Journal of Economics and Finance (2024) 48:544–562
https://doi.org/10.1007/s12197-024-09663-0

Retail and institutional trading during a COVID-19 presidential press conference

Matthew D. Crook[1] · **Andrew A. Lynch**[2] · **Brian R. Walkup**[3]

Accepted: 2 February 2024 / Published online: 20 March 2024

Abstract

The COVID-19 pandemic substantially impacted many aspects of regular life including financial markets. The increased media attention and slowdown associated with the pandemic provide the opportunity to explore how both institutional and retail traders react to an attention-grabbing event. We examine how the market responded to a unique presidential press conference including CEOs of eight publicly-listed U.S. companies addressing the U.S.'s response to the pandemic. Using the press conference on March 13, 2020, we examine the effect on the trading volatility and returns for each of the eight companies represented. We find positive abnormal returns for the companies participating in the press conference. Using the Robintrack data aggregated from the Robinhood retail trading platform and intraday TAQ data, we see that both retail and institutional trading volume increased on the press conference day. However, the increase in retail trading approximately doubled the increase in institutional trading. For the two companies with the lowest Robinhood user ownership prior to the press conference, ownership more than doubled within an hour of the press conference. Panel VAR analysis including control firms shows the press conference resulted in significant intraday returns, volume, and buy-order imbalances in participating firms' stock.

Keywords COVID-19 · Pandemic · Retail trading · Institutional trading · Investor attention

✉ Brian R. Walkup
bwalkup@rollins.edu

Matthew D. Crook
matthew.crook@selu.edu

Andrew A. Lynch
ALynch@walton.uark.edu

[1] Southeastern Louisiana University, Hammond, LA, USA

[2] Sam M. Walton College of Business, University of Arkansas, Fayetteville, AR, USA

[3] Crummer Graduate School of Business at Rollins College, Winter Park, FL, USA

JEL Classification G11 · G12 · G14

1 Introduction

Prior to the lockdown that resulted from the expanding COVID-19 pandemic, fintech trading apps made trading more familiar and accessible to retail investors. These trading platforms fueled a retail trading boom by improving the ease of trading for novice investors, often with no commission fees. Robinhood, most notable among the trading platforms, was founded in 2013 with the stated mission to "democratize finance for all." The number of Robinhood users grew substantially during the early months of the pandemic, from 10 million accounts in December 2019 to 13 million by May 2020 (Popper 2021). Robinhood's platform makes trading feel more like a game resulting in a customer base that is younger (median age of 31) and often opening their first brokerage account (CNBC 2020).

The growth of retail investors in 2019 and 2020 resulted in a new generation of investors that Charles Schwab coined Generation Investor, or Gen I for short (Schwab 2021). While demographic cohorts (such as Baby Boomers and Gen X), generally, comprise the individuals born during a specific time period, individuals who began investing around the pandemic constitute Gen I. According to Schwab's survey, 15 percent of all investors in the U.S. stock market began investing during 2020. Gen I skews younger, with 51 percent being Millennials and 16 percent being Gen Z (Schwab 2021). Given the large influx of new retail investors into the market, we focus on a unique event at the beginning of the pandemic to explore retail investor behavior – the Rose Garden Presidential press conference on March 13, 2020. This press conference is a laboratory which allows precise exploration of how retail and institutional traders react to a nationally publicized, attention-grabbing event.

Barber and Odean (2008) examine the trading behavior of both institutional and retail investors finding that attention does not equally drive both types of investors. Institutional investors have more time to devote to stock selection and are less prone to attention-based buying. However, retail investors are drawn toward buying "attention-grabbing stocks" and are much more likely to buy in response to attention-grabbing events than sell as retail investors have more difficulty identifying stocks to buy from the thousands of choices. The market conditions during the pandemic provide a crucible to examine the purchase activity surrounding an attention-capturing information event. Ben-Raphael et al. (2017) examines how institutional investors respond to news events (attention) and show that institutional traders respond more rapidly to major news events. The authors also find that institutional investor attention leads retail investor attention. Engelberg and Parsons (2011) examine the effect of newspaper media coverage (as the primary source of news) on local investors for companies headquartered in the same metropolitan area. The coverage by local newspapers drives local individual investment. Therefore, we expect that buy volume would be high around such an event.

The impact of news events drives investing behaviors with retail investors contributing to increased trading. Chiah and Zhong (2020) show that the average daily turnover for U.S. stocks increased from 0.687 percent per day pre-pandemic to 1.013

percent during the pandemic. The rise of retail trading provides one factor driving the volume increase. Baig et al. (2022) investigate the link between retail trading and volatility as driven by retail traders during the COVID-19 pandemic. They find that increased volatility coincides with increased retail trading and highlight that during the run-up to the COVID-19 pandemic, the VIX increased from 13.68 on February 14th to 82.69 on March 16th. While the extreme increase in the VIX cannot be tied solely to the increase in retail trading, the increased volatility suggests an increase in retail trades. Morgan Stanley found that the percentage of retail orders present in the total daily trading in the top 1,500 Russell 3000 constituents rose from approximately 8 percent pre-pandemic to as high as approximately 14 percent during the pandemic and associated lockdown period (Morgan Stanley 2022).

In a study of Robinhood traders versus other retail investors, Eaton et al. (2022) finds that Robinhood traders tend to increase volatility in the stocks they trade versus other retail traders. The increased volatility can be tied to deviation from fundamental values due to the increase in uniformed or noise traders (Abreu and Brunnermeier 2002). While increases in volatility decrease price stability, Ozik et al. (2021) suggest that retail traders' access to equity markets facilitated by fintech helped provide liquidity during the pandemic. Based on the analysis, the increase in access does not guarantee long-term trades. In an analysis of Robinhood traders, Barber et al. (2022) suggests that Robinhood traders are more likely to trade on speculation and have the potential to be attention-driven trades. They find that Robinhood users exhibit herding behaviors when a stock appears in Robinhood's "Top Movers" list.

Prior literature has examined how the COVID pandemic affected the overall trading environment. Rahman et al. (2021) examines the market reaction to the pandemic and subsequent stimulus events in Australia finding that the announcement of the pandemic caused the market to decline by 4.73 percent over a (-5,5) day window. Similarly, the Chinese markets saw dramatic declines in the days following the declaration of the COVID crisis (e.g. see, Huo and Qiu 2020; Liu et al. 2020). Smales (2021) examines how investor attention to the pandemic, as a whole, impacts market and sector returns finding a negative effect for returns with increases in searches related to the coronavirus.

This study differs from these papers in that COVID is not its focus. This press conference is used as a laboratory to understand how attention impacts trading and returns. Our study contributes to the literature in two distinct ways. First, we provide additional evidence on the behavior of retail traders. Boehmer et al. (2021) demonstrate the positive correlation between surprise firm-level news and retail order imbalance. Our results show how a specific news event increases retail volume and the retail volume persists several days following the news event using both the Boehmer et al. (2021) measure for identifying retail traders and the Robintrack data showing increased holdings by Robinhood traders.

Second, we provide evidence of how a single news event featuring several companies captures investor attention and impacts returns. Prior research (Barber and Odean 2008; Barber et al. 2022; Boehmer et al. 2021) demonstrates that news events impact trading. Our results show the specific impact of a high-profile news event on returns to the event participants. We compare the market reaction for the participants in the news conference to their peers over the short time horizon surrounding the

event and demonstrate that the news event drives the investor attention and the subsequent returns. Our results show the near immediate reaction to a news event and the event's effect on trading and returns.

We employ several methods to examine the impact of the press conference on the eight featured companies. Using data on the hourly number of users holding the stocks from Robintrack, we examine Robinhood user holdings around the timing of the press conference and find that the number of Robinhood users holding the eight featured companies increases following the press conference. We find that the stocks of the featured companies have positive abnormal returns on the announcement date and a secondary period of abnormal returns two trading days following the press conference, with a reversal occurring on the fourth trading day after the press conference. Furthermore, we utilize intraday trading data to examine the balance of retail and institutional traders active around the event, as well as the balance of buyer and seller-initiated trades. We find that each of the stocks experiences increased volume surrounding the event when compared to the market and their industry peers. The volume increases for retail traders exceeds the volume for institutional traders on the day of the event. Metrics for order imbalance show that institutional traders appear to buy as the stock rises and exit prior to the reversal, while retail traders maintain a high level of buy orders throughout the full event window.

2 Background

Early 2020 saw individuals begin to alter their behavior in response to the early stages of COVID-19 arriving in the United States. People started avoiding large gatherings whether social or work-related, as large gatherings could be "superspreader events," such as the annual Mardi Gras gathering on Bourbon Street in New Orleans in February 2020 (Woodruff 2021). The economy slowed at a historically unprecedented rate (-4.6 percent in Q1 2020 and -29.9 percent in Q2 2020, BEA 2023). Markets additionally saw the simultaneous rise of retail investing on app-based trading accounts, such as Robinhood. Robinhood first championed commission-free trading and other retail investing outlets followed suit. Charles Schwab and TD Ameritrade ended trading fees in early October 2019 (Fitzgerald 2019), and Fidelity ended trading fees shortly after their announcement (Baer 2019). The combination of increased time at home due to social caution, increased attention being paid to news outlets, increased ease of trading for retail investors, and increased access to no-cost trading created a perfect storm for a retail trading boom.

As concern mounted surrounding the increase of cases causing hospitalization and potentially, death, the World Health Organization officially declared the COVID-19 pandemic on March 11, 2020. The Trump administration responded by seeking help from the private sector to provide the outlets for testing and safety. On March 13, 2020, the White House hosted a press conference in the Rose Garden with eight chief executives of companies that had the potential to help with testing and prevention of the spread of the COVID-19 virus. The companies represented (henceforth referred to as The Participants) are highlighted in Table 1. During the course of the press conference, each CEO was recognized and spoke briefly about

Table 1 Companies Represented at the March 13, 2020, Press Conference

Company	Ticker	Market Capitalization	Average Volume	Return 10th Percentile	Return 90th Percentile
Becton, Dickinson and Company	BDX	$73,557.01	$287.01	-0.0159	0.0167
CVS Health Corporation	CVS	$96,648.62	$574.27	-0.0186	0.0179
Laboratory Corporation of America Holdings	LH	$16,426.41	$111.16	-0.0124	0.0157
LHC Group, Inc	LHCG	$4,269.46	$26.10	-0.0184	0.0196
Quest Diagnostics Incorporated	DGX	$14,384.29	$99.48	-0.0110	0.0126
Target Corporation	TGT	$64,968.75	$468.98	-0.0124	0.0189
Walgreens Boots Alliance, Inc	WBA	$52,230.42	$333.13	-0.0163	0.0161
Walmart Inc	WMT	$337,169.87	$649.18	-0.0097	0.0109

Table 1 provides the eight companies represented at the White House press conference in the Rose Garden on March 13, 2020. Market Capitalization for each company is in millions of dollars as of the end of 2019. The average volume is the 2019 mean daily dollar volume in millions of dollars. Return 10th Percentile is the tenth percentile of daily returns for 2019. Return 90th Percentile is the ninetieth percentile of daily returns for 2019.

their corporation's potential participation in the program to stem the spread of COVID-19.[1] In many ways, this opportunity represented an unprecedented "commercial" for the firm that would drive investor attention toward the firm.

During the press conference, several restrictions were announced. Travel bans and quarantines for travelers were put into place. Federal student loan payments were suspended and officials suggested that sporting events ought to be postponed or canceled. The CDC recommended that all in-person meetings should be limited and work-sponsored travel suspended. The suspension of "life as we knew it" created a potential signal for investors – invest in the front-line companies working to solve the problem and get life back to normal.

3 Data and empirical methods

Our analysis begins with an examination of retail trading for The Participants on the Robinhood trading platform around the press conference. We then examine abnormal returns for the firms and extend to an examination of the retail and institutional investing that drove the returns.

Using the Robintrack (https://robintrack.net/) dataset, we identify how the number of retail traders investing in The Participants changes shortly before and after the press conference. The Robintrack dataset collects the number of Robinhood users holding a particular security on an hourly basis. The source data is provided by Robinhood via an API and is collected and aggregated and then shared via the Robintrack website. Robinhood provided this data freely until August 2020 when the API was shut down. While extremely valuable, the Robintrack data is somewhat limited in that it is only captured approximately once per hour and only includes the number of Robinhood users holding, not the volume of shares held, or price paid per share. We assess the change in Robinhood investors by comparing users investing in The Participants five days prior to the press conference through five days after the press conference.

We employ several methods to calculate the abnormal returns experienced by The Participants. We calculate abnormal returns with the market adjusted model, market model, Fama–French three-factor model (Fama and French 1992), and the Carhart (1997) model which adds the momentum factor to the Fama–French three-factor model. To examine the abnormal returns relative to industry peers, we utilize a value weighted index of firms with the same 2-digit SIC code as the benchmark portfolio for each firm. We exclude the firms participating in the press conference from the benchmark portfolios. The coefficient pre-estimation periods for each method to calculate expected returns is the prior calendar year, March 1, 2019 through February, 28, 2020.

[1] The press conference is available to view in its entirety, as well as a full transcript of the press conference, via https://trumpwhitehouse.archives.gov/briefings-statements/remarks-president-trump-vice-president-pence-members-coronavirus-task-force-press-conference-3/

To identify the impacts of the press conference on The Participants' stocks, we examine shifts in trading volume and the balance between buyer-initiated and seller-initiated trades. We use the Boehmer et al. (2021) Trade and Quote (TAQ) database trade classification method to examine in 5-min intraday increments how retail and institutional investors reacted to the press conference.[2]

We include in many of our analyses industry-level controls. For our event study Participant returns are adjusted for exposure to their industries' returns. For our vector autoregression analysis we include value-weighted intraday industry mean values as synthetic control firms. In most cases The Participants do not have an easy comparable company in their respective industries. The control company comprises the value-weighted aggregation of all of the other companies by two-digit SIC codes within each of The Participant's industries. We include results for the control companies in tests to contrast the results for The Participants.

4 Results

Using data provided by Robintrack, we begin by examining the shifts in the number of Robinhood users holding shares of each of The Participants immediately surrounding the Rose Garden press conference. As mentioned in the Data section, Robintrack provides hourly snapshots of the number of Robinhood users holding each stock. Examining Robinhood ownership around the press conference provides a glimpse into the impact the event had on a predominantly retail platform. Figure 1 shows the aggregate number of users holding each of The Participants whose CEOs were present during the press conference. We normalize the figure such that the aggregate ownership five trading days prior to the press conference represents 100 percent. During the five trading days leading up to the event, ownership in The Participants increased by just over 1 percent to 101 percent of the initial ownership. However, on the day of the event, ownership steadily increased to nearly 103 percent in the hour prior to the announcement and spiked to nearly 108 percent during the hour in which the press conference occurred. By the end of trading on the event day, the ownership was approximately 109 percent of the initial ownership five trading days prior. As March 13, 2020 was a Friday, no trading occurred over the weekend resulting in ownership levels remaining flat until Monday, March 16, 2020. Over the next few trading days, ownership continued to increase and had reached approximately 118 percent of the initial ownership by the end of the fifth trading day following the press conference.

[2] Brokerage firms may internally settle non-directed orders for retail clients, but must report the transaction to the Trade Reporting Facility (TRF) and provide a price improvement relative to the prevailing National Best Bid or Offer (NBBO). Such trades are coded in TAQ with exchange code "D" and generally have sub-penny improvements on the NBBO price (often 1/10th of a penny). We process TAQ data in accordance with Box et al. (2021), with trades divided into retail (Boehmer et al. 2021) or institutional (non-retail trades) and classified into buyer or seller initiated based on whether they are executed above or below the quote midpoint.

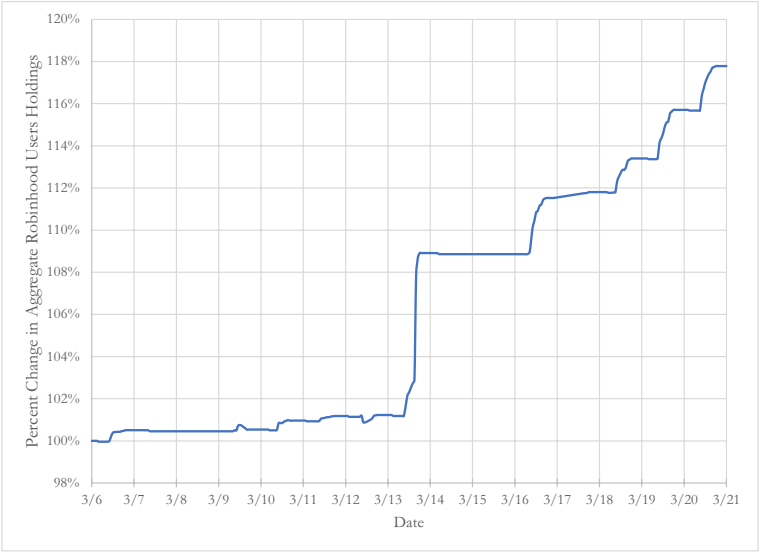

Fig. 1 Increases in Robinhood Users Holding for The Participants. Figure 1 shows the aggregate holding of The Participants by Robinhood users over the eleven trading-day window surrounding the Rose Garden press conference. The flat portions of the plotted trading changes between March 7 to March 8 and March 14 to March 15 represent the weekends in the time series when no trading occurred for Robinhood users

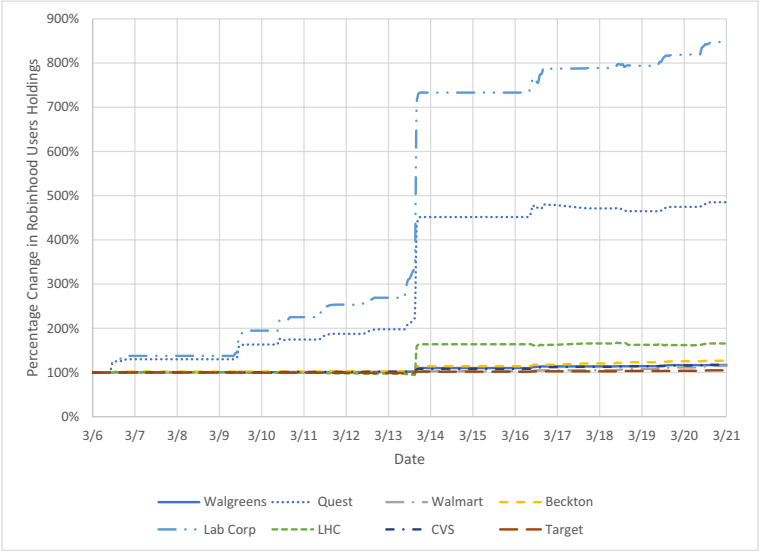

Fig. 2 Increases in Robinhood Users Holding the Individual Stocks of The Participants. Figure 2 shows the changes in holdings by Robinhood users for each of the individual stocks over the eleven trading-day window surrounding the Rose Garden press conference. The flat portions of the plotted trading changes between March 7 to March 8 and March 14 to March 15 represent the weekends in the time series when no trading occurred for Robinhood users

Table 2 Selected Robinhood Holdings

Date	Aggregate	LH	LHCG	DGX
3/6	1.0050	1.3771	1.0090	1.3005
3/7	Weekend – No Trading			
3/8				
3/9	1.0054	1.9481	0.9955	1.6333
3/10	1.0096	2.2526	1.0000	1.7470
3/11	1.0118	2.5363	0.9820	1.8761
3/12	1.0123	2.6920	0.9775	1.9779
3/13	1.0891	7.3322	1.6396	4.5178
3/14	Weekend – No Trading			
3/15				
3/16	1.1152	7.8720	1.6261	4.7929
3/17	1.1180	7.8893	1.6577	4.7131
3/18	1.1340	7.9377	1.6261	4.6503
3/19	1.1570	8.1869	1.6216	4.7470
3/20	1.1779	8.4775	1.6577	4.8523

Table 2 provides the Robinhood user increases for The Participants and select companies participating in the Rose Garden press conference on March 13, 2020. The three individual companies highlighted, Laboratory Corporation of America Holdings (LH), LHC Group, Inc. (LHCG), and Quest Diagnostics Incorporated (DGX), are the three companies with the highest increases in Robinhood users holding the stocks. The percentages expressed in the table are relative to the opening holding data for users five days prior to the Rose Garden press conference. The date presented in the table are end of the day aggregations of user holdings.

In addition to the aggregate ownership, we examine Robinhood ownership levels for each of The Participants individually. The ownership levels are shown in Fig. 2, with 100 percent once again representing the initial ownership five trading days prior to the date of the press conference. Figure 2 shows that, while all stocks experienced substantial growth in ownership, there is a much larger impact on three (and even more specifically two) stocks than the others. Laboratory Corporation of American Holdings (LH – shown on the figure as LabCorp), Quest Diagnostics Incorporated (DGX – shown on the figure as Quest), and LHC Group, Inc (LHCG – shown on the figure as LHC) experience much greater growth in ownership than the other firms. LabCorp increased from the 100 percent normalized value five trading days prior to 338 percent in the hour leading up to the press conference, to 707 percent by the end of the press conference, and finally to 848 percent five trading days after the event. This implies a nearly 750 percent increase in users holding LabCorp during this time window. Quest experienced similar, but slightly less dramatic increases with the normalized 100 percent increasing to 226 percent in the hour leading up to the press conference, 429 percent in the hour following, and 485 percent five trading days after the event. Finally, LHC went from 100 to 95 percent to 158 percent to 166 percent across

the same time segments. The other five stocks experienced growth in users holding their shares ranging between 5 percent (Target Corporation) and 27 percent (Beckton, Dickinson and Company). While we do not present tabulated hourly ownership data for purposes of brevity, Table 2 presents the ownership data by trading day both in an aggregate measure, as well as individually for each of the three most heavily affected stocks.

As previously discussed, three of The Participants (LabCorp, Quest, and LHC) demonstrate the largest gains in Robinhood users holding their securities. The three exhibit qualities that would contribute to a lack of following prior to the news conference – the smallest by market capitalizations and lower daily trading volumes. As shareholders are often drawn to purchase more familiar stocks (Coval and Moskowitz 1999), these three would be the least likely to have already been held in retail portfolios. Therefore, these stocks are most likely to be purchased purely based on increased attention.

While the analysis of the Robintrack data clearly demonstrates the substantial impact the Rose Garden press conference had on retail traders on the Robinhood platform, we next examine the abnormal returns for each firm's stock in response to the event. Table 3 Panel A presents the daily event study abnormal returns for The Participants over the (-5, 5) event window using four different models (Market Adjusted, Market Model, Fama–French Three Factor, and Fama–French Three Factor plus Momentum). For each model, the benchmark index utilized for calculating abnormal returns is a value-weighted index of all stocks with the same two-digit SIC code as the firm of interest (with the firms participating in the press conference excluded). This allows us to capture the abnormal return of the stocks relative to their industry peers. It appears that there may have been some leakage of the CEOs that were intended to be part of the press conference in the days leading up to the event given positive returns prior. More specifically, it appears that on day -4 (which would represent the Monday prior to the event) there was a high probability of leakage given the positive and statistically significant abnormal returns representing between 280 and 355 basis points, depending on the model chosen.

Table 3 Panel A shows a strong positive significant reaction to the event itself with average abnormal returns of 293 to 334 basis points on day 0 that are statistically significant at the 99 percent confidence level across all four models. The following trading day (Monday following the weekend) is relatively flat, but is then followed by two additional days of significant positive average abnormal returns. This secondary spike in returns is consistent with the findings of Welch (2022) who finds that Robinhood users often had a second purchasing spike about two trading days after the initial spike. Welch contributes this to the time that is required for Robinhood users to transfer additional funds into their accounts via a bank transfer. The cumulative average abnormal return (CAAR) from day 0 to day + 3 ranges from 8.56 percent to 12.27 percent across the four models, a number that is not only statistically significant, but also highly economically significant.

The positive abnormal returns seen in the first few days after the press conference (days + 2 and + 3) are met with a reversal in the fourth day after the news conference. On day + 4, CAARs ranging from -2.69 percent to -5.14 percent, depending on the model, are experienced, offsetting a large portion of the gains received the day of the

Table 3 Abnormal Returns

Panel A: Daily Abnormal Returns				
Day	Industry Adjusted	Two-Factor	Four-Factor	Five-Factor
-5	0.0079	0.0072	0.0088	0.0095
	(0.3740)	*(0.4698)*	*(0.4229)*	*(0.3684)*
-4	0.0354***	0.0280***	0.0331***	0.0349
	(0.0005)	*(< 0.0001)*	*(0.0004)*	*(< 0.0001)*
-3	-0.0159	-0.0155	-0.0142	-0.01467
	(0.2333)	*(0.2004)*	*(0.2032)*	*(0.1839)*
-2	0.0070	0.0008	0.0020	0.0033
	(0.3629)	*(0.9367)*	*(0.8455)*	*(0.7501)*
-1	-0.0037	-0.0184	-0.0178	-0.0159
	(0.6961)	*(0.1723)*	*(0.1887)*	*(0.2442)*
0	0.0334**	0.0319***	0.0304***	0.0293***
	(0.0041)	*(0.0007)*	*(0.0011)*	*(0.0016)*
1	0.0254	0.0013	0.0007	0.0040
	(0.2057)	*(0.9509)*	*(0.9751)*	*(0.8270)*
2	0.0317*	0.0302**	0.0301	0.0286
	(0.0557)	*(0.0404)*	*(0.0458)*	*(0.0735)*
3	0.0322	0.0221	0.0295	0.0347
	(0.2249)	*(0.4459)*	*(0.3579)*	*(0.2615)*
4	-0.0514**	-0.0269	-0.0304	-0.0331*
	(0.0328)	*(0.1385)*	*(0.1409)*	*(0.0509)*
5	0.0007	-0.0018	-0.0010	0.0004
	(0.9165)	*(0.8413)*	*(0.9136)*	*(0.9648)*
Panel B: Cumulative Abnormal Returns				
Window	Industry Adjusted	Two-Factor	Four-Factor	Five-Factor
(-1,1)	0.0558*	0.0147	0.0131	0.0172
	(0.0512)	*(0.6093)*	*(0.6419)*	*(0.4927)*
(-2,2)	0.0987**	0.0490	0.0486	0.0522
	(0.0319)	*(0.2849)*	*(0.2898)*	*(0.2267)*
(-3,3)	0.1221*	0.0635	0.0728	0.0804
	(0.0899)	*(0.3822)*	*(0.3407)*	*(0.2700)*

Table 3 provides the aggregate abnormal returns for the eight companies participating in the Rose Garden press conference on March 13, 2020. Day 0 denotes the day of the press conference. Panel A provides the daily market-adjusted returns using the value weighted CRSP index as the market return. Panel B provides cumulative market-adjusted returns using the value weighted CRSP index as the market return. Industry-adjusted returns are stock returns minus their two-digit SIC market capitalization value-weighted return (excluding The Participants). Two-factor alphas include market and industry risk factors. Four-factor alphas include market, industry, size, and value risk factors (Fama French 1993). Five-factor alphas include market, industry, size, value, and momentum risk factors (Carhart 1997). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4 Trading Volume and Order Flow around the Rose Garden Press Conference

Day	Volume	Volume (Retail)	Volume (Inst)	OIB	OIB (Retail)	OIB (Inst)
-5	168.27%	176.66%	168.74%	-4.47%	97.56%	-4.52%
-4	203.68%	228.49%	204.34%	-2.70%	97.82%	-2.78%
-3	172.45%	166.69%	173.30%	-1.87%	97.71%	-1.91%
-2	149.69%	134.93%	150.81%	0.82%	96.77%	0.87%
-1	199.27%	169.32%	201.09%	-2.32%	97.06%	-2.36%
0	188.28%	289.01%	186.31%	2.49%	97.01%	2.33%
1	170.39%	218.94%	169.57%	-1.39%	97.22%	-1.48%
2	209.44%	233.13%	209.59%	1.16%	97.60%	1.14%
3	225.92%	235.70%	225.98%	-1.12%	97.76%	-1.08%
4	168.32%	221.03%	166.81%	-0.11%	97.66%	-0.33%
5	154.80%	209.87%	153.49%	-4.01%	97.76%	-4.18%

Table 4 provides mean daily dollar volume and order imbalance for The Participants for the window of 5 days prior to the March 13, 2020 press conference through 5 days following. Volume is the sum of the dollar value of all transactions during each day for each stock, scaled by mean daily dollar volume between January 1, 2020 and 6 days prior to the press conference, then averaged over the eight stocks. Order Imbalance is daily buy dollar volume minus sell dollar volume scaled by total dollar volume each day, then averaged across the eight stocks. We decompose both variables into retail and institutional versions using only transactions categorizes as retail and institutional (Boehmer et al. 2021).

press conference and days immediately following. This reversal follows the behavior observed for other short-term price spikes. Engelberg et al. (2012) shows a similar reaction for stocks advertised on Jim Cramer's Mad Money program. In their study, they show that stocks highlighted on the program had a positive abnormal return. Shortly after the security is highlighted the gains reverse.

Table 3 Panel B presents the CAARs across the symmetric windows surrounding the press conference. When excluding the reversal which occurs in days + 4 and + 5, the results show large positive CAARs across all windows and models, ranging from 1.3 percent in the shortest window and model with the smallest magnitude, to 12.2 percent in the longest window and model with the largest magnitude. Despite only 8 observations, the results are statistically significant at the 90 percent confidence level or stronger in all instances of the Market Adjusted model, with the (-2, 2) window also being statistically significant at the 95 percent confidence interval.

Table 4 aggregates trade data up to a daily level to examine trading volume and order flow around the day of the press conference. Volume is the dollar value of shares traded during the day divided by average daily volume since January 1, 2020 through 6 trading days prior to the conference. Order Imbalance (OIB) is defined as the difference between buy and sell dollar volume divided by total dollar volume each day. Both variables are decomposed into retail and institutional variables and are averaged over the press conference firms each day.

We do not observe a strong pattern in volume around the press conference. However, we do find two interesting results. First, volume is high relative to January through April. Daily volume is at least 149.69 percent of average and sometimes 200 percent or more. Second, retail volume is the highest we observe

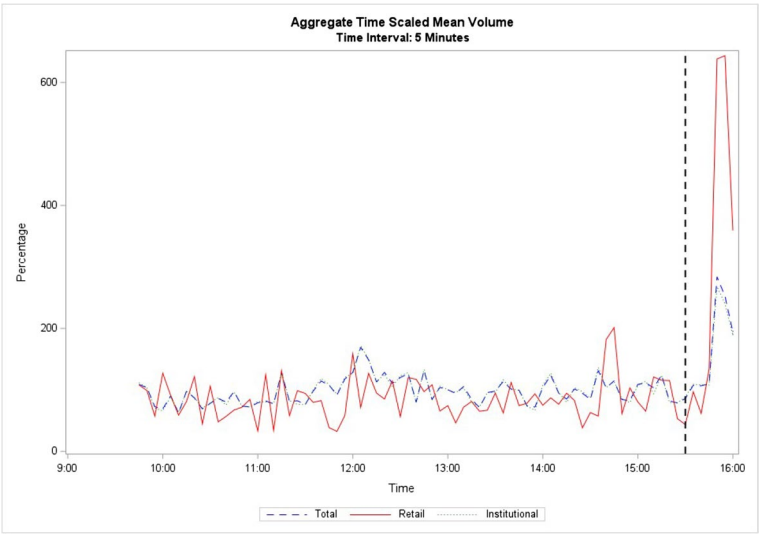

Fig. 3 Increase in Trading Volume during Rose Garden Press Conference. Figure 3 shows the changes in volume for The Participants during the day of the press conference. Trading volume is aggregated into 5-min increments during the trading day and scaled by mean 5-min volume during that same 5-min time period over the prior 15 trading days. It is then averaged across the Participants

during our sample on the day of the press conference at 289.01 percent of its mean daily value. We see an exaggerated level of retail order imbalance when compared to prior research as it fluctuates between 96.8 and 97.8 over the full (-5, 5) time window. However, institutional traders appear to buy into the run-up on day 0 (with a positive order imbalance of 2.33) and then sell on average during the flat returns on day 1 (with a negative order imbalance of -1.48) followed by buying into the secondary spike in day 2 (with a positive order imbalance of 1.14). It then appears that institutional investors cash out of their gains on days 3, 4 and 5 while retail investors continue to hold their positions and lose out on much of the gains they received during the prior days.

To illustrate the magnitude of the volume response to the press conference we graph intraday trading volume during the day of the press conference in Fig. 3. As volume has predictable intraday patterns (i.e. increased volume during the closing auction) we aggregate each stock's volume up to 5-min increments and scale it by the mean volume for that stock during that same 5-min period over the prior 15 trading days. Figure 3 then averages these scaled 5-min observations over The Participants. As the press conference started at 3:30 pm it presses up against the close of trading at 4pm. However, we find two facts consistent with prior results. First, even institutional volume is abnormally high in the last 15 min of the day, over 200 percent of normal institutional closing auction volume. Second, retail volume is over 600 percent of normal retail closing auction volume. Together, both show an exceptional amount of attention paid to these stocks in reaction to the press conference.

As a means of differentiating The Participants from the other firms in their respective industries, we create industry matching portfolios consisting of the firms within their two-digit SIC code while excluding any of The Participants from the portfolios.[3] Using the portfolios and each of The Participants we perform a panel vector autoregression (PVAR) analysis of the event window to track the trading of The Participants in addition to the remaining firms within their industries in 15-s increments.[4] For our analysis, we include one exogenous variable: Event (equaled to 1 for all observations for The Participants during the 30 min of the press conference) and five endogenous variables: midpoint return, institutional and retail volume, and institutional and retail order imbalance. The midpoint return is the log of the midpoint return over the 15-s period. Our volume measures are constructed in two steps. First, excess volume during the 15-s period s on day t is volume minus the mean 15-s volume over trading days $t-25$ through $t-11$:

$$ExcessVol_{t,s} = Volume_{t,s} - \frac{\sum_{t-11}^{t-25} Volume_{t,s}}{23,400} \tag{1}$$

Second, excess volume is symmetrically logged, consistent with Box et al. (2021).[5] The transformation is as follows:

$$Log\_Vol_{t,s} = \begin{cases} \ln\left(1 + ExcessVol_{t,s}\right), if ExcessVol_{t,s} \geq 0 \\ -\ln\left(1 + \left|ExcessVol_{t,s}\right|\right), if ExcessVol_{t,s} < 0 \end{cases} \tag{2}$$

Order imbalance is calculated as follows:

$$OIB_{t,s} = \frac{SharesBought_{t,s} - SharesSold_{t,s}}{\frac{\sum_{t-11}^{t-25} SharesTraded_{t,s}}{23{,}400}} \tag{3}$$

Both *Log_Vol* and *OIB* are calculated separately for retail and institutional trades. To identify the appropriate lag specification for the Panel VAR we estimate the model iteratively with between 1 and 15 endogenous lags. AIC, QIC, and CD specification test statistics all suggested 7 lags is the appropriate specification.

The traditional examination of VAR output is to estimate the impulse response function, which would show the response in one endogenous variable to a one-standard deviation shock to another endogenous variable. In our case our primary variable of interest is Event, which is an exogenous shock to The Participants. We therefore estimate the dynamic multiplier of Event, which shows the response in

[3] Industry portfolio volume is measured as the market capitalization value-weighted mean volume of all firms in the same two-digit SIC code, excluding The Participant firms, with market capitalization measured at the close of trading the prior trading day.

[4] For a discussion of applying vector autoregresion in a panel setting, please see Abrigo and Love (2016).

[5] Panel VAR assumes endogenous variables are continuous, unbounded, and normally distributed. Box et al. (2021) use a symmetrically logged excess volume measure to monotonically transform volume into distribution more appropriate for VAR.

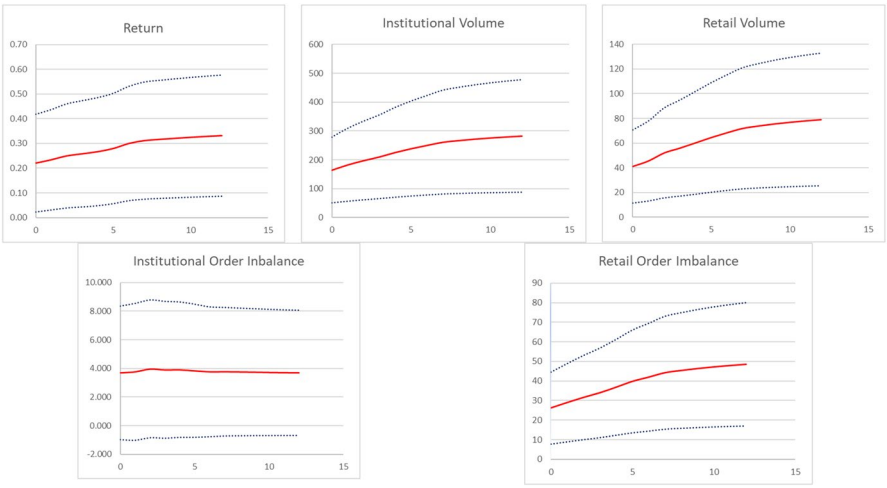

Fig. 4 Panel VAR Analysis of the Rose Garden Event. Figure 4 provides the dynamic multiplier for the panel VAR analysis of the impact of the press conference on The Participants' return, volume, and order imbalance with 15 s observations over the 10 days prior to the Event through the 10 days after. Return is the log change in quote midpoint over the period, with quote midpoint defined as (bid + ask)/2. Dollar volume is decomposed into institutional and retail volume using Boehmer et al. (2021) and then excess values symmetrically logged as in Box et al. (2021). Order imbalance is measured as the difference between shares bought and sold scaled by mean per-period total share volume over the days t-25 through t-11. The sample includes both The Participants and their synthetic control firms. All five variables are included in the VAR as endogenous including 7 lags of each. An exogenous indicator variable is included equal to 1 during the 30 min of the press conference and 0 otherwise. As the variable of interest is an exogenous variable its dynamic multiplier shows the cumulative effect over time (this is equivalent to an endogenous variable's impulse response). The included dotted lines are the 5th and 95th percentile confidence intervals

all endogenous variables to the Event, controlling for the endogenous nature of the other variables in the model. The 5th and 95th percentile confidence intervals are shown as dotted lines.

As shown in Fig. 4, the Event results in a statistically significant response in 4 out 5 endogenous variables. Treatment firms experience a cumulative midpoint return of 33 basis points over the 12 periods (3 min) following the press conference shock. Both institutional and retail volume increase, though their logged nature makes uniform interpretation difficult. The response in institutional order imbalance is insignificant. However, the retail order imbalance response suggests substantial buying during the event Table 5.

Our final analysis, reported in Table 5, examines the daily change in volume and order imbalance using both The Participant firms and our industry portfolio control firms. We regress our variables of interest on four indicator variables equal to 1 if the firm is a Participant and 0 otherwise for the day of the press conference (RGPC) and each of the three days following (PC_{t+1}, PC_{t+2}, and PC_{t+3}). As we include date fixed effects, these four indicator variables show the difference in volume and order imbalance between our control and treatment firms. We find buying pressure the day

Table 5 Volume and Order Imbalance Effects

	Vol_{Tot}	Vol_{Ret}	Vol_{Inst}	OIB_{Tot}	OIB_{Ret}	OIB_{Inst}
Intercept	18.95***	18.92***	12.80***	-51.39***	691.2***	-85.77***
	(80.20)	*(82.09)*	*(5.066)*	*(-3.855)*	*(11.81)*	*(-4.788)*
RGPC	-1.690	-1.704	-4.653*	39.67**	249.1	36.84*
	(-1.057)	*(-1.069)*	*(-1.942)*	*(2.149)*	*(1.519)*	*(1.687)*
PC + 1	-0.008	-0.008	0.004	-0.177*	0.004	-0.181**
	(-0.705)	*(-0.707)*	*(0.361)*	*(-1.907)*	*(0.00426)*	*(-2.001)*
PC + 2	0.004	0.004	0.003	-0.104	-0.266	-0.091
	(0.910)	*(0.918)*	*(0.300)*	*(-1.170)*	*(-0.337)*	*(-0.986)*
PC + 3	0.005	0.005	0.005	-0.141*	-0.061	-0.158*
	(1.070)	*(1.075)*	*(0.410)*	*(-1.764)*	*(-0.0853)*	*(-1.745)*
n	252	252	252	252	252	252
R-squared	0.080	0.079	0.119	0.152	0.078	0.139
Day Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 5 provides the effect of the Rose Garden Press Conference on sell-side volume and order imbalance for retail and institutional investors. Included in the regression data are The Participants and a set of value-weighted indexes of firms from the two-digit sic codes of the participants (without The Participants included in each of the indexes). The dependent variables are the natural log of total, institutional, and retail sell-side volume, *dd*, respectively. RGPC represents an indicator variable for the day of the Rose Garden press conference equaled to 1 for firms represented at the news conference. *PC + 1* represents an indicator variable for the day after the press conference equaled to 1 for firms represented at the news conference. *PC + 2* represents an indicator variable for two days after the press conference equaled to 1 for firms represented at the news conference. *PC + 3* represents an indicator variable for three days after the press conference equaled to 1 for firms represented at the news conference. The variables, *t*-9 to *t + 10* provide the daily fixed effects for the regressions. Robust t-statistics in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

of the press conference, followed by selling pressure in the first and third following days.

5 Conclusion

The COVID-19 pandemic and its associated effects are widespread. The period coincided with the increased availability of fintech apps that both gamified trading and provided no commission trading (such as the Robinhood trading platform) resulting in a perfect storm environment for a spike in retail trading. The subsequent spike in retail trading (creating what is now referred to as Generation Investor, or Gen I) significantly shifted the market. Ortmann et al. (2020) examine the growth of retail investors in the UK during the pandemic and show that the greatest increases in investors opening additional accounts and increasing the funds available in their accounts occurred between February 23 and March 22 of 2020. We examine a unique event that occurred during the initial phases of the COVID-19 pandemic and coincides with the high growth period found

in Ortmann et al. (2020). President Trump's Rose Garden press conference on March 13, 2020 drew significant attention to eight publicly-traded firms as the CEOs of these firms were given the opportunity to speak to the nation regarding their firm's intent to aid in the nation's efforts against and recovery from the COVID-19 pandemic. This provided a signal to investors to invest in these firms.

Our findings from the trading behavior of investors in the days around the Rose Garden press conference corroborate the findings of Barber and Odean (2008) that retail investors are drawn toward attention-grabbing stocks. We show, using data on Robinhood user ownership, that the eight firms featured in the press conference experienced substantial increases in ownership by Robinhood users. More specifically, the three firms that investors would be least likely to be aware of and consider purchasing experienced the largest increases in ownership. The ownership of Laboratory Corporation of America increased by nearly 750 percent in the days immediately surrounding the press conference, while the ownership of Quest Diagnostics Incorporated increased by more than 385 percent in the same time period. The observations support the conclusions found by Pagano et al. (2021) and Welch (2022) that Robinhood investors tend to invest in stocks after a short-term run-up in price.

Event study results demonstrate large statistically significant positive average abnormal returns on the day of the event for the eight firms' stocks. The average abnormal returns ranged from 2.93 percent to 3.34 percent depending on the model used. The firms experienced a second spike in share prices in days + 2 and + 3 following the event. From three days prior to the event to the three days following the event, cumulative average abnormal returns ranged from 8.56 percent to 12.27 percent depending on the model. In day + 4, the firms' stocks reversed some of the gains.

Using TAQ data, volume and order imbalance metrics were examined and further broken down into retail and institutional trades. We observe a strong response in retail dollar volume during the press conference. Order imbalance metrics demonstrate that retail traders are heavily weighted towards buy orders across all days within the window, consistent with Barber and Odean (2008) who argue that retail investors are more likely to buy attention-grabbing stocks than sell. We also demonstrate that institutional investors are weighted towards buy orders on day 0 as the eight firms' values rise. They become net sellers on day 1 and then buy back into the second spike on day 2. In days + 3, + 4, and + 5 the institutional investors are weighted towards sell orders as they realize gains prior to the stocks' reversal, while retail investors tend to hold through the whole period. Panel VAR analysis shows that traders responded to the Rose Garden press conference, with returns, retail volume, institutional volume, and retail order imbalance increasing.

While this study is limited to one unique event and only eight firms, it provides additional evidence on the trading patterns of retail investors, particularly following attention-grabbing events. Our findings build on the findings of Barber and Odean (2008) and demonstrate the increased retail trading effect resulting from the retail boom created by fintech apps and the unique circumstances of the COVID-19 pandemic. Furthermore, the classification of retail and institutional trades allows further understanding of how both classifications of traders respond

(both in volume of trading and order imbalance) across the days immediately surrounding the event.

Data availability Robintrack data is available publicly from https://robintrack.net/data-download. Other data utilized is from NYSE Trade and Quote database and CRSP database.

Declarations The authors do not have any conflicts of interest to disclose. No funding was received for conducting this study. The authors have no relevant financial or non-financial interests to disclose. The authors have chosen to be listed alphabetically due to similar levels of contribution to the study.

Conceptualization Matthew Crook, Andrew Lynch, and Brian Walkup; Methodology: Matthew Crook, Andrew Lynch, and Brian Walkup; Formal analysis and investigation: Andrew Lynch and Brian Walkup; Writing – original draft presentation: Matthew Crook, Andrew Lynch, and Brian Walkup; Writing- review and editing: Matthew Crook, Andrew Lynch, and Brian Walkup.

References

Abreu D, Brunnermeier MK (2002) Synchronization risk and delayed arbitrage. J Financ Econ 66(2–3):341–360. https://doi.org/10.1016/S0304-405X(02)00227-1

Abrigo MR, Love I (2016) Estimation of Panel Vector Autoregression in Stata. Stand Genomic Sci 16(3):778–804

Baig AS, Blau BM, Butt HA, Yasin A (2022) Do retail traders destabilize financial markets? An investigation surrounding the COVID-19 pandemic. Journal of Banking and Finance 144:106744. https://doi.org/10.1016/j.jbankfin.2022.106744

Baer J (2019) Fidelity is latest to cut online trading commissions to zero. Wall Street J. https://www.wsj.com/articles/fidelity-is-latest-to-cut-online-trading-commissions-to-zero-11570680060. Accessed 26 Jan 2023

Barber BM, Odean T (2008) All that Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors. Review of Financial Studies 22(2):785–818. https://doi.org/10.1093/rfs/hhm079

Barber BM, Huang X, Odean T, Schwartz C (2022) Attention-Induced Trading and Returns: Evidence from Robinhood Users. Journal of Finance 77(6):3141–3190. https://doi.org/10.1111/jofi.13183

Ben-Raphael A, Da Z, Israelsen RD (2017) It depends on where you search: Institutional investor attention and underreaction to news. Review of Financial Studies 30(9):3009–3047. https://doi.org/10.1093/rfs/hhx031

Boehmer C, Jones CM, Zhang X, Zhang X (2021) Tracking Retail Investor Activity. Journal of Finance 76(5):2249–2305. https://doi.org/10.1111/jofi.13033

Box T, Davis R, Evans R, Lynch A (2021) Intraday Arbitrage between ETFs and their Underlying Portfolios. The Journal of Financial Economics 141:1078–1095. https://doi.org/10.1016/j.jfineco.2021.04.023

Carhart MM (1997) On persistence in mutual fund performance. J Financ 52(1):57–82. https://doi.org/10.1111/j.1540-6261.1997.tb03808.x

Chiah M, Zhong A (2020) Trading from home: The impact of COVID-19 on trading volume around the world. Financ Res Lett 37:101784. https://doi.org/10.1016/j.frl.2020.101784

CNBC (2020) Fintech app Robinhood is driving a retail trading renaissance during the stock market's wild ride. https://www.cnbc.com/2020/06/17/robinhood-drives-retail-trading-renaissance-during-markets-wild-ride.html. Accessed 19 Oct 2022

Coval JD, Moskowitz TJ (1999) Home bias at home: local equity preference in domestic portfolios. J Financ 54(2):2045–2073. https://doi.org/10.1111/0022-1082.00181

Eaton GW, Green CT, Roseman BS, Wu Y (2022) Retail trader sophistication and stock market quality: Evidence from broker outages. J Financ Econ 146(2):502–528. https://doi.org/10.1016/j.jfineco.2022.08.002

Engelberg JE, Parsons CA (2011) The causal impact of media in financial markets. J Financ 66(1):67–97. https://doi.org/10.1111/j.1540-6261.2010.01626.x
Engelberg JE, Sasserville C, Williams J (2012) Market madness? The Case of Mad Money, Management Science 58(2):351–364. https://doi.org/10.1287/mnsc.1100.1290
Fama EF, French KR (1992) The cross-section of expected stock returns. J Financ 47(2):427–465. https://doi.org/10.1111/j.1540-6261.1992.tb04398.x
Fama EF, French KR (1993) Common risk factors in the returns on stocks and bonds. J Financ Econ 33(1):3–56. https://doi.org/10.1016/0304-405X(93)90023-5
Fitzgerald M (2019) The end of commissions for trading is near as TD ameritrade cuts to zero, matching Schwab. CNBC. https://www.cnbc.com/2019/10/02/the-end-of-commissions-for-stock-trading-is-near-as-td-ameritrade-cuts-to-zero-matching-schwab.html. Accessed 11 Jan 2023
Huo X, Qiu Z (2020) How does China's stock market react to the announcement of the COVID-19 pandemic lockdown? Econ Political Stud 8(4):436–461.
Liu HY, Wang Y, He D, Wang C (2020) Short term response of Chinese stock markets to the outbreak of COVID-19. Appl Econ 52(53):5859–5872. https://doi.org/10.1080/00036846.2020.1776837
Schwab C (2021) The rise of the investor generation. https://www.aboutschwab.com/generation-investor-study-2021. Accessed 19 Oct 2022
Stanley M (2022) Weekly warm-up: That escalated quickly as news always follows stocks. https://advisor.morganstanley.com/the-kelly-group-10821212/documents/field/k/ke/kelly-group/US_Equity_Strategy_5.2.pdf. Access 19 Oct 2022
Ortmann R, Pelster M, Wengerek ST (2020) COVID-19 and investor behavior. Finance Research Letters 37:101717. https://doi.org/10.1016/j.frl.2020.101717
Ozik G, Sadka R, Shen S (2021) Flattening the illiquidity curve: Retail trading during the COVID-19 lockdown. Journal of Financial and Quantitative Analysis 56(7):2356–2388. https://doi.org/10.1017/S0022109021000387
Pagano MS, Sedunov J, Velthuis R (2021) How did retail investors respond to the COVID-19 pandemic? The effect of Robinhood brokerage customers on market quality. Finance Research Letters 43:101946. https://doi.org/10.1016/j.frl.2021.101946
Popper N (2021) Robinhood has lured young traders, sometimes with devastating results. *The New York Times.* https://www.nytimes.com/2020/07/08/technology/robinhood-risky-trading.html. Accessed 11 Jan 2023
Rahman ML, Wang Y, Amin A, Al Mamun MA (2021) The COVID-19 outbreak and stock market reactions: Evidence from Australia, *Finance Research Letters*. No 38:101832. https://doi.org/10.1016/j.frl.2020.101832
Smales LA (2021) Investor attention and the response of US stock market sectors to the COVID-19 crisis. Review of Behavioral Finance 13(1):20–39. https://doi.org/10.1108/RBF-06-2020-0138
Welch I (2022) The Wisdom of the Robinhood Crowd. J Financ 77(3):1489–1527. https://doi.org/10.1111/jofi.13128
Woodruff E (2021) Mardi Gras 2020 spawned up to 50K coronavirus cases, likely from a single source, study says. *nola.com.* https://www.nola.com/news/coronavirus/mardi-gras-2020-spawned-up-to-50k-coronavirus-cases-likely-from-a-single-source-study/article_e4095910-6af1-11eb-a3bc-336456794a5b.amp.html. Accessed 25 Jan 2023