Retail Trading Frenzies and Real Investment

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Abstract

Using trade order imbalances to identify retail buying frenzies, we find that frenzies are associated with large contemporaneous stock price increases followed by prolonged anomaly-adjusted underperformance, consistent with price-pressure-based overvaluation. Retail frenzies strongly predict equity issuance and increased investment, with the relation strengthening in the post-zero commission era. Firms with large investments following retail frenzies incrementally underperform, particularly those that are unprofitable and distressed. Corporate insiders tend to sell their holdings after frenzies, consistent with recognition of overvaluation and agency-induced investment rather than manager optimism. The findings are consistent with retail frenzies adversely impacting the real economy.

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1. Introduction

Individual investors have assumed a more pivotal role in equity markets in recent years. Commission-free trading and the proliferation of finance-oriented social media platforms have led to an increase in correlated retail trading, often leading to large price movements unrelated to fundamentals (e.g., Barber at al., 2022). However, herding among the retail crowd is not new. Research suggests that speculative retail trading has moved markets for decades (e.g., Han and Kumar, 2013; Dorn, Huberman, and Sengmueller, 2008; Barber, Odean, and Zhu, 2008). The persistent, material effect of retail herding on equity markets raises the question of whether retail investors have more widespread effects on corporate strategies. In this article, we introduce an orderflow-based measure of retail buying frenzies, and we explore the relation between retail buying frenzies and corporate decision-making.

In a frictionless, symmetric information setting, equity markets act as passive predictors of future activity (Morck, Shleifer, and Vishny, 1990). However, when stock prices capture private investor information unknown to firm management, markets can provide useful feedback to guide investment (e.g., Luo, 2005; Chen, Goldstein, and Jiang, 2007; Bakke and Whited, 2010; Edmans, Jayaraman, and Schneemeier, 2017, Bennett, Stulz, and Wang, 2020). Conversely, if stock prices reflect non-fundamental information, investment could inefficiently react to stock prices (e.g., Polk and Sapienza, 2009; Hau and Lai, 2013; Lou and Wang, 2018; Dessaint et al., 2019).

Our underlying premise is that retail frenzies create price pressure unrelated to fundamentals. Barber at al. (2022) find supportive evidence at short horizons, showing that extreme herding events, measured as 99.5 percentile increases in Robinhood ownership, are associated with contemporaneous daily abnormal returns of 14% that revert by roughly a third

over the next month. We hypothesize that longer, more persistent episodes of retail buying could lead to potentially larger price effects that attract attention from firm management.

Our conjecture is exemplified by the frenzy episode of AMC Entertainment Holdings. AMC was hit hard by the COVID-19 pandemic and experienced significant financial strain and sharp stock price declines. In early 2021, AMC became a highly discussed stock on social media, and an ensuing retail-driven buying frenzy pushed the stock price from around $10 per share in January 2021 to a high of over $250 by June 2021. Taking advantage of the skyrocketing stock price, AMC issued new equity, increased capital expenditures, and later announced the purchase of a significant stake in Hycroft Mining, a gold and silver mining firm. While some investors lauded the bold move to mitigate core business risks, AMC's performance subsequently languished, and its price at the end of 2023 was back below $10. While the AMC anecdote highlights that retail investors can impact stock prices and corporate strategies, it is unclear whether this phenomenon extends beyond a few prominent examples discussed in the media.[1]

To systematically analyze the relation between retail trading frenzies and firm outcomes, we construct a measure of retail net trading demand for a broad cross-section of firms over a 17-year period (2007-2023). We measure retail order imbalances using the retail trading algorithm proposed by Barber et al. (2023). Our main approach classifies a stock as experiencing a retail frenzy when its net retail order imbalance over a three-month period exceeds 2% of shares outstanding.[2] As expected, the fraction of firm-months classified as retail frenzy has increased over time, growing from 0.75% of all firm-months in the first half of the sample to a peak of nearly 4% in 2021. Cross-sectionally, retail frenzies tend to manifest in smaller stocks characterized by

[1] Other well-covered cases of retail frenzies influencing corporate decision-making include Bed Bath & Beyond, Hertz Rental Car, and GameStop.

[2] Retail selling frenzies are much less prevalent than buying frenzies, and our analysis focuses on retail buying frenzies. which we generally refer to as "retail frenzies."

low profitability, high volatility, and high short interest, aligning with evidence on retail investors' preferred trading habitats (e.g., Kumar and Lee, 2006; Laarits and Sammon, 2023). Moreover, we find compelling evidence that retail frenzies distort prices. Abnormal returns are roughly 27% during frenzy quarters, followed by a near-complete mean reversion in the ensuing 24 months.[3]

Frenzy-induced mispricing could influence equity issuance if managers misinterpret market prices or strategically seek to time the market.[4] Empirically, we uncover a significant relation between retail frenzies and equity issuance, with stocks experiencing frenzies being approximately 30% more likely to issue equity. While issuing firms may accumulate cash or reduce debt, retail frenzies could also have real effects on corporate investment. We find supportive evidence, with capital expenditures increasing by 1.25% of fixed assets following retail frenzies, which reflects a roughly 20% increase relative to the mean. Similarly, we observe significant increases in acquisition expenses following retail frenzies. The evidence of increased issuance and investment is robust to alternative definitions of retail frenzies, various matching techniques, excluding unusual time periods such as the covid pandemic, and excluding very small firms.[5]

The advent of zero-commission trading has led to dramatic increases in retail trading. Although the shock is not truly exogenous, the increase in retail trading does present clear testable hypotheses. Specifically, we expect retail frenzies to intensify in recent periods, resulting in larger price distortions and stronger effects on corporate decisions. Consistent with this prediction, we

[3] We find no evidence of return reversals following frenzies measured using aggregate (non-retail) order imbalances, consistent with retail buying decisions being more influenced by behavioral biases such as attention-based trading relative to institutions (e.g., Barber and Odean, 2008).

[4] Survey evidence suggests that valuation considerations are at important determinant of equity issuance (Graham and Harvey, 2001; Graham, 2022), and a large empirical literature finds evidence of market timing (e.g., Jenter, 2005; Kim and Weisbach, 2008; Khan, Kogan, and Serafeim (2012); Dittmar and Field, 2015; Lee, 2021).

[5] One potential concern is reverse causation, with anticipated future investment helping stimulate retail frenzies. We explore this issue by searching social media posts for textual terms related to corporate investment and we find no evidence of elevated use prior to frenzies. We also find that the results hold if we exclude frenzy episodes that are preceded by elevated corporate action news articles.

find that stocks in the 99th percentile of quarterly retail imbalances experience considerably larger imbalances, contemporaneous returns, and subsequent reversals in the zero-commission era. In line with the return evidence, we find that while retail frenzies predict increased equity issuance and investment in both periods, the relation is significantly stronger in the post-zero commission period. Together, the subsample evidence aligns with the notion that the heightened intensity of retail trading in the zero-commission era has led to more intense trading frenzies, larger price distortions, and a more pronounced impact on real firm decision making.

We next investigate the performance of firms that invest following retail buying frenzies. Our analysis indicates that firms with large investments after experiencing retail frenzies significantly underperform in the 12 months following investment relative to both retail frenzies that are not followed by large investments and large investments that were not preceded by retail frenzies. One potential explanation for inferior performance following post-frenzy investment is that managers misreact to overvalued stock prices. We explore this interpretation by studying insider trading around frenzies. If executives are optimistic about future investment opportunities, they will be more likely to add to their personal holdings. Empirically, we find that insiders engage in significantly less net buying following retail frenzies. This finding is inconsistent with managers being misled by market prices and instead points the possibility that agency considerations contribute to the increased investment.

Although easy access to capital may lead to traditional empire building (Jensen, 1986; Shleifer and Vishny, 1989), managers may also invest as a means to cater to retail investors (e.g., Polk and Sapienza, 2009; Dong, Hirshleifer, and Teoh, 2012). In particular, frenzy firms may view investment as a way to keep their retail investor base enthusiastic about the company and increase

the likelihood it can eventually grow to justify its inflated valuation.[6] We conjecture that incentives to cater to retail investors are stronger for unprofitable and distressed firms. When the threat of bankruptcy or termination is nontrivial, manager compensation becomes naturally more convex, and they may have stronger incentives to pursue risky projects with negative NPVs. Consistent with these predictions, we find that the increased equity issuance and investment following retail frenzies is concentrated in firms with negative free-cash flows, profitability, or Z-scores. Furthermore, the negative returns following retail frenzies are greater in more distressed firms, particularly those engaging in elevated levels of investment.

The findings are subject to several caveats. While we establish an economically large association between retail frenzies and corporate decision making, retail trading decisions are not exogenous. We therefore cautiously interpret the findings as providing evidence that is consistent with retail frenzies impacting real investment. Additionally, the poor firm performance following heavy investments that we document may reflect both assets in place and new investments. At a minimum, we conclude that post-frenzy investment is not sufficiently profitable to justify frenzy valuations. Our findings suggest that retail frenzies and subsequent investment provide a valuable signal that can help investors and other financial market participants make more informed decisions.

Our study contributes to several strands of research. One area of literature studies the implications of retail investors for market efficiency. Research has found that retail order imbalances positively predicts returns at short-horizons (e.g., Kaniel, Saar, and Titman, 2008; Kelley and Tetlock, 2013; Barrot, Kaniel and Sraer, 2016), whereas others document a negative

[6] Dong, Hirshleifer, and Teoh (2021) find evidence that measures of overvaluation are associated with patent citation counts, consistent with "moon shot" investment, and this type of rationale has been offered to explain movie AMC's frenzy-induced growth strategy. https://www.fool.com/investing/2021/06/03/why-amcs-audacious-growth-strategy-makes-sense/

relation over longer horizons (e.g., Barber, Odean, and Zhu, 2008; Mclean, Pontiff, and Reilly, 2022), and when focusing on the subset of stocks with the heaviest retail trading (Barber et al., 2022; Barber, Lin, and Odean, 2023). We offer new evidence that heavy quarterly retail buy imbalances predict significant underperformance over the subsequent 24 months. However, our emphasis is on the relation between retail investors and real investment.[7] We introduce a new retail frenzy measure that allows us to study periods well before the meme stock era, and our analysis provides novel evidence of a relation between retail investor frenzies and real investment.

Our findings also add to the extensive literature on the real effects of financial markets (for a comprehensive review, see Goldstein, 2023). Within this stream of literature, our work is most closely related to studies that analyze how the actions of different financial market participants influence corporate decision making. For example, prior work finds that short-sellers and ETFs increase price informativeness and investment efficiency (Grullon, Michenaud, and Weston, 2015; Antoniou et al., 2023), whereas commodity indexing and flow-induced trading of mutual fund managers can diminish investment efficiency (Brogaard, Ringgenberg, and Sovich, 2019; Hau and Lai, 2013; Dessaint et al., 2019; Xiao, 2020).

We extend the literature on the real effects of investing clienteles in important ways. Our analysis provides an initial exploration of the relation between retail investors and real economic decisions. While institutional investors are prone to fire sales that create negative price pressure, we confirm that retail investors are more likely to engage in buy frenzies. Moreover, the growth of retail trading in recent years, coupled with technological advancements that may amplify behavioral biases (e.g., Barber et al. 2022; Cookson, Engelberg, and Mullins, 2023), suggests a

[7] A large theoretical literature highlights that market efficiency and real efficiency can differ dramatically (e.g., Dow and Gorton, 1997; Bond, Goldstein, and Prescott, 2010; Bond, Edmans, and Goldstein, 2012; and Goldstein and Yang, 2019).

magnified impact for retail investors, particularly among distressed firms where agency-related conflicts may be amplified.

Prior literature often attributes investment sensitivity to stock prices as reflecting managers learning from equity markets, either correctly (e.g., Chen, Goldstein, and Jiang, 2007; Bakke and Whited, 2010; Edmans, Jayaraman, and Schneemeier, 2017) or incorrectly (e.g., Dessaint et al., 2019). On the other hand, the evidence that managers increase equity issuance and investment, while simultaneously decreasing net buying in their own personal holdings offers further support for the literature that argues that overvalued equity coupled with agency conflicts can contribute to suboptimal investment decisions (e.g., Jensen, 2005).

2. Data and Descriptive Statistics

2.1 Measuring Retail Trading and Other Variable Construction

Our approach for identifying retail trading relies on the methodology of Barber et al. (2023).[8] Specifically, for all trades with TAQ exchange code "D", we sign a trade as a retail buy (retail sell) if the execution price is greater than (less than) the quoted midpoint, but we do not sign trades that execute between 40% and 60% of the National Best Bid or Offer.[9] This approach is conservative in the sense that it has a low Type 1 error (i.e., trades classified as retail are very likely to be retail). However, the approach omits some retail trading, including retail trades that take place on registered exchanges and nonmarketable limit orders.

We define daily retail order imbalances for stock *i* on day *t* as the difference between retail purchase volume and retail sell volume, scaled by shares outstanding. We aggregate this measure

[8] We thank Xing Huang for providing code to implement the retail trade algorithm.
[9] Barber et al. (2023) finds that relying on quoted midpoints leads to higher accuracy rates than using the sub-penny digit approach of Boehmer, Jones, Zhang, and Zhang (2021) (BJZZ). In robustness tests (Table 6), we also consider signing trades using the BJZZ algorithm and find similar (albeit slightly weaker) results.

over three-month rolling windows (*Qtr. Retail Imbalance*) and winsorize *Qtr. Retail Imbalance* at the 0.1 and 99.9 percentiles. We define *Retail Frenzy* as an indicator equal to one if *Qtr. Retail Imbalance* is greater than 2%, which corresponds to roughly 1.3% of all firm-month observations, with 1,224 unique firms experiencing a frenzy.[10]

We merge the data on retail trading with accounting data from *Compustat Fundamental Quarterly* and return data from CRSP. Our primary outcome variables of interest are equity issuance and investment. We measure equity issuance using Compustat variable SSTK. The SSTK measure includes both firm-initiated equity issuance and employee-initiated issuances (e.g., the exercise of stock options, warrants, employee stock purchase plans, etc.) To isolate firm-initiated equity issuances, we follow the suggestion of McKeon (2015) and define *Equity Issuance* as an indicator variable equal to one if *SSTK* is greater than 3% of the market capitalization of the firm.[11] Following Dessaint et al. (2019), our primary measure of investment is capital expenditures (Compustat item CAPX) scaled by lagged fixed assets (Compustat item PPENT). We note that the CAPX measure reported in Compustat excludes acquisition expenses, so we also separately examine acquisition expenditures (Compustat item AQC) scaled by lagged fixed assets.

Following Khan, Kogan, and Serafeim (2012), we construct a set of control variables (*Controls)* that have been shown to be associated with equity issuance: *ROA*, *1-year Return*, *Size, Q, Leverage, Dividend Yield, Volatility, Asset Growth.* In addition, we control for total institutional ownership (*Inst. Ownership*), the total number of common shareholders (*Shareholders*), and short interest. To control for existing measures of mispricing, we follow Jensen, Kelly, and Pedersen

[10] We consider various alternative definitions of retail frenzies in robustness tests (see Table 6).
[11] An alternative way to purge employee-initiated equity issuances is to rely on issuance data from SDC. However, SDC is missing the overwhelming majority of firm-initiated equity issuances (McKeon, 2015), including at-the-market offerings which have become an increasingly popular method for issuing new equity (Billet, Floros, and Garfinkel, 2019).

(2023) and construct 153 firm characteristics based on various market data from CRSP and accounting data from Compustat.[12] The full list of the firm characteristics are available in Table J.1 of JKP (2023). We limit the sample of anomalies to 118 firm characteristics that were significant predictors of returns in the original sample (as defined in JKP). Each month, we sort stocks into quintiles, based on NYSE breakpoints, for each anomaly characteristic. We compute *Net Anomaly* as the number of times the stock appears in the long leg of the anomaly portfolio less the number of times the stock appears in the short leg. All variables are defined in greater detail in Appendix A. Our final sample includes all common stocks with non-missing data for *Retail Imbalance, Equity Issuance*, *Investment*, and *Controls* from 2007 through 2023.[13]

2.2 Descriptive Statistics

The sample includes 662,904 firm-month observations from January 2007 through December 2023. Table 1 presents summary statistics. *Retail Frenzy* equals one in 8,452 firm-months (1.31%). Figure 1 plots the mean of *Retail Frenzy* for each year of the sample. We observe that retail frenzies were less common in the earlier part of the sample. For example, from 2007 through 2014 the mean of *Retail Frenzy* ranged from 0.1% to 1.1%. As expected, there is a noticeable spike in the frequency of retail frenzies during the COVID period (2020 and 2021). This declines somewhat post-COVID, but the percentage of firms that experience retail frenzies post-COVID (2022 and 2023) are still larger than all the values prior to 2017.

Figure 1 also plots the frequency of *Retail Selling Frenzies* defined as retail order imbalances less than -2%. Since retail investors rarely short-sell, we expect that the impact of

[12] We thank the authors for providing detailed code and documentation needed to construct the variables. Interested readers can find more information at https://github.com/bkelly-lab/ReplicationCrisis.

[13] Retail trading can be identified beginning with the regulation NMS which was initiated in 2005. However, we observe limited retail trading in 2005 and 2006, possibly because brokerage firms did not immediately adopt the practice of providing fractional cents of price improvement.

behavioral biases such as attention-based trading are more likely to result in heavy buying pressure than heavy selling pressure (Barber and Odean, 2008).[14] Consistent with this prediction, we find that Retail *Selling Frenzies* are infrequent throughout the entire sample. Additionally, retail buying frenzies are likely to induce more mispricing than selling frenzies, since the risks associated with short-selling overvalued stocks are greater than buying underpriced stocks.[15] Accordingly, throughout the remainder of the paper, we focus on retail buying frenzies, which we refer to as "retail frenzies."

Figure 2 plots the average and median retail imbalance conditional on a retail frenzy. The figure reveals a notable escalation in the intensity of these imbalances over time. For example, the average imbalance for frenzy stocks from 2007-2014 ranged from 2.7%-3.5%, whereas the corresponding estimates from 2017-2023 were 5.5%-8.5%. Thus, both the frequency and the intensity of retail frenzies have increased over time.

Figure 3 plots the event-time dynamics of retail frenzies. We find that buying frenzies exhibit persistence. For example, the average retail imbalance for frenzy stocks in quarter *t* (the quarter in which frenzies are measured) is 5.93%. This value remains sizeable in both the previous quarter (2.54%) and subsequent quarter (2.27%) and slowly decays over time. Even after 8-quarters the value is 0.96% which is significant, both economically and statistically, relative to the mean of approximately 0%. The findings are consistent with certain stocks persistently attracting retail buying attention.

2.3 Determinants of Retail Frenzies

[14] More recently, Bradley et al. (2024) finds that social media posts on *Wallstreetbets* are much more likely to induce buying frenzies than selling frenzies.
[15] This is particularly true in the later part of the sample. For example, Qian, Shi, and Yan (2024) find that short-selling hedge funds have significantly reduced their short positions in response to the GME buying frenzy.

We explore the determinants of retail buying frenzies by estimating the following linear probability model:

$$Retail\ Frenzy_{i,t+1} = \alpha + \beta_1 Controls_{i,t} + FE + \varepsilon_{i,t} \quad (1)$$

*Retail Frenz*y and *Controls* are defined as in Section 2.1, and FE can include month fixed effects, month × Fama-French 49 industry fixed effects, and firm fixed effects.[16] The set of *Controls* are standardized to have unit variance, and standard errors are cluster by firm and month.

Specification 1 of Table 2 reports the results with only month fixed effects. We observe that retail frenzies are more prevalent among stocks with low profitability, high volatility, and heavy short interest. For example, a one-standard deviation decrease in return on assets *(ROA)* is associated with a 1.25 percentage point increase in retail frenzies, which is economically large given that the mean of *Retail Frenzy* is 1.3%. We also find that retail frenzies tend to be more common among smaller firms, firms with lower institutional ownership, firms with more common shareholders (primarily retail investors), and firms that are more overpriced (i.e., a low Net *Anomaly Score*). The patterns are similar after including month × industry fixed effects, suggesting that retail frenzies are mostly driven by retail investor preferences for stocks within an industry, rather than a preference for certain industries. The estimates are also qualitatively similar after including firm fixed effects. The evidence in Table 2 aligns with existing evidence regarding retail investors' preferred habitat (Kumar and Lee, 2006; Laarits and Sammon, 2023).

As an additional validity check, we relate retail frenzy episodes to posting activity on the retail investor social finance site WallStreetBets (WSB) from July 2018 through June of 2021 (based on data availability). In particular, we sort stocks into groups based on the total number of WSB posts over three-month periods and relate it to contemporaneous retail order imbalances and

[16] We report estimates from a linear probability model simply for ease of interpretation. In Table IA1 of the Internet Appendix, we also estimate logit models and find qualitatively similar estimates.

frenzies. We observe a monotonic relation between posting activity and retail frenzies (tabulated in Panel A of Table IA2 in the Internet Appendix). For example, for stocks with 0 WSB posts, average retail order imbalances are 0.14% and frenzies account for 2.4% of the firm-quarter observations. Stocks with 2-5 posts have retail imbalances of 0.54% and frenzies occur 6.56% of the time, and stocks more than 100 posts have retail imbalances of 1.88% and frenzies comprise 21.01% of the observations.

3. Retail Frenzies and Stock Prices

We argue that frenzies reflect large, uninformed demand shocks that temporarily push stock prices away from their fundamental values. As a result, we expect sizable positive returns during the frenzy, followed by subsequent reversals. We examine the relation between retail frenzies and returns by estimating the following panel regression[17]:

$$Ret_{i,t+x} = \alpha + \beta_1 Retail\ Frenzy_{i,t} + Time_t + \varepsilon_{it}. \quad (2)$$

The dependent variable is the return on the stock in month $t+x$. We let x vary from 1 to 24, which allows us to examine monthly returns in each of the 24 months following the frenzy. We also set x equal to -1, -2, and -3 to examine returns during the period in which retail buying occurs (hereafter contemporaneous returns). Standard errors are clustered by firm and month.

Columns 1 and 2 of Table 3 report the results. We observe a strong positive relation between retail frenzies and contemporaneous returns. During the three months in which retail frenzies are measured, stocks experience returns of 9.81%, 9.27%, and 7.69%, respectively, and all three estimates are highly significant. More interestingly, we observe consistently negative estimates in each of the 24 months following the frenzy. The estimates range from -0.86% to -

[17] We also repeat the analysis using Fama-MacBeth (1973) regressions. The results, reported in Table IA3 of the Internet Appendix are similar.

2.21% and the majority of the estimates are significant at a 5% level. This evidence is consistent with retail buying pressure pushing prices away from their fundamental values during the quarter of the buying frenzy, with the mispricing being gradually corrected over the subsequent 24 months.

Table 2 shows that retail frenzies are negatively correlated with *Net Anomaly Score*, which suggests that some of the documented underperformance may stem from retail frenzies being concentrated in overvalued stocks. To explore the extent to which the negative returns following retail frenzies are distinct from existing anomalies, we repeat Equation (2) after replacing the dependent variable with anomaly-adjusted returns. Specifically, we sort stocks into 50 portfolios based on the *Net Anomaly Score*, and we compute anomaly-adjusted returns as the return on the stock less the average return of stocks in the same *Net Anomaly* portfolio. Columns 3 and 4 report the estimates and *t*-statistics for the anomaly-adjusted returns. The point estimates for future returns are reduced, but the estimates remain consistently negative and economically large. Thus, retail frenzies are associated with mispricing that is distinct from existing anomalies measures.

To better visualize the event-time returns, Figure 4 plots cumulative market-adjusted and anomaly-adjusted returns from month -3 to +24. We sum the return coefficient estimates from Table 3 to obtain the cumulative returns shown in Figure 4. The figure indicates that retail frenzies are associated with a roughly 27% price run up. Market-adjusted returns more than fully revert over the 24-month window, while the anomaly-adjusted returns fall to 4% over the same window.

We also investigate whether the findings we document are specific to retail investors, or whether frenzies by any type of investors induce similar patterns. To explore this question, we use the Lee and Ready (1991) algorithm to compute the aggregate imbalance from TAQ data. As with the retail measure, we measure aggregate order imbalances for stock *i* on day *t* as the difference between total buying and selling volume, scaled by shares outstanding, and we sum this measure

over three-month rolling windows (*Aggregate Qtr. Imbalance*). We define *Aggregate Frenzy* as an indicator equal to one if *Aggregate Retail Imbalance* exceeds 2%. We contrast the relation between retail frenzies and aggregate frenzies by estimating Equation (2) after including an additional indicator for *Aggregate Frenz*y, and we plot the cumulative anomaly-adjusted returns in Figure IA1 of the Internet Appendix. The results indicate that A*ggregate Frenzies* are also associated with large contemporaneous returns, however these returns do not reverse over longer horizons. Thus, there is no evidence to suggest *Aggregate Frenzies* push prices beyond their fundamental value.

4. Retail Frenzies and Corporate Decisions

The results from the prior section suggest that retail buying frenzies are associated with substantial mispricing. In this section, we examine the implications of this mispricing for corporate decision making, with a particular emphasis on equity issuance and investment.

4.1 Equity Issuance

A positive relation between retail frenzies and equity issuance is consistent with the joint hypothesis that 1) managers chose to issue equity when they believe the firm is overvalued, and 2) managers recognize that their firm is overvalued followed retail frenzies. There is ample anecdotal and empirical evidence supporting the first part of the joint hypothesis. For example, Graham and Harvey (2001) find that two-thirds of CFOs agree that "the amount by which our stock is undervalued or overvalued was an important or very important consideration" in issuing equity.[18] Additionally, a large literature finds that firms are more likely to issue equity when their stock prices appear relatively high, as measured by market-to-book ratios (e.g., Jenter, 2005; DeAngelo,

[18] The updated survey evidence in Graham (2022) suggests that across survey vintages, 1-5% of CFOs consider their stock to be overvalued.

DeAngelo, and Stulz, 2010) or non-fundamental demand shocks (e.g., Khan, Kogan, and Serafeim, 2012). We expect that mangers are aware, at least to some extent, that the large price increases driven by retail frenzies has resulted in overvaluation. However, the extent to which managers take advantage of this mispricing is an empirical question.

We examine the relation between equity issuance and retail frenzies by estimating the following model:

$$Issuance_{it+1} = \alpha + \beta_1 Retail\ Frenzy_{i,t,t-5} + \beta_2 Controls + \beta_3 LagY + FE + \varepsilon_{it}. \quad (3)$$

The dependent variable, *Issuance*, is an indicator equal to one if the firm issued equity during the quarter, as defined in Appendix A. The key dependent variable, *Retail Frenzy*, is an indicator equal to one if the firm experienced a retail frenzy at any point in the six months preceding the quarter.[19] We focus on a six-month horizon to give managers sufficient time to react to mispricing. Further, the evidence in Figure 4 suggests that mispricing remains elevated for several months following buying frenzies.

Controls includes the same set of controls from Equation (2). In addition, we control for persistence in equity issuance by including lagged *Equity Issuance* measured over the prior two to four quarters and prior five to eight quarters. FE denotes industry × quarter fixed effects, and in some specifications, we also include firm fixed effects. We standardize all continuous control variables to have unit variance, and we cluster standard errors by firm and quarter. We estimate the model using both OLS (i.e., a linear probability model) and logistic regressions.

Specification 1 of Table 4 reports the OLS results for the model with industry × quarter fixed effects. We find that the coefficient on *Retail Frenzy* is positive and highly significant. The result is robust to the inclusion of firm fixed effects (Specification 2) or estimating the model using

[19] For example, if the firm's fiscal quarter runs from October - December, *Retail Frenzy* equals one if the *Qtr. Retail Imbalance* exceeds 2% of shares outstanding at the end of any month between April and September.

logistic regressions (Specifications 3 and 4). The estimate from Specification 3 indicates that firms that recently experienced a retail frenzy are 30% more likely to issue equity. To get a sense of the economic significance, the estimated frenzy effect is similar to a two-standard deviation increase in Tobin's Q or a two-standard deviation decrease in ROA.

4.2 Investment - Hypotheses

The evidence in Table 4 suggests that managers issue new equity following retail buying frenzies. An important question is whether this new equity issuance ultimately influences the real economy through increased investment. It is possible that rational managers issue equity in response to overvaluation, but they also recognize that additional investment would not be value maximizing. Under this scenario, managers would simply use the proceeds from the equity issuance to pay off debt or accumulate more cash.

On the other hand, there are several potential reasons why managers would increase investment following a large stock price increase. First, managers may have positive investments opportunities that they could previously not access due to financial constraints (*Financial Constraints,* e.g., Campello and Graham, 2013). Second, managers may erroneously believe that have positive investments opportunities that they could previously not access due to financial constraints (*Overconfidence,* e.g., Malmendier and Tate, 2005). Third, increased investment could stem from managers being unable to fully filter out non-fundamental information when using stock prices as a signal of their investment opportunities (*Faulty Learning, e.g.*, Dessaint et al., 2019). Lastly, it is possible that managers recognize that they do not have positive investment opportunities but chose to invest due to various conflicts of interest that are associated with free-cash flows and overvalued equity (Jensen, 1986; 2005).

4.3 Investment - Empirical

We examine the relation between investment and retail frenzies by re-estimating Equation (3) after replacing the *Equity Issuance* indicator with either *CAPX* or *Acquisitions*, and we also replace lagged equity issuance with either lagged CAPX or lagged acquisition expenses. Table 5 presents the results. We observe a positive and highly significant relation between retail frenzies and capital expenditures (Specifications 1 and 2). For example, the estimates from Specification 1 indicate that capital expenditures increase by 1.11% of total fixed assets, which reflects a 18% increase relative to the mean of capital expenditure of 6.30%. Similarly, we observe a positive relation between retail frenzies and acquisition activity (Specifications 3 and 4).

The economic magnitude of the increased investment is sizeable. Specifically, over our sample period, there are 6,652 firm-quarters where the *Retail Frenzy* indicator equals one, and the average retail buy frenzy stock has $773 million in fixed assets. Thus, the estimates in Specifications 1 and 3 of Table 5 imply an increase in total capital expenditures of $56.6 billion (1.11% × $773 million ×6,652) or roughly $3.3 billion dollars per year, and a total increase in acquisitions over the sample period of $77.1 billion.

As noted previously, in addition to increased investment, firms could use the proceeds from the equity issuance to pay off debt or to increase cash holdings. Table IA4 of the Internet Appendix explores the relation between retail frenzies and both debt retirement and cash holdings. We define *Debt Retirement* as an indicator equal to one if the firm reduced long-term debt (i.e., DLTR − DLTIS) by more than 3% of market capitalization, and *Change in Cash* is defined as the cash change (CHECH) scaled by lagged assets. We then re-estimate Equation (3) after replacing *Equity Issuance* with either *Debt Retirement* or *Change in Cash.* We find no robust relation between retail frenzies and net debt retirement. In contrast, we observe an economically large and statistically significant increase in cash holdings. Thus, firms appear to use the proceeds from equity issuances

following retail frenzies primarily to increase investment and cash holdings rather than to pay off existing debt.

4.4 Equity Issuance and Investment – Robustness and Alternative Explanations

We next examine whether the equity issuance and investment findings are robust to key research design choices. We present the robustness checks in Table 6, where for reference we tabulate the baseline results from Tables 4 and 5 in the first row. In Rows 2 through 4, we consider matched samples based on industry, quarter, and two other matching variables, where we require the matching variables to be in the sample quintile. Thus, these regressions include industry × quarter × first matching variable quintile × second matching variable quintile fixed effects. Following Khan, Kogan, and Serafeim (2012), the matching variables we consider are Q and size (Row 2), past returns and size (Row 3), and asset growth and ROA (Row 4). In addition, in Row 5 we match each retail frenzy firm to a non-frenzy firm with the closest propensity score (i.e., nearest neighbor matching), where the propensity score are the predicted values from Specification 2 of Table 2. The results from these alternative specifications are qualitatively similar to the baseline estimates reported in Row 1.

In Rows 6 through 8 we define retail frenzies using alternative imbalance thresholds ranging from 1% (Row 6) to 5% (Row 8). Intuitively, we find that the estimates get stronger as we raise the frenzy threshold. For example, the estimated coefficient on capital expenditures is 0.74% for the 1% threshold versus 1.44% for the 5% threshold.[20] However, increasing the threshold also substantially reduces the number of buying frenzy observations and typically results in less precise

[20] Although the estimated increases in capital expenditures are smaller at lower levels, the aggregate economic effects are larger. For example, at a 1% threshold, *Retail Frenzy* equals one for 14,860 firm-quarters and the average retail frenzy firm has fixed assets of $904 million. Thus, the 0.74% estimate translates into an aggregate increase in capital expenditures of $99.4 billion compared to $56.6 billion in the baseline estimate.

(although still statistically significant) estimates. In Row 8, we sign retail trades using the BJZZ (2021) sub penny price improvement method rather than quoted midpoint method as suggested by Barber et al. (2023). We generally find slightly smaller estimates which is consistent with the BJZZ (2021) method being less accurate in signing retail trades (Barber et al., 2023).

In Rows 10 and 11, we define a retail frenzy based on the prior three months (Row 10) or based only on the prior four to six months (Row 11). We find modest evidence that equity issuances are more strongly related to frenzies in the prior three months (8.16%) relative to frenzies in the prior four to six months (5.59%). This finding is consistent with firms issuing equity relatively quickly following retail buying pressure.[21] In contrast, the estimates for capital expenditures acquisition are more similar across the two horizons which suggests that investments may react to mispricing with greater delay than equity issuance.

As evident in Figure 1, retail frenzies spiked during COVID (2020-2021). Thus, a natural question is whether our results are entirely driven by the pandemic period. In Row 12, we repeat the analysis after excluding the COVID years. The estimates decline, which is consistent with the effects being particularly strong during COVID. Nevertheless, the estimates remain highly significant, which suggests that the results are not limited to that unusual period. A related concern is that our results are driven by very tiny firms that are not particularly economically important. In Row 13, we repeat the tests after excluding firms with less than $50 million in assets, and we find similar point estimates.

An important potential concern is reverse causation. It is possible that anticipated future investment helps to stimulate retail frenzies. We first explore this alternative interpretation by examining the content of social media posts. We search Due Diligence reports on WallStreetBets

[21] This finding is also consistent with prior that suggests that equity issuances is correlated with both return and changes in institutional demand measured in the previous quarter (Alti and Sulaeman, 2012).

for the corporate investment related terms "issuance," "capital expenditures" or "CAPX," and "merger" or "acquisition." Panel B of Table IA.2 reports the frequency of each term and how the frequency varies with the intensity of posting. We document two main findings. First, the terms are generally infrequent across DD reports. For example, discussion of equity issuance occurs in roughly 0.5% of all DD reports. Second, there is no clear pattern between the intensity of coverage on WSB (i.e., the number of DD reports) and the discussion of issuance and investment. Thus, there is little evidence to suggest that anticipation of major corporate events drives heighted retail attention on WSB.

We also consider frenzy firms in the news. If frenzy investors are driven by anticipated investment, we would expect the findings to be stronger during episodes with greater corporate action related news articles. We explore this conjecture by tracking articles in Ravenpack where the news group is labeled 'Equity Actions' (which includes news about both equity issuance and investment), or 'Acquisitions-Mergers' (which includes all merger related news stories). We find no evidence that the findings are significantly stronger for firms experiencing abnormal corporate-action news articles (see Table IA5 of the Internet Appendix).

Although our regressions control for stock returns, another potential concern is that any firm with positive outlier returns over a three-month period may exhibit the patterns we observe. We address this possibility by constructing pseudo-frenzy firms. In particular, for each frenzy firm, we consider a matching firm from the same asset size quintile with the closest return during the frenzy period. In Figure IA2 in the Internet Appendix, we observe no evidence of reversal for pseudo frenzy firms. Although we do find evidence of increased issuance for pseudo frenzy firms (see Table IA6), the coefficient is less than a third of the magnitude of the coefficient for frenzy firms, and the difference between the two estimates is highly significant. Moreover, the

coefficients on CAPX and acquisitions are economically and statistically insignificant, in sharp contrast to the evidence for frenzy firms.

4.5 Retail Frenzies and Corporate Decisions – Time Series Trends

Figures 1 and 2 indicate that the frequency and intensity of retail buying frenzies have increased substantially, with both measures exhibiting a noticeable spike beginning in 2017. This corresponds to the time period when zero-commission broker Robinhood began to see significant growth, and, in response, other brokerages significantly reduced trading commissions.[22] Thus, we loosely refer to the 2007-2016 period as *pre-zero commission period* (or pre period) and the 2017-2023 period as the *post zero commission period* (or post period). Of course, many other factors, such as work from orders during the pandemic and greater coordination through social media (Cookson, Engelberg, and Mullins, 2023), may have contributed to amplified retail trading in the post-zero commission era. Regardless of the exact mechanism driving increased retail trading, a natural prediction is that increased retail buying pressure should, all else equal, lead to greater mispricing and potentially larger effects on corporate decisions.

We introduce an alternative definition of retail frenzies, *Relative Frenzy*, which as an indicator equal to one if the firm is in the 99th percentile of the distribution relative to all firms in the same calendar month. By switching to a relative measure, we effectively hold the frequency of buying frenzies constant over time and therefore focus on the impact on the differences in the intensity of the frenzies.

[22] Over the 2017 calendar year, Robinhood grew from 2 million accounts to 6 million accounts (https://www.businessofapps.com/data/robinhood-statistics/). In February of 2017, Fidelity Investments, Charles Schwab, and TD Ameritrade all reduced trading commissions (https://www.bloomberg.com/news/articles/2017-02-28/fidelity-slashes-commissions-in-the-latest-salvo-in-the-fee-wars?sref=VdHMQbm0).

Figure 5 plots the average and median buying imbalance for *Relative Frenzy* firms. We find that the average imbalance increases from 1.4% in 2007 to 18.7% in 2021. To examine whether the larger imbalances in recent years are associated with greater mispricing, we also plot the cumulative anomaly-adjusted returns from month -3 to +24 associated with *Relative Retail Frenzy* in the pre-period sample (2007-2016) and post-period sample (2017-2023). Figure 6 reports the results. We find that the relation between *Relative Retail Frenzy* and contemporaneous returns is much larger in the post period. Specifically, the returns from month *t-3* to *t-1* are 38.89% for the post period compared to 18.28% in the pre period. In addition, we observe larger reversals in the post period. In the post period, retail frenzy stocks earn anomaly-adjusted returns of –36.50% over the subsequent 24 months, compared to -21.64% in the pre period. These findings are consistent with retail frenzies inducing considerably larger mispricing in the post zero commission era.

We next repeat the estimates from Equation 3, after replacing *Retail Frenzy* with *Relative Retail Frenzy (Pre-Period)* and *Relative Retail Frenzy (Post-Period)*, and we also test whether the two estimates are significantly different from each other. Specification 1 of Table 7 reports the results for equity issuance. We find that both *Relative Retail Frenzy (Pre-Period)* and *Relative Retail Frenzy (Post-Period)* are significant. Thus, retail frenzies are associated with increased equity issuance even in the earlier part of the sample when the imbalances and price effects of retail trading frenzies were more modest. However, as expected, *Relative Retail Frenzy (Post Period)* is much larger in magnitude. Specifically, the estimates indicate that *Retail Frenzies* in the pre period are associated with a 2.49 percentage point increase in equity issuances compared to a 9.84 percentage point increase in the post period, and the difference between the two estimates is statistically significant.

The results for capital expenditures, reported in Specification 2, are qualitatively similar. In particular, the estimates for the pre and post period are significant, and the magnitude of the estimate for the post period is considerably larger. However, the difference between the two estimates is not reliably different from zero. In addition, Specification (3) indicates that the positive relation between retail frenzies and acquisitions is entirely concentrated in the post-period. Taken together, the evidence from Figure 6 and Table 7 aligns with the notion that the heightened intensity of retail frenzies in the post-zero commission period is associated with greater stock price effects and more pronounced impacts on firms' real decision making.

5. What Drives Increased Investment Following Retail Frenzies?

Our analysis uncovers a robust relation between retail frenzies and increased equity issuance and investment. The positive association with increased equity issuance is perhaps not surprising given the abundant anecdotal and empirical evidence that managers chose to time equity issuance (e.g., Graham and Harvey, 2001, Graham, 2022). However, the mechanism driving increased investment is less obvious. As discussed in Section 4.2, there are at least four potential explanations for increased investment: *Financial Constraints*, *Overconfidence*, *Faulty Learning*, and *Agency Conflicts*. In this section, we conduct several additional tests to better understand the factors driving the increased investment.

5.1 The Performance of Investment following Retail Frenzies

The *financial constraints* explanation (Campello and Graham, 2013; Warusawitharana and Whited, 2016) suggests that the increase in stock price following retail frenzies relaxes financial constraints that previously prevented managers from investing in positive NPV projects. This implies that increased investment following retail frenzies could be associated with higher future

returns relative to other retail frenzy stocks. In contrast, the alternative explanations suggest that the increased investment is suboptimal, pointing to the possibility of lower future returns.

An important caveat to these predictions is that the returns following large investments capture both the performance of new investments and the performance of the firm's existing assets in place. While large negative returns following investment are consistent with bad investments, it is possible that the firm may have had poor performance due to existing assets in place. Despite this limitation, studying post-investment performance is informative. Negative performance following large investments after buying frenzies would suggest at a minimum that the increased investment, subsidized by retail investor enthusiasm, did not help the firm achieve its inflated valuation. More broadly, the analysis can assist investors and other market participants in identifying overvalued firms.

We classify a firm as have made large capital expenditures (*Large CAPX)* if the firm's capital expenditures in the previous quarter was in the top quartile of capital expenditures across all firms and at least 50% larger than the firm's average capital expenditures in the prior two to four quarters. We classify a firm as having made a large acquisition (*Large Acq*) if the firm made an acquisition that was at least 1% of total fixed effects in the previous quarter. We then define *Large Investment* as the maximum of *Large CAPX* and *Large AQC*. As in previous tests, *Retail Frenzy* is an indicator equal to one if the firm experienced a retail frenzy at any point in the past six months. Our key independent variable, *Frenzy* × *Large Investment,* interacts *Retail Frenzy* and *Large Investment.* In other words, *Frenzy* × *Large Investment* equals one if the firm made a large investment in the past quarter and *Retail Frenzy* was equal to one at any point in the six months preceding the large investment.

We then estimate the following panel regressions:

$$Ret_{i,t+1} = \alpha + \beta_1 Large\ Investment_{i,t-1,t-12} + B_2 Retail\ Frenzy_{i,t-1,t-12} \quad (4)$$
$$+ B_3 Frenzy\ \times Large\ Investment_{i,t-1,t-12} + FE_{it} + \varepsilon_{it}.$$

The dependent variable is the one-month ahead market-adjusted (or anomaly-adjusted) return. *Large Investment*$_{t-1,\ t-12}$ is an indicator equal to one if *Large Investment* equals one in any month from month *t-1, t-12*.[23] *Retail Frenzy* and *Frenzy* × *Large Investment* are defined analogously. We focus on a relatively long window after investment (12-months) based on the view that the market may only gradually learn about the quality of the investments over time, which seems likely given the ample evidence on long-run underperformance following major corporate events (e.g., Loughran and Ritter, 1995; Loughran and Vijh, 1997).[24] FE denote either month fixed effects of industry × month fixed effects. Standard errors are clustered by month and firm.

Specification 1 of Table 8 reports the results using market-adjusted returns and month fixed effects. The estimate for *Large Investment* is -0.11%, suggesting that large investments that were not preceded by retail frenzies underperform by (a statistically insignificant) 0.11% per month over the subsequent 12 months. Similarly, the coefficient on *Retail Frenzy* indicates that retail frenzies that are not followed by large investment underperform by a statistically insignificant 0.64% per month. The coefficient on the variable of primary interest, *Frenzy* × *Large Investment*, reveals that retail frenzies that are coupled with large investment incrementally underperform by -1.37% per month over the subsequent 12 months. This estimate is economically large and statistically significant. We find that the estimate is similar after including industry × time fixed effects (Specification 2) or replacing market-adjusted returns with anomaly-adjusted returns

[23] The mean of *Large Investment*$_{t-1}$ *(Large Investment*$_{t-1,\ t-12}$*)* is Approximately 20% (50%). Roughly half of the large investments stem from acquisitions, with the remaining half stemming from large capital expenditures.

[24] This approach is conceptually similar to converting the dependent variable to a one-year ahead return. We lag the independent variable to avoid overlapping holding periods in the dependent variable that could result in biased standard errors.

(Specifications 3 and 4). Panels B and C repeat the analysis after replacing *Large Investment* with either *Large CAP*X or *Large Acquisitions*. The results are qualitatively similar using both measures of investment. In sum, firms that make large investments after retail frenzies, either through capital expenditures or acquisitions, experience particularly poor future returns over the subsequent 12 months.[25]

In Table IA8 of the Internet Appendix, we also examine the performance of equity issuance following retail buying frenzies. We find that firms that issue equity following retail frenzies significantly underperform relative to other retail frenzy firms. However, when we partition equity issuances into how the proceeds were primarily used (large investment, debt retirement, or cash increase), we find that underperformance is concentrated among equity issuers who use the proceeds for large investments.

5.2 Insider Trading Following Retail Frenzies

The results from the prior section are consistent with managers engaging in value-destroying investment following retail frenzies. One potential explanation is that managers incorrectly believe that they have promising investment opportunities, perhaps because managers are overconfident (Malmendier and Tate, 2005). Alternatively, they may incorrectly interpret the dramatic price increases as reflecting positive private information regarding promising future investment opportunities (e.g., Dessaint et al., 2019). On the other hand, managers may also recognize that they do not have profitable investment opportunities, but nevertheless chose to increase investments for agency-related reasons (Jensen, 1986).

[25] In the Internet Appendix, we also examine the returns around earnings announcement days (0,1). Although earnings days account for roughly 3% of the days in our sample, they account for roughly 40% of the underperformance. This is consistent with increased investment being associated with disappointed earnings news (see Table IA7).

To disentangle overoptimism from agency conflicts, we examine insider trading following retail frenzies. If executives are genuinely optimistic about future investment opportunities, we would expect executives to increase their net buying. In contrast, if managers believe the stock is overvalued and are investing for more strategic reasons, we expect a decline in net insider buying.

We collect insider trading data from Thomson Refinitiv, which captures and cleans Form 4 filing by corporate insiders. Our key variable, *Net Buy*, is the total shares bought by insiders less the total shares sold, scaled by shares outstanding. *Net Buy* is measured at a monthly frequency, and values are winsorized at -0.5% and +0.5% (roughly the 1st and 99th percentiles). We test the relation between insider trading and retail frenzies by estimating the following panel regression:

$$Net\ Buy_{i,t+1} = \alpha + \beta_1 Retail\ Frenzy_{i,t} + \beta_2 Controls + +\beta_3 Lag\ Y + FE + \varepsilon_{it}. \quad (5)$$

We anticipate that insider trading can respond quickly to mispricing, and we set the *Retail Frenzy* indicator equal to one if the firm experienced a retail frenzy in the previous month. *Controls* include the sets of controls used in Table 4 plus an indicator for equity issuance.

Specifications 1 and 2 of Table 9 report the results for the full sample after including industry × month fixed effects (both Specifications) and firm fixed effects (Specification 2). In both specifications, we observe that the coefficient on *Retail Frenzy* is negative and statistically significant at a 1% level. This indicates that insiders engage in less net buying following retail frenzies, which is consistent with managers recognizing that the firm is overvalued.

5.3 Agency Problems and Increased Investment

The evidence that corporate insiders tend to sell their holdings after frenzies is consistent with recognition of overvaluation and agency-induced investment rather than manager optimism. Several agency-based explanations may contribute to the increased investment following retail buying sprees. First, the increased proceeds from equity issuance naturally amplifies agency costs

associated with free-cash flow (Jensen, 1986). Second, increased investment may reflect managers catering to maintain overvaluation (e.g., Dong, Hirshleifer, and Teoh, 2012). Maintaining retail investor enthusiasm for a longer period could benefit the firm by allowing it to raise equity at discounted rates, but it may also benefit the manager since compensation typically increases with recent stock performance and market capitalization. Another potential agency problem may stem from convex managerial payouts. For example, managers of struggling firms, such as unprofitable and distressed firms that are frequently subject to retail frenzies, face significant job loss risk regardless of whether their performance slowly declines or rapidly declines. Thus, managers may have an incentive to pursue investment projects that offer a small probability of success even if the expected NPV of the project is negative.

We anticipate that agency-related problems are likely to be more severe in distressed firms. Intuitively, highly profitable firms are more likely to have promising investment opportunities, and thus managers can grow the firm without value-destroying investments. Similarly, convex payoffs stemming from bankruptcy risk are naturally stronger for distressed firms. Accordingly, we examine how both the investment level and the profitability of investment following retail frenzies varies with proxies for financial distress. We consider three measures of distress: *Negative FCF*, an indicator equal to one if *Free Cash Flows* are negative, *Negative Profitability*, an indicator equal to one if *EBITDA* is negative, and *Negative Z-score*, an indicator equal to one if the Altman (1968) Z-score is negative.[26] All distress measures are calculated at the end of the previous calendar year.

We first examine how the level of equity issuance and investment following retail frenzies varies with distress. Specifically, we repeat the analyses in Tables 4 and 5, after interacting retail

[26] The mean of *Negative FCF, Negative Profitability*, and *Negative Z-score* for non-retail buying frenzy firms are 32.7%, 19.1%, and 7.6%. These values increase to 77.6%, 68.3% and 45.3% for retail frenzy firms.

frenzy with a distress indicator. We also evaluate whether the two coefficients are significantly different from each other.

Panel A of Table 10 reports the results for equity issuance. We find that retail frenzies are associated with increased equity issuance for both distressed and non-distressed firms. However, the magnitude of the effect is substantially larger for distressed firms, and the difference between the two estimates is statistically significant. Panel B reports the results for capital expenditures. We find that the relation between retail frenzies and capital expenditure is significantly positive for distressed firms. In contrast, the estimates are never reliably different from zero for non-distressed firms. Furthermore, the difference between the two estimates is significant across all three measures. The results for acquisitions, reported in Panel C, are similar. The collective evidence from Table 10 is consistent with the increased investment following retail frenzies being concentrated in distressed firms.[27]

We next examine whether the poor performance following retail frenzies is stronger among distressed firms. Specifically, we estimate the following panel regression:

$$Ret_{i,t+1} = \alpha + \beta_1 Distress_{i,t-12} + B_2 Retail\ Frenzy_{i,t-1,t-12} + B_3 Frenzy\ \times Distress_{i,t-1,t-12} + FE_{it} + \varepsilon_{it}. \quad (6)$$

The dependent variable is the one-month ahead anomaly-adjusted return (the results using market-adjusted returns are similar). *Distress* is one the of the three distress indicators (*Negative FCF, Negative Profitability*, or *Negative Z-score*), $Retail\ Frenzy$ is defined as in Equation (4), and *Frenzy* × *Distress* is equal to the interaction term *Retail* $Frenzy$ × *Distress*. *FE* denotes industry × month fixed effects. Specifications 1-3 of Table 11 report the results for each of the distress

[27] In Table IA10 of the Internet Appendix, we also examine whether insider selling results in Table 9 systematically vary with distress. We find that insider selling following retail frenzies is statistically significant for distressed firms (with coefficient ranging from -0.75% to -1.01), and insignificant than non-distressed firms (-0.03% to -0.44%). However, the coefficients are not reliably different from each other.

proxies. We find that the coefficient on *Retail* × *Distress* is consistently negative, ranging from –-1.15% to -1.26%, and statistically significant.

To further explore the role of investment in the poor performance of distressed firms, we repeat equation (6) after partitioning *Retail* × *Distress* into *Retail* × *Distress* × *Large Investment* and *Retail* × *Distress* × *Small Investment,* where *Large Investment* is defined as in Table 8. Specifications 4-6 report the results. We find that the estimates on *Retail* × *Distress* × *Large Investment* are always more negative than the estimates on *Retail* × *Distress* × *Small Investment.* Furthermore, the difference between the two estimates is always statistically significant. Collectively, the evidence from Tables 10 and 11 show that both the increased investment and the poor performance following investment for retail frenzy firms is concentrated in distressed firms, where agency conflicts are potentially more severe.

6. Conclusions

We introduce a new proxy for retail trading frenzies based on quarterly retail order imbalances. Our findings indicate a strong positive relation between retail buying frenzies and contemporaneous stock returns, followed by sustained negative performance over the next two years, consistent with a correction of frenzy-induced mispricing. The negative returns remain significant after adjusting for market anomalies, suggesting that the mispricing related to retail frenzies is distinct from existing anomalies. The analysis supports the view that retail frenzies result in overvaluation that reverses only gradually.

We find evidence that retail frenzies strongly correlate with equity issuance and investment. The trend is more pronounced in the post-zero-commission era, consistent with a reduction in trading costs amplifying the impact of retail frenzies on stock prices and corporate behavior. Moreover, firms with large investments following retail frenzies significantly

underperform compared to both large investments at non-frenzy firms and retail frenzy firms that do not heavily invest.

The evidence that investment following retail frenzies is associated with poor subsequent performance could be attributable to either misjudged market signals or more strategic considerations. Insider trading data indicates that executives are more likely to sell shares following frenzies, implying recognition of overvaluation rather than optimism about future investment opportunities. We also find that both the increased investment and the poor performance following the investment for retail frenzy firms are concentrated in more distressed firms where agency conflicts are likely to be more severe. Taken together, our results provide novel evidence consistent with retail investors reducing the efficiency of real investment decisions.

Our findings are relevant to both academics and regulators. From a regulatory perspective, the evidence contributes to the ongoing policy debates surrounding the factors that drive coordinated retail trading, such as zero commission trading, the gamification of trading apps, and the proliferation of finance-focused social media platforms. Much of this discussion, particularly during and following the GameStop frenzy, highlights how these forces contribute to increased volatility and amplify potential losses to small investors.[28] Our research is consistent with retail frenzies not only redistributing wealth but also influencing real investment decisions and potentially diminishing investment efficiency. The estimates suggest that the real economic effects are sizeable, providing an additional rationale for regulatory scrutiny.

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[28]For example, Secretary of the Commonwealth of Massachusetts William Gavin proposed 30-day trading suspensions in GameStop and meme stocks because "unsophisticated investors are going to be hurt by this." (https://www.cnbc.com/2021/01/27/gamestop-speculation-is-danger-to-whole-market-massachusetts-regulator.html). Similarly, following the GME episode the committee of financial services held congressional hearings entitled: "Game Stopped: Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide?"

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Appendix A: Variable Definitions

- *Qtr. Retail Imbalance:* Retail buy volume less retail sell volume scaled by total shares outstanding measured over a 3-month window. Retail trades are assigned as buys or sells based on the Barber et al. (2023) algorithm. (Source: TAQ and CRSP).
  - *Retail Frenzy:* An indicator equal to one if *Qtr. Retail Imbalance* is greater than 2% of shares outstanding.
  - *Retail Frenzy*$_{t,,t-5}$*:* An indicator equal to one if *Qtr. Retail Imbalance* is greater than 2% of shares outstanding in any of the past six months.
  - *Relative Retail Frenzy:* An indicator equal to one if *Qtr. Retail Imbalance* is greater than or equal to the 99th percentile value relative to other firms in the same calendar month.
  - *Retail Selling Frenzy:* An indicator equal to one if *Qtr. Retail Imbalance* is less than or equal to the -2% of shares outstanding.
- *Qtr. Aggregate Imbalance:* Aggregate TAQ buy volume less aggregate TAQ sell volume scaled by total shares outstanding measured over a 3-month window. Trades are assigned as buys or sells based on the Lee and Ready (1991) algorithm. (Source: TAQ and CRSP).
  - *Aggregate Frenzy:* An indicator equal to one if *Qtr. Aggregate Imbalance* is greater than 2% of shares outstanding.
- *Equity Issuance*: An indicator equal to one if equity issuance (Compustat item SSTK) is greater than 3% of a firm's market capitalization.
- *Capital Expenditures*: Capital expenditures (Compustat item CAPX) scaled by fixed assets (Compustat item PPENT) in the prior quarter.
  - *Large CAPX* – An indicator equal to one if the firm's capital expenditures are at least 50% larger than the firm's average capital expenditures in the prior two to four quarters and exceed the top quartile of capital expenditures across all firms.
- *Acquisitions*: Acquisition expenditures (Compustat item AQC) scaled by fixed assets (PPENT) in the prior quarter.
  - *Large Acquisitions:* An indicator equal to one if firm has acquisition expenses that are more than 1% of total fixed effects.
- *Large Investment:* An indicator equal to one if either *Large CAPX* or *Large Acquisitions* is equal to one.
  - *Retail* ×*Large Investment*: An indicator equal to one if *Large Investment* equals one and *Retail Frenzy*$_{t-6,t-1}$ equals one.
- *Debt Retirement:* an indicator equal to one if long-term debt reduction (Compustat item DLTR) less long-term debt issuance (Compustat item DLTIS) exceeds 3% of market capitalization.
- *Changes in Cash*: The change in cash and cash equivalents (Compustat item CHECH) scaled by total assets in the prior quarter.
- *ROA*: Net Income (Compustat item: NI) scaled by total assets in the prior quarter.
- *Ret*$_{t-12,\ t-1}$: The return over the prior 1 to 12 months. (Source: CRSP)

- *Assets*: Total assets (Compustat item: AT).
- *Q*: Tobin's, defined as book value of assets (Compustat item AT) less book value of equity (Compustat Item: CEQ) plus market value of equity (Compustat: PRCC × CSHO) at the end of the calendar year. Scaled by book value of assets (Compustat item AT).
- *Leverage*: Total assets (AT) scaled by book equity (BE).
- *Div Yield:* Total dividends (Compustat item: DVT) over the prior 12 months scaled by the current price (CRSP item: PRC).
- *Volatility:* The standard deviation of daily returns over the prior month (Source: CRSP).
- *Short Interest:* The total number of shares held short (Compustat item SHORTINT) scaled by shares outstanding.
- *Asset Growth:* The percentage growth in total assets over the prior year (Source: Compustat).
- *Institutional Ownership:* Total ownership by 13F-filing institutional investors (Sources: Thomson/Refinitiv S34 Holdings).
- *Shareholders:* Common shareholders (Compustat item: CSHR).
- *Insider Net Buying*: The number of shares purchased by insiders less the number of shares sold by insiders, scaled by shared outstanding (Source: Thomson/Refinitiv Insiders Data).
- *Pre-Zero Commission Period:* An indicator equal to one for the 2007-2016 sample period.
- *Post-Zero Commission Period*: An indicator equal to one for the 2017-2023 sample period.
- *Net Anomaly Score:* The number of times the stock appears in the long leg of an anomaly portfolio less the number of times the stock appears in the short-leg. The measure considers 118 anomalies that were significant predictors of returns in Jensen, Kelly, and Pedersen (2023). The full list of anomalies is available in Table J.1 of Jensen, Kelley, Pedersen (2023).
- *Anomaly-Adjusted Returns:* The return on the stock less the average return of stocks in the same *Net Anomaly Score* portfolio, where portfolios are created using 50 breakpoints each month.
- *Z-score:* The z-score equals $1.2 \times WC + 1.4 \times RE + 3.3 \times EB + 0.6 \times ME + 1.0 \times SA$ where.
  - $WC = (CA - CL)/AT$
  - RE = RE/AT
  - EB = EBITDA/AT
  - SA = Sale/AT
  - ME = *ME_Fiscal/LT*
- *FCF:* Operating cash flow (Compustat item: OANCF) less capital expenditures (Compustat item: CAPX).
- *EBITDA:* Compustat item: EBITDA).
- *High News* – an indicator equal to one if the firm's news coverage of corporate actions is in the top quartile compared to the number of articles for the same firm over the preceding 12-months. We measure corporate action news articles by counting the number of articles in Ravenpack that are categorized as either "equity actions" or 'acquisitions-mergers".
    - *Low News* – an indicator equal to one if the firm is not classified as *High News*.

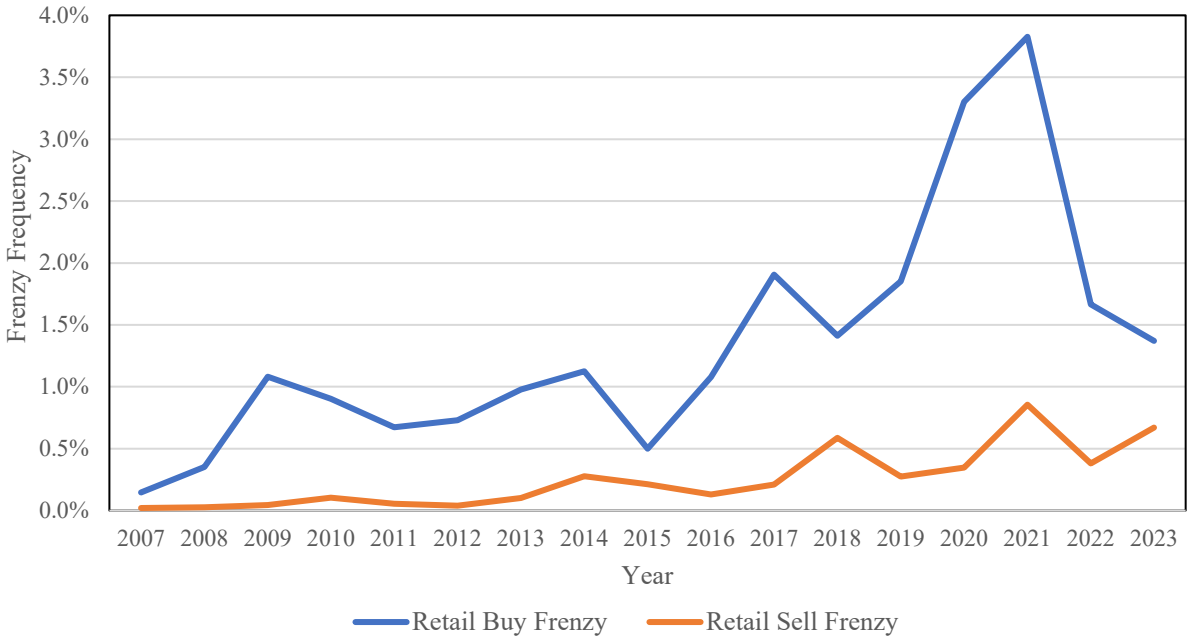

Figure 1: Frenzy Frequency by Year
This figure plots the average of *Retail Buy Frenzy* and *Retail Sell Frenzy* for each year in the sample. Retail *Buy Frenzy* is an indicator equal to one if Q*tr. Retail Imbalance* is greater than 2% of shares outstanding, and *Retail Sell Frenzy* is an indicator equal to one if Q*tr. Retail Imbalance* is less than -2% of shares outstanding.

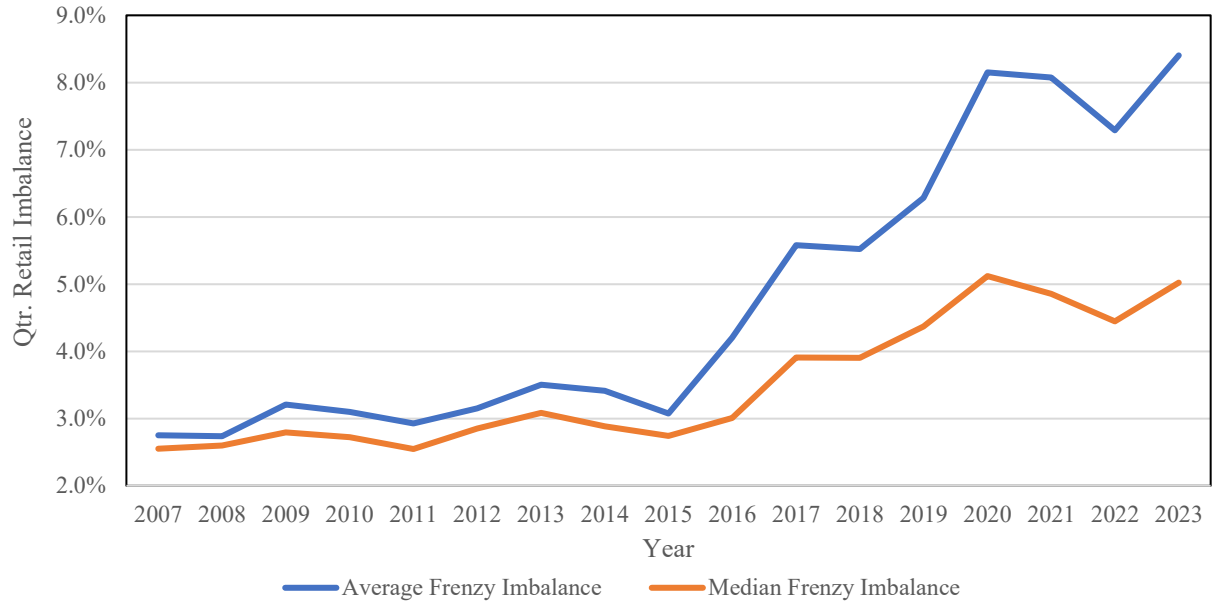

Figure 2: Frenzy Intensity by Year
This figure plots the average and median Q*tr. Retail Imbalance* each year in the sample for the subset of stocks that are classified as having experienced a retail frenzy defined as *Qtr. Retail Imbalances* greater than 2% of shares outstanding.

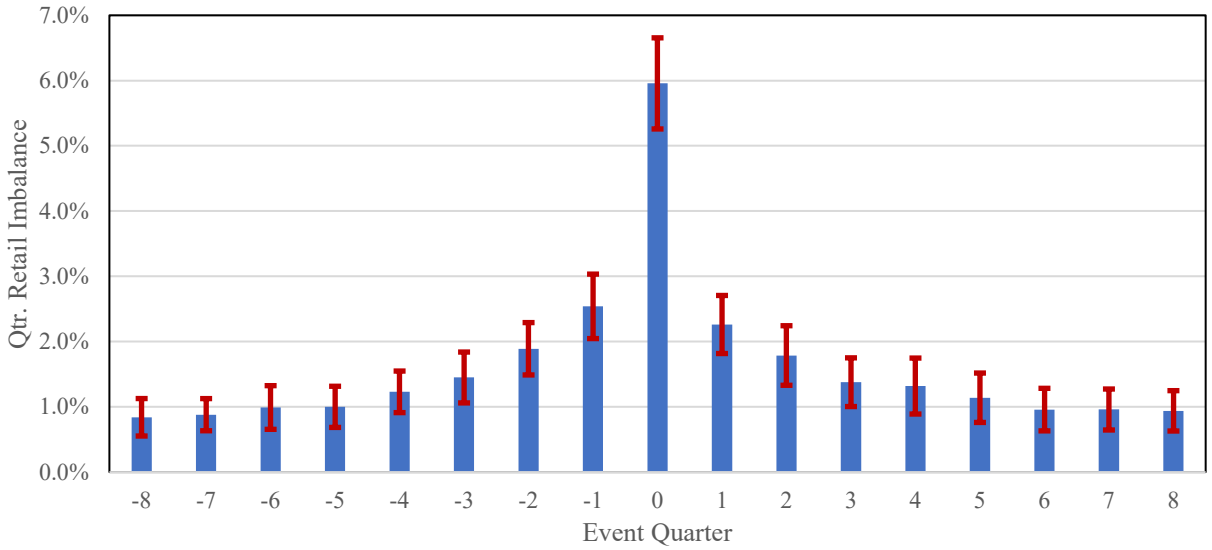

Figure 3: Frenzy Persistence
This figure plots the average Qtr. *Retail Imbalance* in event time, where quarter 0 is the quarter in which the stock is classified as having a buying frenzy (i.e., the event quarter), Quarter 1 (-1) is the quarter immediately following (preceding) the event quarter, etc. The error bars report the 95% confidence intervals based on standard errors clustered by firm and quarter.

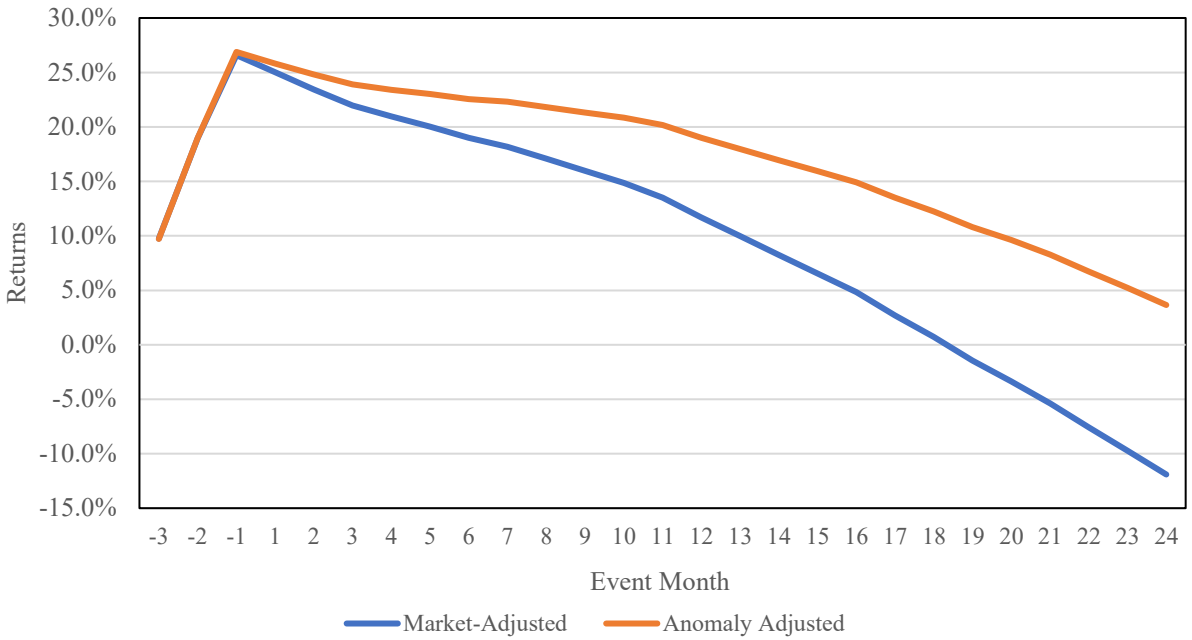

Figure 4: Cumulative Returns around Retail Frenzies
This figure plots the cumulative market-adjusted and anomaly-adjusted returns from month *t-3* to *t+24* following a retail frenzy, where retail frenzy is measured from month *t-3* to *t-1*. The cumulative returns are estimated by summing the monthly return estimates reported in Table 3.

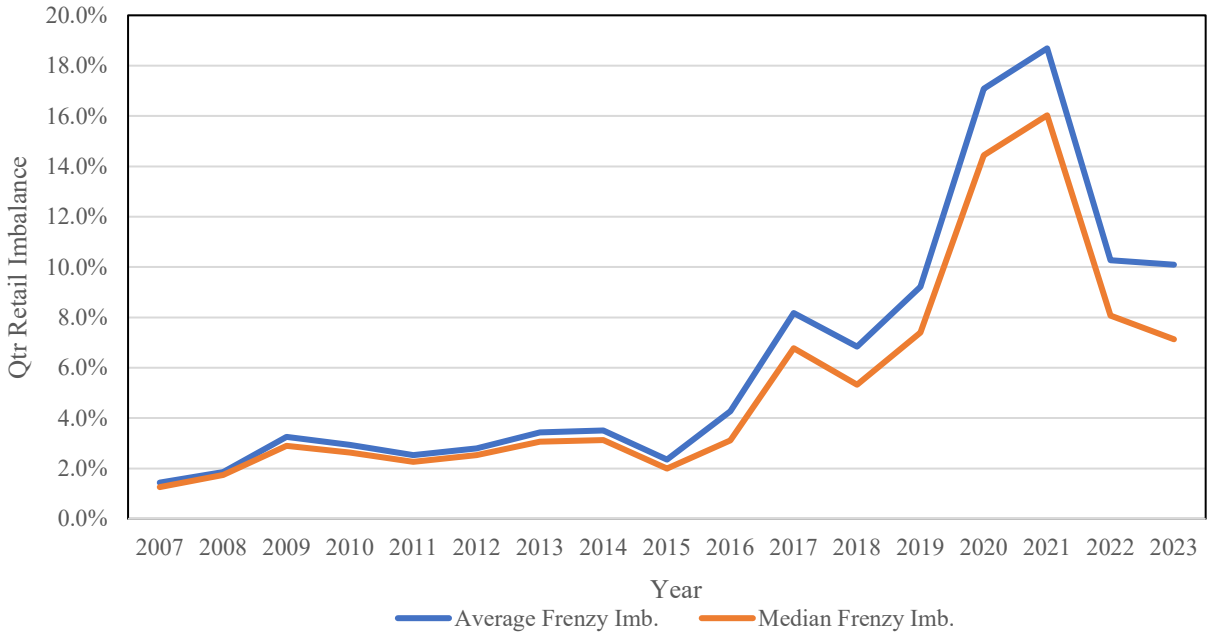

Figure 5: Relative Frenzy Intensity by Year
This figure plots the average and median Q*tr. Retail Imbalance* each year in the sample for the subset of stocks that are classified as having experienced *Relative Retail Frenzies*, defined as *Qtr. Retail Imbalances* in the 99th percentile of the distribution relative to all firms in that month.

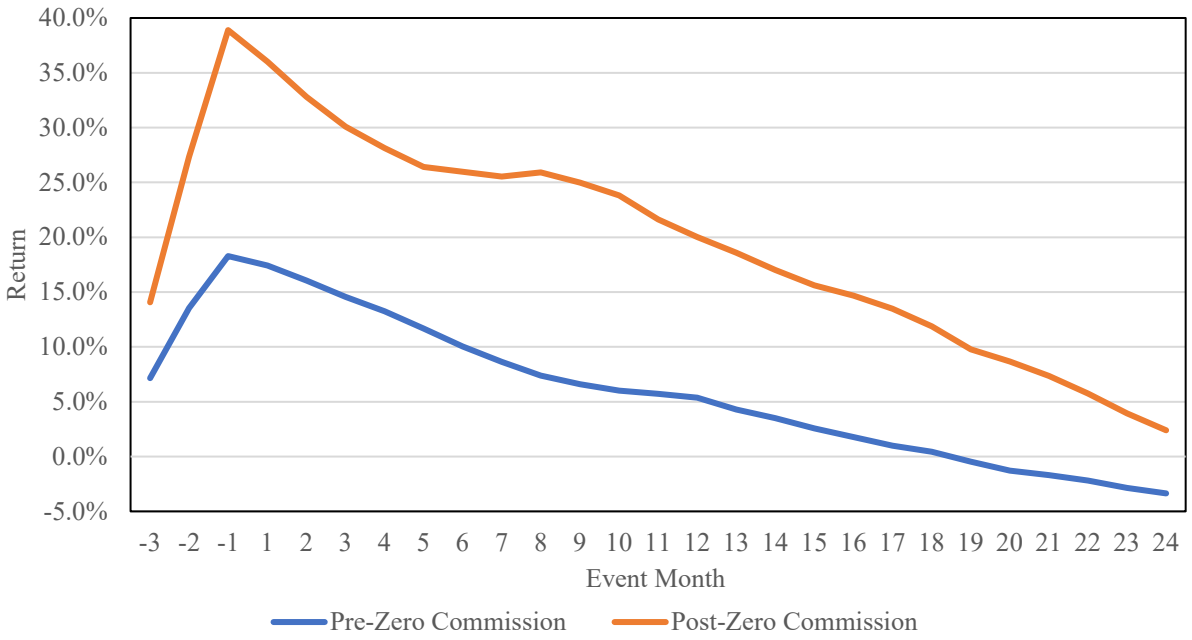

Figure 6: Cumulative Returns around Relative Retail Frenzies – Pre vs. Post Zero Commission Trading
This figure plots the cumulative anomaly-adjusted returns from month *t-3* to *t+24* following *relative retail frenzy*. We repeat the analysis in Table 3 after replacing *Retail Frenzy* with *Relative Retail Frenzy* × *Pre*-Zero Commission and *Relative Retail Frenzy* × *Post*-Zero Commission. *Relative Retail Frenzy* is an indicator equal to one if *Qtr. Retail Imbalance* is in the 99th percentile of the distribution relative to all firms in the same calendar month. *Pre-Zero Commission* is an indicator equal to one for the 2007-2016 sample period and zero otherwise, and *Post Zero Commission* is an indicator equal to one for the 2017-2023 sample period and zero otherwise. The cumulative returns are estimated by summing the monthly return estimates.

Table 1: Summary Statistics

This table reports summary statistics for the main variables used throughout the analysis. Detailed variable definitions are provided in Appendix A. All firm characteristics without subscripts are computed in the month prior to the start of the construction of *Qtr. Retail Imbalance.* The sample includes 662.904 firm-month observations from January 2007 through December 2023.

Variable	Mean	Std Dev	1%	25%	50%	75%	99%
Qtr. Retail Imbalance	0.05%	1.03%	-1.05%	-0.13%	-0.03%	0.07%	2.51%
Retail Frenzy	1.31%	11.35%	0.00%	0.00%	0.00%	0.00%	100.00%
Q	2.01	1.62	0.61	1.05	1.42	2.26	10.15
ROA	-1.06%	6.51%	-34.18%	-0.86%	0.40%	1.72%	9.90%
$Ret_{t-12,\ t-1}$	9.11%	54.56%	-85.01%	-23.32%	3.22%	30.03%	247.72%
Assets	6,687	20,243	9	199	890	3,596	146,682
Leverage	0.22	0.22	0.00	0.03	0.16	0.34	0.98
Div Yield	1.11%	1.90%	0.00%	0.00%	0.00%	1.72%	10.38%
Volatility	3.00%	2.10%	0.66%	1.60%	2.40%	3.70%	12.32%
Short Interest	4.74%	5.41%	0.01%	1.09%	2.82%	6.42%	27.27%
Asset Growth	15.58%	47.09%	-48.57%	-2.83%	5.26%	17.44%	302.83%
Inst Ownership	45.41%	37.86%	0.00%	0.00%	47.62%	82.62%	100.00%
Shareholders	7.67	25.33	0.00	0.06	0.37	2.90	184.25
Net Anomaly Score	-3.58	16.30	-44.00	-15.00	-2.00	8.00	31.00
$Equity\ Issuance_{t+1}$	4.86%	21.49%	0.00%	0.00%	0.00%	0.00%	100.00%
$Capital\ Expenditures_{t+1}$	6.32%	9.66%	-0.01%	1.87%	3.87%	7.35%	45.39%
$Acquisitions_{t+1}$	5.25%	25.81%	-2.70%	0.00%	0.00%	0.00%	196.14%

Table 2: Determinants of Retail Frenzies

This table reports the estimates from Equation (1):

$$Retail\ Frenzy_{i,t+1} = \alpha + \beta_1 Controls_{i,t} + FE + \varepsilon_{i,t}.$$

The dependent variable, *Retail Frenzy*, is an indicator equal to one if quarterly retail imbalance is greater than 2% of shares outstanding. Detailed variable definitions for the controls are available in Appendix A, and all control variables are standardized to have mean zero and unit variance. FE denotes either month fixed effects (Specification 1), month × Fama-French 49 industry fixed effects (Specification 2), or month × Fama-French 49 industry fixed effects and firm fixed effects (Specification 3). Standard errors are clustered by firm and month, and *t*-statistics are reported in parentheses.

	[1]	[2]	[3]
Q	-0.48%	-0.50%	-0.13%
	(-7.01)	(-6.63)	(-1.28)
ROA	-1.25%	-1.28%	-0.56%
	(-11.29)	(-11.06)	(-5.98)
$Ret_{t-12,\ t-1}$	0.59%	0.56%	0.71%
	(7.29)	(6.91)	(9.35)
Log (Assets)	-0.56%	-0.59%	-1.49%
	(-6.68)	(-6.70)	(-5.49)
Leverage	0.04%	0.06%	0.46%
	(0.78)	(1.02)	(4.51)
Div Yield	0.14%	0.12%	0.09%
	(4.33)	(3.39)	(2.24)
Log (*Volatility*)	1.35%	1.43%	1.57%
	(16.48)	(16.42)	(17.89)
Short Interest	1.10%	1.14%	0.69%
	(14.14)	(14.53)	(12.68)
Asset Growth	-0.08%	-0.06%	-0.20%
	(-1.38)	(-1.06)	(-3.62)
Inst Ownership	-0.63%	-0.61%	-0.37%
	(-9.90)	(-9.60)	(-5.83)
Log (Shareholders)	0.49%	0.52%	0.24%
	(9.52)	(8.91)	(2.09)
Net Anomaly Score	-0.16%	-0.12%	-0.38%
	(-3.33)	(-2.52)	(-7.36)
Time FE	Yes	Absorbed	Absorbed
Ind × Time FE	No	Yes	Yes
Firm FE	No	No	Yes
Obs. (Firm-Moths)	662,904	662,904	662,904
R-squared	6.70%	8.60%	21.32%

Table 3: Event Time Returns around Retail Frenzies

This table reports the estimates from Equation (2):

$$Ret_{i,t+x} = \alpha + \beta_1 \text{Retail Frenzy}_{i,t} + Time_t + \varepsilon_{i,t}.$$

The dependent variable is either the market-adjusted return (Columns 1 and 2) or the anomaly-adjusted return (Columns 3 and 4) on the stock in month *t*+*x*, where x varies from -3 to +24. The construction of anomaly-adjusted returns is described in greater detail in Appendix A. The returns from -3 to -1 test the relation between retail frenzies and returns during the period in which retail buying frenzy occurs (contemporaneous returns), and the returns from +1 to +24 measure the relation between retail frenzies and monthly returns over each of the subsequent 24 months. Time denotes month fixed effects. Standard errors are clustered by firm and month, and *t*-statistics are reported in parentheses next to the estimates.

	Market-Adjusted Returns		Anomaly-Adjusted Returns	
	[1]	[2]	[3]	[4]
Event Month	Estimate	t-stat	Estimate	t-stat
-3	9.81%	(6.20)	9.76%	(6.79)
-2	9.27%	(5.73)	9.30%	(6.36)
-1	7.69%	(5.07)	7.95%	(5.81)
1	-1.53%	(-1.42)	-1.03%	(-1.06)
2	-1.56%	(-1.54)	-0.97%	(-1.07)
3	-1.42%	(-1.51)	-0.84%	(-1.03)
4	-0.95%	(-0.96)	-0.44%	(-0.52)
5	-0.96%	(-0.98)	-0.42%	(-0.50)
6	-1.08%	(-1.13)	-0.50%	(-0.59)
7	-0.86%	(-0.98)	-0.28%	(-0.37)
8	-1.15%	(-1.35)	-0.58%	(-0.79)
9	-1.31%	(-1.61)	-0.65%	(-0.96)
10	-1.13%	(-1.49)	-0.50%	(-0.79)
11	-1.31%	(-1.76)	-0.66%	(-1.06)
12	-1.86%	(-2.55)	-1.19%	(-1.98)
13	-1.70%	(-2.36)	-1.03%	(-1.76)
14	-1.72%	(-2.27)	-1.02%	(-1.64)
15	-1.69%	(-2.48)	-1.00%	(-1.79)
16	-1.71%	(-2.43)	-1.02%	(-1.78)
17	-2.15%	(-3.47)	-1.43%	(-2.92)
18	-1.97%	(-3.18)	-1.25%	(-2.64)
19	-2.17%	(-3.44)	-1.42%	(-2.75)
20	-1.89%	(-3.17)	-1.15%	(-2.47)
21	-2.04%	(-3.33)	-1.35%	(-2.93)
22	-2.21%	(-4.21)	-1.55%	(-4.07)
23	-2.11%	(-4.07)	-1.49%	(-3.81)
24	-2.18%	(-4.14)	-1.54%	(-3.83)

Table 4: Retail Frenzies and Equity Issuance

This table reports the estimates from Equation (3):

$$Issuance_{it+1} = \alpha + \beta_1 Retail\ Frenzy_{i,t,t-5} + \beta_2 Controls + \beta_3 LagY + FE + \varepsilon_{it}.$$

Issuance is an indicator equal to one if equity issuance exceeds 3% of total market capitalization, and *Retail Frenzy* is an indicator equal to one if the firm experienced a retail buying frenzy at any point in the previous six months. Detailed variable definitions for the controls are available in Appendix A, and all control variables are standardized to have mean zero and unit variance. *Lag Y* denotes controls for past values of the dependent variables, measured over the prior two to four quarters, and five to eight quarters, and FE denotes various fixed effects listed below the regression estimates. We report the regression estimates using either linear probability models (Specifications 1&2) or logistic regressions (Specification 3&4). The logistic regression coefficients are reported as odds ratios. Standard errors are clustered by firm and quarter, and *t*-statistics are reported in parentheses.

	Equity Issuance (LPM)		Equity Issuance (Logistic)	
	[1]	[2]	[3]	[4]
Retail Frenzy	7.13%	3.96%	1.30	1.25
	(9.87)	(6.33)	(5.87)	(4.86)
Q	1.19%	2.96%	1.13	1.47
	(8.91)	(12.89)	(8.64)	(15.84)
ROA	-2.73%	-1.82%	0.84	0.89
	(-18.72)	(-11.65)	(-15.59)	(-10.59)
$Ret_{t-12,\ t-1}$	0.37%	0.13%	1.09	0.97
	(3.68)	(1.32)	(3.38)	(-0.94)
Log (Assets)	-0.03%	1.02%	0.95	1.21
	(-0.29)	(2.12)	(-1.12)	(4.61)
Leverage	0.16%	0.69%	1.06	1.19
	(1.76)	(4.89)	(2.79)	(8.78)
Div Yield	0.17%	0.08%	1.01	1.12
	(3.05)	(0.94)	(0.75)	(7.52)
Log (Volatility)	1.43%	1.42%	1.53	1.37
	(12.21)	(10.49)	(12.11)	(8.46)
Short Interest	-0.01%	0.25%	1.02	1.04
	(-0.09)	(1.79)	(0.01)	(0.02)
Asset Growth	-0.75%	-0.53%	0.89	0.93
	(-7.43)	(-4.96)	(-11.24)	(-7.15)
Inst Ownership	-0.50%	-0.95%	0.82	0.74
	(-6.53)	(-7.34)	(-9.87)	(-14.34)
Log (Shareholders)	0.21%	-0.73%	1.00	0.89
	(3.07)	(-3.68)	(-0.24)	(-5.12)
Net Anomaly Score	-1.06%	-0.73%	0.60	0.79
	(-11.44)	(-8.64)	(-26.04)	(-13.83)
$Issuance_{q-2,\ q-4}$	2.31%	-0.05%	1.18	0.95
	(15.78)	(-0.36)	(17.40)	(-4.55)
$Issuance_{\ q-5,\ q-8}$	1.84%	0.18%	1.22	0.99
	(12.20)	(1.24)	(18.75)	(-0.87)
Obs. (Firm - Quarter)	223,610	223,610	223,610	223,610
Time × Industry FE	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes

Table 5: Retail Frenzies and Investment

This table reports the estimates from the following panel regression:

$$Investment_{it+1} = \alpha + \beta_1 Retail\ Frenzy_{i,t,t-5} + \beta_2 Controls + \beta_3 LagY + FE + \varepsilon_{it}.$$

Investment is either capital expenditures (CAPX) or acquisitions, where both measures are scaled by fixed assets in the prior quarter. *Retail Frenzy* is an indicator equal to one if the firm experienced a retail buy frenzy at any point in the previous six months. All other variables are defined as in Table 4, and more detailed variable definitions are available in Appendix A. Standard errors are clustered by firm and quarter, and *t*-statistics are reported in parentheses.

	CAPX		Acquisitions	
	[1]	[2]	[3]	[4]
Retail Frenzy	1.11%	1.03%	1.50%	1.53%
	(4.13)	(3.96)	(3.73)	(3.36)
Q	0.68%	1.07%	0.47%	1.53%
	(8.33)	(9.43)	(5.12)	(9.07)
ROA	-0.07%	-0.06%	0.49%	0.32%
	(-0.98)	(-0.73)	(5.26)	(3.21)
$Ret_{t-12,\ t-1}$	0.86%	0.72%	0.76%	0.35%
	(11.71)	(10.45)	(6.46)	(3.23)
Log (Assets)	-0.19%	0.24%	1.21%	7.50%
	(-2.84)	(1.03)	(8.07)	(10.32)
Leverage	-0.23%	-0.89%	-0.66%	-1.85%
	(-3.28)	(-11.26)	(-7.14)	(-10.35)
Div Yield	-0.14%	0.07%	-0.62%	-0.25%
	(-5.40)	(1.84)	(-8.14)	(-2.81)
Log (Volatility)	-0.02%	-0.13%	-0.10%	0.15%
	(-0.42)	(-2.90)	(-1.03)	(1.30)
Short Interest	0.06%	-0.01%	0.28%	0.19%
	(1.58)	(-0.26)	(3.14)	(1.65)
Asset Growth	0.33%	0.50%	0.14%	0.20%
	(6.16)	(9.15)	(1.87)	(2.83)
Inst Ownership	-0.05%	-0.21%	-0.05%	-0.41%
	(-1.67)	(-3.31)	(-0.50)	(-2.59)
Log (Shareholders)	-0.07%	-0.01%	-0.66%	-1.09%
	(-2.34)	(-0.13)	(-6.95)	(-3.77)
Net Anomaly Score	0.05%	-0.15%	0.59%	0.38%
	(0.85)	(-3.51)	(5.85)	(3.37)
$Y_{q-2,\ q-4}$	2.56%	1.26%	3.01%	-0.15%
	(22.02)	(13.09)	(15.98)	(-1.01)
$Y_{q-5,\ q-8}$	0.75%	-0.26%	3.04%	-0.34%
	(7.70)	(-3.25)	(15.74)	(-2.02)
Obs. (Firm - Quarter)	223,610	223,610	223,610	223,610
Time × Industry FE	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes

Table 6: Retail Frenzies and Corporate Decisions – Robustness

This table reports the sensitivity of our baseline estimates from Tables 4 and 5 to different research design choices. For reference, Columns 1-3 report the baseline estimate for equity issuance (Specification 1 of Table 4), capital expenditures (Specification 1 of Table 5), and acquisitions (Specification 3 of Table 5). Rows 2 through 4 report the results from matched sample where we match on industry, quarter, and two other matching variables, requiring the matching variable to be in the same quintile. In other words, these regressions include industry × quarter × first matching variable quintile × second matching variable quintile fixed effects. Row 5 reports the results after matching retail frenzy firm to a non-frenzy firm with the closest propensity score (i.e., nearest neighbor matching), where the propensity score are the predicted values from Specification 2 of Table 2. In Rows 6-8, we define a retail frenzy as an indicator equal to one if quarterly retail imbalance in any of the past six months are greater than 1%, 3%, or 5% of shares outstanding, respectively. In Row 9, we sign retail trades using the methodology of Boehmer, Jones, Zhang, and Zhang (2021). In Rows 10 and 11, we define retail frenzies based on only the prior 3 months or the prior four to six months. In Rows 12 and 13, we repeat the analysis after excluding the COVID period (2020 and 2021) or excluding small firms (assets < 50 million).. Standard errors are clustered by firm and quarter, and *t*-statistics are reported in parentheses.

	Issuance	CAPX	Acquisitions
	[1]	[2]	[3]
1. Baseline	7.13%	1.11%	1.50%
	(9.87)	(4.13)	(3.73)
Alternative Fixed Effects/Matching			
2. Match on Time - Industry - Size - Q	6.49%	1.14%	1.24%
	(8.93)	(3.72)	(3.01)
3. Match on Time - Industry - Size - Past Return	6.43%	1.22%	1.65%
	(9.94)	(4.17)	(4.26)
4. Match on Time - Industry - ROA- Asset Growth	6.89%	0.93%	0.95%
	(9.69)	(3.32)	(2.46)
5. Match on Propensity Score (Nearest Neighbor)	4.75%	1.15%	1.46%
	(6.59)	(3.72)	(3.01)
Alternative Frenzy Definitions			
6. >1% Imbalance	4.79%	0.74%	0.51%
	(9.56)	(4.69)	(1.91)
7. >3% Imbalance	8.34%	1.44%	2.54%
	(8.51)	(3.64)	(4.52)
8. >5% Imbalance	9.35%	1.86%	2.97%
	(6.53)	(2.77)	(3.74)
9. BJZZ Measure	6.09%	0.79%	0.84%
	(7.91)	(3.11)	(2.31)
Alternative Timing			
10. Current Quarter Only [*t*-3, *t*-1]	8.16%	1.25%	1.61%
	(10.38)	(3.55)	(3.43)
11 Previous Quarter Only [*t*-6, *t*-4]	5.59%	0.96%	1.54%
	(6.43)	(3.25)	(3.05)
Alternative Samples			
12. Exclude Covid (2020 & 2021)	6.05%	0.93%	1.24%
	(8.26)	(2.98)	(2.98)
13. Exclude small firms (assets < 50 million)	7.33%	1.04%	1.66%
	(7.36)	(3.58)	(2.74)

Table 7: Retail Frenzies and Corporate Decisions: Pre vs. Post Zero Commission Trading

We repeat the baseline equity issuance regressions (Specification 1 of Table 4) and investment regressions (Specifications 1 and 3 of Table 5) after replacing *Retail Frenzy* with *Relative Retail Frenzy × Pre Zero Commissions* and *Relative Retail Frenzy × Post Zero Commissions*. *Relative Retail Frenzy* is an indicator equal to one if it is in the 99th percentile of the distribution relative to all firms in the same calendar month. *Pre Zero Commissions* is an indicator equal to one for the 2007-2016 sample period and zero otherwise, and *Post Zero Commissions* is an indicator equal to one for the 2017-2023 sample period and zero otherwise. All other details are identical to Tables 4 and 5. Standard errors are clustered by firm and quarter, and t-statistics are reported in parentheses. Below the regression estimates, we also assess whether the estimates on the *Retail Frenzy × Post Zero Commissions* and *Retail Frenzy × Pre Zero Commissions* are significantly different from each other.

	Equity Issuance	CAPX	Acquisitions
	[1]	[2]	[3]
Relative Retail Frenzy × Post Zero Commission	9.84%	1.74%	3.71%
	(6.39)	(2.42)	(4.68)
Relative Retail Frenzy × Pre Zero Commission	2.49%	0.66%	-0.03%
	(3.35)	(2.58)	(-0.06)
Difference	7.35%	1.08%	3.74%
	(4.11)	(1.39)	(4.09)
Controls	Yes	Yes	Yes
Time × Industry Fixed Effects	Yes	Yes	Yes
Obs. (Firm-Quarters)	223,610	223,610	223,610

Table 8: Retail Frenzies and the Performance of Large Investments

This table reports the estimates from Equation (4):

$$Ret_{i,t+1} = \alpha + \beta_1 Large\ Investment_{i,t-1,t-12} + B_2 Retail\ Frenzy_{i,t-1,t-12} + B_3 Frenzy\ \times Large\ Investment_{i,t-1,t-12} + FE_{it} + \varepsilon_{it}$$

The dependent variable is the one-month ahead market-adjusted (or anomaly-adjusted) return. *Large Investment* is an indicator equal to one if the firm has either made a large acquisition, defined as an acquisition that is greater than 1% of total fixed assets, or has made large capital expenditures, defined as capital expenditures in the top quartile of capital expenditures across all firms and at least 50% larger than the firm's average capital expenditures in the prior two to four quarters. *Large Investment$_{t-1,\ t-12}$* is an indicator equal to one if *Large Investment* equals one in any month from month *t-1, t-12. Retail Frenzy* is an indicator equal to one if the firm experienced a retail frenzy at any point in the six months prior to investment, and *Frenzy × Large Investment* as an interaction term equal to one for firms that made high investments following a retail frenzy. FE denotes either month fixed effects of industry × month fixed effects. Panels B and C repeat the analysis after replacing *Large Investment* with *Large CAPX* and *Large Acquisitions*, respectively Standard errors are clustered by month and firm, and t-statistics are reported in parentheses.

Panel A: Large Investment (CAPX or Acquisitions)

	Market-Adjusted Returns		Anomaly-Adjusted Returns	
	[1]	[2]	[3]	[4]
Large Investment	-0.11%	-0.18%	-0.01%	-0.09%
	(-1.29)	(-2.47)	(-0.08)	(-1.19)
Retail Frenzy	-0.64%	-0.57%	-0.14%	-0.28%
	(-0.97)	(-1.00)	(-0.25)	(-0.55)
Frenzy × Large Investment	-1.37%	-1.39%	-1.08%	-1.05%
	(-3.29)	(-3.57)	(-2.63)	(-2.70)
Time FE	Yes	Absorbed	Yes	Absorbed
Industry × Time FE	No	Yes	No	Yes

Panel B: Large CAPX

	Market-Adjusted Returns		Anomaly-Adjusted Returns	
	[1]	[2]	[3]	[4]
Large Investment	-0.15%	-0.18%	0.02%	-0.05%
	(-1.72)	(-2.72)	(0.26)	(-0.73)
Retail Frenzy	-0.75%	-0.68%	-0.24%	-0.35%
	(-1.16)	(-1.20)	(-0.45)	(-0.72)
Frenzy × Large Investment	-1.35%	-1.36%	-1.13%	-1.11%
	(-3.10)	(-3.42)	(-2.69)	(-2.82)
Time FE	Yes	Absorbed	Yes	Absorbed
Industry × Time FE	No	Yes	No	Yes

Panel C: Large Acquisitions

	Market-Adjusted Returns		Anomaly-Adjusted Returns	
	[1]	[2]	[3]	[4]
Large Investment	-0.02%	-0.10%	-0.01%	-0.07%
	(-0.23)	(-1.19)	(-0.01)	(-0.77)
Retail Frenzy	-0.89%	-0.85%	-0.36%	-0.52%
	(-1.54)	(-1.67)	(-0.78)	(-1.17)
Frenzy × Large Investment	-1.73%	-1.79%	-1.26%	-1.19%
	(-3.82)	(-3.84)	(-2.92)	(-2.74)
Time FE	Yes	Absorbed	Yes	Absorbed
Industry × Time FE	No	Yes	No	Yes

Table 9: Retail Buying Frenzies and Insider Trading

This table reports the estimates from Equation (5):

$$Net\ Buy_{i,t+1} = \alpha + \beta_1 Retail\ Frenzy_{i,t} + \beta_2 Controls + \beta_3 LagY + FE + \varepsilon_{it}.$$

Net Buy is the total shares bought by insiders less the total shares sold, scaled by shares outstanding, and Retail Frenzy is an indicator equal to one if the firm experienced a retail buy frenzy in the previous month. The set of control variables includes the controls from Table 4 plus an equity issuance indicator. FE denotes industry × time fixed effects (all specifications) and firm fixed effects (Specification 2). Standard errors are clustered by firm and month, and t-statistics are reported in parentheses.

	[1]	[2]
Retail Frenzy	-0.66%	-0.60%
	(-3.76)	(-3.27)
Q	-0.43%	-0.48%
	(-10.47)	(-8.01)
ROA	-0.12%	-0.12%
	(-3.87)	(-3.90)
$Ret_{t-12,\ t-1}$	-1.24%	-1.21%
	(-23.61)	(-22.86)
Log (Assets)	-0.25%	0.17%
	(-5.49)	(1.18)
Leverage	0.15%	0.09%
	(4.73)	(1.80)
Div Yield	0.14%	0.02%
	(5.20)	(0.44)
Log (Volatility)	0.11%	0.09%
	(3.09)	(2.49)
Short Interest	-0.19%	-0.04%
	(-5.95)	(-1.02)
Asset Growth	-0.23%	-0.19%
	(-8.84)	(-7.46)
Inst Ownership	-0.18%	0.13%
	(-5.81)	(2.55)
Log (Shareholders)	0.24%	0.17%
	(7.92)	(2.14)
Net Anomaly Score	0.00%	0.03%
	(-0.02)	(0.89)
Equity Issuance	1.67%	1.69%
	(14.23)	(14.39)
$Net\ Buy_{q-2,\ q-4}$	1.54%	0.75%
	(31.51)	(16.76)
$Net\ Buy_{q-5,\ q-8}$	0.83%	0.07%
	(17.78)	(1.67)
Observations (Firm - Month)	627,710	627,710
Time × Industry FE	Yes	Yes
Firm FE	No	Yes

Table 10: Retail Frenzy: Equity Issuance and Investment by Firm Distress

We repeat the baseline equity issuance regressions (Specification 1 of Table 4) and investment regressions (Specifications 1 and 3 of Table 5) after replacing *Retail Frenzy* with *Retail Frenzy × Distress* and *Retail Frenzy × Not Distressed*, and we also include a *Distress* indicator (unreported). *Distress* is an indicator equal to one if the firm has negative free-cash flows (Specification 1), negative EBITDA (Specification 2), or a negative z-score (Specification 3). All other details are identical to Tables 4 and 5. Standard errors are clustered by firm and quarter, and t-statistics are reported in parentheses. Below the regression estimates, we also assess whether the estimates on the *Retail Frenzy × Distress* and *Retail Frenzy × Not Distressed* interaction terms are significantly different from each other.

Panel A: Equity Issuance

	[1] *Negative FCF*	[2] *Negative Profitability*	[3] *Negative Z-score*
Retail Frenzy × Distress	8.49%	8.70%	9.27%
	(12.07)	(11.33)	(9.98)
Retail Frenzy ×Not Distressed	2.56%	3.89%	4.20%
	(3.24)	(4.58)	(6.00)
Difference	5.93%	4.80%	5.07%
	(5.87)	(4.23)	(4.47)
Controls	Yes	Yes	Yes
Time × Industry Fixed Effects	Yes	Yes	Yes

Panel B: Capital Expenditures

	[1] *Negative FCF*	[2] *Negative Profitability*	[3] *Negative Z-score*
Retail Frenzy × Distress	(4.66)	(4.78)	(4.69)
	0.34%	0.25%	0.55%
Retail Frenzy × Not Distressed	(1.02)	(2.32)	(1.83)
	0.97%	1.41%	1.16%
Difference	(2.25)	(3.53)	(2.43)
	(4.66)	(4.78)	(4.69)
Controls	Yes	Yes	Yes
Time × Industry Fixed Effects	Yes	Yes	Yes

Panel C: Acquisitions

	[1] *Negative FCF*	[2] *Negative Profitability*	[3] *Negative Z-score*
Retail Frenzy × Distress	1.88%	2.42%	3.33%
	(4.60)	(5.22)	(6.09)
Retail Frenzy ×Not Distressed	0.14%	-0.39%	-0.04%
	(0.15)	(-0.59)	(-0.09)
Difference	1.74%	2.81%	3.37%
	(1.70)	(3.55)	(4.71)
Controls	Yes	Yes	Yes
Time × Industry Fixed Effects	Yes	Yes	Yes

Table 11: Retail Frenzies and the Performance of Distressed Firms

This table reports the estimates from Equation (6):

$$Ret_{i,t+1} = \alpha + \beta_1 Distress_{i,t-12} + B_2 Retail\ Frenzy_{i,t-1,t-12} + B_3 Retail\ Frenzy\ \times Distress_{i,t-1,t-12} + FE_{it} + \varepsilon_{it}.$$

The dependent variable is the one-month ahead anomaly-adjusted return. *Distress* is an indicator equal to one if the firm has negative free-cash flows (Specification 1), negative EBITDA (Specification 2), or a negative z-score (Specification 3). *Retail Frenzy* is an indicator equal to one if the firm experienced a retail buy frenzy at any point in the past six months, and *Retail × Distress* is an interaction term between *Retail Frenzy* and *Distress*. Specifications 4-6 repeat Specifications 1 -3 after partitioning *Retail Frenzy× Distress* into *Retail Frenzy × Distress × Large Investment* and *Retail Frenzy × Distress × Small Investment,* where *Large Investment* is defined as in Table 8. Standard errors are clustered by month and firm, and t-statistics are reported in parentheses.

Distress Measure	*Neg FCF*	*Neg Prof.*	*Neg Z-score*	*Neg FCF*	*Neg Prof.*	*Neg Z-score*
	[1]	[2]	[3]	[4]	[5]	[6]
Distress	0.12%	0.15%	0.95%	0.12%	0.15%	0.10%
	(0.98)	(0.88)	(0.40)	(0.99)	(0.90)	(0.41)
Retail Frenzy	0.16%	0.11%	-0.19%	0.16%	0.11%	-0.19%
	(0.36)	(0.25)	(-0.50)	(0.36)	(0.25)	(-0.49)
Retail Frenzy × Distress	-1.15%	-1.26%	-1.18%			
	(-2.54)	(-2.92)	(-2.48)			
Retail Frenzy × Distress -Large Investment				-1.72%	-1.81%	-2.08%
				(-3.64)	(-3.80)	(-3.91)
Retail Frenzy × Distress -Small Investment				-0.81%	-0.91%	-0.67%
				(-1.59)	(-1.88)	(-1.20)
Retail Frenzy × Distress (Large - Small Investment)				-0.92%	-0.90%	-1.41%
				(-2.15)	(-2.07)	(-2.52)
Ind-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs. (Firm-Months)	658,324	658,324	658,324	658,324	658,324	658,324

Internet Appendix for:

Retail Trading Frenzies and Real Investment

In this appendix, we tabulate results of robustness and supplementary analyses referenced in the paper. The set of figures and table are as follows:

- Figure IA1. Cumulative Returns around Retail and Institutional Frenzies
- Figure IA2. Cumulative Returns around Frenzy and Pseudo Frenzy periods
- Table IA1. Determinants of Retail Frenzies – Logistic Regressions
- Table IA2. WallStreetBets Posting and Retail Frenzies
- Table IA3. Event Time Returns around Retail Frenzies – Fama-MacBeth Estimates
- Table IA4. Retail Frenzies and Other Corporate Decisions
- Table IA5. Retail Frenzies and Corporate Decisions –The Role of News
- Table IA6. Retail Frenzies and Corporate Decisions –Pseudo Frenzy Firms
- Table IA7. Retail Frenzies and the Performance of Large Investments – Earnings Announcements Returns
- Table IA8. Retail Frenzies and the Performance of Equity Issuances
- Table IA9. Retail Frenzies and Insider Trading – Distressed vs. Non-Distressed Firms

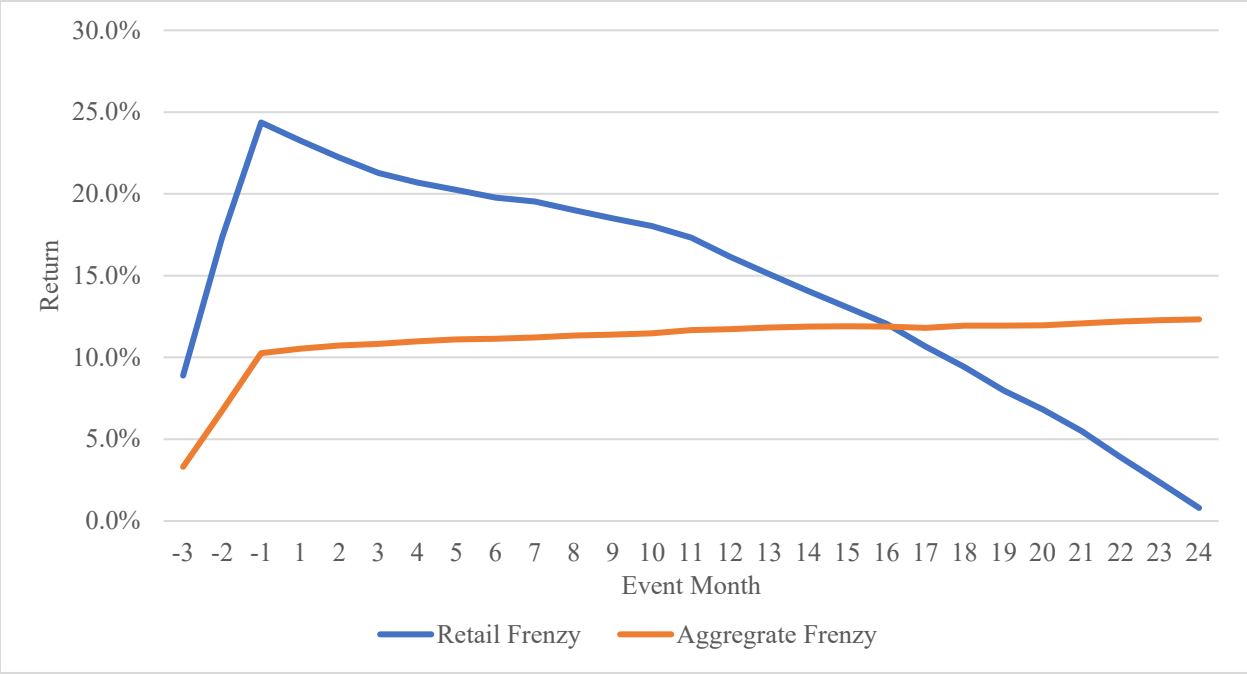

Figure IA1. Cumulative Returns around Retail and Institutional Frenzies
We estimate the following panel regression:

$$Ret_{i,t+x} = \alpha + \beta_1 \text{Retail Frenzy}_{i,t} + +\beta_1 \text{Aggregate Buy Frenzy}_{i,t} + Time_t + \varepsilon_{i,t}.$$

The dependent variable is the anomaly-adjusted return on the stock in month *t+x*, where x varies from -3 to +24. The returns from -3 to -1 tests the relation between frenzies and returns during the period in which frenzied buying occurs (contemporaneous returns), and the returns from +1 to +24 measure the relation between frenzies and monthly returns over each of the subsequent 24 months. Retail Frenzy is an indicator equal to one if Q*tr. Retail Imbalance* is greater than 2% of shares outstanding, and institutional buy frenzy is defined analogously. The figure plots the cumulative returns from month *t-3* to *t+24,* where the cumulative returns are estimated by summing the monthly return estimates.

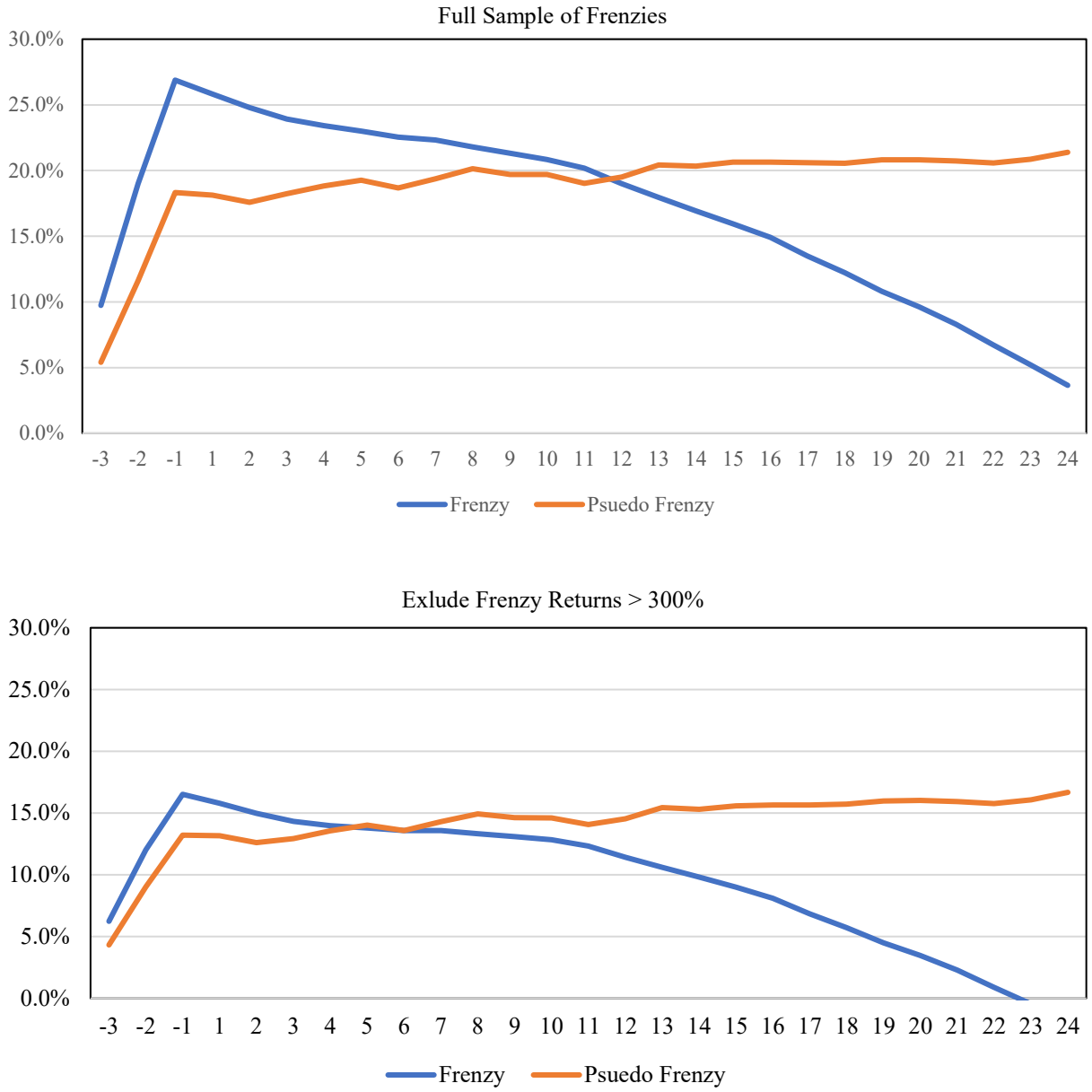

Figure IA2. Cumulative Returns around Frenzy and Pseudo Frenzy periods
Similar to Figure 3 in the text, these plots show the cumulative anomaly-adjusted returns from month *t-3* to *t+24* following a retail frenzy or pseudo frenzy, where frenzies are measured from month *t-3* to *t-1*. Pseudo frenzies are chosen as the stock in the same asset size quintile with the closest returns to the frenzy stock during the frenzy period. In the lower panel, we exclude frenzies with frenzy period returns that are greater than 300% (2.2% of frenzy observations).

Table IA1. Determinants of Retail Frenzies - Logistic Regression

This table repeats the analysis in Table 2, except that we replace the linear probability model with a logistic regression. The table reports the odds ratios from the logistic regressions.

	[1]	[2]	[3]
Q	0.67	0.67	0.85
	(-9.57)	(-9.19)	(-3.41)
ROA	0.86	0.85	0.90
	(-6.69)	(-6.75)	(-3.65)
$Ret_{t-12,\ t-1}$	1.26	1.24	1.39
	(15.30)	(12.63)	(21.66)
Log (Assets)	0.38	0.38	0.43
	(-8.82)	(-8.06)	(-3.40)
Leverage	1.11	1.09	1.25
	(4.27)	(3.01)	(5.60)
Div Yield	1.08	1.11	1.08
	(2.30)	(3.06)	(1.67)
Log (*Volatility*)	3.15	3.15	2.60
	(35.75)	(35.51)	(29.56)
Short Interest	2.09	2.10	1.95
	(23.05)	(23.21)	(18.31)
Asset Growth	0.96	0.96	0.95
	(-2.41)	(-2.32)	(-2.82)
Inst Ownership	0.55	0.56	0.72
	(-9.77)	(-9.11)	(-3.43)
Log (Shareholders)	1.14	1.12	0.86
	(2.57)	(2.02)	(-1.10)
Net Anomaly Score	0.72	0.73	0.73
	(-9.33)	(-8.30)	(-6.69)
Time FE	Yes	Absorb	Absorbed
Ind × Time FE	No	Yes	Yes
Firm FE	No	No	Yes
Obs. (Firm-Months)	662,904	662,904	662,904

Table IA2. WallStreetBets Posting and Retail Frenzies

Panel A sorts all stocks into groups based on the total number of WSB posts over the prior three months. For each group, we report the total number of observations (i.e., firm-months), the average *Qtr. Retail Imbalance*, and the percentage of firm-months classified as having experienced a retail buy frenzy (i.e., *Qtr. Retail Imbalance > 2%.* In Panel B, we report the total number of Due Dilligence (DD) reports for the stock, and the fraction of DD reports that mention words related to issuance, capital expenditures, and acquisitions. We search posts for the corporate investment related terms "issuance," "capital expenditures" or "CAPX," and "merger" or "acquisition." In the last column, we also report the fraction of reports that have an M&A term and are followed in quarter *t*+1 with Compustat acquisition expenses greater than zero. The sample period is based on the availability of WSB data and spans July 2018 – June 2021

Panel A: WallStreetBets Posting and Retail Order Imbalances

Total WSB Posts	Observations	Average Retail Imbalance	% Frenzy
0	143,762	0.14%	2.44%
1	3,784	0.49%	5.84%
[2, 5]	3,287	0.54%	6.56%
[6, 20]	1,254	0.93%	10.38%
[21, 100]	433	1.08%	17.05%
>100	117	1.88%	21.01%

Panel B: WallStreetBets Due Diligence Report Contents

Total WSB Posts	DD Reports	Issuance	CAPX	M&A	M&A & Future Acquisition
Any	4,764	0.52%	0.42%	11.29%	0.97%
1	1,839	0.49%	0.50%	14.13%	1.31%
[2,5]	598	0.84%	0.33%	12.04%	1.62%
[6,20]	620	0.16%	0.48%	12.74%	0.87%
[21,100]	674	0.45%	0.59%	12.31%	1.22%
>100	1,033	0.68%	0.19%	4.26%	0.00%

Table IA3. Even Time Returns around Retail Frenzies - Fama MacBeth Estimates

This table repeats the analysis in Table 3, but we now estimate the regression month-by-month, and we report the average of the monthly estimates (i.e., Fama-MacBeth estimates). Standard errors are computed from the time-series standard deviation of the estimates, and t-statistics are reported in parentheses.

	Market-Adjusted Returns		Anomaly-Adjusted	
	[1]	[2]	[3]	[4]
Event Month	Estimate	t-stat	Estimate	t-stat
-3	8.22%	(5.81)	8.55%	(6.38)
-2	7.39%	(5.63)	7.76%	(6.31)
-1	7.20%	(5.79)	7.56%	(6.53)
1	-1.68%	(-1.58)	-1.26%	(-1.27)
2	-2.10%	(-2.29)	-1.67%	(-1.93)
3	-2.09%	(-2.31)	-1.64%	(-1.95)
4	-2.05%	(-3.32)	-1.65%	(-2.96)
5	-2.08%	(-3.35)	-1.74%	(-3.04)
6	-1.34%	(-2.06)	-0.95%	(-1.58)
7	-1.25%	(-1.98)	-0.79%	(-1.37)
8	-1.05%	(-1.52)	-0.61%	(-0.95)
9	-1.39%	(-2.21)	-0.96%	(-1.66)
10	-1.51%	(-2.63)	-1.08%	(-2.07)
11	-1.56%	(-3.04)	-1.12%	(-2.46)
12	-1.51%	(-2.73)	-1.11%	(-2.25)
13	-1.71%	(-3.05)	-1.32%	(-2.70)
14	-1.34%	(-2.39)	-0.91%	(-1.81)
15	-1.29%	(-2.31)	-0.87%	(-1.78)
16	-1.25%	(-2.44)	-0.74%	(-1.64)
17	-0.94%	(-1.68)	-0.44%	(-0.86)
18	-1.41%	(-2.77)	-1.03%	(-2.32)
19	-1.96%	(-3.74)	-1.46%	(-3.07)
20	-1.38%	(-2.71)	-0.94%	(-2.09)
21	-1.36%	(-2.92)	-0.93%	(-2.27)
22	-1.46%	(-3.42)	-1.03%	(-2.68)
23	-1.58%	(-3.59)	-1.17%	(-3.04)
24	-1.27%	(-2.57)	-0.90%	(-2.08)

Table IA4. Retail Frenzies and Other Corporate Decisions

This table repeats the analysis from Tables 5 after replacing the investment measures with either *Debt Retirement*, defined as an indicator equal to one if the firm reduced long-term debt (i.e., long-term debt reduction less long-term debt issuance) by more than 3% of its market capitalization, or *Change in Cash*, defined as the change in cash and cash equivalents scaled by lagged assets. Standard errors are clustered by firm and quarter, and t-statistics are reported in parentheses.

	Debt Retirement		Change in Cash	
	[1]	[2]	[3]	[4]
Retail Frenzy	-0.36%	-0.30%	3.63%	4.25%
	(-0.87)	(-0.66)	(7.40)	(7.98)
Q	-1.61%	-1.20%	1.36%	3.03%
	(-21.42)	(-11.90)	(14.85)	(18.01)
ROA	0.14%	-0.26%	-0.48%	-1.37%
	(1.84)	(-2.67)	(-4.77)	(-11.28)
$Ret_{t-12,\ t-1}$	-1.31%	-1.09%	1.50%	1.01%
	(-15.34)	(-11.74)	(19.13)	(12.91)
Log (Assets)	0.15%	0.29%	1.44%	9.18%
	(1.24)	(0.77)	(18.66)	(22.58)
Leverage	3.89%	5.42%	-0.34%	-0.72%
	(32.96)	(28.74)	(-6.06)	(-5.41)
Div Yield	0.38%	0.61%	-0.06%	-0.18%
	(3.86)	(4.55)	(-1.41)	(-3.01)
Log (Volatility)	1.96%	1.80%	0.54%	0.78%
	(17.55)	(14.58)	(9.15)	(11.46)
Short Interest	0.15%	0.34%	-0.12%	-0.17%
	(1.82)	(2.71)	(-2.21)	(-2.07)
Asset Growth	0.11%	-0.08%	-0.39%	-0.35%
	(1.78)	(-1.27)	(-4.96)	(-4.20)
Inst Ownership	-0.24%	-0.20%	-0.27%	-0.93%
	(-2.87)	(-1.29)	(-6.28)	(-10.47)
Log (Shareholders)	-0.03%	-0.06%	-0.44%	-1.01%
	(-0.37)	(-0.27)	(-9.21)	(-6.10)
Net Anomaly Score	(-0.00)	(-0.00)	(-0.00)	(0.00)
	(-2.48)	(-2.41)	(-4.13)	(0.04)
$Y_{q-2,\ q-4}$	6.11%	2.79%	0.53%	-0.80%
	(47.84)	(20.10)	(5.30)	(-7.54)
$Y_{q-5,\ q-8}$	3.03%	-0.06%	-0.69%	-1.50%
	(25.81)	(-0.52)	(-7.49)	(-15.09)
Obs. (Firm - Quarter)	223,610	223,610	223,610	223,610
Time × Industry FE	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes

Table IA5. Retail Frenzies and Corporate Decisions: The Role of News

We repeat the baseline regressions for equity issuance (Specification 1 of Table 4), capital expenditures (Specification 1 of Table 5), and acquisitions (Specification 3 of Table 5) after replacing *Retail Frenzy* with *Retail Frenzy × Low News* and *Retail Frenzy × High News*, and we also include a *High News* indicator (unreported). The High News indicator equals one if the total number of Ravenpack articles in the "Equity Actions" or "Acquisitions-Mergers" news groups for a firm during the frenzy quarter is in the top quartile compared to the number of articles for the same firm over the preceding 12 quarters. All other quarters are classified as *Low News.* All other details are identical to the baseline regressions Standard errors are clustered by firm and quarter, and t-statistics are reported in parentheses. We also report a statistical test for the difference in coefficients.

	Equity Issuance	CAPX	Acquisitions
	[1]	[2]	[3]
Retail Frenzy × Low News	8.19%	0.96%	1.21%
	(9.53)	(3.75)	(3.08)
Retail Frenzy × High News	5.56%	1.50%	1.22%
	(5.31)	(3.29)	(1.60)
Difference	2.63%	-0.55%	-0.01%
	(2.18)	(1.27)	(-0.01)
Controls	Yes	Yes	Yes
Time × Industry Fixed Effects	Yes	Yes	Yes

Table IA6. Retail Frenzies and Corporate Decisions: Pseudo Frenzy Firms

We repeat the baseline regressions for equity issuance (Specification 1 of Table 4), capital expenditures (Specification 1 of Table 5), and acquisitions (Specification 3 of Table 5) after including an indicator for pseudo frenzy firms (*Pseudo Frenzy*), where pseudo frenzy firms are defined as in Figure IA2. All other details are identical to the baseline regressions Standard errors are clustered by firm and quarter, and t-statistics are reported in parentheses. We also report a statistical test for the difference in coefficients.

	Equity Issuance	CAPX	Acquisitions
	[1]	[2]	[3]
Retail Frenzy	7.14%	1.13%	1.48%
	(9.99)	(4.22)	(3.69)
Pseudo Frenzy	1.88%	0.04%	0.04%
	(5.09)	(0.27)	(0.19)
Difference	5.26%	1.10%	1.44%
	(7.09)	(4.05)	(3.09)
Controls	Yes	Yes	Yes
Time × Industry Fixed Effects	Yes	Yes	Yes

Table IA7. Retail Buying Frenzies and the Performance of Large Investments - Earnings Announcement Returns

This table repeats the analysis in Table 8 of the paper, except we replace the monthly return with the two-day (0,1) market-adjusted return around quarterly earnings announcement. The sample is therefore limited to months in which the firm announced quarterly earnings. Specifications 1 and 2 report the results for *Large Investment* (Panel A of Table 8), Specifications 3 and 4 report results for *Large CAPX* (Panel B of Table 8), and Specifications 5 and 6 report results for *Large Acquisitions* (Panel C of Table 8). All other details are identical to Table 8. Standard errors are clustered by firm and month, and t-statistics are reported in parentheses.

	Large Investment		Large CAPX		Large Acquisitions	
	[1]	[2]	[3]	[4]	[5]	[6]
Large Investment	-0.36%	-0.02%	0.19%	0.04%	-0.10%	-0.10%
	(-1.01)	(-0.48)	(0.47)	(1.10)	(-2.66)	(-2.45)
Retail Frenzy	-0.83%	-0.66%	-1.03%	-0.90%	-1.35%	-1.21%
	(-3.36)	(-2.67)	(-5.05)	(-4.35)	(-6.91)	(-6.07)
Frenzy × Large Investment	-1.64%	-1.81%	-1.25%	-1.36%	-1.60%	-1.83%
	(-3.57)	(-3.86)	(-2.45)	(-2.64)	(-2.43)	(-2.65)
Time FE	Yes	Absorbed	Yes	Absorbed	Yes	Absorbed
Ind × Time FE	No	Yes	No	Yes	No	Yes

Table IA8. Retail Frenzies and the Performance of Equity Issuances

Panel A repeats the analysis in Table 8 after replacing *Large Investment* with *Equity Issuance*, where *Equity Issuance* is defined as in Table 4. In Panel B, we split equity issuance into three groups: Investment, Debt Retirement, and Cash. *Investment* is in an indicator equal to one if the firm makes a large investment (as defined in Table 8). *Debt Retirement* is an indicator equal to one if the firm reduces its net debt by at least 3% of market capitalization, and *Cash* is an indicator equal to one if both *Investment* and *Debt Retirement* are equal to zero. All other details are identical to Table 8. Standard errors are clustered by firm and month, and t-statistics are reported in parentheses.

Panel A: All Equity Issuance

	Market-Adjusted Returns		Anomaly Adjusted Returns	
	[1]	[2]	[3]	[4]
Equity Issuance	-0.77%	-0.58%	-0.21%	-0.11%
	(-3.40)	(-3.40)	(-1.53)	(-1.01)
Retail Frenzy	-0.42%	-0.45%	-0.11%	-0.25%
	(-0.90)	(-1.06)	(-0.27)	(-0.65)
Frenzy × Equity Issuance	-0.82%	-0.98%	-0.69%	-0.86%
	(-1.79)	(-2.29)	(-1.73)	(-2.19)
Time FE	Yes	Absorbed	Yes	Absorbed
Ind × Time FE	No	Yes	No	Yes

Panel B: Equity Issuance Split by Use of Proceeds

	Market-Adjusted Returns		Anomaly Adjusted Returns	
	[1]	[2]	[3]	[4]
Equity Issuance - Cash	-0.75%	-0.57%	-0.18%	-0.13%
	(-2.88)	(-3.08)	(-1.15)	(-1.06)
Equity Issuance - Investment	-0.76%	-0.76%	-0.08%	-0.16%
	(-3.35)	(-4.14)	(-0.47)	(-1.14)
Equity Issuance - Debt Repayment	-0.65%	-0.27%	-0.47%	-0.04%
	(-2.25)	(-1.07)	(-1.71)	(-0.17)
Retail Frenzy	-0.45%	-0.48%	-0.13%	-0.27%
	(-0.94)	(-1.12)	(-0.30)	(-0.68)
Frenzy × Equity Issuance -Cash	-0.73%	-0.85%	-0.71%	-0.84%
	(-1.49)	(-1.83)	(-1.65)	(-1.93)
Frenzy × Equity Issuance -Investment	-2.12%	-1.99%	-1.79%	-1.69%
	(-4.08)	(-3.91)	(-3.64)	(-3.46)
Frenzy × Equity Issuance- Dept Repayment	1.55%	0.95%	-1.54%	-0.98%
	(1.53)	(1.00)	(1.63)	(1.09)
Time FE	Yes	Absorbed	Yes	Absorbed
Ind × Time FE	No	Yes	No	Yes

Table IA9. Retail Frenzies and Insider Trading: Distressed vs. Non-Distressed Firms

We repeat the baseline insider trading regressions (Specification 1 of Table 9) after replacing *Retail Frenzy* with *Retail Frenzy × Distress* and *Retail Frenzy × Not Distressed*, and we also include a *Distress* indicator (unreported). *Distress* is an indicator equal to one if the firm has negative free-cash flows (Specification 1), negative EBITDA (Specification 2), or a negative z-score (Specification 3). All other details are identical to Table 9. Standard errors are clustered by firm and quarter, and t-statistics are reported in parentheses. Below the regression estimates, we also assess whether the estimates on the *Retail Frenzy × Distress* and *Retail Frenzy × Not Distressed* are significantly different from each other.

	[1] Negative FCF	[2] Negative Profitability	[3] Negative Z-score
Retail Frenzy × Distress	-8.03%	-7.46%	-10.01%
	(-4.10)	(-3.73)	(-4.19)
Retail Frenzy ×Not Distressed	-0.29%	-4.41%	-4.32%
	(-0.07)	(-1.28)	(-1.68)
Difference	-7.74%	-3.05%	-5.69%
	(-1.68)	(-0.77)	(-1.62)
Controls	Yes	Yes	Yes
Time × Industry Fixed Effects	Yes	Yes	Yes