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Stocks only go up:
Discussions on WallStreetBets and their relationship with stock returns and trading activity

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Abstract: We investigate the ability of stock ticker mentions on the online message board Reddit WallStreetBets (WSB) to forecast abnormal stock returns and trading activity. By simply counting the number of times a stock is mentioned on WSB, we construct a novel and direct measure of investor attention. In a sample of more than 2,500 U.S. companies from 2018 to 2021, we observe that discussions on WSB concentrate on attention-grabbing stocks, i.e., stocks with recent extreme returns, high abnormal trading volume, and large market capitalization. Using a portfolio sorting approach, we establish that the most mentioned stocks on WSB are associated with a significant increase in abnormal trading activity on the day following portfolio formation. Besides, we find significantly higher next-day returns for the most discussed small-cap and illiquid stocks that persist when controlling for risk factors. Contrary to previous research on investor attention, we do not detect quick return reversals but rather find increasing return differentials over the following two months.

Keywords: WallStreetBets, Reddit, Investor Attention, Stock Returns, Trading Activity

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Table of contents

1 Introduction **2**

2 Description of Reddit and WallStreetBets **5**

3 Literature review **7**

4 Data **10**

4.1 WallStreetBets data 10

4.2 Financial market data 10

5 Methodology **14**

5.1 Hypothesis 14

5.2 Variable description 15

5.3 Stock discussions on WSB 15

5.4 Univariate analysis: Portfolio formation 15

5.4.1 Single-sorted portfolios 15

5.4.2 Double-sorted portfolios 16

5.5 Multivariate analysis: Factor models 16

5.6 Event-time analysis 18

5.7 Robustness tests 19

6. Empirical results **20**

6.1 Description of stock discussions on WSB 20

6.2 Characteristics of stocks discussed 21

6.3 Single-sorted portfolios 23

6.3.1 Stock characteristics of single-sorted portfolios 23

6.3.2 Analysis of single-sorted portfolios 24

6.4 Double-sorted portfolios 26

6.4.1 Analysis of double-sorted portfolios 26

6.5 Factor model regressions 29

6.5.1 Analysis of factor model regressions 29

6.6 Event-time analysis 32

6.6.1 Period before portfolio formation 32

6.6.2 Period after portfolio formation 33

6.7 Robustness tests 34

6.7.1 Sample period 34

6.7.2 Sorting mechanism 35

6.7.3 Portfolio size and subsets 36

6.7.4 Portfolio formation frequency 37

6.7.6 Persistence in portfolio returns 38

7 Limitations and areas for future research **39**

8 Conclusion **41**

References **43**

Appendices **47**

1 Introduction

Since the involvement of the WallStreetBets (WSB) community in the trading turmoil surrounding GameStop, WSB receives substantial media coverage and can no longer be ignored when analyzing the trading of retail investors. In January 2021, GameStop's share price increased by more than 1,500% after the share gained prominence through discussions on WSB (Pack et al., 2021). WSB is a sub-community of the online message board Reddit where people congregate to discuss stocks and trading strategies. The number of subscribers to WSB has grown substantially from 200,000 at the beginning of 2018, to 1.8 million at the beginning of 2021, and further to 10.0 million as of April 2021 (Subreddit Stats, n.d.). Not only increased the number of subscribers sharply as a result of the trading turmoil surrounding GameStop but WSB also received broader recognition within the finance community.

Therefore, we examine discussions on WSB to analyze retail investor behavior and to predict stock market movements. Bradley et al. (2021) provide evidence for a link between WSB discussions and the stock market as they find a significant intraday increase in retail trading following due diligence posts on WSB. Our variable of interest is the number of times a stock ticker is mentioned in the daily discussion threads on WSB on a given day. By analyzing stock ticker mentions on WSB independent of the posts' content, length, and opinion about stock price movements, we purely focus on the attention a stock receives on WSB. Considering the growing size and popularity of WSB, we propose to use the number of stock ticker mentions on WSB as a proxy for retail investor attention.

To study the relationship of investor attention with asset prices and trading activity, literature has mostly focused on indirect measures. Common indirect measures include extreme returns (Barber & Odean, 2008), trading volume (Barber & Odean, 2008; Gervais et al., 2001), and news appearance (Barber & Odean, 2008; Huberman & Regev, 2001). These measures inherently assume that retail investors pay attention to stocks if they experience extreme returns, high trading volumes, or are covered in the news. In contrast, our proxy for investor attention directly measures attention. When people talk about a stock on WSB, they undoubtedly pay attention to it. Another established direct measure of attention is Google search frequency (Da et al., 2011). Compared to using Google search frequency, our proposed measure has two major advantages. WSB is an online community dedicated to stock market discussions so that ticker mentions unambiguously reflect attention paid toward a firm's stock and not general attention unrelated to investing. In addition, we can observe the absolute number of stock ticker mentions and can thus compare the level of attention across stocks.

The strong increase in retail trading to 23% of all U.S. equity trading in the beginning of the year 2021 indicates that retail investors have gained importance for asset prices in recent times (Martin & Wigglesworth, 2021). Innovations in the investment landscape are one major driver behind the growth in retail trading as they facilitate stock market participation, simplify trading, and reduce transaction costs. Commission-free brokers such as Robinhood enable individual investors to easily invest via smartphone applications. Since attention-induced trading is primarily driven by retail investors (Barber & Odean, 2008), we expect the relevance of investor attention for the stock market to grow in line with the rise in retail trading.

As WSB has only recently gained wider recognition by the media and financial community, its influence and relationship with the stock market are not well documented up to date. To our knowledge, we are the first to use the number of stock ticker mentions on WSB as a proxy for investor attention. Moreover, this is the first paper to investigate if frequently mentioned stocks on WSB experience attention-induced trading activity and abnormal returns resulting from it. To explore the appropriateness of our proxy for investor attention, we start by analyzing whether the characteristics of intensely discussed stocks on WSB are in line with the characteristics of attention-grabbing stocks described in earlier literature (e.g., Barber & Odean, 2008). In a further step, we study whether stock ticker mentions are associated with changes in next-day returns and trading activity.

We establish three main findings in our paper. Firstly, we find that the most mentioned stocks in the daily discussion threads on WSB indeed display the characteristics associated with trading of retail investors. We observe that discussions on WSB focus on stocks with recent extreme high or low returns, abnormal trading activity, and large market capitalization. Secondly, we provide support for investor attention as an important mechanism influencing trading activity. Concretely, by employing a portfolio sorting approach, we detect significantly higher abnormal trading activity of the most mentioned stocks on the day following portfolio formation as measured by dollar volume and stock turnover rate. Thirdly, we demonstrate that the most discussed small-cap and illiquid stocks on WSB are associated with significantly higher next-day returns, which are meaningful in size and persist when controlling for common risk factors. Thereby, we show that the impact of investor attention on stock prices is stronger for firms that experience larger price impact from correlated retail trading and are more difficult to arbitrage. While attention-induced returns are expected to reverse, we do not detect subsequent reversals but rather see increasing return differentials over at least the following two months.

Consequently, we contribute to research on investor attention by introducing a novel measure to the field that can be employed to forecast stock price movements and abnormal trading activity. Moreover, our findings have real-life implications. Firstly, our novel proxy for investor attention is simple to construct and can serve as a basis for a profitable trading strategy. Secondly, by tapping into this new source of information, institutional investors can more easily and in real time foresee the trading activity of retail investors. For example, short sellers can use this information to avoid short squeezes driven by retail demand as happened during the excessive trading of GameStop.

The remainder of this paper is organized in the following way. Section 2 and 3 give an overview of Reddit, WSB, and relevant literature. We describe our sample data in Section 4 and go on to explain our research hypotheses and methodology in section 5. In section 6, we present and discuss our results and show several robustness tests. Section 7 outlines areas for future research and section 8 concludes our paper.

2 Description of Reddit and WallStreetBets

Reddit is an online discussion forum founded in 2005 where people talk about news and share their own content. As of April 2021, Reddit ranks as the 19th most visited website in the world and the 7th most visited website in the U.S. with more than 50 million daily active users and 50 billion monthly views (Alexa, n.d.; Reddit, n.d.). The website is organized into communities, called *subreddits*, which are dedicated to a central subject such as politics, news, entertainment, or sports. These user-created subreddits are open to everyone and each registered user can share content with the community by submitting a titled post. The submissions usually contain a body of text, link, or image and other users can comment on them (see Appendix 1). One essential feature of Reddit is that users can vote submissions and comments up or down, which determines their visibility on the website. The visibility of submissions increases with the number of upvotes but decreases with age. As a result, the most popular submissions are positioned on top of a subreddit and visible to the highest number of users. Besides, the subreddits are supervised by moderators who specify rules for content submission and delete posts that violate the guidelines.

The subreddit WallStreetBets was launched in 2012 by Jamie Rogozinski. It is devoted to discussions about stock and options trading with particular emphasis on highly speculative strategies. WSB contains both serious discussions about investment opportunities as well as entertaining posts. According to the subreddit's FAQ, WSB "is a community for making money and being amused while doing it. Or, realistically, a place to come and upvote memes[1] when your portfolio is down" (Reddit WallStreetBets, n.d.-b). As mentioned above, the increased media attention related to WSB's role in the GameStop short squeeze fueled substantial user growth in 2021. With 10 million subscribers as of April 2021, WSB is by far the largest finance-related community on Reddit (Subreddit Stats, n.d.). Its audience primarily consists of young and male users who possess a trading account (Boylston et al., 2021; Semenova & Winkler, 2021). While some users are professionals with investment and trading experience, the majority of users are inexperienced investors. A key characteristic of the community is its juvenile, profane language combined with non-malicious mockery. For example, the subscriber count on WSB refers to *degenerates* instead of subscribers and users habitually call themselves *autists*, *retards*, and *apes*. Moreover, members invent their own words such as *stonks* for stocks, *tendies* for profits or gains, and *diamond hands* (usually written with diamond and hand icons)

[1] A meme is "an image, video, piece of text, etc., typically humorous in nature, that is copied and spread rapidly by internet users, often with slight variations" (Oxford University Press, n.d.).

for a strong willingness to hold a stock for a long time. The language reflects the lighthearted culture of WSB and the community's attitude of not taking itself too seriously (Boylston et al., 2021).

WSB is a highly moderated and structured subreddit with clear content guidelines that evolve based on new developments (see Appendix 2). Due to the potential influence of the community on the financial market as a result of its subscriber growth, WSB prohibits submissions regarding microcaps, penny stocks, low volume stocks, cryptocurrencies, SPACs, and over-the-counter stocks to prevent market manipulation. Besides, WSB encourages users to post proofs of the trades they recommend to increase the reliability of advice (see Appendix 3). Since submissions may fail to adhere to the rules, several moderators including one automated moderator monitor the community and delete inappropriate content (Boylston et al., 2021). At the same time, humorous, entertaining, and ironic content are allowed and constitute an integral component of WSB. To organize discussions, users have to categorize their submissions into predefined *flairs*. Prominent flairs are i) *DD* (due diligence), which involves long text posts about stocks with detailed research, ii) *Discussion*, which are posts about investment ideas or articles users would like to discuss, iii) *YOLO,* which covers posts regarding significant amounts invested in a single position, iv) *Gain* and *Loss*, which entail position screenshots of investment results, and v) *Meme*, which comprises humorous pictures and videos (Reddit WallStreetBets, n.d.-a; see Appendix 4). Furthermore, WSB opens two daily discussion panels for each trading day where users congregate to discuss market conditions, specific stocks, and trading strategies (see Appendix 5). The automated moderator launches the *Daily Discussion Thread* when the U.S. stock market opens and the *What Are Your Moves Tomorrow* thread when it closes. Up-to-date stock discussions are centered to a large degree on these two daily discussion threads, which are easily accessible from the top bar of the navigation pane (see Appendix 6).

Regarding the types of investments discussed, high-risk day trading and options trading play a major role on WSB. Users display a preference for opportunities with the prospect of large profits yet high risks, which oftentimes resemble gambling rather than investing (Semenova & Winkler, 2021). Nevertheless, it should be noted that buy-and-hold strategies are also part of WSB and users generally tend toward long positions. According to Bradley et al. (2021), 80% of the due diligence reports posted on WSB are buy recommendations. Further, the community's regular use of the phrase *stocks only go up* reflects its preference for long positions (Martin & Wigglesworth, 2021).

3 Literature review

The efficient market hypothesis states that the price of a security is equal to its fundamental value independent of asset demand. However, literature has established that demand curves for stocks slope downward and that changes in aggregate demand for stocks, which are unrelated to fundamentals, can affect stock prices in the absence of arbitrage (Miller, 1977; Shleifer, 1986). One driver of demand for a specific stock is the attention it receives from investors. In a seminal paper, Barber and Odean (2008) show that individual investors are more likely to buy than sell stocks that have caught their attention. When individual investors want to buy a stock, they are confronted with a formidable search problem of selecting from a large universe of different stocks. Since attention is a limited cognitive resource (Kahneman, 1973), investors tend to narrow down the opportunity set to stocks that have recently caught their attention. However, when individual investors want to sell stocks, they face short-selling constraints and usually only consider the few stocks they have in their portfolios. Thus, retail investors are net buyers of attention-grabbing stocks and the resulting buying pressure can temporarily inflate stock prices. Therefore, the phenomenon of attention-induced trading relates mainly to retail investors and not institutional investors. According to the price pressure hypothesis, the attention-induced mispricing subsequently reverts, typically within a few weeks up to one year (Barber et al., 2009).

Since investor attention cannot directly be observed, various proxies for investor attention have been used to study its relationship with stock prices and abnormal trading activity. Barber and Odean (2008) show that individual investors are net buyers of stocks appearing in the news, stocks with large abnormal trading volume, and stocks with extreme one-day returns, both positive and negative. Other literature has confirmed and extended these findings by showing that media coverage (Huberman & Regev, 2001; Kaniel & Parham, 2017), advertising expenditure (Chemmanur & Yan, 2019; Lou, 2014), and televised stock recommendations (Engelberg et al., 2012) are associated with higher temporary abnormal returns and trading activity. While these measures are indirect proxies for investor attention, the rise of the internet enables to build direct measures of investor attention. Most prominently, Google search inquiries have been employed to predict attention-induced abnormal stock returns and trading volumes (Da et al., 2011; Joseph et al., 2011). Consistent with the price pressure hypothesis, these two papers find that the abnormal returns are temporary and subsequently reverse.

Furthermore, literature points out that the impact of investor attention varies by firm characteristics. Attention-driven price movements primarily exist for small-cap and illiquid stocks since correlated trading of individual investors has greater price impact for these firms (Barber et al., 2009). In addition, the influence of investor demand depends on the difficulty to arbitrage stocks. Arbitrage tends to be most costly and risky for small-cap, illiquid, and volatile stocks (D'Avolio, 2002; Shleifer & Vishny, 1997; Wurgler & Zhuravskaya, 2002). This prevents informed traders from immediately correcting the mispricing, leading to larger attention-induced abnormal returns for these types of companies (Barber et al., 2009; Cheng et al., 2020; Engelberg et al., 2012).

The strong increase in trading of retail investors in combination with the rising interaction of investors via social media indicates that the relationship between investor attention and stock prices becomes even more important today (Martin & Wigglesworth, 2021). Before the rise of social media, social interaction has already been found to contribute to stock market fluctuations (Shiller, 2000), influence stock market participation of retail investors (Hong et al., 2004), and affect portfolios of fund managers (Hong et al., 2005). Today, investors can discuss stocks and share investment ideas on online forums such as WSB at a much faster pace and larger scale. Moreover, the prominence of online communities can lead to further concentration of investor attention on the same subset of stocks. This became particularly visible during the trading turmoil surrounding meme stocks in the beginning of the year 2021. Supporting the tendency of online communities to channel attention, Semenova and Winkler (2021) show that WSB users who comment on a specific asset are four times more likely to begin a new discussion about the same asset in the future. Besides, the design of social networks oftentimes results in selective exposure of users to information, which tends to confirm their prior beliefs (Cookson et al., 2020). This can have detrimental consequences, as opinions built in these *information silos* are associated with lower future stock returns. Looking at the characteristics of stocks traded by retail investors, a recent study by Barber et al. (2020) supports earlier research by again showing that retail investors focus on attention-grabbing stocks. Robinhood users only trade a small range of stocks and periods of correlated trading can be predicted by extreme returns and abnormal trading volumes.

Hitherto, literature about WSB mainly focuses on user characteristics, network dynamics, and WSB's role in the GameStop short squeeze (e.g., Long et al., 2021). Yet, there is little research on WSB's general relationship with the stock market and trading of retail investors. Bradley et al. (2021) provide initial insights into this regard. They find a 7% increase in trading of retail investors subsequent to due diligence posts on WSB. In addition, they show

that due diligence reports on WSB concentrate on companies with large market capitalization, high trading activity, high volatility, and low institutional ownership. Nevertheless, the relationship between overall discussion behavior on WSB and the stock market remains a gap in literature.

4 Data

To study the relationship between discussions on WSB and the stock market, we take a sample of 2,638 U.S. stocks listed at the New York Stock Exchange, American Stock Exchange, and NASDAQ Stock Market. Our analysis covers the period from 1st August 2018 till 26th February 2021. The period length is defined by the availability of WSB data. In the following section, our data sources and sample characteristics are explained in detail.

4.1 WallStreetBets data

The daily number of stock tickers mentions on WSB is used as a proxy for investor attention on U.S. stocks. The data on WSB is obtained through REST API access from Quiver Quantitative, a provider of alternative data. Quiver Quantitative counts the number of times a stock ticker is mentioned in the WSB threads *What Are Your Moves Tomorrow* and *Daily Discussion Thread*. Stock ticker mentions are counted independent of the type, content, or length of submissions as well as independent of the author's opinion about stock price movements. By solely looking at the frequency of ticker mentions, we capture the attention a stock receives from WSB users.

The data of daily stock ticker mentions reaches back until the beginning of August 2018, when daily discussion threads were introduced on WSB. In total, 2,022 stocks of our sample are mentioned at least once on WSB, leaving 616 stocks in the sample that were not mentioned on WSB during our sample period. If a stock ticker is not mentioned on a specific date, an observation with the value of zero is added to the data. Two dates are excluded from the sample as Quiver Quantitative did not collect data on these dates.

4.2 Financial market data

Financial market data for the period from August 2018 to February 2021 is obtained from Compustat Daily Updates – Security Daily. The data includes stocks' daily closing price, shares outstanding, number of shares traded, daily total return factor, issue type code, adjustment factor for dividend payments, foreign incorporation code, IPO date, and stock exchange code. Likewise, we obtain quarterly data to calculate book values from Compustat (Daily Updates – Fundamentals Quarterly). Of the calculated book-to-market values, negative values are omitted following Fama and French (1992). Further, we gather short interest data from Compustat Daily Updates - Supplemental Short Interest File. This type of data is reported biweekly. Lastly,

daily risk factors for the U.S. stock market are attained from Compustat Fama-French Factors - Daily Frequency.

Since stock discussions on WSB focus on U.S. companies, the sample includes ordinary stocks of companies incorporated in the U.S. listed either at the New York Stock Exchange, American Stock Exchange, or NASDAQ Stock Market. Stocks with a market capitalization below $500 million at the start of the sample period or their IPO date are excluded in accordance with the content guidelines of WSB, which ban discussions of microcaps. By setting the size restriction at the beginning of the sample period or the IPO date, respectively, we rule out that our sample is affected by survivorship bias. Further, thinly traded stocks with a daily average dollar trading volume below $1 million or with five or more days without trading volume are not part of the sample. Finally, the data set is manually examined for stocks with incomplete or incorrect data, leading to the exclusion of five stocks from the sample. The final data set includes 2,638 stocks.

As Compustat states prices without adjusting for stock splits and dividend payments, we calculate adjusted prices using the daily total return factor and the adjustment factor for dividend payments (Appendix 7). These adjusted prices are used to calculate daily returns, which represent a stock's total daily returns.

To investigate the relationship between stock discussions on WSB and subsequent trading, several measures of trading activity are adopted. To be precise, we focus in this study on dollar volume, stock turnover rate, and illiquidity ratio. Each of these measures is calculated on a daily basis. Dollar volume is defined as the number of shares traded times the respective closing price of a stock in U.S. dollar:

$$\$VO_t^i = VO_t^i \times P_t^i \tag{1}$$

where $\$VO_t^i$ is stock i's total dollar volume, VO_t^i the total share volume, and P_t^i the stock's closing price. Consequently, a higher total dollar volume on a certain day is associated with higher trading activity.

The stock turnover rate measures the relative fraction of shares traded in respect to the number of shares outstanding:

$$TO_t^i = \frac{VO_t^i}{NOSH_t^i} \tag{2}$$

where TO_t^i is the stock turnover rate of stock *i,* and $NOSH_t^i$ the number of shares outstanding. The ratio measures the number of shares that are traded on a given day relative to the number of shares outstanding. Thus, a higher turnover rate represents an increase in trading activity. The ratio can also be interpreted as the reciprocal of the average time investors hold a stock, implying that the average holding period of investors is shorter for stocks with higher turnover rates.

Moreover, we investigate the link between discussions on WSB and stock liquidity. Previous studies such as Bank et al. (2011) and Ding and Hou (2015) suggest that stocks enjoying attention experience an increase in stock liquidity. In line with Amihud (2002), we define a stock's daily illiquidity ratio as the proportion of a stock's absolute return on a given day over its dollar trading volume on the same day:

$$ILLIQ_t^i = \frac{\left|R_t^i\right|}{\$VO_t^i} \tag{3}$$

where $ILLIQ_t^i$ is the illiquidity ratio and $\left|R_t^i\right|$ the daily return in absolute terms of stock *i*. The illiquidity ratio relates to the price impact associated with trading volume. In specific, it states the daily percentage price change relative to the dollar trading volume. Hence, the ratio is higher for illiquid stocks, which experience larger price impact from trading volume.

In a next step, we calculate the daily abnormal dollar volume, abnormal stock turnover rate, and abnormal illiquidity ratio for each stock on a given day compared to the average over the sample period. By using abnormal values, the measures of trading activity can be compared across stocks and time. Abnormal values are calculated by dividing the difference between the value on a given day and the average daily value over the entire sample period by the average value:

$$Abnormal\ Value_t^i = \frac{Value_t^i - \overline{Value^i}}{\overline{Value^i}} \tag{4}$$

where $Abn.Value_t^i$ is the abnormal value, $Value_t^i$ the value on day *t*, and $\overline{Value^i}$ the average value over the sample period.

Further, we investigate how investor attention as proxied by discussions on WSB relates to changes in short selling. Following Ofek and Richardson (2003), we first calculate the short interest ratio for any given day as:

$$SIR_t^i = \frac{SI_t^i}{NOSH_t^i} \tag{5}$$

where SIR_t^i denotes stock i's short interest ratio and SI_t^i the number of shorted shares. The short interest ratio is defined as the number of shares sold short but not yet repurchased relative to the number of shares outstanding. To calculate the change in short interest ratio, we use the difference between the short interest ratio on the next publication date and the short interest ratio on a given date. Thereby, we track changes in the fraction of shorted stocks.

5 Methodology

5.1 Hypothesis

As mentioned above, the WSB community has grown substantially in recent times and reached 10 million subscribers as of April 2021. As a result of the subscriber growth, the message board has gained media publicity and becomes increasingly important for the overall retail investor community (Platt et al., 2021). In a first step, we examine our proxy for investor attention by analyzing whether stock discussions on WSB are consistent with the typical characteristics of trades by retail investors. In line with Barber and Odean (2008), we expect discussions on WSB to be centered on attention-grabbing stocks, i.e., stocks with extreme positive or negative recent returns and stocks with high abnormal trading volume. In addition, consistent with general patterns of retail trading, discussions should be tilted toward stocks with large market capitalization and growth stocks with low book-to market value (Odean, 1999).

The core question of this paper is whether the number of stock ticker mentions in the daily discussion threads on WSB, as a proxy for investor attention, can forecast abnormal stock returns and trading activity. Since retail investors tend to be net buyers of attention-grabbing stocks (Barber & Odean, 2008), we hypothesize higher short-term returns and abnormal trading activity for the most discussed stocks on WSB. The effect of attention-driven buying on returns should be particularly pronounced for small-cap and illiquid stocks since they display larger price impact from correlated trading of retail investors and are more difficult to arbitrage (Barber et al., 2009). In addition, we expect to find stronger return sensitivity to investor attention for volatile stocks as such stocks are also associated with higher difficulty to arbitrage (Baker & Wurgler, 2007). If buying pressure is an underlying mechanism behind higher short-term returns, the abnormal returns should persist even when controlling for common risk factors. Furthermore, the price pressure hypothesis predicts that attention-induced demand shocks only cause temporary deviations from fundamental values and prices subsequently reverse (Barber et al., 2009).

This paper attempts to validate the following hypotheses:

1. Discussions on WSB focus on attention-grabbing stocks.
2. The most discussed stocks on WSB are associated with higher next-day returns and abnormal trading activity.
3. The impact of investor attention on returns is stronger for small-cap, illiquid, and volatile stocks.

4. The abnormal returns of the most discussed stocks persist when controlling for common risk factors.
5. The attention-driven price movements are temporary and revert over a longer horizon.

5.2 Variable description

In our analysis, we use the absolute number of stock ticker mentions in the daily discussion threads on WSB as a proxy for investor attention. On a given date, the stocks are ranked according to the frequency they appear in submissions of WSB users. From an intuitive point, this absolute measure is desirable as the most mentioned stocks are likely to be the ones that receive the highest attention from WSB users and the broad retail investor community.

5.3 Stock discussions on WSB

To get an overview of discussion patterns on WSB, we start our analysis by examining the development of mentions over time and the distribution of mentions across stocks. Second, we analyze what kind of stocks are discussed to test our first hypothesis that discussions on WSB focus on attention-grabbing stocks. Therefore, we sort stocks into deciles according to returns, trading activity, and other stock characteristics. We identify which types of stocks are frequently discussed on WSB by analyzing how often stocks in each decile are mentioned and how often they are among the 30 most mentioned stocks.

5.4 Univariate analysis: Portfolio formation

5.4.1 Single-sorted portfolios

To investigate the relationship between stock discussions on WSB and subsequent returns and trading activity, each day we sort stocks into two portfolios based on their number of ticker mentions on WSB: the *High-WSB* and the *Low-WSB* portfolio. Daily portfolio sorts are implemented due to the up-to-date nature of stock discussion on WSB and the creation of new discussion threads on each day. The High-WSB portfolio contains the 30 most mentioned stocks, while the Low-WSB portfolio contains all other stocks in the sample. We focus on two portfolios with different sizes due to the concentration of WSB discussion on a narrow range of stocks (Semenova & Winkler, 2021). The focus of ticker mentions on a few stocks is supported by the higher visibility of popular submissions based on the forum's ranking algorithm. On days where only a few different stocks are mentioned on WSB, the portfolio size

of the High-WSB portfolio can be smaller than 30 as stocks have to be mentioned at least once to be included. If more than one stock rank 30th in terms of the number of stock ticker mentions, the High-WSB portfolio contains all of them. Hence, the portfolio size can be larger than 30 on a given day. Individual stocks within each portfolio are equally weighted. Based on the daily sorts, we compare returns and abnormal trading activity on the day following portfolio sorts. While the study focuses on next-day returns and trading activity, we also look at same-day measures from a descriptive perspective. By construction, the number of WSB mentions cannot explain same-day measures considering that the final number of mentions is only known after the market closes. Nevertheless, it can shed light on the potentially reciprocal relationship between the measures and investor attention.

To examine if statistically significant differences in abnormal trading activity and stock returns exist, two-sample, two-sided t-tests on the differences in means between the High-WSB and Low-WSB portfolios are performed. Point estimates for the differences in means are stated together with 95% confidence intervals.

5.4.2 Double-sorted portfolios

To analyze whether our results differ by firm characteristics, stocks are presorted each day into terciles based on their characteristics. We presort based on market capitalization, illiquidity, and three-month rolling volatility one after another to test the hypothesis that the relationship between discussions on WSB and next-day stock returns is stronger for small-cap, illiquid, and volatile stocks. In addition, we presort stocks into terciles based on book-to-market value and same-day return to examine the results when controlling for these characteristics. Within each tercile, stocks are then assigned to either the High-WSB or Low-WSB portfolio according to the approach described above. Consequently, for each presorting, we eventually end up with six distinct portfolios. For each of these portfolios, we calculate the average next-day return and trading activity measures. Finally, we determine the differences in means between the High-WSB and Low-WSB portfolios within each presorting and test the differences for statistical significance.

5.5 Multivariate analysis: Factor models

To assess whether the potential abnormal next-day returns of the most discussed stocks on WSB persist when controlling for risk factors, we use various factor models. Furthermore, we build an additional portfolio for this analysis by combining the High-WSB and Low-WSB portfolios into a single “Discussed minus Neglected” (DMN) portfolio. The DMN portfolio

takes a long position in the High-WSB portfolio and a short position of equal weight in the Low-WSB portfolio. Hence, each day a zero-investment portfolio is constructed which keeps the portfolio weight at zero. In our analysis, we run factor model regressions for the High-WSB, Low-WSB, and the DMN zero-cost portfolio to study whether the most discussed stocks on WSB can generate abnormal returns controlling for risk factors. In particular, we focus on the factor model regressions for the double-sorted portfolios based on market capitalization, illiquidity, and volatility to test our hypothesis that attention-induced, risk-adjusted abnormal returns predominantly for small-cap, illiquid, and volatile stocks. Precisely, we deploy the capital asset pricing model (CAPM), the Fama-French (1993) three-factor model, and the Carhart (1997) four-factor model.

The CAPM was first introduced independently of each other by Treynor (1961, 1962), Sharpe (1964), Lintner (1965a, 1965b), and Mossin (1966). According to the model, the risk premium of each asset is solely determined by the exposure to undiversifiable risk (also known as market risk). The regression is carried out using the following equation:

$$r_t^i - r_t^f = \alpha_i + \beta_i\left(r_t^M - r_t^f\right) + \epsilon_t^i \tag{6}$$

where r_t^i is the return of asset *i*, r_t^f the risk-free rate, and r_t^M the market return. The risk-free rate is the one-month U.S. Treasury bill rate.

Both, the Fama-French (1993) three-factor model and the Carhart (1997) four-factor model, can be regarded as extensions of the CAPM. Fama and French (1993) observe that small-cap outperform large-cap firms and high book-to-market outperform low book-to-market firms. These excess returns earned on small-cap and high book-to-market firms are considered to be a compensation for risk to investors. Hence, Fama and French (1993) added a size and a value risk factor to the established market risk factor. The regression is carried out using the following equation:

$$r_t^i - r_t^f = \alpha_i + \beta_i\left(r_t^M - r_t^f\right) + s_i(r_t^{SMB}) + h_i(r_t^{HML}) + \epsilon_t^i \tag{7}$$

where s_i and h_i are the asset's exposure to size and value risk, respectively. Moreover, SMB and HML are zero-cost portfolios taking a long position in small-cap stocks and a short position in large-cap stocks as well as a long position in high book-to-market stocks and a short position in low book-to-market stocks.

Carhart (1997) further finds that stocks that performed well over the previous year tend to continue to outperform. Hence, he added a momentum risk factor to the Fama-French (1993) three-factor model described above. The regression is carried out using the following equation:

$$r_t^i - r_t^f = \alpha_i + \beta_i\left(r_t^M - r_t^f\right) + s_i(r_t^{SMB}) + h_i(r_t^{HML}) + m_i(r_t^{MOM}) + \epsilon_t^i \quad (8)$$

where m_i is the asset's exposure to the momentum factor and MOM is a zero-cost portfolio taking a long position in a portfolio of previous winners and a short position in a portfolio of previous losers.

The factor model regressions are performed for the DMN, High-WSB, and Low-WSB portfolios. Stocks are sorted and portfolios are formed in the same fashion as in the univariate analysis. The rebalancing of the portfolios is done daily and the time series of equally-weighted returns in excess of the risk-free rate is then regressed on the risk factors. If the potential differences between the returns of the High-WSB and Low-WSB portfolios arise due to exposure to risk factors, the intercept estimates of the factor model regressions for the High-WSB and the DMN portfolio should not be significantly different from zero. If the intercept estimates are significantly different from zero, we provide evidence for attention-induced abnormal returns.

5.6 Event-time analysis

Since attention-induced abnormal returns should only be temporary, we present an event-time analysis to investigate if any potential abnormal returns found in the preceding analyses revert over a longer time horizon. Again, we sort stocks into the High-WSB and Low-WSB portfolios based on the number of stock ticker mentions on WSB. Subsequently, we compare the cumulative mean return differentials between the two portfolios over the ten days prior to portfolio formation (day -10 until day 0) as well as over the 40 days following portfolio formation (day 1 until day 40). The portfolio compositions are held constant and daily returns are accumulated over time. In addition, the cumulative returns of the portfolios are investigated over a period of 126 trading days (six months) and 252 trading days (one year). For example, the cumulative return differentials before portfolio formation are calculated using the following equation:

$$Cum\ R_\tau^p = \prod_{t=\tau-10}^{\tau}(1 + R_t^h) - \prod_{t=\tau-10}^{\tau}(1 + R_t^l) \quad (9)$$

where $Cum\ R_{\tau}^{p}$ is the difference in cumulative return between the High-WSB and Low-WSB portfolios, $\prod_{t=\tau-10}^{\tau}(1+R_t^h)$ the cumulative return of the High-WSB portfolio, and $\prod_{t=\tau-10}^{\tau}(1+R_t^l)$ the cumulative return of the Low-WSB portfolio. To determine whether the differences in cumulative average daily returns between the High-WSB and Low-WSB portfolios are statistically significant, we conduct t-tests just like in the univariate analysis. Moreover, cumulative portfolio returns are compared with the value-weighted returns of the sample.

5.7 Robustness tests

To investigate whether the findings also hold when making changes to our methodology, we perform several robustness tests. We test our analysis for robustness of the sample period, sorting mechanism, portfolio size, and frequency of portfolio formation. In addition, we examine whether persistence in portfolio returns drives our results.

6. Empirical results

6.1 Description of stock discussions on WSB

We start by analyzing the development of stock discussions on WSB. Figure 1 shows that the total number of mentions per day starts to ascend from early 2020 onwards. This development was not only driven by the growing subscriber numbers but also by the larger number of mentions per subscriber. For example, the discussion activity on WSB increased strongly during the Covid-19 pandemic. The stock market participation and trading of retail investors also rose significantly during that time (Fitzgerald, 2021). Regarding the number of subscribers, there was a sharp increase in WSB users in connection with the stock market turmoil and media attention associated with the trading of GameStop and other meme stocks in the beginning of the year 2021. Confirming the findings of Semenova and Winkler (2021), the distribution of ticker mentions across stocks is extremely skewed. Discussions on WSB are heavily concentrated on a few stocks as the top 1% of the most mentioned stocks on each day receive 38% of the total number of mentions. As a consequence, a few stocks dominate the discussions on WSB whereas most other stocks are mentioned only sporadically or not at all.

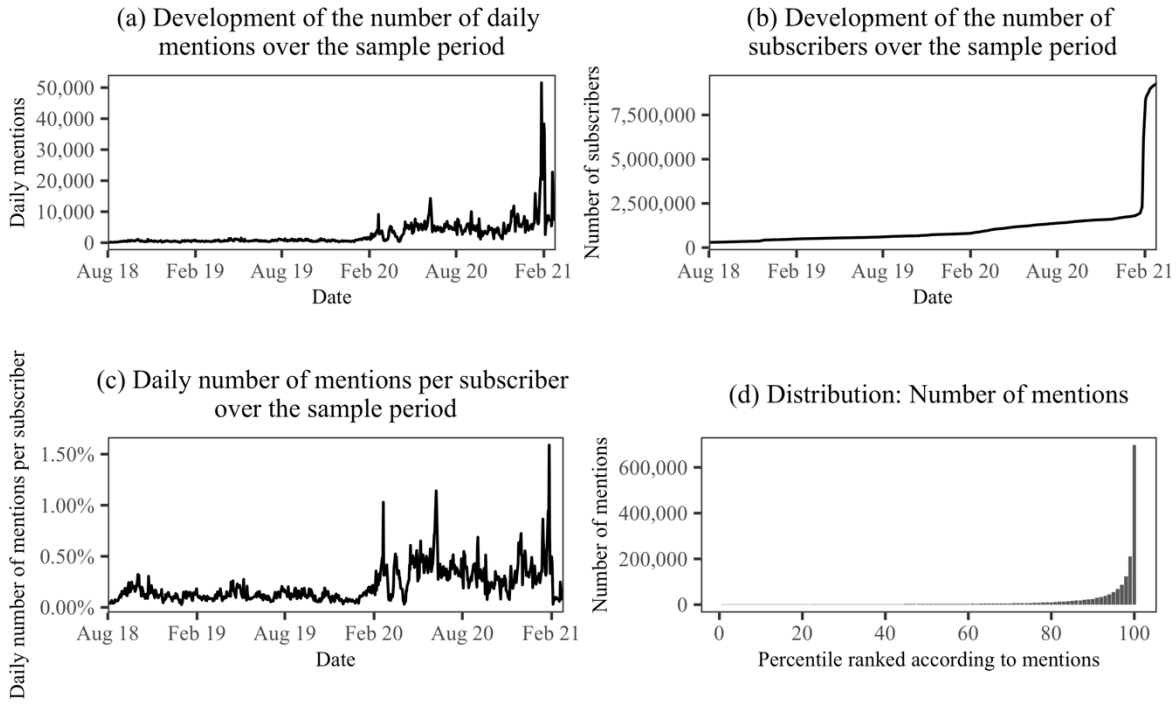


Figure 1: **Illustration of stock discussions on WSB**

This figure depicts the development of stock discussions and distribution of stock ticker mentions on WSB. Chart (a) shows the development of total daily ticker mentions over the sample period. Chart (b) plots the development of subscribers to WSB over the sample period. Chart (c) displays the daily total number of stock ticker mentions as a fraction of subscribers to WSB. In chart (d) stocks mentioned on WSB are arranged each day into percentiles according to their number of mentions on that day. For each percentile, the aggregated number of mentions over the sample period is shown.

6.2 Characteristics of stocks discussed

To test our first hypothesis that WSB discussions concentrate on attention-grabbing stocks, we sort stocks into deciles according to various firm characteristics. We then observe how often stocks in each decile are mentioned and how often stocks in each decile are among the 30 most mentioned stocks. The latter depicts the characteristics of stocks included in the High-WSB portfolio. In this section, we primarily present the results for the types of stocks that are among the 30 most mentioned stocks on each day. We find similar results when looking at the total number of mentions over the sample period, which are shown in Appendix 8.

As observable from Figure 2 on the next page, we find support for our first hypothesis that WSB discussions focus on attention-grabbing stocks. Consistent with the findings of Barber and Odean (2008), stocks with extreme same-day returns and stocks experiencing high abnormal trading volume are most frequently among the 30 most mentioned tickers on a given day. Extreme returns relate to both high positive and high negative returns. Comparing these two, stocks with high positive returns are more often among the most mentioned stocks than stocks with high negative returns. In particular, the picture in Figure 2 is driven by the stocks in the top and bottom percentiles in terms of same-day return (Appendix 9). We detect similar results when categorizing stocks according to the previous-day return and ten-day cumulative return before portfolio formation instead of same-day return.

Likewise, we see that stocks with the highest abnormal trading activity are among the most mentioned stocks on WSB. Discussions concentrate to a large extent on stocks with high abnormal dollar volume and abnormal stock turnover rates. These abnormal trading volumes are likely to be influenced by attention-grabbing events such as news, earnings announcements, or IPOs. For the latter, we find support in our data as companies with recent IPOs are frequently among the most mentioned stocks. Alongside stocks with extreme same-day returns and stocks experiencing high abnormal trading activity, we find that WSB discussions are tilted toward stocks with large market capitalization and low book-to-market value. This is consistent with the general preference of retail investors to trade large-cap and growth stocks (Odean, 1999). Stocks with large market capitalization are often well-known corporations, which are more familiar to retail investors and appear more frequently in the news. Taking together the results presented above, we can confirm our first hypothesis that discussions on WSB predominantly revolve around attention-grabbing stocks. In addition, the type of stocks discussed on WSB fits to general trading patterns of retail investors and is consistent with recent studies (Barber et al., 2020; Welch 2020).

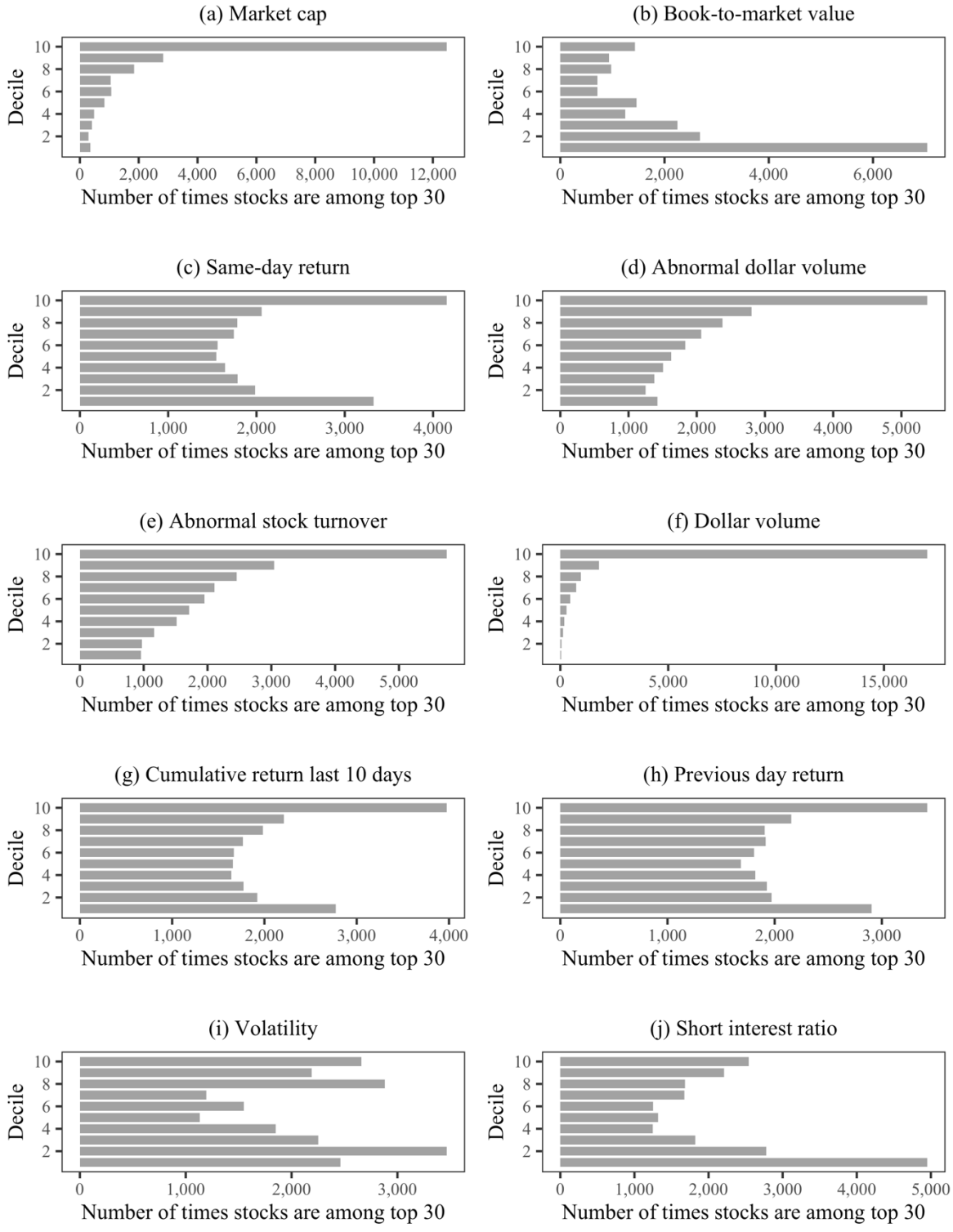


Figure 2: **Characteristics of the most discussed stocks: Decile analysis**

This figure shows the characteristics of the most mentioned stocks on WSB. Each day the stocks are sorted into a decile according to the respective characteristics. For example, we build 10 deciles ranked by market cap in chart (a). Then, for each decile, the number of stocks that are among the 30 most mentioned stocks (i.e., stocks in the High-WSB portfolio) for a given day is aggregated over the sample period.

6.3 Single-sorted portfolios

For our portfolio analysis, we sort stocks each day into the High-WSB and Low-WSB portfolios according to the number of stock ticker mentions. We start by comparing the general characteristics between the two portfolios in section 6.3.1. In section 6.3.2, we go on to examine the differences in means between the two portfolios for next-day returns and abnormal trading activity.

6.3.1 Stock characteristics of single-sorted portfolios

Looking at the average stock characteristics of the High-WSB and Low-WSB portfolios on the day of portfolio formation (Table 1), we find further support for our first hypothesis that discussions on WSB focus on attention-grabbing stocks. Stocks in the High-WSB portfolio have significantly larger market capitalizations of $182.25bn on average compared to $11.35bn in the Low-WSB portfolio, highlighting that most attention is directed toward big corporations. Furthermore, stocks in the High-WSB portfolio display substantially higher abnormal trading activity on the day of portfolio sorts. On average, abnormal dollar volume of stocks in the High-WSB portfolio is 61.74 percentage points higher, abnormal stock turnover rate is 58.06 percentage points higher, and abnormal stock illiquidity is 4.01 percentage points lower than in the Low-WSB portfolio. The differences in means between the portfolios are all statistically significant at the 1% level and economically meaningful. Looking at the difference in abnormal dollar volume, this means that stocks in the High-WSB portfolio have 61.74 percentage points

Table 1
Single-sorted portfolios: Same-day characteristics

	Ticker mentions		Difference	95% Confidence interval	
	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_t	0.56	0.08	0.49 ***	0.38	0.59
$A\$VO_t$	60.86	-0.89	61.74 ***	57.04	66.45
ATO_t	57.24	-0.83	58.06 ***	54.77	61.36
$AILLIQ_t$	-4.00	0.01	-4.01 ***	-5.28	-2.75
Market cap_t	182.25	11.35	170.90 ***	166.23	175.58

This table shows the average stock characteristics of daily portfolios, which are sorted according to their number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return (R_t), abnormal dollar volume ($A\$VO_t$), abnormal stock turnover rate (ATO_t), abnormal stock turnover rate ($AILLIQ_t$), and market capitalization (Market cap_t) on the day of portfolio formation. Market capitalization is stated in U.S. dollar billions. All other variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

more trading volume on the day of portfolio formation than the Low-WSB portfolio relative to their averages over the sample period. Regarding the average returns on the day of portfolio formation, we detect a significant return differential between the High-WSB and Low-WSB portfolios of 0.49%. When analyzing the risk factor exposure of the portfolios, the positive coefficient of the DMN portfolio for the market risk factor underlines the preference of WSB users for high beta stocks (Appendix 10). In addition, its negative exposure to the value risk factor shows that stock discussions on WSB are comparatively tilted toward growth stocks with low book-to-market ratios. All in all, discussions on WSB concentrate on stocks with larger market capitalization, higher daily returns, and higher abnormal trading activity on the day of portfolio formation.

6.3.2 Analysis of single-sorted portfolios

To validate our second hypothesis that stock ticker mentions in the daily discussion threads on WSB are associated with higher next-day returns and abnormal trading activity, we investigate the differences in means between the High-WSB and Low-WSB portfolios on the day following portfolio sorts. To start with, we see evidence for the ability to predict higher next-day abnormal trading activity for the most discussed stocks on WSB (Table 2). The most frequently mentioned stocks are associated with substantially higher abnormal next-day trading volumes and stock liquidity, indicating attention-driven trading of retail investors. The differential between the two portfolios equals 48.19 percentage points for abnormal dollar volume, 45.18 percentage points for abnormal stock turnover rate, and -10.23 percentage points for abnormal illiquidity ratio (all significant at the 1% level).

Table 2:
Single-sorted portfolios: Next-day analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.16	0.09	0.07 *	-0.01	0.14
$A\$VO_{t+1}$	47.36	-0.84	48.19 ***	44.61	51.78
ATO_{t+1}	44.38	-0.80	45.18 ***	42.75	47.60
$AILLIQ_{t+1}$	-10.04	0.18	-10.23 ***	-11.43	-9.02
ΔSIR_{t+1}	0.04	-0.01	0.05 ***	0.02	0.08

This table shows the average stock characteristics of daily portfolios, which are sorted according to their number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) on the day following portfolio formation. All values are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Looking at the average next-day returns, the evidence is less conclusive. The daily return differential between the High-WSB and Low-WSB portfolio amounts to 0.07%, which is only marginally significant at the 10% level and largely driven by the year 2021. In section 6.7.1, we present a robustness test excluding the year 2021. Nevertheless, Figure 3 highlights that the outperformance of the High-WSB over the Low-WSB portfolio becomes substantial when accumulating the daily returns of the portfolios over the sample period. The difference in total returns equals 24.36% at the end of 2020 and 78.31% at the end of the sample period (end of February 2021). As visible from the graph, the cumulative return differential between the High-WSB and Low-WSB portfolios begins to grow from late 2019 onwards. Even though the daily returns of the High-WSB portfolio are more volatile, its Sharpe ratio of 1.04 is still superior to that of the Low-WSB portfolio of 0.62 (Appendix 11). In support of the influence of attention-induced trading on returns, we detect a significantly larger change in short interest ratio of 0.05 percentage points at the next reporting date for stocks in the High-WSB portfolio. This means that institutional investors increase their short position for the most mentioned stocks on WSB, suggesting that the higher returns of the High-WSB portfolio represent mispricing. In total, the analysis of single-sorted portfolios indicates that the most discussed stocks on WSB experience attention-driven trading and provides some evidence for consequential higher returns.

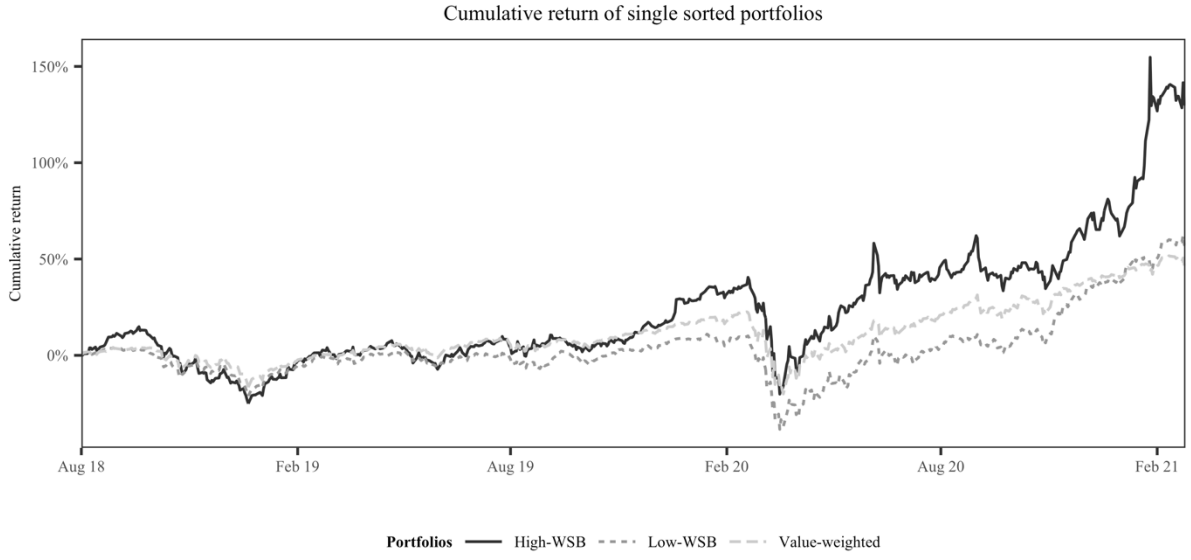


Figure 3: **Cumulative return of single-sorted portfolios**

This figure shows the cumulative return of the High-WSB and Low-WSB portfolios over the sample period. In addition, the cumulative return of a value-weighted portfolio is shown. The High-WSB and Low-WSB portfolios are sorted daily. The value-weighted portfolio is comprised of all stocks part of the sample.

6.4 Double-sorted portfolios

To test our third hypothesis that the impact of investor attention on next-day returns is stronger for small-cap, illiquid, and volatile stocks, we build double-sorted portfolios based on firm characteristics. Each day, the stocks are first categorized into terciles according to their market capitalization, illiquidity ratio, and volatility and then further classified into the High-WSB and Low-WSB portfolios based on the number of stock ticker mentions. Besides, we examine the relationship between discussions on WSB and abnormal trading activity when double-sorting based on various firm characteristics.

6.4.1 Analysis of double-sorted portfolios

We start by investigating whether ticker mentions on WSB can predict higher next-day returns for the double-sorted portfolios based on market capitalization (Table 3 and Appendix 12).

Table 3:
Double-sorted portfolios: Next-day return analysis

1. Market capitalization					
	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Small	0.47	0.12	0.35 ***	0.21	0.48
Medium	0.18	0.08	0.10 **	0.01	0.19
Large	0.09	0.07	0.02	-0.04	0.08
2. Illiquidity ratio					
	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Low	0.12	0.08	0.04	-0.02	0.11
Medium	0.20	0.08	0.11 **	0.02	0.20
High	0.45	0.11	0.34 ***	0.22	0.47
3. Volatility					
	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Low	0.07	0.05	0.02	-0.02	0.05
Medium	0.12	0.09	0.03	-0.02	0.08
High	0.22	0.13	0.09 *	0.00	0.18

This table shows the average next-day returns of daily portfolios, which are first sorted according to various firm characteristics and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return on the day following portfolio formation. The daily returns are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Indeed, we find significant differences in average next-day returns between the High-WSB and Low-WSB portfolios of 0.35 percentage points for small-cap stocks (1st tercile) and of 0.10 percentage points for medium-cap stocks (2nd tercile), which are significant at the 1% and 5% level, respectively. In contrast, the average daily return differential between the two portfolios of 0.02 percentage points for large-cap stocks (3rd tercile) is not significant. These results are directly in line with our expectation that the influence of investor attention is stronger for smaller stocks since they display larger price impact from correlated retail trading and are more difficult to arbitrage (Barber et al., 2009). In addition, the significantly higher increase in short interest ratio for the High-WSB portfolio for small-cap stocks provides further support that the return differential arises, at least partly, due to attention-induced mispricing (Appendix 12).

The return differential between the High-WSB and Low-WSB portfolio for small-cap stocks is not only statistically significant but also economically meaningful, amounting to 7.55% on a monthly basis. Figure 4 highlights the substantial outperformance of the High-WSB portfolio when accumulating the daily portfolio returns over time. The difference in total returns equals 178.32% at the end of 2020 and 232.30% at the end of the sample period. Similar to the single sort, the spread in cumulative returns between the High-WSB and Low-WSB portfolio starts to widen in late 2019. Further, Figure 4 demonstrates that the return differential predominantly arises in bull markets. During the downturn related to the Covid-19 pandemic,

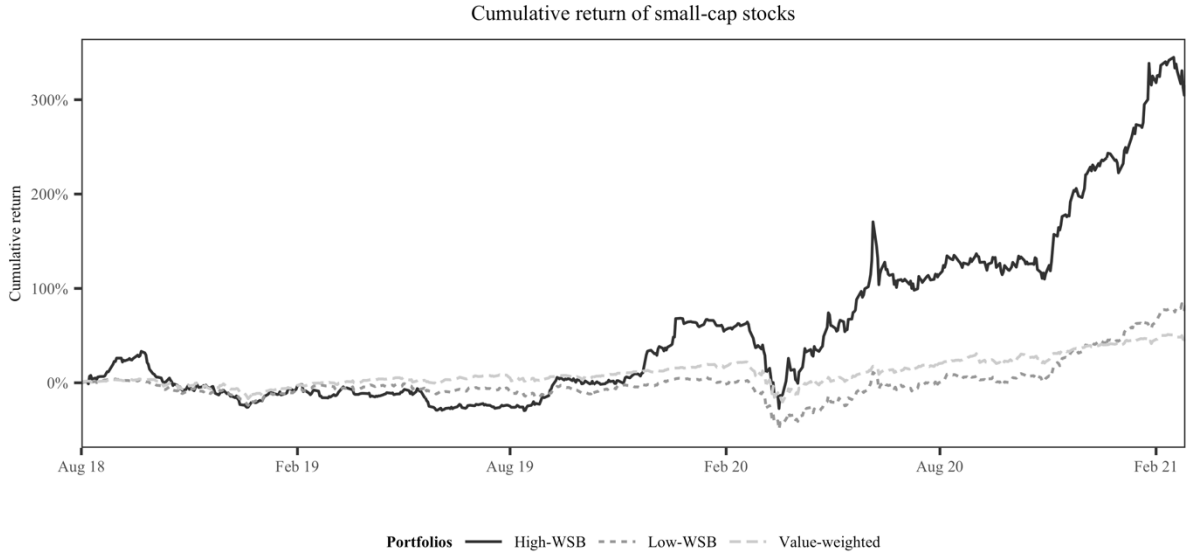


Figure 4: **Cumulative return of small-cap stocks**

This figure shows the cumulative return of the small-cap High-WSB and Low-WSB portfolios over the sample period. In addition, the cumulative return of a value-weighted portfolio is shown. The High-WSB and Low-WSB portfolio are sorted daily. The value-weighted portfolio is comprised of all stocks part of the sample.

the High-WSB portfolio for small-cap stocks experienced a maximum drawdown of -55.75% compared to -50.46% for the Low-WSB portfolio. In general, daily returns of the High-WSB portfolio are more volatile. Yet, its daily Sharpe ratio of 1.38 is still notably higher compared to 0.69 for the Low-WSB portfolio (Appendix 13). Again, we observe that the return differential between the two portfolios strongly increases in 2021. While our findings for the double-sorted portfolios are generally reinforced by the trading turmoil surrounding meme stocks in the beginning of the year 2021, they cannot be explained by these events. The robustness test excluding the year 2021 in section 6.7.1 establishes similar results.

The categorization of stocks into terciles based on the illiquidity ratio further adds to the finding of a stronger impact of investor attention on stocks that experience larger price impact and are more difficult to arbitrage (Table 3 and Appendix 14). We detect significant differentials in average next-day returns between the High-WSB and Low-WSB portfolios of 0.34% for the high illiquidity tercile and of 0.11% for the medium illiquidity tercile. In contrast, the return differential of 0.04% for stocks in the low illiquidity tercile is statistically not significant.

Looking at the double-sorts based on volatility, the evidence for higher next-day returns of the most mentioned tickers for difficult-to-arbitrage stocks is weaker (Table 3 and Appendix 15). We again see the pattern of increasing return differentials between the High-WSB and Low-WSB portfolios with higher difficulty to arbitrage (0.02% for low volatility stocks, 0.03% for medium volatility stocks, and 0.09% for high volatility stocks). However, the return differential for high volatility stocks is only marginally significant at the 10% level.

Regarding the results for abnormal trading activity on the day following portfolio sorts, we observe significantly higher average abnormal dollar volumes and stock turnover rates for the High-WSB portfolio independent of double sort (Appendix 12, 14, and 15). This means that the strong relationship between discussions on WSB and subsequent abnormal trading volume remains even when controlling for various firm characteristics (i.e., market capitalization, liquidity, volatility, book-to-market value, and same-day return[2]). Looking at abnormal illiquidity, the findings are less conclusive as we detect both positive and negative differences in abnormal illiquidity between the High-WSB and Low-WSB portfolios. One underlying reason why the abnormal illiquidity ratio increases for the most discussed small-cap and illiquid stocks could be the extreme returns which lead to higher numerators. This

[2] Results for double-sorted portfolios based on book-to-market value and same-day return are presented in Appendix 39 and Appendix 40

provides further indication that the higher returns described above are at least partly due to price impact from correlated retail trading.

All in all, the analysis of double-sorted portfolios provides additional evidence for the relationship between stock ticker mentions on WSB and attention-induced trading. In particular for small-cap and high illiquidity stocks, the most discussed stocks on WSB are associated with substantially higher next-day returns. Without considering transaction costs, a trading strategy of investing in the High-WSB portfolio generated an annual total return of 74.45% for small-cap stocks and 59.40% for high illiquidity stocks during our sample period. The results highlight that the impact of investor attention varies with the price impact of trading and the difficulty to arbitrage stocks. In the following section, we test our fourth hypothesis whether the higher next-day returns persist when controlling for common risk factors.

6.5 Factor model regressions

To determine whether the most discussed stocks on WSB earn abnormal next-day returns on a risk-adjusted basis, we perform various factor model regressions. In addition to the High-WSB and Low-WSB portfolios, we construct the DMN zero-cost portfolio for this analysis. The DMN portfolio goes long in the High-WSB portfolio and short in the Low-WSB portfolio. The daily returns in excess of the risk-free rate on the day following portfolio sorts of the High-WSB, Low-WSB, and DMN portfolios are regressed on the risk factors of the CAPM, Fama-French three-factor model, and the Carhart four-factor model. The regressions are conducted for the single-sorted and the double-sorted portfolios.

6.5.1 Analysis of factor model regressions

Starting with the factor model regressions for the single-sorted portfolios, the High-WSB portfolio does not generate significant abnormal next-day returns when accounting for risk factors in neither of the factor models (Appendix 16). Similarly, the positive intercepts in the regressions for the DMN zero-cost portfolio are not significant either. From a conceptual perspective, the findings for the single-sorted portfolios can be partly attributed to the large average market capitalization of stocks in the High-WSB portfolio. It can be expected that stocks with large market capitalization experience less price impact from correlated, attention-driven trading of retail investors. Furthermore, the results of the factor model regressions are consistent with the earlier univariate analysis of single-sorted portfolios where we only established a marginally significant difference in average next-day returns between the High-WSB and Low-WSB portfolios.

Going on with the factor model regressions for small-cap, high illiquidity, and high volatility stocks, we find evidence for our fourth hypothesis that the abnormal returns cannot be explained by the portfolios' exposure to risk factors. For small-cap stocks, the High-WSB portfolio generates significant abnormal next-day returns for all factor models (Table 4), amounting to 0.20% in the Carhart four-factor model. Regarding the exposure to risk factors in the Carhart four-factor model, the High-WSB portfolio loads positively on the market, size, and value factors but negatively on the Carhart momentum factor (Appendix 17). The negative exposure of the High-WSB portfolio to the Carhart momentum factor may appear surprising

Table 4:
Double-sorted portfolios for small-cap stocks:
Risk factor exposures and alphas

	Mean	CAPM	Fama-French three-factor model	Carhart four-factor model
Coefficients for DMN portfolio (zero cost)				
MKT - RF		0.1302 **	0.1097 **	0.1133 **
		(0.0512)	(0.0519)	(0.0518)
SMB			0.1681	0.1315
			(0.1143)	(0.1155)
HML			0.0969	-0.0905
			(0.0712)	(0.1192)
MOM				-0.1844* *
				(0.0942)
Constant	**0.0016** *	**0.0015** *	**0.0015** *	**0.0014** *
	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Observations	644	644	644	644
R^2	0	0.01	0.0176	0.0235
Alphas for the High-WSB portfolio (long)				
Constant	**0.0027** **	**0.0018** *	**0.0022** ***	**0.0020** **
	(0.0013)	(0.0010)	(0.0009)	(0.0008)
Alphas for the Low-WSB portfolio (short)				
Constant	**0.0011**	**0.0003**	**0.0007** ***	**0.0006** ***
	(0.0009)	(0.0005)	(0.0002)	(0.0002)

This table shows the coefficients from the factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to their market capitalization and then according to the number of stock ticker mentions on WSB. The DMN portfolio goes long in the High-WSB portfolio and short in the Low-WSB portfolio. MKT - RF represents the exposure of portfolios to the market risk factor, SMB to the size risk factor, HML to the value risk factor, and MOM the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

given that discussions on WSB concentrate to a large degree on stocks with high recent gains. However, the Carhart momentum factor is built based on the one-year momentum in stock returns and thus does not reflect short-term stock returns (Carhart, 1997). Another finding is that the Low-WSB portfolio for small-cap stocks also generates significant abnormal daily returns of 0.06% in the Carhart four-factor model. The fact that the long and short portfolios both generate positive, risk-adjusted abnormal returns can be explained by the equal-weighting approach used to compute portfolio returns (Fang & Peress, 2009). Looking at the DMN zero-cost portfolio for small-cap stocks, we detect a marginally significant positive alpha at the 10% level for all factor models (Table 4). For the Carhart four-factor model, the intercept for risk-adjusted daily excess returns equals 0.14%. This abnormal return is economically meaningful, amounting to 42.82% annually. In total, the factor model regressions for small-cap stocks suggest that ticker mentions on WSB for these stocks can predict risk-adjusted excess returns on the day following portfolio sorts.

We establish similar findings for the High-WSB portfolio of the high illiquidity tercile (Appendix 17 and 18). Again, the High-WSB portfolio has a significant positive loading on the market, size, and value risk factors but negative on the momentum risk factor. In the Carhart four-factor model, the High-WSB portfolio for high illiquidity stocks generates a significant risk-adjusted alpha of 0.16%. This provides additional support for the fourth hypothesis that abnormal returns for the most discussed stocks on WSB remain when controlling for risk factors. Looking at the DMN zero-cost portfolio for high illiquidity stocks, we find a positive intercept for risk-adjusted daily returns of 0.11%. Even though it amounts to 31.84% annually, the intercept is statistically not significant.

For high volatility stocks, the evidence for risk-adjusted abnormal returns is weaker. The positive intercept 0.13% for the High-WSB portfolio is marginally significant at the 10% level in the Carhart four-factor model (Appendix 19). Regarding the DMN zero-cost portfolio for high volatility stocks, the positive intercept 0.08% in the Carhart four-factor model is not significant.

Overall, the factor model regressions suggest that discussion activity on WSB can predict abnormal risk-adjusted returns for small-cap and illiquid stocks on the day following portfolio sorts. These types of stocks experience larger price impact from attention-induced buying pressure and are more difficult to arbitrage. While the evidence for high volatility stocks is less conclusive, we generally find support for our fourth hypothesis that abnormal returns persist when controlling for risk factors.

6.6 Event-time analysis

To determine whether the higher returns of the most discussed stocks on WSB represent temporary price pressure or whether they persist over a longer horizon, event-time analyses are performed for the single-sorted portfolios and the double-sorted portfolios based on market capitalization, illiquidity ratio, and volatility (Figure 5 and Appendix 20 to 23). We begin with a brief analysis of stock returns over the ten-day period before portfolio formation and then focus on the cumulative returns over 40-day, half-year, and one-year horizons.

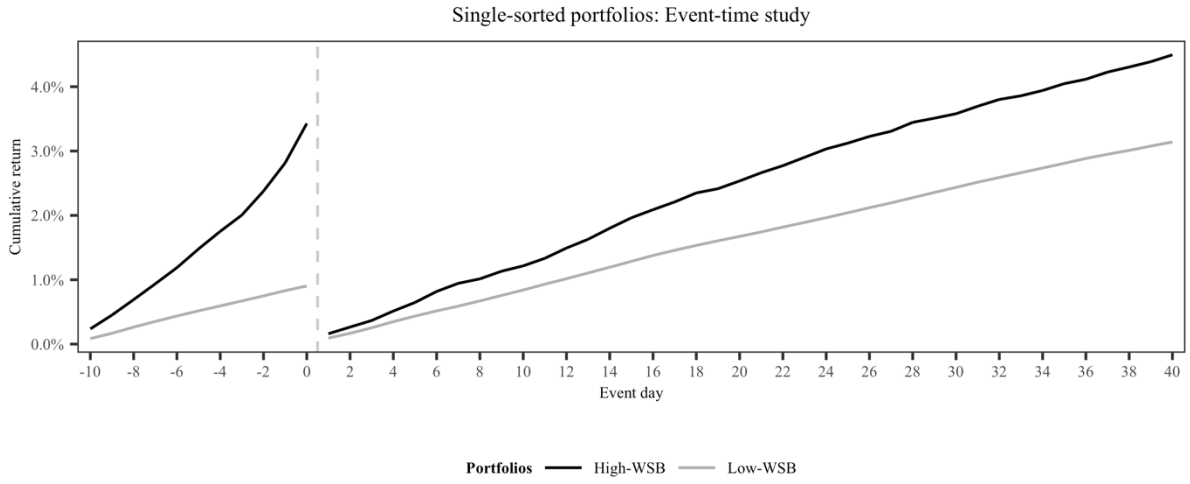


Figure 5: **Single-sorted portfolios: Average cumulative returns of High-WSB and Low-WSB stocks before and after portfolio formation**

This figure shows the average cumulative returns of stocks in the single-sorted High-WSB and Low-WSB portfolios before and after portfolio formation. Stocks are sorted into the High-WSB or Low-WSB portfolios according to the number of stock ticker mentions on a given day. The cumulative return is calculated from day -10 to day 0 and from day 0 to day 40, respectively.

6.6.1 Period before portfolio formation

Firstly, we detect a significant positive return differential between the High-WSB and Low-WSB portfolios in the period prior to portfolio formation for stocks across all firm characteristics, especially for small-cap, illiquid, and volatile firms. For example, the cumulative difference in returns between the High-WSB and Low-WSB portfolios from day -10 until day -1 equals 3.27% for small-cap stocks, 2.31% for medium-cap stocks, and 1.13% for large-cap stocks (Appendix 21), underlining that heavily discussed stocks on WSB, on average, experience substantial short-term momentum. While stocks with high previous losses are also among the frequently mentioned stocks on WSB, the vast majority are still stocks with high gains during the last days. Similarly, the difference in means for daily returns on the day of portfolio formation between the High-WSB and Low-WSB portfolios is positive for the

single sort and all double sorts (e.g., 0.84% for small-cap stocks, 0.51% for medium-cap stocks, and 0.23% for large stocks; Appendix 21).

6.6.2 Period after portfolio formation

When testing our fifth hypothesis that attention-driven price movements revert over a longer horizon, we do not identify any evidence of return reversals over the 40 trading days following portfolio formation. In contrast, we observe almost monotonously increasing differences in cumulative returns between the High-WSB and Low-WSB portfolios across all portfolio sorts. This finding generally does not correspond to literature on investor attention which detects return reversals over such a horizon (e.g., Da et al., 2011; Joseph et al., 2011). Similar to our results, however, a recent paper on retail investor interest by Cheng et al. (2020) does not find return reversals either when analyzing one-month periods. Note that our findings are not a consequence of the equal-weighting approach and the return differentials remain similar when comparing the High-WSB portfolios with the value-weighted sample averages (Appendix 20 to 23). Furthermore, the finding of increasing cumulative return differentials shows that stocks in the High-WSB portfolio do not simply start trading at a higher price on the day following portfolio sorts but prices keep rising. Looking at the second day after portfolio formation, for example, we still see significantly higher average daily returns of the High-WSB portfolios for small-cap and high illiquidity stocks (Appendix 24). From a trading perspective, this result is beneficial as it allows to better exploit attention-induced returns.

Comparing the cumulative return differential across firm characteristics, we again see the pattern of higher differences in means between the High-WSB and Low-WSB portfolios for small-cap, illiquid, and volatile stocks. For example, the cumulative 40-day return differential between the two portfolios equals 10.88% for small-cap stocks, 3.97% for medium-cap stocks, and 0.95% for large-cap stocks (all values are significant at the 1% level; Appendix 20). These findings are in line with Barber et al. (2009) who also detect higher and longer lasting cumulative market-adjusted returns for small-cap than for large-cap firms.

Analyzing cumulative average returns over six-month and one-year horizons, we again see little evidence for return reversals (Appendix 20 to 23). Once more, we rather see the opposite picture of rising outperformance of the most discussed stocks on WSB over time. For example, the cumulative return differential between the High-WSB and Low-WSB portfolio amounts to 6.55% after six months and 25.21% after twelve months for the single sort. For the double-sorted portfolios, we observe the same pattern of increasing return differentials between the High-WSB and Low-WSB portfolios over time. When comparing cumulative returns of

the High-WSB portfolios to the value-weighted cumulative returns of the entire sample, we detect minor indications of return reversal over a one-year horizon for some double sorts. One driver of the high cumulative returns is the limited portfolio size of the High-WSB portfolios combined with the equal-weighting approach as stocks with extreme positive stock price developments push up returns of the overall High-WSB portfolio. When excluding stocks with extreme positive cumulative returns from the High-WSB portfolio, we identify some indication of return reversal (Appendix 25). Generally, the results for the cumulative returns over six-months and one-year horizons have to be considered with caution due to the short period of our sample of 2.5 years[3], limiting the number of independent observations. In a nutshell, we find little support for our fifth hypothesis that the higher short-term returns of the High-WSB portfolios subsequently revert but rather see increasing returns differentials over at least 40 days following portfolio sorts.

6.7 Robustness tests

In this section, we show that the results discussed above are robust to changes to our methodology. Our analysis is examined for robustness of the sample period, sorting mechanism, portfolio size, and frequency of portfolio formation. We also rule out that persistence in portfolio returns drives our results.

6.7.1 Sample period

The trading turmoil surrounding meme stocks in the beginning of the year 2021 represents a special time period where the link between the online message board WSB and the stock market was arguably stronger than usual. To address the concern that this period alone can explain our results, we perform an analysis excluding the year 2021. In addition, we conduct two separate robustness tests starting our sample period in 2019 and 2020, respectively, since the number of stock ticker mentions on WSB was lower in the beginning of our sample period. Thus, stock discussions on WSB were presumably a weaker proxy for investor attention during that time. The results of these robustness tests are all largely in line with our main analysis and presented in detail in Appendix 26 to Appendix 28.

We start with the analysis excluding the year 2021 from our sample (Appendix 26). We again see significant differences in next-day abnormal trading activity between the High-WSB and Low-WSB portfolios for the single-sorted and all double-sorted portfolios, confirming our

[3] Our sample period is from August 2018 to February 2021. The cumulative one-year return can only be calculated for portfolios that were sorted until February 2020.

hypothesis that stock discussions on WSB can predict abnormal trading activity. For the double-sorted High-WSB portfolios, we also find significant abnormal returns for the most discussed stocks on WSB for small-cap and high illiquidity stocks, which remain when controlling for risk factors in the Carhart four-factor model. However, we do not see significant results for high volatility stocks. Whereas the absolute return differentials between the High-WSB and Low-WSB portfolios are generally slightly lower than in the main study, they remain meaningful and we observe the same pattern of increasing return differentials over time.

The robustness tests when starting our analysis in 2019 and 2020, respectively, establish similar results as in the main study (Appendix 27 and 28). Despite the lower number of subscribers and stock ticker mentions on WSB in the beginning of our sample period, we do not see stronger effects when starting our analysis at later dates. The size of the return differentials between the High-WSB and Low-WSB are in line with our main study, showing that it is robust to changes in the sample period.

6.7.2 Sorting mechanism

In the main study, we use the total number of stock ticker mentions on WSB as a proxy for investor attention. As an alternative, we propose to analyze the abnormal number of stock ticker mentions as a proxy for the change in investor attention on specific stocks. Thereby, we aim to get an indication of the buying pressure resulting from abnormal retail investor interest. Further, this measure prevents the potential issue that stocks remain part of the High-WSB portfolio for a long time. In contrast to our proxy in the main study, the abnormal number of stock ticker mentions is affected by the natural rise of mentions over time due to subscriber growth. Therefore, we use stock ticker mentions per subscriber for this analysis. The abnormal number of ticker mentions per subscriber is defined as:

$$AMS_t^i = MS_t^i - Median\ (MS_{t-1}^i, \ldots, MS_{t-21}^i) \tag{10}$$

where AMS_t^i are stock *i's* abnormal ticker mentions per subscriber and MS_t^i the mentions per subscriber. Each day, we assign 30 stocks with the highest number of abnormal stock ticker mentions on WSB in the Abnormal High-WSB portfolio and the remainder of the sample in the Abnormal Low-WSB portfolio. Subsequently, we perform the same analyses as in the main study and the results are presented in Appendix 29.

When building our portfolios based on abnormal stock ticker mentions, we again have very similar findings as in our main study and some relationships are even stronger. For example, we do not only find significantly higher next-day returns of stocks with abnormally

high ticker mentions for small-cap and illiquid stocks, but also for high volatility stocks. The excess return of the Abnormal High-WSB portfolio for high volatility stocks remains significant when controlling for risk factors in the Carhart four-factor model. Consequently, this robustness test provides even stronger support for our third hypothesis that the impact of investor attention is stronger for small-cap, illiquid, and volatile stocks. Otherwise, we generally find the same relationships between discussions on WSB and the stock market when building portfolios based on abnormal stock ticker mentions as for portfolios based on total stock ticker mentions.

6.7.3 Portfolio size and subsets

Whereas the High-WSB portfolio in the main analysis is built daily by selecting the 30 most mentioned stocks on WSB, we change the portfolio size to the 5, 10, 20, and 40 most mentioned stocks in this section. Choosing a larger portfolio than 40 would be ineffectual due to the described skewed nature of stock discussions on WSB, which focus on a small quantity of stocks. By building a very small portfolio of 5 and 10 stocks, respectively, we do not only check whether our findings still hold but also whether they are driven by a small subset of the most discussed stocks. For the same rationale, we additionally analyze if we find differences within our portfolio of 30 stocks by comparing the 10 most mentioned stocks with the following 20 stocks for any given day.

For the portfolio sizes of the 40 and 20 most mentioned stocks, the robustness tests identify similar results as in our main study (Appendix 30 and 31). The most discussed small-cap stocks and high illiquidity stocks on WSB are associated with significantly higher next-day returns that persist when controlling for risk factors in the Carhart four-factor model. Interestingly, when increasing the portfolio size to the top 40 most mentioned stocks, we find stronger support for our third hypothesis. In addition to abnormal returns of the High-WSB portfolio for small-cap and illiquid stocks, we detect significant abnormal returns for high volatility stocks.

Looking at the High-WSB portfolio consisting of the 10 and 5 most mentioned stocks on WSB, we do not find evidence that these stocks particularly drive our findings (Appendix 32 and 33). For the single-sorted portfolios, the next-day return differentials between the High-WSB and Low-WSB are not significant. For the double-sorted portfolios, we find the same patterns as for a portfolio size of 30 and also the size of absolute return differentials is largely in line. Depending on the double sort, we even identify lower return differentials compared to the main study.

Supporting the finding that our results are not confined to a narrow group of stocks, next-day returns are not significantly different between the 10 most mentioned stocks and the following 20 stocks (Appendix 34). Only for our measures of trading volume, we indeed find significantly higher abnormal dollar volume and stock turnover rates for the 10 most discussed stocks. Nevertheless, both measures are still considerably higher for the most discussed stocks ranked 11 to 30 than for the Low-WSB portfolio. In general, this robustness test comparing the two subsets of our High-WSB portfolio suggests that a high number of stock ticker mentions on WSB is associated with investor attention but the exact ranking position provides little additional information.

6.7.4 Portfolio formation frequency

In the main analysis, we focus on daily portfolio formation to investigate the relationship between ticker mentions on WSB and the stock market due to the fast-changing nature of stock discussions and the creation of new discussion threads for each trading day. In this section, we conduct a robustness test based on weekly portfolio formation of the 30 most mentioned stocks. Weekly portfolio sorts have the advantage that they are easier to implement as a trading strategy thanks to lower transactions costs. To get a better proxy for investor attention, stocks need to be mentioned at least five times in a given week to be included in the weekly High-WSB portfolio. Thereby, we avoid getting large High-WSB portfolios of rarely mentioned stocks in the early time of the sample period when total ticker mentions on WSB were still low.

Starting with a descriptive analysis of the difference of average weekly returns between the High-WSB and Low-WSB portfolios in the same week of portfolio formation, we find a return differential of 1.44% (Appendix 35). Regarding the week following portfolio sorts, we discover significantly higher abnormal trading activity for stocks in the single-sorted High-WSB portfolio. However, the return differential between the two portfolios of 0.25% is not significant. For the double-sorted portfolios, we identify the same expected pattern as for daily portfolio formation of larger and significant next-week return differentials between the High-WSB and Low-WSB portfolios for small-cap and illiquid stocks (Appendix 36). The difference in average next-week returns amounts to 1.28% for small-cap and to 1.12% for illiquid stocks. From a trading perspective, these return differentials seem to be large enough to trade profitably even when considering transaction costs of weekly portfolio sorts. Overall, the robustness test shows that the overall findings do not only hold for daily but also for weekly portfolio formation.

6.7.6 Persistence in portfolio returns

Stocks with extremely high recent returns are often among the most mentioned stocks on WSB and persistence in returns could be a possible explanation for the outperformance of the High-WSB and DMN portfolios. To control for persistence in portfolio returns, we regress the next-day returns of our portfolios on their previous returns in regression analyses. We do this in two ways. Firstly, we include the returns on the day of portfolio formation and secondly, the cumulative returns over the ten days before portfolio formation as control variables in the regressions. We run regressions of next-day returns on both control variables individually and also include them as fifth variables in the Carhart four-factor model, respectively. If the past returns cannot predict future returns of our portfolios, we can rule out that persistence of returns explains the outperformance of our portfolios. The results are presented in Appendix 37.

For the single sort, we find that the additional control variables are not adding to the explanatory power of the regressions neither when regressing solely on them nor when including them in the Carhart four-factor model. For all regressions, none of the coefficients of the control variables is significantly different from zero at the 5% level. Regarding the double sorts for small-cap and illiquid stocks, we observe significant coefficients for the same-day control variable. However, if significant, the coefficient tends to be negative and rather adds to the significance of the alphas generated by the most discussed small-cap and high illiquidity stocks. Similarly, the control variable for the cumulative ten-day return does not suggest return persistence as it is not significant in most regression analyses. In general, since we find no systematic way in which past returns influence future returns, we consider return persistence not as the driver behind the abnormal next-day returns generated by the most discussed stocks on WSB.

In conclusion, our findings are robust to changes in our methodology such as different sample periods or different ways to construct the High-WSB portfolio. Further, persistence in portfolio returns cannot explain our results. This emphasizes the relationship between investor attention as proxied by ticker mentions on WSB and the stock market.

7 Limitations and areas for future research

In this section, we present limitations of our study and potential fruitful areas for future research. Firstly, daily portfolio sorts make it costly to trade on the most mentioned stocks on WSB. Although we establish that our results are robust for weekly portfolio sorts, we do not test its profitability as a trading strategy. Thus, future research could evaluate transaction costs and construct an implantable trading strategy. While our study concentrates on closing prices, such research could distinguish between price movements from market closing to market opening and price movements within the next trading day. Further, we propose with more data becoming available to study ticker mentions on WSB over a longer time as the short sample period of 2.5 years imposes limitations on the testing approach.

Secondly, our data only counts stock ticker mentions on WSB and does not cover actual trading. Thus, it remains to investigate if ticker mentions are indeed directly related to trading by retail investors. While WSB increased in size and popularity during the sample period, it is not fully clear if users are representative of the broader retail investor community. Given the characteristics of the WSB community, it seems possible that WSB subscribers might represent a special subset of retail investors. Moreover, stock discussions on WSB could be influenced by a minority of users or by users that post spam comments. Therefore, future research could further investigate the appropriateness of stock ticker mentions as a proxy for investor attention. This analysis could include studying the user characteristics and discussion behavior in detail. Furthermore, it should be examined if retail investors are indeed net buyers of the most mentioned stocks on WSB. We establish that these stocks have attention-grabbing attributes but do not have data on the actual trading behavior. So far, there is only some indication that WSB and retail trading are related (e.g., Bradley et al., 2021).

Thirdly, we study posts on WSB independent of the posts' content, length, and opinion about stock price movements by building portfolios based on the number of daily stock ticker mentions. This allows to extend our study by three different means. To begin with, future research could employ intraday data to evaluate the effect of ticker mentions on trading activity and stock returns on a more granular level. This could also address the possible issue of reverse causality. It would be interesting to analyze in more detail if the observed same-day returns are driven by attention or if attention is rather driven by same-day returns. Next, instead of using a portfolio sorting approach based on the relative attention a stock receives on WSB compared to other stocks, our study can be extended by predicting returns and trading activity of a specific stock directly from its number of ticker mentions on WSB. Thus, one could determine whether

the absolute frequency of ticker mentions provides additional information about investor attention. Lastly, we suggest to examine posts on WSB in greater depth to investigate information beyond attention. Thereby, one could reveal other channels than the one studied in this paper. According to Tumarkin and Whitelaw (2001), two additional channels exist how discussions on online message boards can help to predict stock price movements and trading volumes. Besides attention-induced trading, the authors propose that posts on online forums could disclose new information or give an indication about investor sentiment. By studying the language and opinion entailed in posts, one could discover the channels that effectively influence trading activity and stock prices.

Finally, we propose to investigate when and what type of stocks are heavily discussed on WSB. Future research could relate stock ticker mentions to earnings announcements, news appearance, and important company events such as IPOs or mergers. Furthermore, such research could reveal whether discussions on WSB are centered on certain industries, which may contribute to the outperformance of our High-WSB portfolios.

8 Conclusion

This paper investigates the ability of discussions on WSB to forecast abnormal stock returns and trading activity by using a portfolio sorting approach. For this purpose, we employ stock ticker mentions in the daily discussion threads on WSB as a proxy for investor attention to examine its impact on the U.S. stock market. This proxy has the advantage that it can directly measure the attention people pay toward specific stocks and is available on a real-time basis. In our study, we take daily observations over the period from August 2018 to February 2021 to analyze stock ticker mentions and subsequent market movements of 2,638 U.S. companies.

First of all, our paper establishes that discussions on WSB are centered on attention-grabbing stocks, which is consistent with previous studies on investor attention and retail trading. The most discussed stocks on WSB have extreme recent returns, high abnormal trading activity, and large market capitalizations. We then detect that a portfolio of the most mentioned stocks on WSB is associated with significantly higher abnormal dollar volume, abnormal stock turnover, and abnormal liquidity on the day following portfolio sorts, which indicates attention-induced trading. As expected, the impact of attention-induced trading on stock returns varies across firm characteristics. Our paper provides evidence that investor attention particularly affects returns of small-cap and illiquid stocks, which experience larger price impact from correlated retail trading and are more difficult to arbitrage. We find that a portfolio of the most discussed small-cap and illiquid stocks generates significantly higher next-day returns that remain when controlling for risk factors. For high volatility stocks, the evidence for attention-induced abnormal returns is weaker and we only observe marginal significance.

One notable finding of our study is that the abnormal next-day returns of the most mentioned small-cap and illiquid firms are not only statistically significant but also meaningful in size. The risk-adjusted alpha in the Carhart four-factor model of the High-WSB portfolio amounts to 65.42% for small-cap and to 48.62% for high illiquidity stocks on an annual basis. While daily portfolio sorts cause substantial transaction costs, the robustness of our findings to weekly portfolio formation suggests that stock ticker mentions on WSB can be employed to construct a profitable trading strategy.

In contrast to earlier literature, the return differentials between the High-WSB and Low-WSB portfolios do not subsequently reverse but rather increase over a horizon of at least two months. Therefore, strong investor attention as proxied by ticker mentions on WSB seems to be a continuation signal in the short run. It remains to determine whether this result is an artifact of our sample period or also holds over longer time frames.

To conclude, this paper contributes to literature on investor attention by introducing a novel measure to this field that can be employed to predict stock price movements and abnormal trading activity. Especially for small-cap and illiquid stocks, our measure can forecast higher risk-adjusted returns in the short run. Thanks to the recent media attention and substantial subscriber growth of WSB, we expect the relationship between discussions on WSB and the stock market to become even stronger in the future. In combination with the rising share of retail trading and the increasing interaction of individual investors via social media, the findings of our paper may gain even more relevance going forward.

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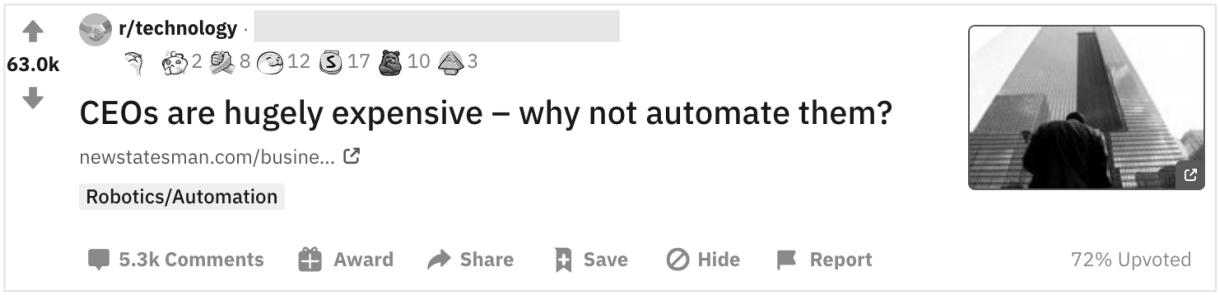
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Appendices

Overview of appendices			
Appendices	**Section name**	**Section number**	**Page**
1–6	Description of Reddit and WallStreetBets	2	48
7	Financial market data	4.2	56
8–9	Characteristics of stocks discussed	6.2	57
10–11	Single-sorted portfolios	6.3	60
12–15	Double-sorted portfolios	6.4	62
16–19	Factor model regressions	6.5	66
20–25	Event-time analysis	6.6	71
26–37	Robustness tests	6.7	77
38–40	Other appendices	–	101

Appendix 1
Examples of submissions on Reddit

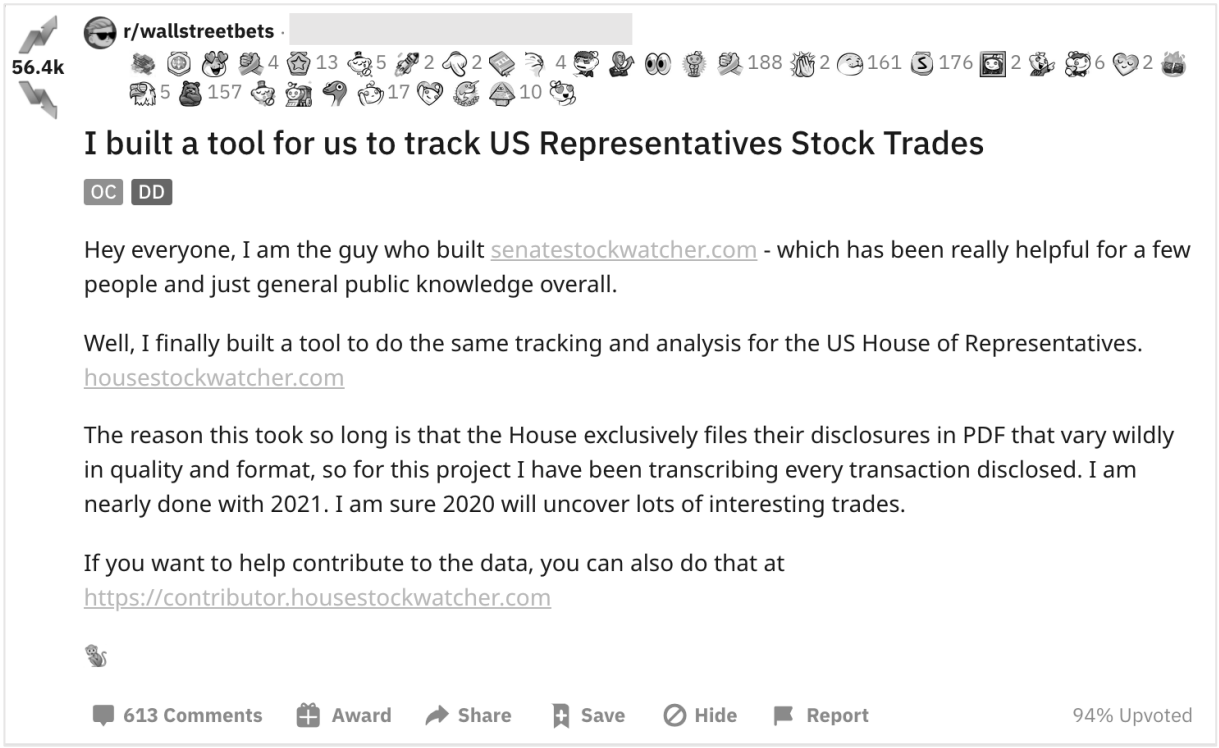
1.1



This picture shows an example of a submission on Reddit. This submission was posted on the subreddit r/technology. It contains a title and a link to an article on an external website. Other users voted (upvoted or downvoted) and commented on this submission.

Source: https://www.reddit.com/r/technology/

1.2



This picture shows an example of a submission on the subreddit WallStreetBets. It contains a titled post with links to external websites. Other users voted (upvoted or downvoted) and commented on this submission.

Source: https://www.reddit.com/r/wallstreetbets/

1.3



This picture shows an example of a submission on the subreddit WallStreetBets. This post represents a meme. Other users voted (upvoted or downvoted) and commented on this submission.

Source: https://www.reddit.com/r/wallstreetbets/

Appendix 2
Table of contents of WSB's content guide

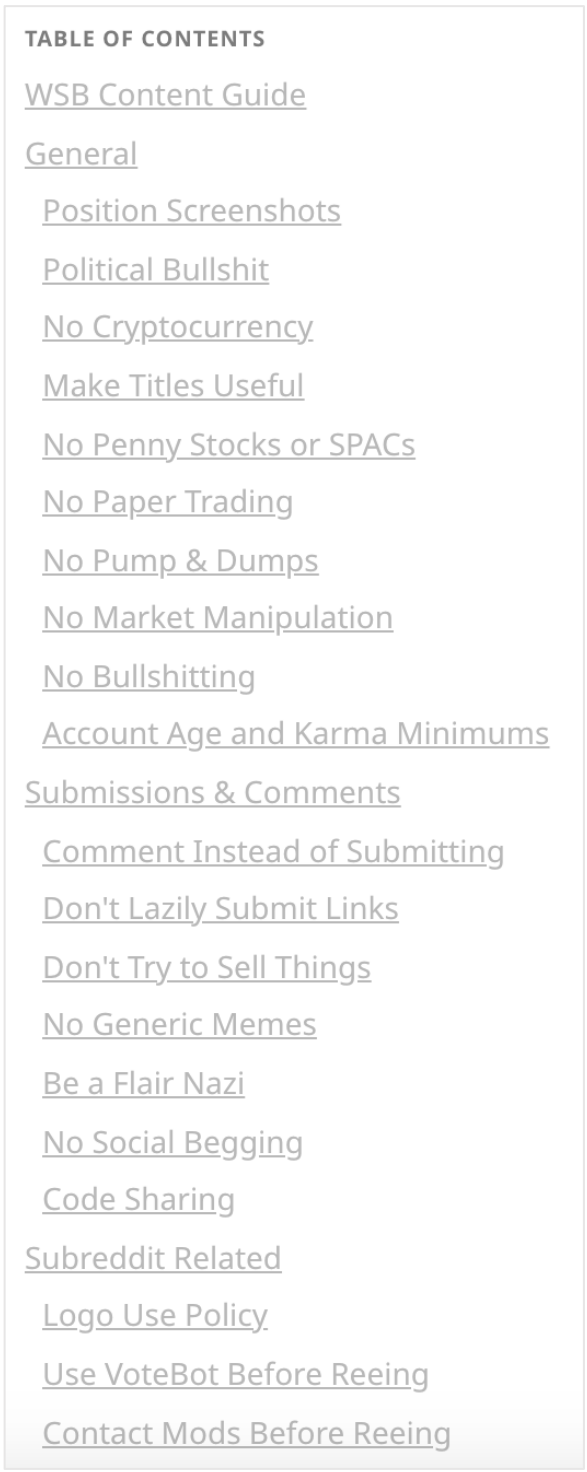


TABLE OF CONTENTS

WSB Content Guide

General

- Position Screenshots
- Political Bullshit
- No Cryptocurrency
- Make Titles Useful
- No Penny Stocks or SPACs
- No Paper Trading
- No Pump & Dumps
- No Market Manipulation
- No Bullshitting
- Account Age and Karma Minimums

Submissions & Comments

- Comment Instead of Submitting
- Don't Lazily Submit Links
- Don't Try to Sell Things
- No Generic Memes
- Be a Flair Nazi
- No Social Begging
- Code Sharing

Subreddit Related

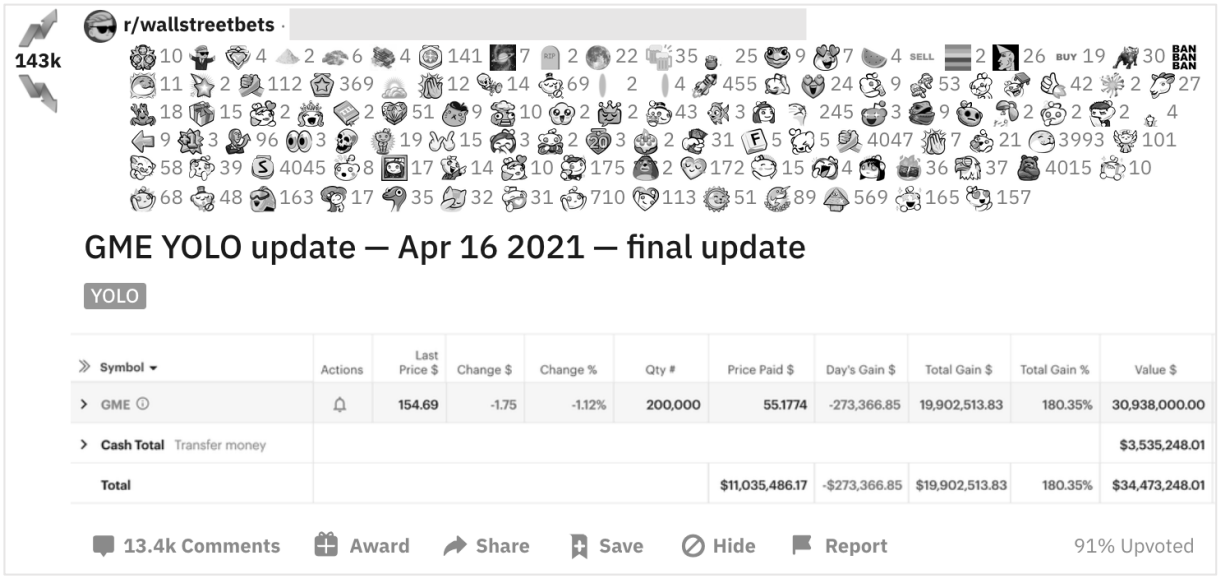
- Logo Use Policy
- Use VoteBot Before Reeing
- Contact Mods Before Reeing

This picture shows the table of contents of the content guide on WSB. It is created by the moderators of WSB and states the rules for submissions on WSB. These rules are updated based on new developments.

Source: https://www.reddit.com/r/wallstreetbets/wiki/contentguide

Appendix 3
Position screenshots of WSB users

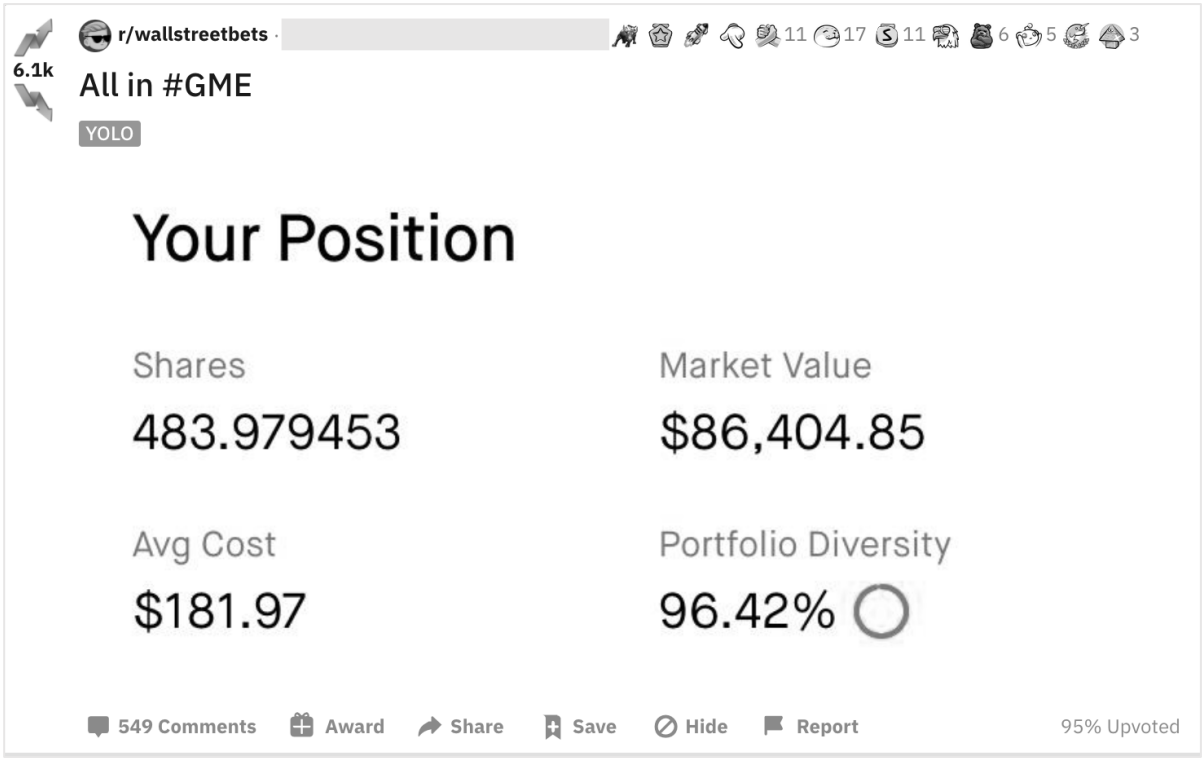
3.1



This picture shows an example of a position screenshot on WSB. Other users can comment and vote on position screenshots in the same way as on other submissions. Position screenshots are encouraged by the WSB content guide to increase the reliability of advice.

Source: https://www.reddit.com/r/wallstreetbets/

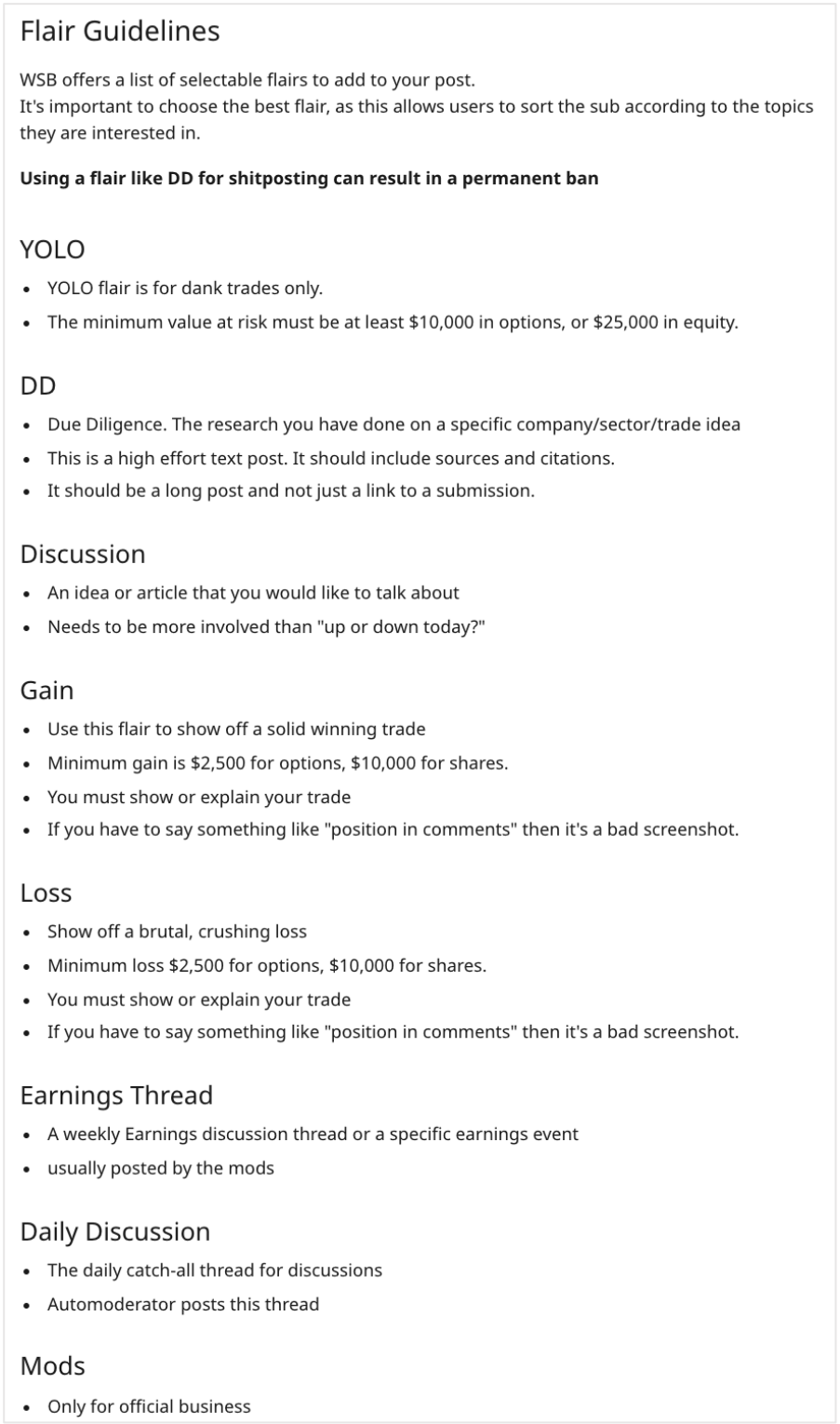
3.2



This picture shows an example of a position screenshot on WSB. Other users can comment and vote on position screenshots in the same way as on other submissions. Position screenshots are encouraged by the WSB content guide to increase the reliability of advice.

Source: https://www.reddit.com/r/wallstreetbets/

Appendix 4
Categorization of submission on WSB: Flair guidelines



Flair Guidelines

WSB offers a list of selectable flairs to add to your post.
It's important to choose the best flair, as this allows users to sort the sub according to the topics they are interested in.

Using a flair like DD for shitposting can result in a permanent ban

YOLO

- YOLO flair is for dank trades only.
- The minimum value at risk must be at least $10,000 in options, or $25,000 in equity.

DD

- Due Diligence. The research you have done on a specific company/sector/trade idea
- This is a high effort text post. It should include sources and citations.
- It should be a long post and not just a link to a submission.

Discussion

- An idea or article that you would like to talk about
- Needs to be more involved than "up or down today?"

Gain

- Use this flair to show off a solid winning trade
- Minimum gain is $2,500 for options, $10,000 for shares.
- You must show or explain your trade
- If you have to say something like "position in comments" then it's a bad screenshot.

Loss

- Show off a brutal, crushing loss
- Minimum loss $2,500 for options, $10,000 for shares.
- You must show or explain your trade
- If you have to say something like "position in comments" then it's a bad screenshot.

Earnings Thread

- A weekly Earnings discussion thread or a specific earnings event
- usually posted by the mods

Daily Discussion

- The daily catch-all thread for discussions
- Automoderator posts this thread

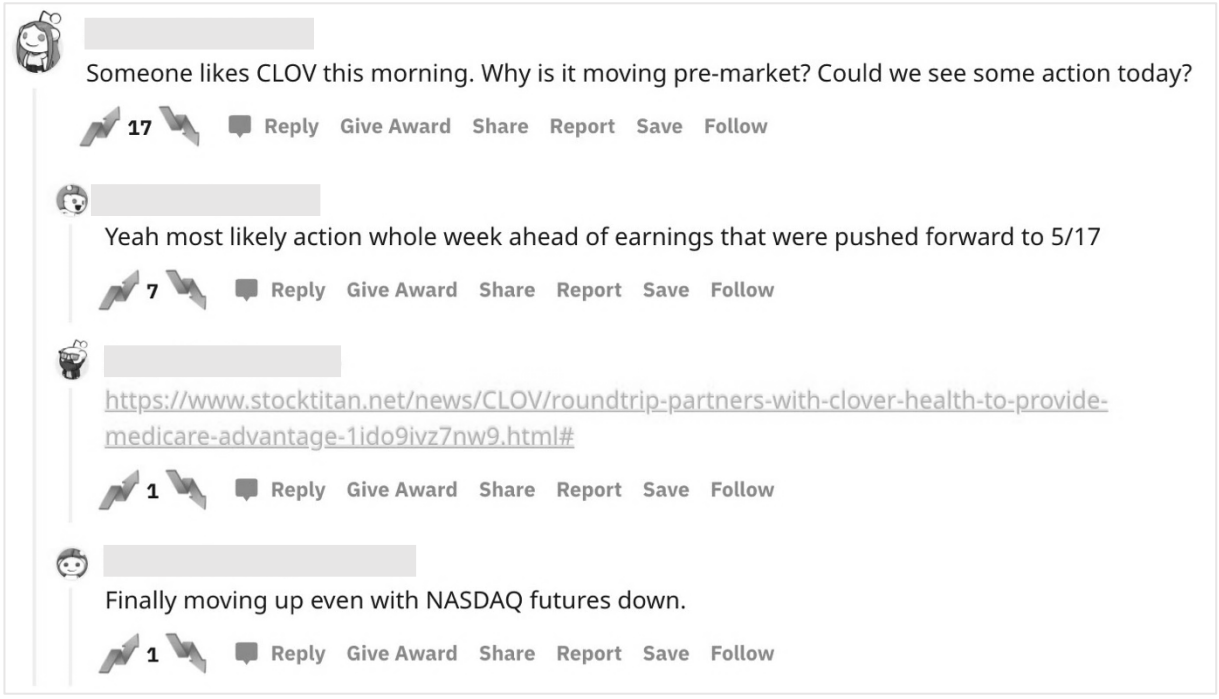
Mods

- Only for official business

This picture entails an explanation of the most common flairs that users can add to their posts to categorize them.
Source: https://www.reddit.com/r/wallstreetbets/wiki/linkflair

Appendix 5
Stock discussions in the Daily Discussion threads

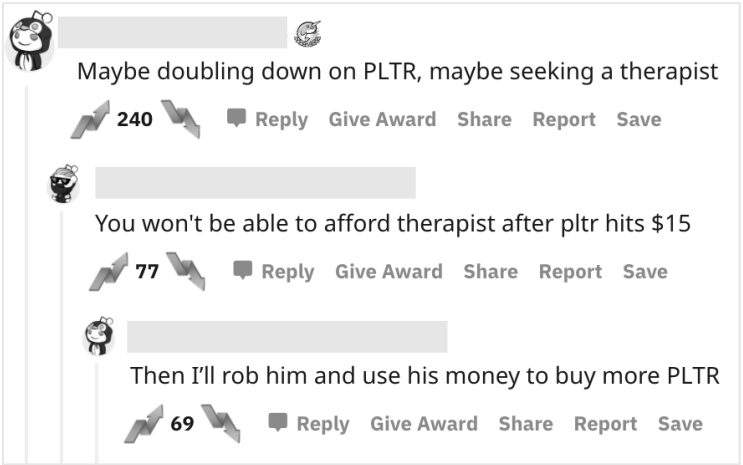
5.1



This picture shows an example of stock discussions in the Daily Discussion threads on WSB. Users make posts and include the stock ticker of the company they would like to discuss. Other users can vote and comment on posts.

Source:
https://www.reddit.com/r/wallstreetbets/search?q=flair_name%3A%22Daily%20Discussion%22&restrict_sr=1&sort=new

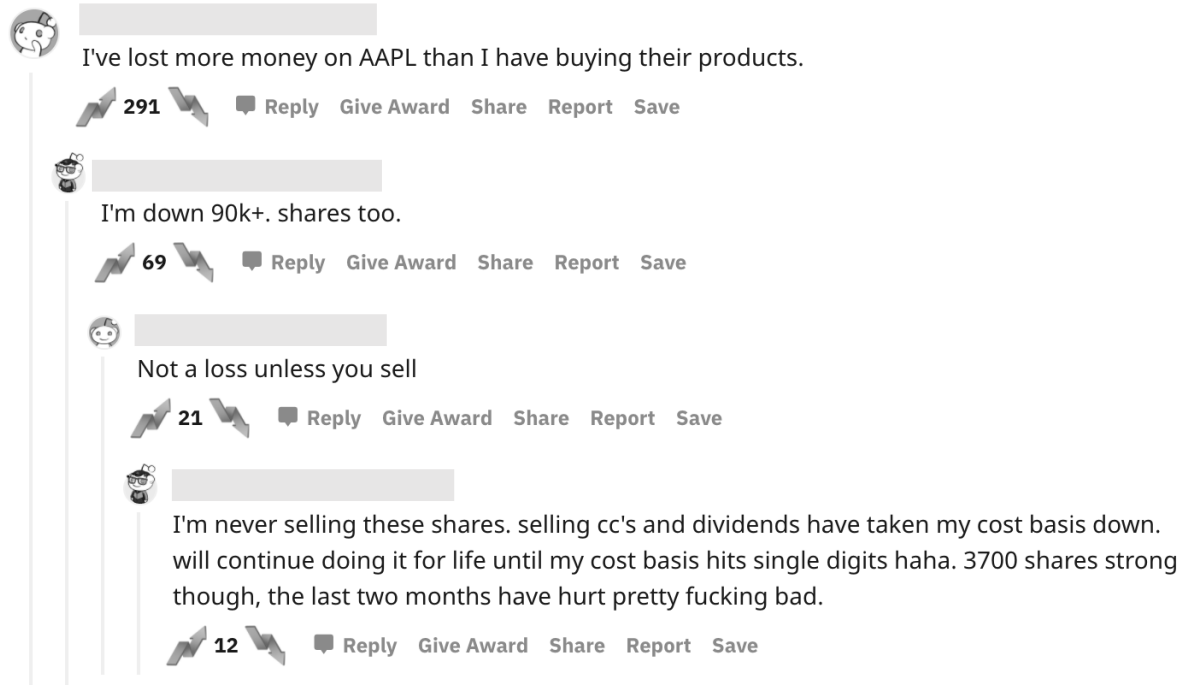
5.2



This picture shows an example of stock discussions in the Daily Discussion threads on WSB. Users make posts and include the stock ticker of the company they would like to discuss. Other users can vote and comment on posts.

Source:
https://www.reddit.com/r/wallstreetbets/search?q=flair_name%3A%22Daily%20Discussion%22&restrict_sr=1&sort=new

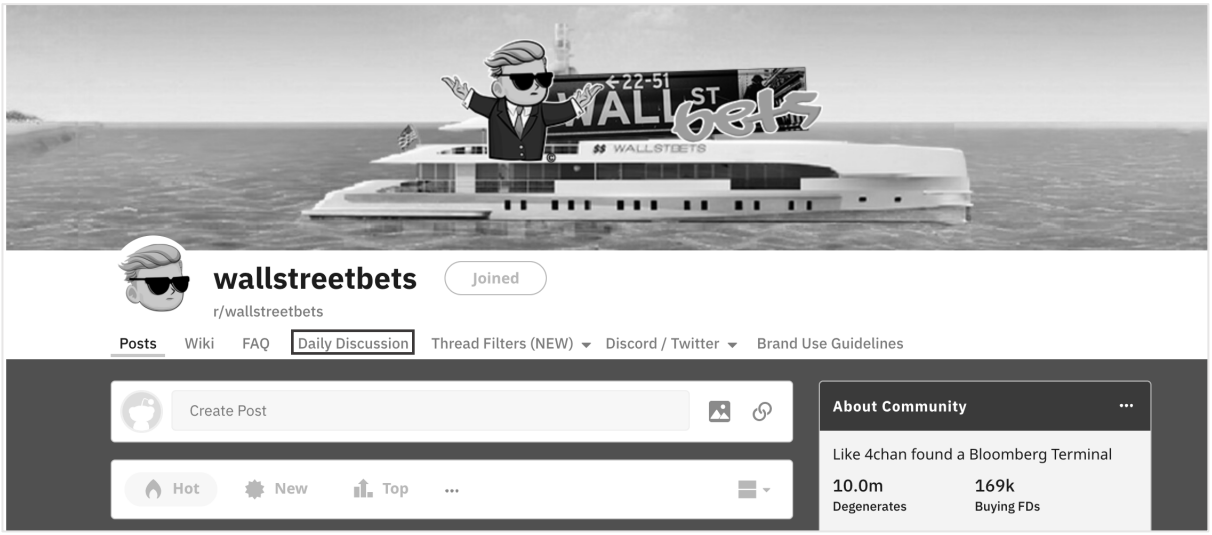
5.3



This picture shows an example of stock discussions in the Daily Discussion threads on WSB. Users make posts and include the stock ticker of the company they would like to discuss. Other users can vote and comment on posts.

Source: https://www.reddit.com/r/wallstreetbets/search?q=flair_name%3A%22Daily%20Discussion%22&restrict_sr=1&sort=new

Appendix 6
Navigation pane of WSB



This picture shows the navigation pane of WSB. The Daily Discussion threads are easily accessible from the top bar.

Source: https://www.reddit.com/r/wallstreetbets/

Appendix 7
Calculation of total returns

Total daily returns are derived by first calculating adjusted closing prices:

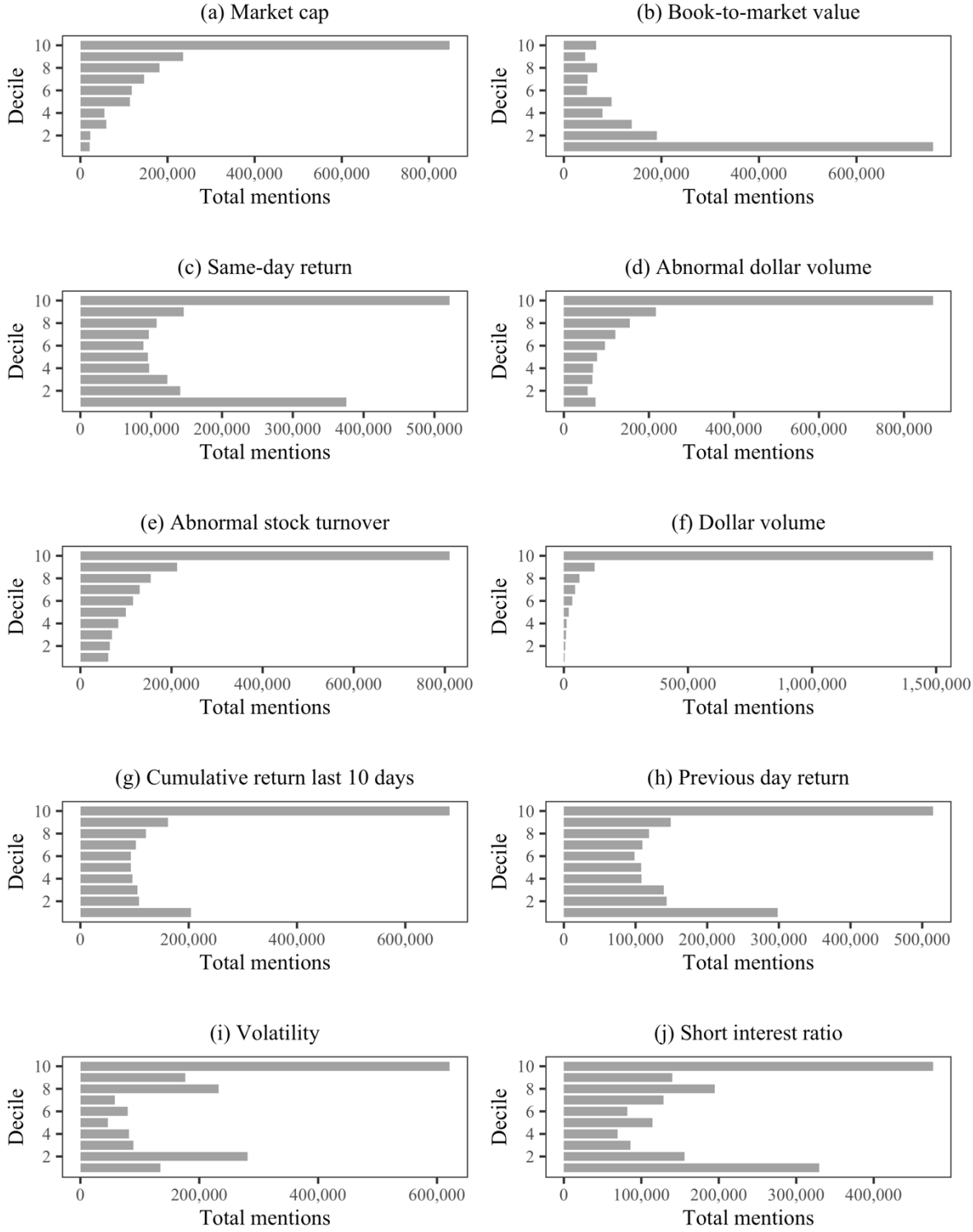
$$Adj.P_t^i = \frac{P_t^i}{AJEXDI_t^i} * TRFD_t^i \tag{11}$$

where $Adj.P_t^i$ is the adjusted closing price, P_t^i the actual closing price, $AJEXDI_t^i$ the adjustment factor for stock splits, and $TRFD_t^i$ a stock *i's* total return factor, which is used to adjust for dividend payments. Then the total return is calculated as follows:

$$R_t^i = \frac{Adj.P_t^i - Adj.P_{t-1}^i}{Adj.P_{t-1}^i} \tag{12}$$

where R_t^i is the return of stock *i*.

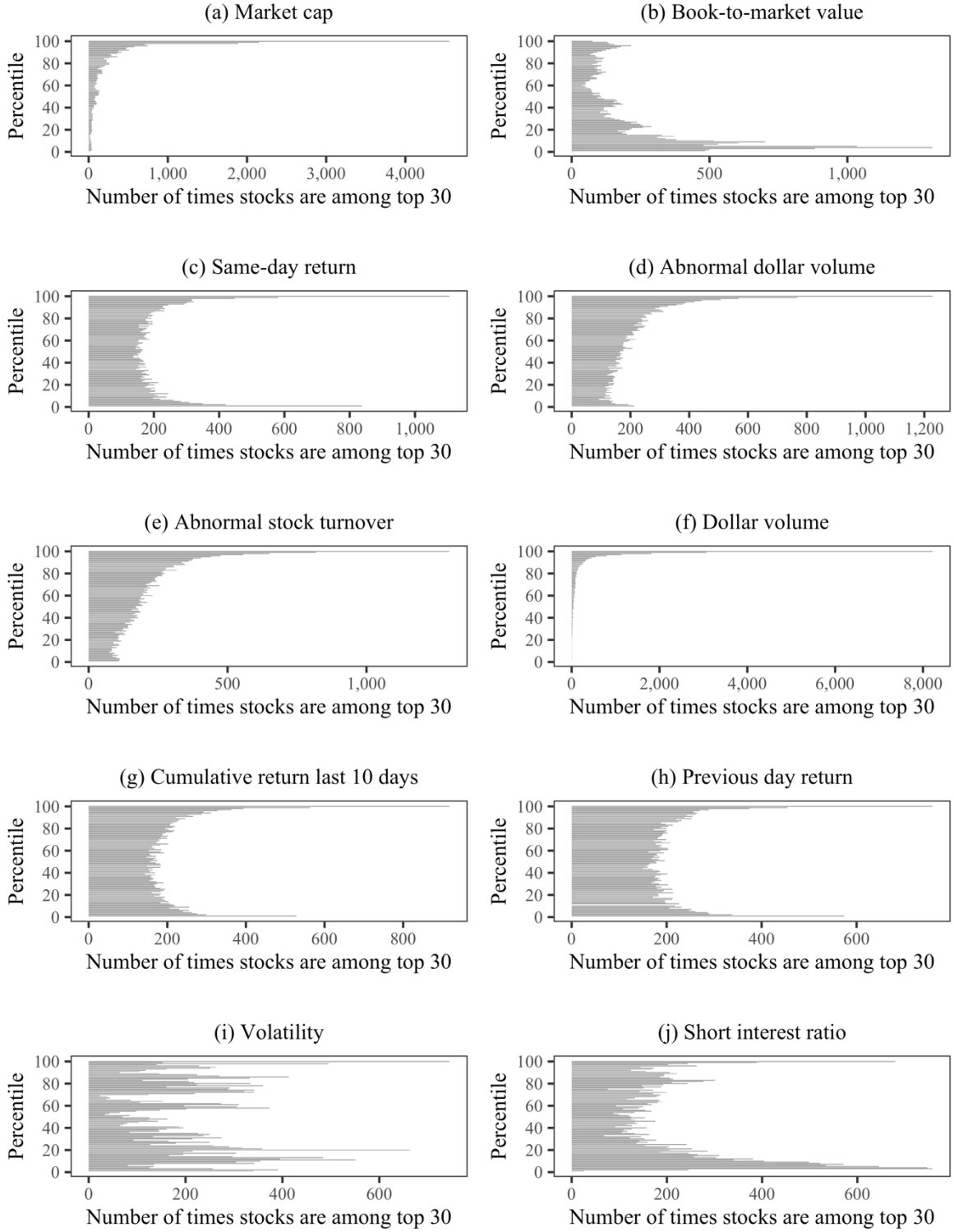
Appendix 8



Characteristics of the most discussed stocks: Decile analysis

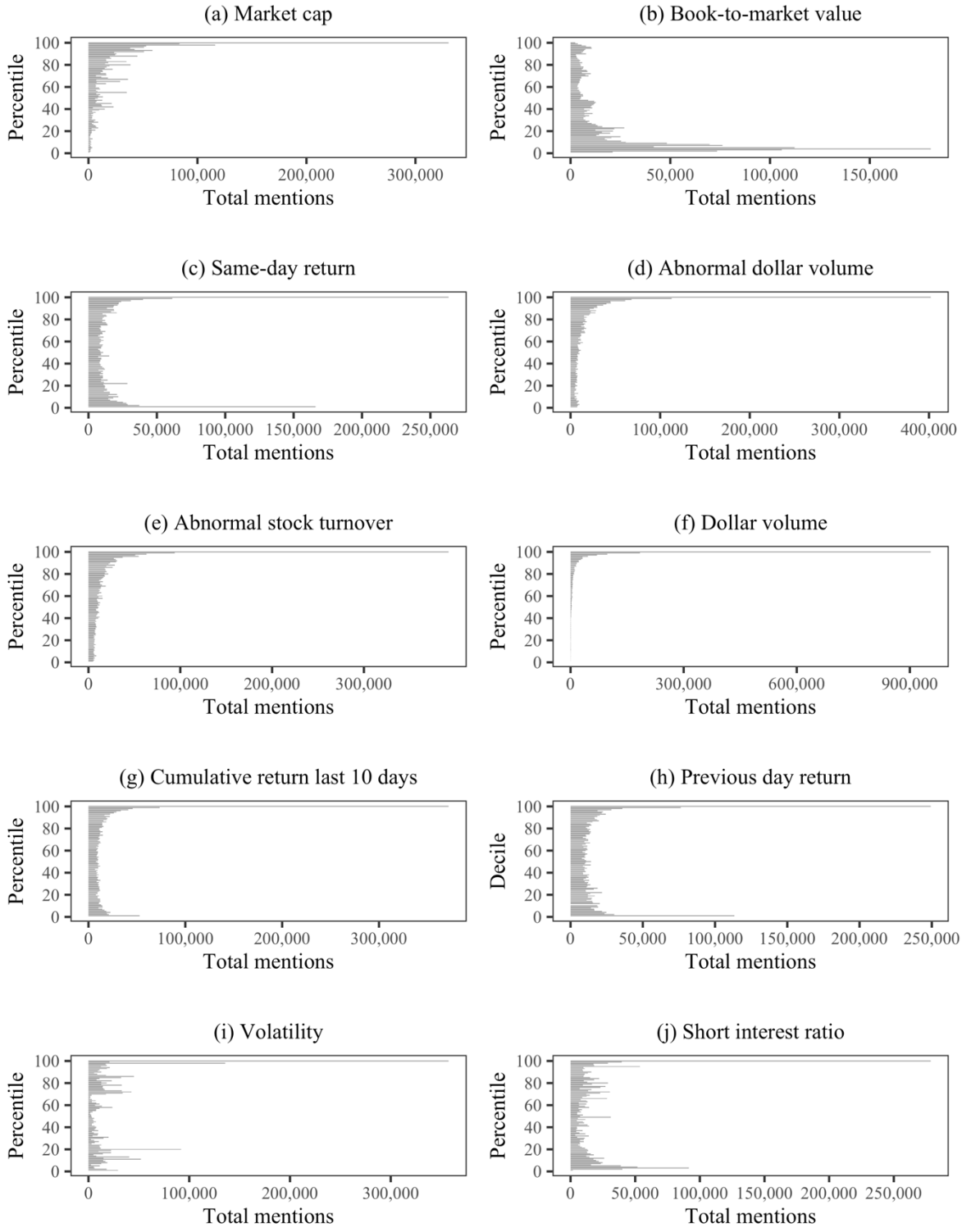
This figure shows the characteristics of the most-mentioned stocks. Each day the stocks are sorted into a decile according to the respective characteristics. For example, we build 10 deciles ranked by market cap in chart (a). Then, for each decile, the number of stock mentions is aggregated over the sample period.

Appendix 9



9.1 Characteristics of the most discussed stocks: Percentile analysis

This figure shows the characteristics of the most-mentioned stocks. Each day the stocks are sorted into a percentile according to the respective characteristics. For example, we build 100 percentiles ranked by market cap in chart (a). Then, for each percentile, the number of stocks that are among the 30 most mentioned stocks for a given day (i.e. stocks in the High-WSB portfolio) is aggregated over the sample period.



9.2 Characteristics of the most discussed stocks: Percentile analysis

This figure shows the characteristics of the most-mentioned stocks. Each day the stocks are sorted into a percentile according to the respective characteristics. For example, we build 100 percentiles ranked by market cap in chart (a). Then, for each percentile, the number of stock mentions is aggregated over the sample period.

Appendix 10

Single-sorted portfolios: Risk factor exposures

Coefficient	High-WSB	Low-WSB	DMN portfolio
CAPM			
MKT - RF	1.1616 ***	1.1259 ***	0.0356
Fama-French three-factor model			
MKT - RF	1.1366 ***	1.0394 ***	0.0972 **
SMB	0.6297 ***	0.7073 ***	-0.0776
HML	-0.0737	0.4115 ***	-0.4852 ***
Carhart four-factor model			
MKT - RF	1.1363 ***	1.0407 ***	0.0956 **
SMB	0.6330 ***	0.6948 ***	-0.0618
HML	-0.0568	0.3476 ***	-0.4043 ***
MOM	0.0167	-0.0629 ***	0.0796

This table shows the coefficients from factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are sorted based on the number of stock ticker mentions on WSB. MKT - RF represents the exposure of portfolios to the market risk factor, SMB to the size risk factor, HML to the value risk factor, and MOM the momentum factor. The null hypothesis is formulated as: The coefficient is equal to zero.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Note:

Appendix 10 shows that the High-WSB portfolio has significant and positive exposure of 1.14 to the market risk factor and of 0.63 to the size risk factor in the Carhart four-factor model. The latter may be surprising given the large average market capitalization of the High-WSB portfolio, but is likely to be a result of the equal-weighting approach used. When constructing the DMN zero-cost portfolio, which goes long in the High-WSB and short in the Low-WSB portfolio, the coefficient of the size risk factor becomes negative and is no longer significant. The DMN portfolio has significant coefficients of 0.10 on the market risk factor and of -0.40 on the value risk factor. The negative loading of the DMN portfolio on the value risk factor indicates that stocks in the High-WSB portfolio are comparatively tilted toward growth stocks with low book-to-market ratios.

Appendix 11

Single-sorted portfolios: Portfolio return statistics (annualized)

	High-WSB	Low-WSB	DMN portfolio
Excess return	38.76	18.90	15.78
Volatility	37.28	30.65	24.79
Sharpe ratio	1.04	0.62	0.64

This table shows the annualized excess return, volatility, and Sharpe ratio of portfolios, which are sorted based on their number of stock ticker mentions on WSB. Excess return and volatility are expressed in percentage terms.

Appendix 12

Double-sorted portfolios based on market capitalization: Next-day analysis

1. Small-cap

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.47	0.12	0.35 ***	0.21	0.48
$A\$VO_{t+1}$	31.33	-7.35	38.68 ***	33.51	43.85
ATO_{t+1}	60.45	-0.70	61.14 ***	56.75	65.54
$AILLIQ_{t+1}$	18.21	7.38	10.83 ***	8.41	13.25
ΔSIR_{t+1}	0.07	-0.01	0.08 ***	0.03	0.13

2. Medium-cap

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.18	0.08	0.10 **	0.01	0.19
$A\$VO_{t+1}$	39.86	0.96	38.90 ***	35.32	42.47
ATO_{t+1}	43.28	-1.80	45.08 ***	42.57	47.59
$AILLIQ_{t+1}$	1.80	-3.47	5.27 ***	3.47	7.07
ΔSIR_{t+1}	-0.01	-0.01	0.00	-0.04	0.04

3. Large-cap

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.09	0.07	0.02	-0.04	0.08
$A\$VO_{t+1}$	34.48	2.16	32.32 ***	30.27	34.38
ATO_{t+1}	27.98	-2.56	30.54 ***	29.12	31.96
$AILLIQ_{t+1}$	-10.93	-4.18	-6.74 ***	-7.90	-5.59
ΔSIR_{t+1}	0.00	-0.02	0.02 **	0.00	0.04

This table shows the average stock characteristics of daily portfolios, which are first sorted according to their market capitalization and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) on the day following portfolio formation. All variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 13

Double-sorted portfolios for small market-cap stocks: Portfolio return statistics (annualized)

	High-WSB	Low-WSB	DMN portfolio
Excess return	72.18	25.03	40.18
Volatility	52.37	36.54	32.13
Sharpe ratio	1.38	0.69	1.25

This table shows the annualized excess return, volatility, and Sharpe ratio of portfolios, which are first sorted according to their market capitalization and then according to the number of stock ticker mentions on WSB. Excess return and volatility are expressed in percentage terms.

Appendix 14

Double-sorted portfolios based on illiquidity ratio: Next-day analysis

1. Low illiquidity

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.12	0.08	0.04	-0.02	0.11
$A\$VO_{t+1}$	40.08	5.92	34.15 ***	31.46	36.85
ATO_{t+1}	34.66	1.69	32.97 ***	31.14	34.80
$AILLIQ_{t+1}$	-12.14	-7.35	-4.79 ***	-5.91	-3.67
ΔSIR_{t+1}	0.00	-0.02	0.01	-0.02	0.04

2. Medium illiquidity

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.20	0.08	0.11 **	0.02	0.20
$A\$VO_{t+1}$	32.00	1.33	30.66 ***	27.07	34.25
ATO_{t+1}	39.57	-0.28	39.85 ***	36.96	42.74
$AILLIQ_{t+1}$	3.88	-3.70	7.58 ***	5.79	9.38
ΔSIR_{t+1}	0.07	-0.01	0.08 ***	0.04	0.11

3. High illiquidity

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.45	0.11	0.34 ***	0.22	0.47
$A\$VO_{t+1}$	17.00	-10.99	27.99 ***	23.34	32.65
ATO_{t+1}	36.76	-5.84	42.60 ***	38.86	46.34
$AILLIQ_{t+1}$	30.55	10.54	20.01 ***	17.25	22.76
ΔSIR_{t+1}	0.00	-0.01	0.01	-0.02	0.04

This table shows the average stock characteristics of daily portfolios, which are first sorted according to their illiquidity ratio and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) on the day following portfolio formation. All variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 15

Double-sorted portfolios based on volatility: Next-day analysis

1. Low volatility

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.07	0.05	0.02	-0.02	0.05
$A\$VO_{t+1}$	13.91	-1.22	15.13 ***	13.97	16.29
ATO_{t+1}	7.97	-6.28	14.25 ***	13.13	15.37
$AILLIQ_{t+1}$	-7.58	-7.66	0.07	-1.12	1.26
ΔSIR_{t+1}	-0.01	-0.02	0.01 **	0.00	0.02

2. Medium volatility

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.12	0.09	0.03	-0.02	0.08
$A\$VO_{t+1}$	18.95	-1.45	20.41 ***	18.88	21.94
ATO_{t+1}	17.08	-3.03	20.12 ***	18.71	21.52
$AILLIQ_{t+1}$	-4.02	0.45	-4.47 ***	-5.79	-3.15
ΔSIR_{t+1}	-0.02	-0.02	0.00	-0.02	0.02

3. High volatility

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.22	0.13	0.09 *	0.00	0.18
$A\$VO_{t+1}$	53.71	-1.02	54.73 ***	50.74	58.72
ATO_{t+1}	55.32	5.58	49.74 ***	46.80	52.68
$AILLIQ_{t+1}$	-12.11	7.11	-19.22 ***	-20.65	-17.80
ΔSIR_{t+1}	-0.04	-0.01	-0.03 *	-0.07	0.01

This table shows the average stock characteristics of daily portfolios, which are first sorted according to their volatility and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) on the day following portfolio formation. All variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 16

Single-sorted portfolios: Risk factor exposures and alphas

	Mean	CAPM	Fama-French three-factor model	Carhart four-factor model
Coefficients for the DMN portfolio (zero cost)				
MKT - RF		0.0356	0.0972 **	0.0956 **
		(0.0396)	(0.0376)	(0.0376)
SMB			-0.0776	(0.0618)
			(0.0828)	(0.0839)
HML			-0.4852 ***	-0.4043 ***
			(0.0516)	(0.0865)
MOM				0.0796
				(0.0684)
Constant	**0.0007**	**0.0007**	**0.0004**	**0.0004**
	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Observations	645	645	645	645
R^2		0.0013	0.1320	0.1338
Alphas for the High-WSB portfolio (long)				
Constant	**0.0015**	**0.0008**	**0.0007**	**0.0007**
	(0.0009)	(0.0006)	(0.0006)	(0.0006)
Alphas for the Low-WSB portfolio (short)				
Constant	**0.0008**	**0.0001**	**0.0003** ***	**0.0003** **
	(0.0008)	(0.0003)	(0.0001)	(0.0001)

This table depicts the coefficients from regressions of portfolio excess returns on the day following formation (i.e., next-day portfolio returns minus one-month U.S. T-Bill rate) on recognized risk factors for the U.S. stock market. The portfolios consist of stocks, which are sorted according to the number of mentions on WSB. Three different factor models are presented. The DMN portfolio goes long in the High-WSB portfolio and short in the Low-WSB portfolio. MKT −RF denotes a portfolio's exposure to the market factor, SMB its exposure to the size factor, HML its exposure to the value factor, and MOM its exposure to the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 17

17.1 Double-sorted portfolios for small-cap stocks: Risk factor exposures

Coefficient	High-WSB	Low-WSB
CAPM		
MKT - RF	1.3402 ***	1.2101 ***
Fama-French three-factor model		
MKT - RF	1.1801 ***	1.0704 ***
SMB	1.3442 ***	1.1761 ***
HML	0.7461 ***	0.6492 ***
Carhart four-factor model		
MKT - RF	1.1871 ***	1.0738 ***
SMB	1.2720 ***	1.1405 ***
HML	0.3766 **	0.4670 ***
MOM	-0.3636 ***	-0.1792 ***

This table shows the coefficients from factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to their market capitalization and then according to the number of stock ticker mentions on WSB. MKT - RF represents the exposure of portfolios to the market risk factor, SMB to the size risk factor, HML to the value risk factor, and MOM the momentum factor. The null hypothesis is formulated as: The coefficient is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

17.2 Double-sorted portfolios for high illiquidity stocks: Risk factor exposures

Coefficient	High-WSB	Low-WSB
CAPM		
MKT - RF	1.3265 ***	1.2045 ***
Fama-French three-factor model		
MKT - RF	1.1687 ***	1.0685 ***
SMB	1.2287 ***	1.1013 ***
HML	0.7570 ***	0.6325 ***
Carhart four-factor model		
MKT - RF	1.1747 ***	1.0716 ***
SMB	1.1642 ***	1.0688 ***
HML	0.4246 ***	0.4650 ***
MOM	-0.327 ***	-0.1648 ***

This table shows the coefficients from factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to their illiquidity ratio and then according to the number of stock ticker mentions on WSB. MKT - RF represents the exposure of portfolios to the market risk factor, SMB to the size risk factor, HML to the value risk factor, and MOM the momentum factor. The null hypothesis is formulated as: The coefficient is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

17.3 Double-sorted portfolios for high volatility stocks: Risk factor exposures

Coefficient	High-WSB	Low-WSB
CAPM		
MKT - RF	1.3667 ***	1.3705 ***
Fama-French three-factor model		
MKT - RF	1.2651 ***	1.2313 ***
SMB	1.3262 ***	1.2632 ***
HML	0.2584 ***	0.6056 ***
Carhart four-factor model		
MKT - RF	1.2653 ***	1.2372 ***
SMB	1.3236 ***	1.2032 ***
HML	0.2452 *	0.2982 ***
MOM	-0.0130	-0.3024 ***

This table shows the coefficients from factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to their volatility and then according to the number of stock ticker mentions on WSB. MKT - RF represents the exposure of portfolios to the market risk factor, SMB to the size risk factor, HML to the value risk factor, and MOM the momentum factor. The null hypothesis is formulated as: The coefficient is equal to zero.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 18

Double-sorted portfolios for high illiquidity stocks: Risk factor exposures and alphas

	Mean	CAPM	Fama-French three-factor model	Carhart four-factor model
Coefficients for DMN portfolio (zero cost)				
MKT - RF		0.1220 ***	0.1002 **	0.1032 **
		(0.0459)	(0.0465)	(0.0464)
SMB			0.1274	0.0954
			(0.1023)	(0.1034)
HML			0.1245 *	-0.0405
			(0.0636)	(0.1065)
MOM				-0.1623 *
				(0.0841)
Constant	**0.0012** *	**0.0011**	**0.0012** *	**0.0011**
	(0.0007)	(0.0007)	(0.0007)	(0.0007)
Observations	643	643	643	643
R^2	0	0.0109	0.021	0.0267
Alphas for the High-WSB portfolio (long)				
Constant	**0.0022** *	**0.0013**	**0.0018** **	**0.0016** **
	(0.0012)	(0.0009)	(0.0008)	(0.0008)
Alphas for the Low-WSB portfolio (short)				
Constant	**0.001**	**0.0002**	**0.0006** ***	**0.0005** **
	(0.0009)	(0.0005)	(0.0002)	(0.0002)

This table shows the coefficients from factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to their illiquidity ratio and then according to the number of stock ticker mentions on WSB. The DMN portfolio goes long in the High-WSB portfolio and short in the Low-WSB portfolio. MKT - RF represents the exposure of portfolios to the market risk factor, SMB to the size risk factor, HML to the value risk factor, and MOM the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 19

Double-sorted portfolios for high volatility stocks: Risk factor exposures and alphas

	Mean	CAPM	Fama-French three-factor model	Carhart four-factor model
Coefficients for DMN portfolio (zero cost)				
MKT - RF		-0.0040	0.0337	0.0281
		(0.0434)	(0.0430)	(0.0426)
SMB			0.0629	0.1204
			(0.0947)	(0.0950)
HML			-0.3471 ***	-0.053
			(0.0589)	(0.0980)
MOM				0.2894 ***
				(0.0774)
Constant	**0.0008**	**0.0008**	**0.0006**	**0.0008**
	(0.0007)	(0.0007)	(0.0007)	(0.0007)
Observations	645	645	645	645
R^2	0	0.00001	0.0517	0.072
Alphas for the High-WSB portfolio (long)				
Constant	**0.0020** *	**0.0012**	**0.0013** *	**0.0013** *
	(0.0012)	(0.0008)	(0.0007)	(0.0007)
Alphas for the Low-WSB portfolio (short)				
Constant	**0.0012**	**0.0003**	**0.0007** **	**0.0005** *
	(0.0010)	(0.0006)	(0.0003)	(0.0003)

This table shows the coefficients from factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to their volatility and then according to the number of stock ticker mentions on WSB. MKT - RF represents the exposure of portfolios to the market risk factor, SMB to the size risk factor, HML to the value risk factor, and MOM the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 20

Single-sorted portfolios: Event-time analysis

	Cumulative return					*Daily return*
				Difference		Difference
Event day	High-WSB	Low-WSB	Value-weighted sample ("Market")	High-Low	High-Market	High-Low
			Pre-event			
-10	0.24	0.09	0.11	0.15 ***	0.13	0.15 ***
-9	0.45	0.17	0.21	0.28 ***	0.24	0.13 ***
-8	0.69	0.26	0.32	0.43 ***	0.37	0.13 ***
-7	0.94	0.35	0.43	0.58 ***	0.51	0.13 ***
-6	1.19	0.44	0.54	0.75 ***	0.65	0.15 ***
-5	1.48	0.52	0.64	0.96 ***	0.84	0.19 ***
-4	1.75	0.59	0.74	1.16 ***	1.01	0.17 ***
-3	2.01	0.67	0.85	1.33 ***	1.16	0.18 ***
-2	2.38	0.75	0.95	1.63 ***	1.43	0.27 ***
-1	2.81	0.83	1.05	1.98 ***	1.76	0.31 ***
0	3.43	0.90	1.11	2.53 ***	2.32	0.49 ***
			Post-event			
1	0.16	0.09	0.07	0.07 *	0.09	0.07 *
2	0.26	0.17	0.14	0.10 *	0.12	0.03
3	0.37	0.25	0.21	0.11	0.16	0.01
4	0.51	0.35	0.28	0.16 **	0.23	0.04
5	0.65	0.43	0.35	0.21 **	0.30	0.04
6	0.82	0.52	0.42	0.30 ***	0.40	0.09 ***
7	0.94	0.59	0.49	0.36 ***	0.45	0.05
8	1.01	0.67	0.56	0.34 ***	0.45	0.03
9	1.13	0.76	0.63	0.38 ***	0.50	0.03
10	1.22	0.84	0.71	0.38 ***	0.51	-0.01
11	1.33	0.93	0.79	0.40 ***	0.54	0.03
12	1.49	1.02	0.86	0.48 ***	0.63	0.05
13	1.63	1.11	0.94	0.52 ***	0.69	0.04
14	1.80	1.19	1.01	0.61 ***	0.79	0.07 **
15	1.96	1.29	1.09	0.68 ***	0.87	0.07 **
16	2.09	1.38	1.16	0.71 ***	0.93	0.03
17	2.21	1.46	1.23	0.75 ***	0.98	0.06 **
18	2.35	1.53	1.30	0.82 ***	1.05	0.05
19	2.41	1.61	1.37	0.81 ***	1.04	0.02
20	2.54	1.67	1.43	0.86 ***	1.11	0.05
21	2.66	1.74	1.49	0.92 ***	1.17	0.05
22	2.77	1.82	1.56	0.95 ***	1.21	0.03
23	2.90	1.89	1.63	1.01 ***	1.27	0.01
24	3.03	1.96	1.69	1.07 ***	1.34	0.02
25	3.12	2.04	1.76	1.08 ***	1.36	0.02
26	3.23	2.12	1.83	1.11 ***	1.40	0.02
27	3.31	2.19	1.90	1.11 ***	1.41	0.05 *
28	3.45	2.28	1.97	1.17 ***	1.48	0.06 **
29	3.51	2.36	2.03	1.15 ***	1.48	0.03
30	3.58	2.44	2.10	1.14 ***	1.48	0.02
31	3.70	2.52	2.17	1.18 ***	1.53	0.04
32	3.80	2.59	2.23	1.21 ***	1.57	0.04
33	3.86	2.66	2.30	1.20 ***	1.56	0.03
34	3.94	2.74	2.37	1.20 ***	1.57	0.03
35	4.05	2.81	2.43	1.24 ***	1.62	0.06 *
36	4.12	2.89	2.50	1.23 ***	1.62	0.03
37	4.23	2.95	2.56	1.28 ***	1.67	0.04
38	4.31	3.01	2.62	1.30 ***	1.69	0.03
39	4.39	3.08	2.69	1.31 ***	1.70	0.05 *
40	4.50	3.14	2.75	1.35 ***	1.75	0.03
126	13.79	7.25	8.66	6.55 ***	5.13	0.08 **
252	29.02	3.81	12.56	25.21 ***	16.46	0.00

This table shows the average cumulative returns for daily portfolios, which are sorted according to their number of stock ticker mentions on WSB on event day 0. For each portfolio and the value-weighted sample as market benchmark, equally weighted averages of cumulative returns are computed for the pre-event and post-event periods, respectively. The differences in means are stated between the High-WSB and Low-WSB portfolios (High-Low) as well as between the High-WSB portfolio and the value-weighted sample (High-Market). In addition, the difference in means between the High-WSB and Low-WSB portfolios for daily returns is stated. All values are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the difference in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*,** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Appendix 21

Double-sorted portfolios: Event-time analysis for double-sorts based on market capitalization

Cumulative return (in %)

	Small-cap			Medium-cap			Large-cap			High-WSB vs. value-weighted sample (Market)		
Event day	High-WSB	Low-WSB	Difference High-Low	High-WSB	Low-WSB	Difference High-Low	High-WSB	Low-WSB	Difference High-Low	Small-cap	Medium-Cap	Large-cap
						Pre-event						
-10	0.34	0.03	0.31 ***	0.23	0.11	0.13 ***	0.20	0.10	0.09 ***	0.24	0.13	0.09
-9	0.65	0.07	0.58 ***	0.49	0.21	0.28 ***	0.37	0.21	0.17 ***	0.44	0.28	0.16
-8	0.92	0.12	0.80 ***	0.82	0.32	0.50 ***	0.55	0.32	0.24 ***	0.60	0.50	0.23
-7	1.13	0.16	0.97 ***	1.22	0.43	0.79 ***	0.73	0.42	0.31 ***	0.70	0.79	0.30
-6	1.41	0.19	1.22 ***	1.59	0.53	1.06 ***	0.94	0.53	0.41 ***	0.87	1.05	0.40
-5	1.81	0.22	1.59 ***	1.88	0.63	1.24 ***	1.16	0.63	0.53 ***	1.17	1.23	0.51
-4	2.17	0.24	1.93 ***	2.19	0.73	1.45 ***	1.36	0.72	0.64 ***	1.43	1.44	0.62
-3	2.54	0.26	2.27 ***	2.50	0.83	1.67 ***	1.59	0.82	0.77 ***	1.69	1.65	0.75
-2	3.01	0.29	2.72 ***	2.84	0.93	1.91 ***	1.84	0.92	0.92 ***	2.07	1.89	0.90
-1	3.58	0.31	3.27 ***	3.34	1.03	2.31 ***	2.15	1.02	1.13 ***	2.53	2.28	1.10
0	4.49	0.32	4.17 ***	3.97	1.11	2.86 ***	2.51	1.11	1.40 ***	3.38	2.86	1.40
						Post-event						
1	0.47	0.12	0.35 ***	0.18	0.08	0.10 **	0.09	0.07	0.02	0.39	0.10	0.02
2	0.74	0.21	0.52 ***	0.34	0.14	0.19 ***	0.14	0.13	0.01	0.60	0.20	0.00
3	1.02	0.33	0.69 ***	0.50	0.21	0.29 ***	0.19	0.19	0.00	0.81	0.29	-0.01
4	1.32	0.45	0.87 ***	0.68	0.30	0.38 ***	0.26	0.27	0.00	1.04	0.40	-0.02
5	1.68	0.56	1.12 ***	0.81	0.37	0.43 ***	0.32	0.34	-0.02	1.33	0.45	-0.03
6	2.06	0.66	1.40 ***	0.96	0.44	0.51 ***	0.39	0.40	-0.01	1.64	0.54	-0.03
7	2.40	0.75	1.65 ***	1.13	0.50	0.62 ***	0.47	0.46	0.01	1.91	0.64	-0.01
8	2.67	0.84	1.83 ***	1.26	0.57	0.68 ***	0.54	0.53	0.00	2.11	0.70	-0.02
9	3.02	0.94	2.07 ***	1.43	0.65	0.78 ***	0.61	0.60	0.00	2.38	0.80	-0.03
10	3.47	1.04	2.43 ***	1.55	0.72	0.83 ***	0.67	0.68	0.00	2.76	0.84	-0.03
11	3.84	1.15	2.69 ***	1.72	0.80	0.91 ***	0.75	0.75	-0.01	3.05	0.93	-0.04
12	4.27	1.25	3.02 ***	1.82	0.88	0.95 ***	0.83	0.82	0.01	3.41	0.96	-0.03
13	4.59	1.36	3.23 ***	1.92	0.96	0.97 ***	0.92	0.89	0.03	3.65	0.99	-0.01
14	4.99	1.47	3.52 ***	2.08	1.04	1.04 ***	1.03	0.96	0.07	3.98	1.07	0.02
15	5.42	1.59	3.84 ***	2.21	1.12	1.10 ***	1.14	1.03	0.11 *	4.34	1.13	0.06
16	5.76	1.70	4.06 ***	2.38	1.19	1.19 ***	1.24	1.10	0.14 **	4.60	1.23	0.08
17	6.16	1.80	4.36 ***	2.55	1.26	1.29 ***	1.35	1.17	0.18 **	4.93	1.32	0.12
18	6.48	1.89	4.59 ***	2.71	1.33	1.38 ***	1.43	1.23	0.19 **	5.18	1.41	0.13
19	6.80	1.97	4.83 ***	2.93	1.39	1.54 ***	1.50	1.29	0.20 ***	5.43	1.56	0.13
20	7.13	2.05	5.09 ***	3.16	1.44	1.72 ***	1.59	1.35	0.24 ***	5.70	1.72	0.16
21	7.49	2.14	5.36 ***	3.36	1.50	1.86 ***	1.70	1.41	0.29 ***	6.00	1.86	0.20
22	7.85	2.22	5.62 ***	3.54	1.56	1.97 ***	1.77	1.47	0.30 ***	6.28	1.97	0.21
23	8.25	2.31	5.94 ***	3.73	1.62	2.10 ***	1.88	1.53	0.36 ***	6.63	2.10	0.26
24	8.73	2.39	6.33 ***	3.90	1.68	2.22 ***	1.96	1.59	0.37 ***	7.03	2.21	0.26
25	9.14	2.48	6.65 ***	4.09	1.75	2.34 ***	2.05	1.65	0.39 ***	7.37	2.32	0.28
26	9.53	2.58	6.95 ***	4.23	1.82	2.41 ***	2.15	1.72	0.43 ***	7.70	2.40	0.31
27	9.96	2.66	7.30 ***	4.39	1.88	2.51 ***	2.25	1.78	0.47 ***	8.06	2.49	0.35
28	10.42	2.76	7.66 ***	4.51	1.95	2.57 ***	2.36	1.84	0.52 ***	8.46	2.55	0.39
29	10.91	2.86	8.05 ***	4.67	2.02	2.65 ***	2.46	1.90	0.56 ***	8.88	2.64	0.43
30	11.40	2.95	8.45 ***	4.81	2.08	2.73 ***	2.57	1.96	0.60 ***	9.30	2.71	0.47
31	11.78	3.05	8.73 ***	4.99	2.15	2.84 ***	2.66	2.03	0.63 ***	9.61	2.82	0.49
32	12.18	3.14	9.04 ***	5.20	2.21	2.99 ***	2.74	2.09	0.65 ***	9.94	2.97	0.50
33	12.47	3.23	9.25 ***	5.36	2.27	3.09 ***	2.83	2.15	0.68 ***	10.17	3.06	0.53
34	12.79	3.32	9.47 ***	5.51	2.33	3.18 ***	2.93	2.21	0.72 ***	10.42	3.14	0.56
35	13.08	3.40	9.68 ***	5.70	2.39	3.30 ***	3.03	2.27	0.76 ***	10.65	3.26	0.59
36	13.37	3.50	9.88 ***	5.89	2.45	3.44 ***	3.13	2.33	0.80 ***	10.88	3.39	0.63
37	13.72	3.57	10.15 ***	6.02	2.51	3.51 ***	3.20	2.39	0.81 ***	11.16	3.45	0.63
38	14.00	3.64	10.36 ***	6.18	2.56	3.63 ***	3.29	2.44	0.85 ***	11.37	3.56	0.67
39	14.32	3.71	10.61 ***	6.41	2.61	3.80 ***	3.40	2.50	0.90 ***	11.63	3.72	0.71
40	14.67	3.79	10.88 ***	6.63	2.66	3.97 ***	3.50	2.56	0.95 ***	11.92	3.88	0.75
126	41.77	7.21	34.55 ***	20.07	5.93	14.14 ***	13.08	7.33	5.75 ***	33.10	11.41	4.42
252	54.51	0.79	53.72 ***	17.38	1.96	15.42 ***	24.45	7.78	16.67 ***	41.94	4.82	11.89

This table shows the average cumulative returns for daily portfolios, which are first sorted according to their market capitalization and then according to the number of stock ticker mentions on WSB on event day 0. For each portfolio, equally weighted averages of cumulative returns are computed for the pre-event and post-event periods, respectively. All values are expressed in percentage terms. The differences in means are stated between the High-WSB and Low-WSB portfolios (High-Low) as well as between the High-WSB portfolio and the value-weighted sample (High-Market). We employ two-sample, two-sided Welch t-tests on the difference in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*,** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Appendix 22

Double-sorted portfolios: Event-time analysis for double-sorts based on illiquidity ratio

Cumulative return (in %)

	Low illiquidity			Medium illiquidity			High illiquidity			High-WSB vs. value-weighted sample (Market)		
Event day	High-WSB	Low-WSB	Difference High-Low	High-WSB	Low-WSB	Difference High-Low	High-WSB	Low-WSB	Difference High-Low	Low illiquidity	Medium illiquidity	Large illiquidity
Pre-event												
-10	0.23	0.12	0.11***	0.23	0.09	0.14***	0.26	0.04	0.22***	0.12	0.12	0.16
-9	0.44	0.23	0.21***	0.44	0.18	0.26***	0.52	0.08	0.44***	0.23	0.23	0.31
-8	0.68	0.35	0.33***	0.67	0.28	0.39***	0.76	0.13	0.63***	0.36	0.35	0.43
-7	0.92	0.47	0.45***	0.90	0.38	0.52***	1.01	0.17	0.84***	0.49	0.47	0.58
-6	1.18	0.58	0.60***	1.19	0.47	0.72***	1.24	0.22	1.02***	0.64	0.64	0.69
-5	1.43	0.69	0.74***	1.41	0.56	0.85***	1.50	0.24	1.25***	0.79	0.77	0.85
-4	1.70	0.80	0.90***	1.66	0.64	1.01***	1.87	0.27	1.60***	0.95	0.92	1.13
-3	1.95	0.91	1.04***	1.92	0.74	1.18***	2.17	0.29	1.88***	1.10	1.07	1.32
-2	2.25	1.02	1.23***	2.24	0.82	1.42***	2.54	0.32	2.22***	1.30	1.29	1.59
-1	2.67	1.15	1.52***	2.60	0.91	1.69***	3.04	0.33	2.71***	1.62	1.55	1.98
0	3.02	1.19	1.83***	3.44	0.99	2.45***	4.18	0.38	3.80***	1.90	2.32	3.07
Post-event												
1	0.12	0.08	0.04	0.20	0.08	0.11**	0.45	0.11	0.34***	0.04	0.12	0.38
2	0.22	0.14	0.08*	0.27	0.15	0.12*	0.70	0.20	0.50***	0.08	0.13	0.56
3	0.28	0.22	0.07	0.42	0.22	0.20**	1.01	0.30	0.71***	0.08	0.21	0.81
4	0.46	0.29	0.17**	0.56	0.30	0.26***	1.25	0.42	0.83***	0.18	0.28	0.97
5	0.57	0.36	0.20**	0.63	0.39	0.24**	1.42	0.52	0.90***	0.21	0.28	1.07
6	0.68	0.43	0.25***	0.81	0.46	0.35***	1.72	0.62	1.10***	0.26	0.39	1.30
7	0.80	0.50	0.30***	0.92	0.53	0.38***	2.05	0.69	1.36***	0.31	0.43	1.56
8	0.88	0.58	0.30***	1.01	0.61	0.40***	2.40	0.77	1.62***	0.31	0.45	1.83
9	0.99	0.65	0.34***	1.08	0.69	0.39***	2.70	0.87	1.82***	0.35	0.44	2.06
10	1.06	0.73	0.32***	1.30	0.76	0.54***	2.98	0.96	2.02***	0.35	0.59	2.27
11	1.09	0.81	0.28**	1.56	0.84	0.72***	3.31	1.06	2.24***	0.30	0.77	2.52
12	1.21	0.89	0.32***	1.75	0.92	0.83***	3.65	1.16	2.50***	0.35	0.88	2.79
13	1.32	0.97	0.35**	1.90	1.00	0.91***	3.91	1.26	2.65***	0.38	0.97	2.97
14	1.37	1.05	0.32***	2.14	1.08	1.06***	4.24	1.36	2.89***	0.36	1.13	3.24
15	1.57	1.13	0.44***	2.24	1.16	1.08***	4.59	1.46	3.12***	0.49	1.15	3.50
16	1.62	1.22	0.41***	2.40	1.24	1.16***	4.86	1.56	3.30***	0.46	1.24	3.70
17	1.79	1.28	0.50***	2.58	1.31	1.26***	5.19	1.65	3.53***	0.56	1.34	3.96
18	1.87	1.36	0.51***	2.78	1.38	1.40***	5.45	1.73	3.71***	0.57	1.48	4.15
19	1.92	1.42	0.49***	3.02	1.44	1.58***	5.67	1.82	3.85***	0.55	1.65	4.31
20	2.04	1.48	0.56***	3.16	1.50	1.66***	5.99	1.89	4.10***	0.61	1.73	4.56
21	2.17	1.56	0.61***	3.28	1.55	1.73***	6.29	1.97	4.33***	0.67	1.79	4.80
22	2.25	1.63	0.62***	3.46	1.62	1.84***	6.58	2.04	4.54***	0.69	1.89	5.02
23	2.37	1.70	0.68***	3.65	1.68	1.96***	6.88	2.12	4.77***	0.75	2.02	5.26
24	2.52	1.76	0.75***	3.81	1.75	2.05***	7.22	2.19	5.03***	0.82	2.11	5.53
25	2.48	1.82	0.65***	4.18	1.83	2.36***	7.51	2.28	5.23***	0.71	2.42	5.75
26	2.58	1.89	0.69***	4.34	1.89	2.44***	7.85	2.37	5.48***	0.75	2.51	6.02
27	2.69	1.96	0.73***	4.47	1.96	2.51***	8.28	2.45	5.84***	0.79	2.57	6.39
28	2.67	2.02	0.65***	4.80	2.04	2.76***	8.67	2.54	6.13***	0.71	2.83	6.70
29	2.82	2.09	0.73***	4.95	2.11	2.84***	8.98	2.63	6.34***	0.78	2.92	6.94
30	2.87	2.16	0.71***	5.15	2.18	2.97***	9.28	2.72	6.56***	0.77	3.06	7.18
31	2.93	2.23	0.70***	5.43	2.26	3.18***	9.61	2.81	6.80***	0.76	3.27	7.44
32	3.03	2.29	0.74***	5.63	2.32	3.31***	9.86	2.90	6.97***	0.80	3.39	7.63
33	3.16	2.36	0.80***	5.73	2.38	3.35***	10.11	2.98	7.13***	0.86	3.43	7.81
34	3.23	2.42	0.81***	5.96	2.44	3.51***	10.41	3.06	7.35***	0.87	3.59	8.05
35	3.40	2.49	0.91***	6.04	2.51	3.52***	10.64	3.14	7.51***	0.96	3.60	8.21
36	3.42	2.55	0.87***	6.33	2.58	3.75***	11.01	3.22	7.79***	0.92	3.83	8.51
37	3.49	2.62	0.87***	6.42	2.64	3.79***	11.27	3.29	7.99***	0.93	3.86	8.71
38	3.59	2.68	0.91***	6.58	2.69	3.89***	11.58	3.34	8.24***	0.96	3.96	8.96
39	3.75	2.74	1.01***	6.72	2.76	3.97***	11.80	3.40	8.39***	1.06	4.03	9.11
40	3.82	2.80	1.02***	6.93	2.82	4.12***	12.11	3.47	8.64***	1.06	4.18	9.36
126	13.60	7.44	6.15***	18.30	6.50	11.80***	38.32	6.78	31.54***	4.93	9.63	29.66
252	26.00	6.74	19.26***	22.32	2.58	19.74***	38.18	1.39	36.78***	13.44	9.76	25.61

This table shows the average cumulative returns for daily portfolios, which are first sorted according to their illiquidity ratio and then according to the number of stock ticker mentions on WSB on event day 0. For each portfolio, equally weighted averages of cumulative returns are computed for the pre-event and post-event periods, respectively. All values are expressed in percentage terms. The differences in means are stated between the High-WSB and Low-WSB portfolios (High-Low) as well as between the High-WSB portfolio and the value-weighted sample (High-Market). We employ two-sample, two-sided Welch t-tests on the difference in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.

*,** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Appendix 23

Double-sorted portfolios: Event-time analysis for double-sorts based on volatility

Cumulative return (in %)

	Low volatility			Medium volatility			High volatility			High-WSB vs. value-weighted sample (Market)		
Event day	High-WSB	Low-WSB	Difference High-Low	High-WSB	Low-WSB	Difference High-Low	High-WSB	Low-WSB	Difference High-Low	Low Volatility	Medium Volatility	High Volatility
Pre-event												
-10	0.10	0.06	0.04**	0.11	0.07	0.04*	0.29	0.11	0.18***	-0.01	0.00	0.18
-9	0.19	0.12	0.06***	0.23	0.14	0.09***	0.61	0.22	0.40***	-0.02	0.02	0.40
-8	0.29	0.19	0.11***	0.38	0.22	0.16***	0.99	0.34	0.65***	-0.03	0.05	0.67
-7	0.41	0.25	0.16***	0.51	0.29	0.22***	1.34	0.46	0.89***	-0.02	0.08	0.91
-6	0.50	0.31	0.19***	0.65	0.36	0.30***	1.66	0.57	1.09***	-0.04	0.11	1.12
-5	0.58	0.37	0.22***	0.78	0.42	0.36***	1.98	0.68	1.30***	-0.06	0.14	1.34
-4	0.67	0.42	0.25***	0.92	0.49	0.44***	2.27	0.78	1.49***	-0.07	0.18	1.53
-3	0.77	0.47	0.29***	1.04	0.55	0.48***	2.62	0.88	1.74***	-0.08	0.19	1.77
-2	0.85	0.52	0.33***	1.20	0.62	0.58***	3.04	0.99	2.06***	-0.10	0.25	2.10
-1	0.96	0.58	0.38***	1.37	0.69	0.68***	3.63	1.09	2.54***	-0.09	0.32	2.58
0	1.08	0.62	0.46***	1.58	0.75	0.84***	4.43	1.18	3.24***	-0.03	0.47	3.31
Post-event												
1	0.07	0.05	0.02	0.12	0.09	0.03	0.22	0.13	0.09*	-0.01	0.04	0.15
2	0.13	0.09	0.04	0.21	0.15	0.06*	0.39	0.24	0.15*	-0.01	0.08	0.26
3	0.18	0.13	0.05*	0.34	0.23	0.11***	0.53	0.37	0.16*	-0.02	0.13	0.33
4	0.25	0.18	0.07**	0.40	0.31	0.09*	0.73	0.51	0.22**	-0.03	0.12	0.45
5	0.30	0.23	0.07**	0.51	0.39	0.12**	0.90	0.65	0.25**	-0.05	0.16	0.55
6	0.35	0.26	0.09**	0.60	0.46	0.13**	1.02	0.77	0.25**	-0.07	0.18	0.60
7	0.40	0.30	0.10**	0.70	0.53	0.17***	1.15	0.89	0.26**	-0.08	0.21	0.66
8	0.44	0.34	0.10**	0.78	0.60	0.18***	1.19	1.01	0.18	-0.12	0.22	0.63
9	0.50	0.38	0.12**	0.86	0.67	0.19***	1.37	1.14	0.23*	-0.13	0.23	0.73
10	0.55	0.43	0.12**	0.98	0.75	0.23***	1.50	1.27	0.24	-0.16	0.27	0.79
11	0.62	0.47	0.15***	1.07	0.83	0.24***	1.68	1.40	0.27*	-0.17	0.28	0.89
12	0.68	0.52	0.16***	1.16	0.90	0.26***	1.89	1.53	0.36*	-0.18	0.30	1.03
13	0.75	0.56	0.19***	1.25	0.98	0.27***	2.06	1.67	0.39**	-0.19	0.31	1.12
14	0.81	0.60	0.21***	1.33	1.05	0.28***	2.27	1.82	0.45*	-0.20	0.32	1.26
15	0.88	0.64	0.23***	1.43	1.13	0.30***	2.49	1.96	0.53**	-0.21	0.34	1.40
16	0.96	0.69	0.28***	1.52	1.21	0.31***	2.66	2.11	0.55***	-0.20	0.36	1.50
17	1.03	0.72	0.31***	1.60	1.27	0.33***	2.88	2.24	0.65***	-0.20	0.37	1.65
18	1.11	0.76	0.35***	1.66	1.34	0.33***	3.01	2.36	0.65***	-0.19	0.36	1.71
19	1.17	0.79	0.38***	1.76	1.39	0.36***	3.16	2.47	0.69***	-0.20	0.39	1.79
20	1.25	0.82	0.42***	1.82	1.45	0.37***	3.32	2.58	0.74***	-0.19	0.38	1.89
21	1.27	0.85	0.42***	1.89	1.50	0.39***	3.50	2.70	0.81***	-0.22	0.40	2.01
22	1.34	0.89	0.45***	1.97	1.57	0.40***	3.66	2.82	0.84***	-0.22	0.41	2.10
23	1.39	0.92	0.47***	2.07	1.62	0.44***	3.83	2.93	0.90***	-0.24	0.44	2.21
24	1.45	0.96	0.49***	2.15	1.69	0.47***	3.98	3.05	0.94***	-0.24	0.46	2.29
25	1.53	0.99	0.54***	2.24	1.75	0.49***	4.08	3.17	0.91***	-0.23	0.48	2.32
26	1.61	1.03	0.58***	2.36	1.82	0.54***	4.19	3.30	0.89***	-0.22	0.52	2.35
27	1.70	1.06	0.64***	2.43	1.88	0.55***	4.28	3.42	0.85***	-0.20	0.53	2.38
28	1.76	1.09	0.67***	2.50	1.95	0.56***	4.42	3.56	0.87***	-0.21	0.54	2.46
29	1.83	1.12	0.71***	2.59	2.01	0.57***	4.54	3.69	0.85***	-0.20	0.56	2.51
30	1.91	1.16	0.76***	2.69	2.08	0.61***	4.63	3.82	0.81***	-0.18	0.59	2.53
31	1.96	1.19	0.77***	2.79	2.15	0.64***	4.78	3.95	0.83***	-0.20	0.62	2.62
32	2.03	1.22	0.81***	2.88	2.21	0.67***	4.96	4.07	0.89***	-0.20	0.65	2.73
33	2.08	1.25	0.83***	2.95	2.28	0.67***	5.03	4.19	0.84***	-0.22	0.65	2.73
34	2.14	1.28	0.86***	3.03	2.34	0.69***	5.15	4.31	0.84***	-0.22	0.67	2.78
35	2.19	1.32	0.87***	3.11	2.40	0.71***	5.29	4.42	0.87***	-0.24	0.68	2.86
36	2.27	1.35	0.92***	3.21	2.47	0.73***	5.45	4.54	0.91***	-0.23	0.71	2.95
37	2.35	1.38	0.97***	3.31	2.53	0.78***	5.55	4.64	0.91***	-0.22	0.74	2.99
38	2.40	1.41	1.00***	3.42	2.58	0.84***	5.73	4.74	0.99***	-0.22	0.79	3.10
39	2.49	1.44	1.05***	3.52	2.64	0.88***	5.86	4.84	1.02***	-0.20	0.83	3.17
40	2.52	1.47	1.05***	3.62	2.69	0.93***	6.00	4.94	1.06***	-0.23	0.87	3.25
126	6.51	3.30	3.22***	13.77	6.52	7.25***	18.67	11.31	7.36***	-2.15	5.11	10.01
252	6.62	-0.63	7.25***	13.32	2.28	11.04***	38.17	8.13	30.04***	-5.95	0.76	25.61

This table shows the average cumulative returns for daily portfolios, which are first sorted according to their volatility and then according to the number of stock ticker mentions on WSB on event day 0. For each portfolio, equally weighted averages of cumulative returns are computed for the pre-event and post-event periods, respectively. All values are expressed in percentage terms. The differences in means are stated between the High-WSB and Low-WSB portfolios (High-Low) as well as between the High-WSB portfolio and the value-weighted sample (High-Market). We employ two-sample, two-sided Welch t-tests on the difference in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.

*,** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Appendix 24

Analysis of daily returns on the second day following portfolio formation (R_{t+2})

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Single sort	0.12	0.08	0.03	-0.04	0.11
Double-sorted portfolios based on market capitalization					
Small-cap	0.26	0.11	0.16 **	0.04	0.28
Medium-cap	0.16	0.07	0.09 **	0.00	0.17
Large-cap	0.06	0.07	-0.01	-0.06	0.04
Double-sorted portfolios based on illiquidity ratio					
Low illiquidity	0.10	0.07	0.03	-0.03	0.10
Medium illiquidity	0.07	0.07	0.00	-0.08	0.08
Large illiquidity	0.27	0.10	0.16 ***	0.05	0.28
Double-sorted portfolios based on volatility					
Low volatility	0.07	0.05	0.02	-0.01	0.05
Medium volatility	0.11	0.08	0.03	-0.02	0.08
Large volatility	0.18	0.12	0.06	-0.02	0.15

This table shows the average daily returns (R_{t+2}) of portfolios generated on the second day following portfolio formation. The single-sorted portfolio which is sorted according to the number of stock ticker mentions on WSB. The double-sorted portfolios are first sorted according to firm characteristics and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return (R_{t+2}) on the second day following portfolio formation. All values are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 25

Event-time analysis for double-sorts for small-cap and medium-cap stocks when excluding stocks with extreme positive cumulative returns from the High-WSB portfolios

Cumulative return (in %)

	Small-cap			Medium-cap			High-WSB vs. value-weighted sample (Market)	
Event day	High-WSB	Low-WSB	Difference High-Low	High-WSB	Low-WSB	Difference High-Low	High-Market small-cap	High-Market medium-cap
				Pre-event				
-10	0.35	0.03	0.32 ***	0.21	0.11	0.11 **	0.24	0.10
-9	0.65	0.07	0.58 ***	0.45	0.21	0.24 ***	0.44	0.24
-8	0.90	0.12	0.78 ***	0.76	0.32	0.43 ***	0.58	0.43
-7	1.10	0.16	0.94 ***	1.13	0.43	0.70 ***	0.67	0.69
-6	1.38	0.19	1.18 ***	1.50	0.53	0.97 ***	0.84	0.95
-5	1.77	0.22	1.55 ***	1.76	0.63	1.13 ***	1.13	1.12
-4	2.15	0.24	1.91 ***	2.09	0.73	1.36 ***	1.41	1.34
-3	2.51	0.27	2.24 ***	2.37	0.82	1.55 ***	1.66	1.53
-2	3.01	0.29	2.72 ***	2.70	0.92	1.78 ***	2.06	1.75
-1	3.59	0.31	3.28 ***	3.16	1.02	2.14 ***	2.54	2.11
0	4.53	0.32	4.21 ***	3.78	1.11	2.67 ***	3.42	2.66
				Post-event				
1	0.47	0.12	0.35 ***	0.18	0.08	0.11 **	0.39	0.11
2	0.73	0.21	0.52 ***	0.32	0.14	0.18 ***	0.59	0.18
3	1.01	0.33	0.68 ***	0.49	0.21	0.28 ***	0.80	0.29
4	1.31	0.45	0.86 ***	0.66	0.29	0.37 ***	1.03	0.38
5	1.67	0.56	1.11 ***	0.80	0.37	0.43 ***	1.32	0.45
6	2.05	0.66	1.40 ***	0.97	0.44	0.53 ***	1.63	0.55
7	2.38	0.74	1.64 ***	1.10	0.50	0.61 ***	1.90	0.62
8	2.66	0.84	1.83 ***	1.23	0.57	0.67 ***	2.10	0.67
9	3.02	0.94	2.08 ***	1.37	0.64	0.73 ***	2.38	0.73
10	3.48	1.04	2.44 ***	1.49	0.71	0.78 ***	2.77	0.78
11	3.85	1.14	2.71 ***	1.65	0.79	0.86 ***	3.06	0.87
12	4.31	1.24	3.06 ***	1.75	0.86	0.89 ***	3.44	0.89
13	4.63	1.35	3.28 ***	1.84	0.94	0.90 ***	3.69	0.90
14	5.05	1.46	3.59 ***	1.98	1.02	0.96 ***	4.04	0.97
15	5.49	1.57	3.92 ***	2.09	1.10	0.99 ***	4.41	1.01
16	5.83	1.69	4.14 ***	2.21	1.18	1.03 ***	4.67	1.05
17	6.23	1.78	4.45 ***	2.38	1.24	1.13 ***	5.00	1.15
18	6.54	1.87	4.67 ***	2.53	1.31	1.22 ***	5.24	1.23
19	6.86	1.95	4.91 ***	2.73	1.37	1.36 ***	5.49	1.36
20	7.20	2.03	5.18 ***	2.97	1.42	1.55 ***	5.77	1.54
21	7.56	2.11	5.45 ***	3.19	1.48	1.71 ***	6.07	1.69
22	7.91	2.20	5.71 ***	3.34	1.54	1.80 ***	6.35	1.77
23	8.31	2.28	6.03 ***	3.50	1.60	1.90 ***	6.69	1.88
24	8.80	2.37	6.43 ***	3.68	1.66	2.02 ***	7.11	1.99
25	9.22	2.45	6.76 ***	3.86	1.73	2.13 ***	7.46	2.09
26	9.61	2.54	7.07 ***	4.03	1.79	2.23 ***	7.78	2.19
27	10.04	2.63	7.41 ***	4.20	1.85	2.35 ***	8.14	2.30
28	10.52	2.73	7.79 ***	4.31	1.92	2.39 ***	8.55	2.35
29	11.01	2.82	8.19 ***	4.45	1.99	2.47 ***	8.98	2.42
30	11.48	2.91	8.57 ***	4.55	2.05	2.50 ***	9.38	2.46
31	11.85	3.01	8.84 ***	4.72	2.12	2.60 ***	9.69	2.55
32	12.25	3.10	9.15 ***	4.90	2.18	2.72 ***	10.02	2.67
33	12.55	3.18	9.36 ***	5.09	2.24	2.85 ***	10.25	2.79
34	12.84	3.27	9.57 ***	5.20	2.30	2.91 ***	10.48	2.84
35	13.13	3.36	9.78 ***	5.38	2.36	3.02 ***	10.70	2.94
36	13.40	3.45	9.95 ***	5.57	2.42	3.16 ***	10.90	3.07
37	13.73	3.52	10.21 ***	5.70	2.47	3.23 ***	11.16	3.14
38	13.97	3.59	10.38 ***	5.89	2.52	3.37 ***	11.35	3.27
39	14.26	3.66	10.60 ***	6.10	2.57	3.53 ***	11.57	3.41
40	14.58	3.73	10.85 ***	6.31	2.62	3.69 ***	11.83	3.56
126	38.04	6.85	31.19 ***	16.61	5.81	10.80 ***	29.38	7.95
252	25.46	0.09	25.38 ***	8.06	1.55	6.51 ***	12.90	-4.51

This table shows the average cumulative returns for daily portfolios, which are first sorted according to their market capitalization and then according to the number of stock ticker mentions on WSB on event day 0. In this analysis, we exclude stocks with extreme positive cumulative returns from the High-WSB portfolio, leading to the exclusion of five stocks from the High-WSB portfolio for small-cap stocks and five stocks from the High-WSB portfolio for medium-cap stocks. For each portfolio, equally weighted averages of cumulative returns are computed for the pre-event and post-event periods, respectively. All values are expressed in percentage terms. The differences in means are stated between the High-WSB and Low-WSB portfolios (High-Low) as well as between the High-WSB portfolios and the value-weighted sample (High-Market). We employ two-sample, two-sided Welch t-tests on the difference in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.

*,** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Appendix 26

Robustness test of the sample period
26.1 Sample period from 2018 to 2020: Next-day analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Single sort	0.11	0.07	0.03	-0.03	0.10
Double-sorted portfolios based on market capitalization					
Small-cap	0.43	0.09	0.34 ***	0.20	0.48
Medium-cap	0.10	0.06	0.04	-0.05	0.12
Large-cap	0.07	0.06	0.01	-0.04	0.07
Double-sorted portfolios based on illiquidity ratio					
Low illiquidity	0.08	0.06	0.01	-0.05	0.07
Medium illiquidity	0.18	0.06	0.11 **	0.02	0.21
Large illiquidity	0.40	0.08	0.33 ***	0.19	0.46
Double-sorted portfolios based on volatility					
Low volatility	0.06	0.04	0.02	-0.02	0.05
Medium volatility	0.09	0.07	0.03	-0.02	0.08
Large volatility	0.14	0.10	0.04	-0.05	0.13

This table shows the average next-day returns of daily single-sorted and double-sorted portfolios for the robustness test of a sample period from August 2018 to end of 2020. The double-sorted portfolios are first sorted according to various firm characteristics and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return on the day following portfolio formation. The daily returns are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Robustness test of the sample period
26.2 Sample period from 2018 to 2020: Risk factor exposures and alphas

Portfolio sorts:	Single sort	Small-cap	High illiquidity	High volatility
Coefficients for the DMN portfolio (zero cost)				
MKT - RF	0.1647 ***	0.1421 ***	0.1245 ***	0.0987 ***
	(0.0279)	(0.0517)	(0.0472)	(0.0353)
SMB	-0.3152 ***	0.0347	0.0591	-0.1392* *
	(0.0663)	(0.1228)	(0.1120)	(0.0838)
HML	-0.6312 ***	-0.161	-0.0804	-0.2771 ***
	(0.0659)	(0.1220)	(0.1111)	(0.0833)
MOM	-0.073	-0.2442 **	-0.1922 **	0.1358 **
	(0.0516)	(0.0956)	(0.0870)	(0.0652)
Constant	**-0.0002**	**0.0014** *	**0.001**	**0.0001**
	(0.0004)	(0.0008)	(0.0007)	(0.0006)
Observations	607	606	605	607
R^2	0.3066	0.0299	0.0313	0.132
Alphas for the High-WSB portfolio (long)				
Constant	**0.0001**	**0.0021** **	**0.0016** **	**0.0006**
	(0.0005)	(0.0009)	(0.0008)	(0.0007)
Alphas for the Low-WSB portfolio (short)				
Constant	**0.0004** ***	**0.0006** ***	**0.0005** ***	**0.0005** *
	(0.0001)	(0.0002)	(0.0002)	(0.0003)

This table shows the coefficients from the factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to firm characteristics and then according to the number of stock ticker mentions on WSB. The DMN portfolio goes long in the High-WSB and short in the Low-WSB portfolio. The table depicts the results for the Carhart 4-factor model for four different portfolio sorts (i.e., single sort and double sorts based on small market cap, high illiquidity ratio, and high volatility) and the sample period is from August 2018 to December 2020. MKT −RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 27

Robustness test of the sample period
27.1 Sample period from 2019 to 2021: Next-day analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Single sort	0.24	0.14	0.10 **	0.01	0.19
Double-sorted portfolios based on market capitalization					
Small-cap	0.50	0.18	0.32 ***	0.18	0.46
Medium-cap	0.22	0.13	0.09 *	0.00	0.18
Large-cap	0.15	0.11	0.04	-0.03	0.11
Double-sorted portfolios based on illiquidity ratio					
Low illiquidity	0.18	0.12	0.06	-0.01	0.14
Medium illiquidity	0.25	0.13	0.11 **	0.01	0.21
Large illiquidity	0.47	0.16	0.31 ***	0.18	0.44
Double-sorted portfolios based on volatility					
Low volatility	0.10	0.08	0.02	-0.02	0.06
Medium volatility	0.15	0.14	0.01	-0.04	0.07
Large volatility	0.31	0.20	0.11 **	0.01	0.21

This table shows the average next-day returns of daily single-sorted and double-sorted portfolios for the robustness test of a sample period from beginning of the year 2019 to end of February 2021. The double-sorted portfolios are first sorted according to various firm characteristics and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return on the day following portfolio formation. The daily returns are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Robustness test of the sample period
27.2 Sample period from 2019 to 2021: Risk factor exposures and alphas

Portfolio sorts:	a) Single sort	b) Small-cap	c) High illiquidity	High volatility
Coefficients for the DMN portfolio (zero cost)				
MKT - RF	0.0828 *	0.115 **	0.1234 ***	0.0107
	(0.0431)	(0.0543)	(0.0437)	(0.0482)
SMB	-0.0465	0.0982	0.0741	0.1225
	(0.0956)	(0.1206)	(0.0971)	(0.1071)
HML	-0.3774 ***	-0.0622	-0.0195	0.0131
	(0.0990)	(0.1248)	(0.1005)	(0.1109)
MOM	0.0976	-0.1873 *	-0.1616 **	0.3243 ***
	(0.0763)	(0.0962)	(0.0775)	(0.0855)
Constant	**0.0006**	**0.0016** *	**0.0008**	**0.0012**
	(0.0007)	(0.0009)	(0.0007)	(0.0008)
Observations	540	540	540	540
R^2	0.1255	0.0296	0.0459	0.0698
Alphas for the High-WSB portfolio (long)				
Constant	**0.0009**	**0.0022** **	**0.0013** *	**0.0017** ***
	(0.0007)	(0.0009)	(0.0007)	(0.0009)
Alphas for the Low-WSB portfolio (short)				
Constant	**0.0003** **	**0.0006** **	**0.0005** **	**0.0005** *
	(0.0001)	(0.0002)	(0.0002)	(0.0003)

This table shows the coefficients from the factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to firm characteristics and then according to the number of stock ticker mentions on WSB. The DMN portfolio goes long in the High-WSB and short in the Low-WSB portfolio. The table depicts the results for the Carhart 4-factor model for four different portfolio sorts (i.e., single sort and double sorts based on small market cap, high illiquidity ratio, and high volatility) and the sample period is from January 2019 to February 2021. MKT −RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 28

Robustness test of the sample period
28.1 Sample period from 2020 to 2021: Next-day analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Single sort	0.27	0.17	0.09	-0.06	0.24
Double-sorted portfolios based on market capitalization					
Small-cap	0.51	0.25	0.27 ***	0.11	0.43
Medium-cap	0.27	0.15	0.12 *	-0.01	0.24
Large-cap	0.15	0.11	0.04	-0.08	0.15
Double-sorted portfolios based on illiquidity ratio					
Low illiquidity	0.16	0.13	0.03	-0.09	0.16
Medium illiquidity	0.29	0.15	0.14 **	0.01	0.27
Large illiquidity	0.53	0.23	0.31 ***	0.15	0.46
Double-sorted portfolios based on volatility					
Low volatility	0.10	0.07	0.04	-0.02	0.10
Medium volatility	0.18	0.16	0.02	-0.06	0.11
Large volatility	0.40	0.28	0.12	-0.05	0.29

This table shows the average next-day returns of daily single-sorted and double-sorted portfolios for the robustness test of a sample period from beginning of the year 2020 to end of February 2021. The double-sorted portfolios are first sorted according to various firm characteristics and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return on the day following portfolio formation. The daily returns are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Robustness test of the sample period
28.2 Sample period from 2020 to 2021: Risk factor exposures and alphas

Portfolio sorts:	Single sort	Small-cap	High illiquidity	High volatility
Coefficients for the DMN portfolio (zero cost)				
MKT - RF	0.038	0.1141 **	0.1051 **	-0.0459
	(0.0604)	(0.0541)	(0.0439)	(0.0659)
SMB	-0.0052	0.2156 *	0.1368	0.1876
	(0.1356)	(0.1216)	(0.0986)	(0.1479)
HML	-0.2302	-0.0283	0.0391	0.2106
	(0.1515)	(0.1358)	(0.1102)	(0.1652)
MOM	0.2147 *	-0.1539	-0.1199	0.4628 ***
	(0.1145)	(0.1026)	(0.0832)	(0.1248)
Constant	**0.0007**	**0.0012**	**0.0013**	**0.0014**
	(0.0012)	(0.0011)	(0.0009)	(0.0013)
Observations	289	289	289	289
R^2	0.1263	0.0628	0.0847	0.0863
Alphas for the High-WSB portfolio (long)				
Constant	**0.0011**	**0.002** *	**0.002** **	**0.0023**
	(0.0012)	(0.0012)	(0.0010)	(0.0015)
Alphas for the Low-WSB portfolio (short)				
Constant	**0.0004**	**0.0008** **	**0.0007** *	**0.0009**
	(0.0003)	(0.0004)	(0.0004)	(0.0006)

This table shows the coefficients from the factor model regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to firm characteristics and then according to the number of stock ticker mentions on WSB. The DMN portfolio goes long in the High-WSB and short in the Low-WSB portfolio. The table depicts the results for the Carhart 4-factor model for four different portfolio sorts (i.e., single sort and double sorts based on small market cap, high illiquidity ratio, and high volatility) and the sample period is from January 2020 to February 2021. MKT −RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 29

Robustness test of the sorting mechanism
29.1 Portfolios based on abnormal stock ticker mentions: Next-day analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	Abnormal High-WSB	Abnormal Low-WSB	Abnormal High minus Abnormal Low	Lower bound	Upper bound
Single sort	0.13	0.09	0.04	-0.04	0.11
Double-sorted portfolios based on market capitalization					
Small-cap	0.47	0.12	0.35 ***	0.19	0.50
Medium-cap	0.22	0.08	0.14 ***	0.05	0.22
Large-cap	0.09	0.07	0.02	-0.04	0.07
Double-sorted portfolios based on illiquidity ratio					
Low illiquidity	0.13	0.08	0.05	-0.02	0.12
Medium illiquidity	0.24	0.08	0.15 ***	0.06	0.25
Large illiquidity	0.42	0.11	0.31 ***	0.16	0.45
Double-sorted portfolios based on volatility					
Low volatility	0.19	0.50	0.04 *	0.00	0.08
Medium volatility	0.05	0.22	0.03	-0.02	0.09
Large volatility	-0.04	0.07	0.17 ***	0.06	0.28

This table shows the average next-day returns of daily single-sorted and double-sorted portfolios for the robustness test of building portfolios based on abnormal stock ticker mentions on WSB. The double-sorted portfolios are first sorted according to various firm characteristics and then according to the abnormal number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return on the day following portfolio formation. The daily returns are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the Abnormal High-WSB and the Abnormal Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Robustness test of the sorting mechanism
29.2 Portfolios based on abnormal stock ticker mentions: Risk factor exposures and alphas

Portfolio sorts:	Single sort	Small-cap	High illiquidity	High volatility
Coefficients for the DMN portfolio (zero cost)				
MKT - RF	0.0566	0.1422**	0.1252**	0.0387
	(0.0413)	(0.0569)	(0.0503)	(0.0466)
SMB	0.0714	0.1798	0.1105	0.1234
	(0.0921)	(0.1269)	(0.1120)	(0.1038)
HML	-0.2956***	-0.0659	0.0629	-0.1011
	(0.0949)	(0.1308)	(0.1154)	(0.1070)
MOM	0.0715	-0.2123**	-0.0153	0.1063
	(0.0750)	(0.1034)	(0.0912)	(0.0846)
Constant	**0.0003**	**0.0018****	**0.0011**	**0.0012***
	(0.0006)	(0.0009)	(0.0008)	(0.0007)
Observations	645	643	642	645
R^2	0.0642	0.0329	0.017	0.0194
Alphas for the Abnormal High-WSB portfolio (long)				
Constant	**0.0006**	**0.0024****	**0.0016***	**0.0017****
	(0.0006)	(0.0009)	(0.0008)	(0.0008)
Alphas for the Abnormal Low-WSB portfolio (short)				
Constant	**0.0003****	**0.0006*****	**0.0005****	**0.0005***
	(0.0001)	(0.0002)	(0.0002)	(0.0003)

This table shows the coefficients from regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to firm characteristics and then according to the number of abnormal stock ticker mentions on WSB. The table shows the results for the Carhart 4-factor model for four different portfolio sorts (i.e., single sort and double sorts based on small market cap, high illiquidity ratio, and high volatility). The DMN portfolio goes long in the Abnormal High-WSB and short in the Abnormal Low-WSB portfolio. MKT −RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 30

Robustness test of the portfolio size
30.1 Portfolio size of 40: Next-day analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Single sort	0.14	0.09	0.05	-0.01	0.11
Double-sorted portfolios based on market capitalization					
Small-cap	0.52	0.11	0.41 ***	0.28	0.54
Medium-cap	0.22	0.08	0.14 ***	0.07	0.22
Large-cap	0.10	0.07	0.03	-0.02	0.07
Double-sorted portfolios based on illiquidity ratio					
Low illiquidity	0.12	0.08	0.04	-0.01	0.10
Medium illiquidity	0.24	0.08	0.16 ***	0.08	0.24
Large illiquidity	0.43	0.11	0.32 ***	0.20	0.45
Double-sorted portfolios based on volatility					
Low volatility	0.07	0.05	0.02	-0.02	0.05
Medium volatility	0.14	0.09	0.06 **	0.01	0.10
Large volatility	0.24	0.13	0.11 **	0.03	0.20

This table shows the average next-day returns of daily single-sorted and double-sorted portfolios for the robustness test of increasing the portfolio size of the High-WSB portfolio to the 40 most mentioned stocks. The double-sorted portfolios are first sorted according to various firm characteristics and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return on the day following portfolio formation. The daily returns are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Robustness test of the portfolio size
30.2 Portfolio size of 40: Risk factor exposures and alphas

Portfolio sorts:	Single sort	Small-cap	High illiquidity	High volatility
Coefficients for the DMN portfolio (zero cost)				
MKT - RF	0.071**	0.1339***	0.1032**	0.0288
	(0.0312)	(0.0513)	(0.0460)	(0.0378)
SMB	-0.0616	0.131	0.1093	0.0729
	(0.0696)	(0.1143)	(0.1025)	(0.0844)
HML	-0.3231***	-0.0632	-0.0147	-0.1086
	(0.0718)	(0.1179)	(0.1056)	(0.0870)
MOM	0.085	-0.1851**	-0.1374	0.1987***
	(0.0567)	(0.0932)	(0.0834)	(0.0688)
Constant	**0.0004**	**0.0015***	**0.0011**	**0.0009**
	(0.0005)	(0.0008)	(0.0007)	(0.0006)
Observations	645	644	643	645
R^2	0.1396	0.0303	0.0262	0.0655
Alphas for the High-WSB portfolio (long)				
Constant	**0.0007**	**0.0021****	**0.0016****	**0.0013***
	(0.0005)	(0.0008)	(0.0007)	(0.0007)
Alphas for the Low-WSB portfolio (short)				
Constant	**0.0003****	**0.0006*****	**0.0005****	**0.0005***
	(0.0001)	(0.0002)	(0.0002)	(0.0003)

This table shows the coefficients from regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to firm characteristics and then according to the number of stock ticker mentions on WSB (size of High-WSB: 40 stocks). The table shows the results for the Carhart 4-factor model for four different portfolio sorts (i.e., single sort and double sorts based on small market cap, high illiquidity ratio, and high volatility). The DMN portfolio goes long in the High-WSB and short in the Low-WSB portfolio. MKT −RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 31

Robustness test of the portfolio size
31.1 Portfolio size of 20: Next-day analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Single sort	0.17	0.09	0.08	-0.03	0.18
Double-sorted portfolios based on market capitalization					
Small-cap	0.48	0.12	0.35 ***	0.20	0.51
Medium-cap	0.21	0.08	0.13 **	0.03	0.23
Large-cap	0.11	0.07	0.04	-0.04	0.12
Double-sorted portfolios based on illiquidity ratio					
Low illiquidity	0.15	0.08	0.07	-0.02	0.16
Medium illiquidity	0.18	0.09	0.10 *	-0.01	0.20
Large illiquidity	0.43	0.11	0.32 ***	0.19	0.46
Double-sorted portfolios based on volatility					
Low volatility	0.08	0.05	0.03	-0.01	0.07
Medium volatility	0.09	0.09	0.00	-0.06	0.05
Large volatility	0.21	0.13	0.07	-0.04	0.18

This table shows the average next-day returns of daily single-sorted and double-sorted portfolios for the robustness test of decreasing the portfolio size of the High-WSB portfolio to the 20 most mentioned stocks. The double-sorted portfolios are first sorted according to various firm characteristics and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return on the day following portfolio formation. The daily returns are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Robustness test of the portfolio size
31.2 Portfolio size of 20: Risk factor exposures and alphas

Portfolio sorts:	Single sort	Small-cap	High illiquidity	High volatility
Coefficients for the DMN portfolio (zero cost)				
MKT - RF	0.1149 **	0.1282 **	0.0802	0.0597
	(0.0486)	(0.0589)	(0.0503)	(0.0526)
SMB	0.0060	0.1674	0.1456	0.1369
	(0.1084)	(0.1312)	(0.1121)	(0.1173)
HML	-0.4508 ***	-0.0690	-0.0281	-0.1358
	(0.1118)	(0.1353)	(0.1154)	(0.1209)
MOM	0.0873	-0.1763 *	-0.1729 *	0.3028 ***
	(0.0884)	(0.1069)	(0.0912)	(0.0956)
Constant	**0.0004**	**0.0021** **	**0.0012**	**0.0006**
	(0.0007)	(0.0009)	(0.0008)	(0.0008)
Observations	645	644	643	645
R^2	0.0995	0.0225	0.0260	0.0703
Alphas for High-WSB portfolio (long)				
Constant	**0.0007**	**0.0027** ***	**0.0017** **	**0.0011**
	(0.0007)	(0.0010)	(0.0008)	(0.0009)
Alphas for Low-WSB portfolio (short)				
Constant	**0.0003** **	**0.0006** ***	**0.0005** **	**0.0005** *
	(0.0001)	(0.0002)	(0.0002)	(0.0003)

This table shows the coefficients from regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to firm characteristics and then according to the number of stock ticker mentions on WSB (size of High-WSB: 20 stocks). The table shows the results for the Carhart 4-factor model for four different portfolio sorts (i.e., single sort and double sorts based on small market cap, high illiquidity ratio, and high volatility). The DMN portfolio goes long in the High-WSB and short in the Low-WSB portfolio. MKT −RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 32

Robustness test of the portfolio size
32.1 Portfolio size of 10: Next-day analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Single sort	0.18	0.09	0.09	-0.07	0.25
Double-sorted portfolios based on market capitalization					
Small-cap	0.47	0.12	0.35 ***	0.14	0.56
Medium-cap	0.19	0.08	0.11 *	-0.02	0.23
Large-cap	0.10	0.07	0.03	-0.10	0.15
Double-sorted portfolios based on illiquidity ratio					
Low illiquidity	0.18	0.08	0.10	-0.06	0.25
Medium illiquidity	0.10	0.09	0.01	-0.11	0.13
Large illiquidity	0.38	0.11	0.27 ***	0.10	0.45
Double-sorted portfolios based on volatility					
Low volatility	0.10	0.05	0.05 *	0.00	0.10
Medium volatility	0.09	0.09	0.00	-0.08	0.08
Large volatility	0.20	0.14	0.06	-0.12	0.25

This table shows the average next-day returns of daily single-sorted and double-sorted portfolios for the robustness test of decreasing the portfolio size of the High-WSB portfolio to the 10 most mentioned stocks. The double-sorted portfolios are first sorted according to various firm characteristics and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return on the day following portfolio formation. The daily returns are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Robustness test of the portfolio size
32.2 Portfolio size of 10: Risk factor exposures and alphas

	Single sort	Small-cap	High illiquidity	High volatility
Coefficients for the DMN portfolio (zero cost)				
MKT - RF	0.1253 *	0.1319 *	0.0563	0.0094
	(0.0641)	(0.0781)	(0.0644)	(0.0807)
SMB	0.1493	0.3082 *	0.3613 **	0.2824
	(0.1429)	(0.1741)	(0.1436)	(0.1799)
HML	-0.4435 ***	0.2589	0.094	-0.2026
	(0.1473)	(0.1796)	(0.1478)	(0.1856)
MOM	0.1698	0.0514	-0.0594	0.2893 **
	(0.1164)	(0.1419)	(0.1168)	(0.1466)
Constant	**0.0005**	**0.0025** **	**0.0019** **	**0.0003**
	(0.0010)	(0.0012)	(0.0010)	(0.0012)
Observations	645	644	643	645
R^2	0.0760	0.0208	0.0226	0.0367
Alphas for High-WSB portfolio (long)				
Constant	**0.0008**	**0.0031** **	**0.0024** **	**0.0008**
	(0.0010)	(0.0013)	(0.0010)	(0.0013)
Alphas for Low-WSB portfolio (short)				
Constant	**0.0003** **	**0.0006** ***	**0.0005** ***	**0.0005** *
	(0.0001)	(0.0002)	(0.0002)	(0.0003)

This table shows the coefficients from regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to firm characteristics and then according to the number of stock ticker mentions on WSB (size of High-WSB: 10 stocks). The table shows the results for the Carhart 4-factor model for four different portfolio sorts (i.e., single sort and double sorts based on small market cap, high illiquidity ratio, and high volatility). The DMN portfolio goes long in the High-WSB and short in the Low-WSB portfolio. MKT −RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 33

Robustness test of the portfolio size
33.1 Portfolio size of 5: Next-day analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
Single sort	0.18	0.09	0.09	-0.17	0.35
Double-sorted portfolios based on market capitalization					
Small-cap	0.33	0.13	0.20	-0.06	0.46
Medium-cap	0.20	0.08	0.12	-0.08	0.32
Large-cap	0.05	0.07	-0.02	-0.23	0.19
Double-sorted portfolios based on illiquidity ratio					
Low illiquidity	0.16	0.08	0.08	-0.17	0.33
Medium illiquidity	0.12	0.09	0.03	-0.15	0.22
Large illiquidity	0.48	0.11	0.37 ***	0.13	0.61
Double-sorted portfolios based on volatility					
Low volatility	0.17	0.05	0.12 ***	0.04	0.21
Medium volatility	0.06	0.09	-0.03	-0.15	0.10
Large volatility	0.26	0.14	0.12	-0.17	0.42

This table shows the average next-day returns of daily single-sorted and double-sorted portfolios for the robustness test of decreasing the portfolio size of the High-WSB portfolio to the five most mentioned stocks. The double-sorted portfolios are first sorted according to various firm characteristics and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return on the day following portfolio formation. The daily returns are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Robustness test of the portfolio size
33.2 Portfolio size of 5: Risk factor exposures and alphas

Portfolio sorts:	Single sort	Small-cap	High illiquidity	High volatility
Coefficients for the DMN portfolio (zero cost)				
MKT - RF	0.0912	0.1885 *	0.2587 ***	-0.0431
	(0.1027)	(0.1106)	(0.0985)	(0.1115)
SMB	0.379 *	0.4176 *	0.2034	0.4085
	(0.2290)	(0.2466)	(0.2195)	(0.2487)
HML	-0.3747	0.115	0.5615 **	-0.2474
	(0.2362)	(0.2544)	(0.2260)	(0.2564)
MOM	0.1591	-0.001	0.3272 *	0.2336
	(0.1866)	(0.2010)	(0.1785)	(0.2026)
Constant	**0.0005**	**0.0022**	**0.0039** **	**0.0007**
	(0.0016)	(0.0017)	(0.0015)	(0.0017)
Observations	645	644	643	645
R^2	0.0246	0.0131	0.0257	0.0194
Alphas for the High-WSB portfolio (long)				
Constant	**0.0009**	**0.0028**	**0.0044** ***	**0.0012**
	(0.0016)	(0.0017)	(0.0016)	(0.0017)
Alphas for the Low-WSB portfolio (short)				
Constant	**0.0003** **	**0.0006** ***	**0.0005** ***	**0.0005** *
	(0.0001)	(0.0002)	(0.0002)	(0.0003)

This table shows the coefficients from regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on risk factors. The portfolios are first sorted according to firm characteristics and then according to the number of stock ticker mentions on WSB (size of High-WSB: five stocks). The table shows the results for the Carhart 4-factor model for four different portfolio sorts (i.e., single sort and double sorts based on small market cap, high illiquidity ratio, and high volatility). The DMN portfolio goes long in the High-WSB and short in the Low-WSB portfolio. MKT −RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. Standard errors are expressed in brackets. The null hypothesis is formulated as: The coefficient is equal to zero. A significant constant represents an abnormal return that cannot be explained by risk factors.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 34

Robustness test of the portfolio size
Next-day analysis for single-sorted portfolios: Comparing the top 10 most mentioned stocks (ranked 1st to 10th) with the following 20 (ranked 11th to 30th)

	Ticker mentions			95% Confidence interval	
in %	High-WSB 1-10	High-WSB 11-30	Difference	Lower bound	Upper bound
R_{t+1}	0.18	0.15	0.03	-0.15	0.21
$A\$VO_{t+1}$	71.45	36.66	34.79 ***	26.53	43.04
ATO_{t+1}	65.74	34.89	30.86 ***	25.56	36.16
$AILLIQ_{t+1}$	-10.95	-9.64	-1.31	-3.86	1.23
ΔSIR_{t+1}	0.02	0.05	-0.03	-0.11	0.06
Market cap_t	312.77	124.29	188.48 ***	176.05	200.91

This table shows the average stock characteristics of daily portfolios, which are sorted according to their number of stock ticker mentions on WSB. The 10 most mentioned stocks on WSB on each day are included in the High-WSB 1-10 portfolio and the following 20 most mentioned stocks are included in the High-WSB 11-30 portfolio. For each portfolio, we calculate equally weighted averages of daily return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) on the day following portfolio formation. These variables are expressed in percentage terms. In addition, we show the market capitalization in U.S. dollar billions on the day of portfolio sorts. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB 1-10 and the High-WSB 11-30 portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 35

35.1 Single-sorted weekly portfolios: Same-week characteristics

	Ticker mentions		Difference	95% Confidence interval	
	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_t	1.81	0.37	1.44 ***	0.97	1.91
$A\$VO_t$	47.12	-0.63	47.75 ***	40.69	54.81
ATO_t	45.14	-0.60	45.74 ***	41.40	50.08
$AILLIQ_t$	-7.15	0.10	-7.24 ***	-9.19	-5.29
Market cap_t	201.15	11.33	189.82 ***	178.58	201.07

This table shows the average stock characteristics of weekly portfolios, which are sorted according to their number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of weekly return (R_t), abnormal dollar volume ($A\$VO_t$), abnormal stock turnover rate (ATO_t), abnormal stock turnover rate ($AILLIQ_t$), and market capitalization (Market cap_t) in the week of portfolio formation. Market capitalization is stated in U.S. dollar billions. All other variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

35.2 Single-sorted weekly portfolios: Next-week analysis

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.63	0.39	0.25	-0.13	0.63
$A\$VO_{t+1}$	23.80	-0.19	23.99 ***	18.64	29.34
ATO_{t+1}	23.00	-0.16	23.16 ***	20.21	26.11
$AILLIQ_{t+1}$	-8.24	0.22	-8.46 ***	-10.43	-6.49
ΔSIR_{t+1}	0.05	-0.02	0.06	-0.02	0.14

This table shows the average stock characteristics of weekly portfolios, which are sorted according to their number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of weekly return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) in the week following portfolio formation. Market capitalization is stated in U.S. dollar billions. All other variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 36

36.1 Double-sorted weekly portfolios based on market cap: Next-week analysis

1. Small-cap

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	1.78	0.50	1.28 ***	0.47	2.09
$A\$VO_{t+1}$	31.27	-6.29	37.56 ***	26.07	49.04
ATO_{t+1}	58.87	0.47	58.40 ***	50.15	66.66
$AILLIQ_{t+1}$	20.49	7.41	13.09 ***	8.18	18.00
ΔSIR_{t+1}	0.03	-0.01	0.04	-0.12	0.21

2. Medium-cap

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	1.10	0.33	0.77 ***	0.19	1.35
$A\$VO_{t+1}$	28.83	1.62	27.21 ***	20.08	34.35
ATO_{t+1}	35.05	-1.07	36.12 ***	31.72	40.52
$AILLIQ_{t+1}$	7.84	-3.45	11.29 ***	7.74	14.84
ΔSIR_{t+1}	-0.03	-0.01	-0.02	-0.13	0.10

3. Large-cap

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.27	0.30	-0.03	-0.28	0.21
$A\$VO_{t+1}$	19.11	3.00	16.11 ***	13.37	18.84
ATO_{t+1}	14.98	-1.65	16.63 ***	14.48	18.79
$AILLIQ_{t+1}$	-10.25	-4.03	-6.22 ***	-8.05	-4.38
ΔSIR_{t+1}	-0.01	-0.02	0.01	-0.02	0.05

This table shows the average stock characteristics of weekly portfolios, which are first sorted according to their market capitalization and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of weekly return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) in the week following portfolio formation. All variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

36.2 Double-sorted weekly portfolios based on illiquidity ratio: Next-week analysis

1. Low illiquidity

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.62	0.32	0.30	-0.07	0.67
$A\$VO_{t+1}$	24.12	6.32	17.81 ***	12.62	22.99
ATO_{t+1}	20.12	1.72	18.41 ***	15.72	21.09
$AILLIQ_{t+1}$	-10.92	-7.99	-2.93 ***	-4.71	-1.16
ΔSIR_{t+1}	0.01	-0.02	0.03	-0.04	0.10

2. Medium illiquidity

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.92	0.34	0.58 **	0.05	1.11
$A\$VO_{t+1}$	16.62	2.35	14.28 ***	8.71	19.84
ATO_{t+1}	29.83	0.40	29.43 ***	24.97	33.89
$AILLIQ_{t+1}$	15.61	-3.99	19.60 ***	15.80	23.39
ΔSIR_{t+1}	0.03	-0.01	0.04	-0.06	0.14

3. High illiquidity

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	1.59	0.47	1.12 **	0.20	2.03
$A\$VO_{t+1}$	17.73	-9.68	27.41 ***	13.71	41.11
ATO_{t+1}	41.93	-3.71	45.64 ***	34.48	56.80
$AILLIQ_{t+1}$	43.79	11.50	32.29 ***	25.48	39.10
ΔSIR_{t+1}	-0.03	-0.02	-0.02	-0.17	0.14

This table shows the average stock characteristics of weekly portfolios, which are first sorted according to their illiquidity ratio and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of weekly return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) in the week following portfolio formation. All variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 37

37.1 Testing for return persistence: Single-sorted portfolios

	DMN portfolio				High-WSB portfolio			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
MKT- RF		0.0964**		0.0957**		1.1437***		1.1358***
		(0.0376)		(0.0377)		(0.0373)		(0.0371)
SMB		-0.0645		-0.0621		0.6392***		0.6303***
		(0.0839)		(0.0841)		(0.0827)		(0.0829)
HML		-0.4051***		-0.4044***		-0.0557		-0.0585
		(0.0865)		(0.0866)		(0.0852)		(0.0854)
MOM		0.0785		0.0795		0.0229		0.0156
		(0.0684)		(0.0684)		(0.0674)		(0.0674)
RET DMN	-0.0268	-0.0279						
	(0.0294)	(0.0275)						
CUM RET DMN			-0.0031	0.0004				
			(0.0095)	(0.0089)				
RET High-WSB					-0.0555*	0.0311		
					(0.0324)	(0.0201)		
CUM RET High-WSB							0.0138	0.0033
							(0.0101)	(0.0062)
Constant	0.0008	0.0006	0.0008	0.0004	0.0019**	0.0005	0.0011	0.0006
	(0.0006)	(0.0006)	(0.0007)	(0.0006)	(0.0009)	(0.0006)	(0.0010)	(0.0006)
Observations	645	645	645	645	645	645	645	645
R^2	0.0013	0.1352	0.0002	0.1339	0.0046	0.6284	0.0029	0.6271

This table shows the coefficients from regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on a control variable for return persistence and on risk factors. The daily portfolios are sorted according to the number of stock ticker mentions on WSB. The DMN portfolio goes long in the High-WSB portfolio and short in the Low-WSB portfolio. The daily excess returns are regressed on the portfolio's return on the day of portfolio sorts in regression (1), the return on the day of portfolio sorts and the four Carhart factors in regression (2), the portfolio's cumulative return over the last ten trading days in regression (3), and cumulative return over the last ten trading days plus the four Carhart factors. MKT − RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. RET is the portfolio's return on the day of portfolio sorts and CUM RET the portfolio's cumulative returns over the last ten trading days. Standard errors are expressed in brackets.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

37.2 Testing for return persistence: Double-sorted portfolios for small-cap stocks

	DMN portfolio				High-WSB portfolio			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
MKT- RF		0.1171**		0.1129**		1.1853***		1.1887***
		(0.0515)		(0.0519)		(0.0553)		(0.0551)
SMB		0.1264		0.1307		1.2705***		1.2743***
		(0.1147)		(0.1157)		(0.1228)		(0.1228)
HML		-0.07		-0.0892		0.3783***		0.376***
		(0.1184)		(0.1194)		(0.1266)		(0.1265)
MOM		-0.1753*		-0.1838*		-0.3642 ***		-0.3631 ***
		(0.0935)		(0.0943)		(0.1000)		(0.1000)
RET DMN	-0.0851***	-0.0873***						
	(0.0269)	(0.0267)						
CUM RET DMN			0.0042	0.0023				
			(0.0125)	(0.0124)				
RET High-WSB					-0.0334	-0.0077		
					(0.0319)	(0.0207)		
CUM RET High-WSB							0.0079	-0.0037
							(0.0115)	(0.0074)
Constant	0.002**	0.0019**	0.0015*	0.0014*	0.0028**	0.002**	0.0025*	0.0021**
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0013)	(0.0009)	(0.0013)	(0.0009)
Observations	644	644	644	644	644	644	644	644
R^2	0.0154	0.0397	0.0002	0.0236	0.0017	0.5856	0.0007	0.5857

This table shows the coefficients from regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on a control variable for return persistence and on risk factors. The daily portfolios are first sorted according to their market capitalization and then based on the number of stock ticker mentions on WSB. The DMN portfolio goes long in the High-WSB portfolio and short in the Low-WSB portfolio. The daily excess returns are regressed on the portfolio's return on the day of portfolio sorts in regression (1), the return on the day of portfolio sorts and the four Carhart factors in regression (2), the portfolio's cumulative return over the last ten trading days in regression (3), and cumulative return over the last ten trading days plus the four Carhart factors. MKT − RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. RET is the portfolio's return on the day of portfolio sorts and CUM RET the portfolio's cumulative returns over the last ten trading days. Standard errors are expressed in brackets.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

37.3 Testing for return persistence: Double-sorted portfolios for high illiquidity stocks

	DMN portfolio				High-WSB portfolio			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
MKT- RF		0.1006**		0.0997**		1.1615***		1.1752***
		(0.0457)		(0.0463)		(0.0488)		(0.0491)
SMB		0.0918		0.0828		1.156***		1.1651***
		(0.1019)		(0.1031)		(0.1084)		(0.1093)
HML		-0.0181		-0.0341		0.4372***		0.4247***
		(0.1050)		(0.1061)		(0.1117)		(0.1124)
MOM		-0.1519*		-0.1663**		-0.3293***		-0.3265***
		(0.0829)		(0.0838)		(0.0882)		(0.0889)
RET DMN	-0.0503***	-0.0505***						
	(0.0113)	(0.0112)						
CUM RET DMN			0.0316**	0.0324**				
			(0.0132)	(0.0131)				
RET High-WSB					-0.0474 ***	-0.0320 ***		
					(0.0169)	(0.0104)		
CUM RET High-WSB							0.009	-0.0012
							(0.0120)	(0.0074)
Constant	0.0016**	0.0015**	0.0009	0.0008	0.0026**	0.0019**	0.0021*	0.0016**
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0012)	(0.0008)	(0.0012)	(0.0008)
Observations	643	643	643	643	643	643	643	643
R^2	0.0302	0.057	0.0089	0.0359	0.012	0.6372	0.0009	0.6318

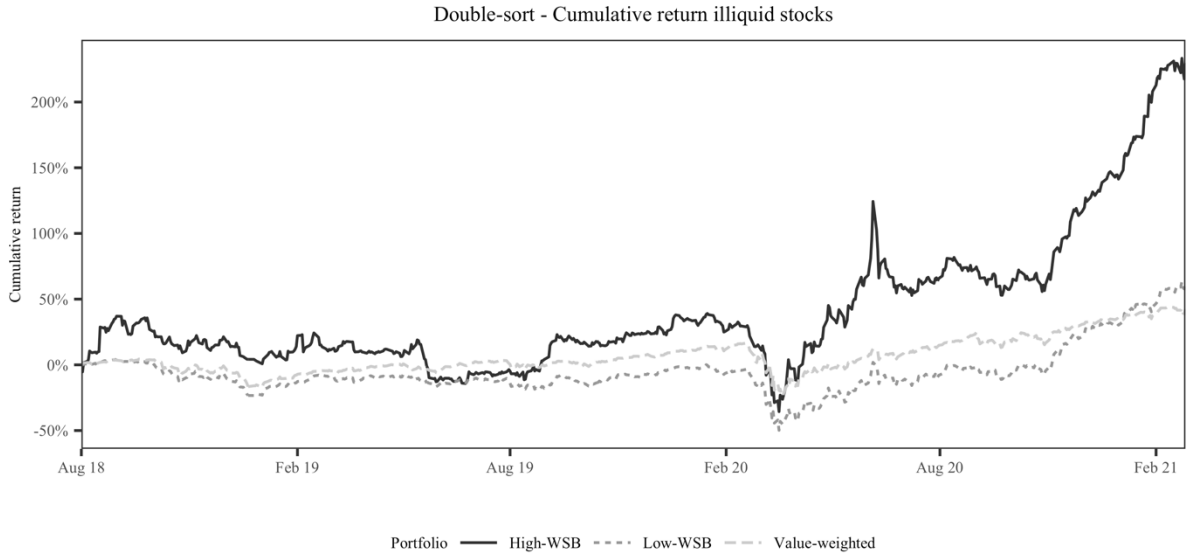
This table shows the coefficients from regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on a control variable for return persistence and on risk factors. The daily portfolios are first sorted according to their illiquidity ratio and then based on the number of stock ticker mentions on WSB. The DMN portfolio goes long in the High-WSB portfolio and short in the Low-WSB portfolio. The daily excess returns are regressed on the portfolio's return on the day of portfolio sorts in regression (1), the return on the day of portfolio sorts and the four Carhart factors in regression (2), the portfolio's cumulative return over the last ten trading days in regression (3), and cumulative return over the last ten trading days plus the four Carhart factors. MKT − RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. RET is the portfolio's return on the day of portfolio sorts and CUM RET the portfolio's cumulative returns over the last ten trading days. Standard errors are expressed in brackets.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

37.4 Testing for return persistence: Double-sorted portfolios for high volatility stocks

	DMN portfolio				High-WSB portfolio			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
MKT- RF		0.0271		0.0282		1.2875***		1.2671***
		(0.0426)		(0.0426)		(0.0480)		(0.0483)
SMB		0.121		0.1169		1.3364***		1.3286***
		(0.0950)		(0.0951)		(0.1064)		(0.1078)
HML		-0.0535		-0.0537		0.2405**		0.2474**
		(0.0980)		(0.0980)		(0.1097)		(0.1111)
MOM		0.2895***		0.2885***		0.0036		-0.0104
		(0.0774)		(0.0774)		(0.0868)		(0.0878)
RET DMN	0.0179	0.0206						
	(0.0292)	(0.0282)						
CUM RET DMN			0.0075	0.0069				
			(0.0091)	(0.0088)				
RET High-WSB					0.0251	0.0827***		
					(0.0324)	(0.0201)		
CUM RET High-WSB							0.0069	-0.0053
							(0.0098)	(0.0061)
Constant	0.0007	0.0006	0.0006	0.0006	0.0018	0.0006	0.0018	0.0015*
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0012)	(0.0007)	(0.0012)	(0.0008)
Observations	645	645	645	645	645	645	645	645
R^2	0.0006	0.0727	0.001	0.0728	0.0009	0.626	0.0008	0.6165

This table shows the coefficients from regressions of portfolio excess returns on the day following sorts (i.e., next-day portfolio returns minus one-month U.S. Treasury bill rate) on a control variable for return persistence and on risk factors. The daily portfolios are first sorted according to their volatility and then based on the number of stock ticker mentions on WSB. The DMN portfolio goes long in the High-WSB portfolio and short in the Low-WSB portfolio. The daily excess returns are regressed on the portfolio's return on the day of portfolio sorts in regression (1), the return on the day of portfolio sorts and the four Carhart factors in regression (2), the portfolio's cumulative return over the last ten trading days in regression (3), and cumulative return over the last ten trading days plus the four Carhart factors. MKT − RF represents the exposure of portfolios to the market factor, SMB to the size factor, HML to the value factor, and MOM to the momentum factor. RET is the portfolio's return on the day of portfolio sorts and CUM RET the portfolio's cumulative returns over the last ten trading days. Standard errors are expressed in brackets.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 38



38.1 Cumulative return of high illiquidity stocks

This figure shows the cumulative return of the high illiquidity High-WSB and Low-WSB portfolio over the sample period. In addition, the cumulative return of a value-weighted portfolio is shown. The High-WSB and Low-WSB portfolio are sorted daily. The value-weighted portfolio is comprised of all stocks part of the sample.

38.2 Double-sorted portfolios for high illiquidity stocks: Portfolio return statistics

	High-WSB	Low-WSB	DMN Portfolio
Excess return	57.34	19.48	33.87
Volatility	49.37	35.71	28.59
Sharpe ratio	1.16	0.55	1.18

This table shows the annualized excess return, volatility, and Sharpe ratio of portfolios, which are sorted based on their number of stock ticker mentions on WSB. Excess return and volatility are expressed in percentage terms.

Appendix 39

Double-sorted portfolios based on book-to-market value: Next-day analysis

1. Low book-to-market value

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.14	0.10	0.04	-0.02	0.10
$A\$VO_{t+1}$	39.24	2.60	36.64 ***	33.80	39.47
ATO_{t+1}	29.01	-2.19	31.20 ***	29.38	33.01
$AILLIQ_{t+1}$	-14.79	-5.04	-9.75 ***	-10.86	-8.64
ΔSIR_{t+1}	-0.02	-0.02	-0.01	-0.03	0.02

2. Medium book-to-market value

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.21	0.07	0.14 ***	0.06	0.21
$A\$VO_{t+1}$	31.06	-1.18	32.25 ***	28.38	36.11
ATO_{t+1}	32.24	-2.35	34.59 ***	31.71	37.48
$AILLIQ_{t+1}$	-0.57	-1.04	0.47	-1.12	2.05
ΔSIR_{t+1}	-0.04	-0.02	-0.03 *	-0.05	0.00

3. High book-to-market value

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.23	0.09	0.14 ***	0.06	0.22
$A\$VO_{t+1}$	12.31	-5.05	17.36 ***	15.65	19.07
ATO_{t+1}	31.14	-0.16	31.31 ***	29.29	33.33
$AILLIQ_{t+1}$	11.90	5.28	6.62 ***	4.82	8.42
ΔSIR_{t+1}	0.05	-0.01	0.06 ***	0.03	0.10

This table shows the average stock characteristics of daily portfolios, which are first sorted according to their book-to-market value and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) on the day following portfolio formation. All variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Appendix 40

Double-sorted portfolios based on same-day return: Next-day analysis

1. Low same-day return

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.06	0.08	-0.02	-0.09	0.05
$A\$VO_{t+1}$	26.89	-1.61	28.50 ***	26.04	30.95
ATO_{t+1}	30.23	0.46	29.77 ***	27.94	31.60
$AILLIQ_{t+1}$	-4.61	4.19	-8.80 ***	-10.30	-7.31
ΔSIR_{t+1}	0.06	-0.01	0.06 ***	0.03	0.09

2. Medium same-day return

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.16	0.07	0.09 ***	0.03	0.15
$A\$VO_{t+1}$	10.79	-6.19	16.97 ***	15.09	18.86
ATO_{t+1}	10.43	-7.40	17.83 ***	16.14	19.52
$AILLIQ_{t+1}$	0.00	-0.32	0.32	-1.07	1.70
ΔSIR_{t+1}	0.01	-0.02	0.03 ***	0.01	0.05

3. High same-day return

	Ticker mentions		Difference	95% Confidence interval	
in %	High-WSB	Low-WSB	High-Low	Lower bound	Upper bound
R_{t+1}	0.18	0.12	0.06 *	-0.01	0.13
$A\$VO_{t+1}$	47.24	3.60	43.64 ***	40.27	47.01
ATO_{t+1}	42.61	2.75	39.86 ***	37.31	42.42
$AILLIQ_{t+1}$	-12.08	-3.08	-9.00 ***	-10.27	-7.72
ΔSIR_{t+1}	-0.01	-0.01	0.00	-0.03	0.03

This table shows the average stock characteristics of daily portfolios, which are first sorted according to their same-day return and then according to the number of stock ticker mentions on WSB. For each portfolio, we calculate equally weighted averages of daily return (R_{t+1}), abnormal dollar volume ($A\$VO_{t+1}$), abnormal stock turnover rate (ATO_{t+1}), abnormal stock turnover rate ($AILLIQ_{t+1}$), and change in short interest ratio (ΔSIR_{t+1}) on the day following portfolio formation. All variables are expressed in percentage terms. We employ two-sample, two-sided Welch t-tests on the differences in means between the High-WSB and the Low-WSB portfolios. The null hypothesis is formulated as: The difference in means between the two portfolios is equal to zero.
*, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.