates and time, whereas $\widehat{EAC}^{news,pm}$ and $\widehat{EAC}^{news,am}$ are the EACs identified with the projected announcement dates and time from the earnings calendar. The sample is from 1/1/2006 to 12/31/2018.

Table 9: Comparison of Characteristics between the AM Announcers and PM Announcers

Characteristic	δ	S.E.	t-stat	N obs
Age	-4.84***	0.66	-7.34	34432
Beta	0.20***	0.03	6.64	33877
B/M	-0.02	0.02	-1.01	34432
Market Cap ($B)	-2.55	4.22	-0.60	34432
DJ News Coverage	-5.39	8.20	-0.66	36206
Operating Profit	-0.13**	0.05	-2.89	34278
Investment	0.01	0.004	1.58	33006
Leverage	-0.02	0.27	-0.09	34333
Momentum	0.01	0.01	1.16	34354

This table compares the firm characteristics between the AM announcers and PM announcers among the S&P 500 companies from 1/1/1999 to 12/31/2018. For each characteristic $Char$, the cross section of announcers are pooled in the following regression:

$$Char_{i,t} = Const + \delta \cdot PM_{i,t} + X_t + \epsilon_{i,t}$$

where $PM_{i,t}$ is a dummy variable indicating PM announcers, X_t is the time-fixed effect. "Investment" is measured as the growth rate of book asset. "Leverage" is the ratio between the book value of debt and the market value of equity. "Momentum" is the stock return during the previous 6 months.

Table 10: Interaction between EAC Premium and Stock Market Turnover

	(1) mkt_t	(2) mkt_t	(3) mkt_t^{o2o}	(4) mkt_t^{o2o}
$turn_t$	-7.52	-10.73**		
	[-1.47]	[-1.99]		
$EAC_t^{news,pm}$		-57.14**		
		[-2.24]		
$EAC_t^{news,pm} \cdot turn_t$		45.21***		
		[3.40]		
$turn_{t-1}$			-2.98	-3.65
			[-0.55]	[-0.65]
$EAC_t^{news,am}$				-16.73
				[-0.36]
$EAC_t^{news,am} \cdot turn_{t-1}$				11.07
				[0.44]
MA_t		11.09**		6.60
		[2.47]		[1.51]
mkt_{t-1}	-0.06**	-0.06**		
	[-2.39]	[-2.47]		
mkt_{t-1}^{o2o}			-0.06*	-0.06*
			[-1.82]	[-1.83]
Constant	16.78**	19.02**	7.53	7.36
	[2.00]	[2.18]	[0.84]	[0.80]
Observations	5030	5030	5020	5020

All return variables are in basis points. t statistics in brackets
* p<0.1, ** p<0.05, *** p<0.01

Panel (a) Interaction with the turnover on the announcement day

	(1) mkt_t	(2) mkt_t	(3) mkt_t^{o2o}	(4) mkt_t^{o2o}
$\bar{turn}_{t-}$	1.46	-0.40	0.62	0.52
	[0.27]	[-0.07]	[0.11]	[0.09]
$EAC_t^{news,pm}$		-22.10		
		[-0.78]		
$EAC_t^{news,pm} \cdot \bar{turn}_{t-}$		28.07*		
		[1.84]		
$EAC_t^{news,am}$				4.09
				[0.07]
$EAC_t^{news,am} \cdot \bar{turn}_{t-}$				0.13
				[0.00]
MA_t		10.92**		6.47
		[2.44]		[1.48]
mkt_{t-1}	-0.05**	-0.05**		
	[-2.19]	[-2.23]		
mkt_{t-1}^{o2o}			-0.06*	-0.06*
			[-1.78]	[-1.79]
Constant	0.57	0.55	1.01	-0.13
	[0.06]	[0.06]	[0.11]	[-0.01]
Observations	5026	5026	5016	5016

All return variables are in basis points. t statistics in brackets

* p<0.1, ** p<0.05, *** p<0.01

Panel (b) Interaction with the average turnover during the week before the announcement day

This panel of tables documents the interaction between the premium of the news-weighted EACs and the turnover of the stock market. $turn_t = \frac{\sum_i \$volume_{i,t}}{\sum_i mcap_{i,t}}$ is the total dollar trading volume divided by the total market capitalization of the S&P 500 firms on date t. $\bar{turn}_{t-} = \frac{1}{5}\sum_{s=1}^{5} turn_{t-s}$ is the average daily turnover during the 5 trading days prior to date t.

Table 11: Response in Market Turnover to EAC

	(1) $turn_t$	(2) $turn_{t-1}$
$EAC_t^{news,pm}$	0.12***	
	[6.44]	
$EAC_t^{news,am}$		0.07***
		[3.95]
MA_t	0.03**	0.01
	[2.39]	[0.68]
$\bar{turn}_{t-1}$	0.93***	
	[64.27]	
$\bar{turn}_{t-2}$		0.93***
		[64.12]
Constant	0.12***	0.13***
	[5.15]	[5.34]
Observations	5026	5025

t statistics in brackets

* p<0.1, ** p<0.05, *** p<0.01

This table documents in the response in stock market turnover to earnings clusters. $\bar{turn}_{t-1}$ ($\bar{turn}_{t-2}$) denotes the average turnover over the five trading days until and including $t-1$ ($t-2$).

Table 12: Short-Sale Constraint and the EAC Premium

	(1) mkt_t	(2) mkt_t^{o2o}
$EAC_t^{news,pm}$	-14.90	
	[-0.70]	
$EAC_t^{news,pm} \cdot util_t$	11.84**	
	[2.20]	
$util_t$	-0.94	
	[-0.51]	
$EAC_t^{news,am}$		-17.77
		[-0.58]
$EAC_t^{news,am} \cdot util_{t-1}$		5.47
		[0.65]
$util_{t-1}$		-0.70
		[-0.39]
MA_t	10.91*	3.87
	[1.92]	[0.70]
mkt_{t-1}	-0.08**	
	[-2.52]	
mkt_{t-1}^{o2o}		-0.06
		[-1.29]
Constant	4.82	5.63
	[0.66]	[0.80]
Observations	3138	3130

All return variables are in basis points. t statistics in brackets
* p<0.1, ** p<0.05, *** p<0.01

This table documents the impact of the short-sale constraint on the EAC premium. *util* is the security lending utilization provided by Markit Group aggregated to the market level weighted by stock market capitalization. Utilization for a particular stock is defined as the ratio between the value of outstanding security loans versus the total value of lendable security. The sample is from 7/1/2006 to 12/31/2018.