# Unusual Option Activity:
# Is it Smart to Follow "Smart Money"?

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## Abstract

CNBC's "Fast Money" show regularly covers unusual option activities (UOAs) and advocates these trades as "smart money" of informed traders. We investigate the informativeness of UOAs. To examine the impact of CNBC coverage, we further identify UOAs not covered by CNBC. We find that UOAs are indeed informative with significant predictive power of underlying stock returns. However, for UOAs covered by CNBC, there is an immediate overreaction at the time of reporting that is followed by subsequent reversal. Our findings suggest that CNBC coverage has a destabilizing effect on underlying stock prices and investors should not naively follow "smart money".

*Keywords*: Unusual option activities; Return predictability; Media coverage; Stock price discovery

JEL Classification: G12, G14

## 1. Introduction

Speculative trading in the options market has become much more prevalent in recent years.[1] One simple options trading strategy, which has gained popularity because of the regular coverage of CNBC's "Fast Money: Halftime Report" show, is options trades with usually large volume. These trades are large in volume, highly levered, and very often directional bets on underlying stocks. Commentators of the CNBC show cover these trades on a daily basis and refer to these trades as unusual option activities (UOAs). They advocate that these large options trades are "smart money" as they are likely placed by informed traders. While most UOAs covered by CNBC are on large or mid cap stocks, they also include those on trendy stocks that receive market attention in a news cycle.[2] For instance, the aggressive options trading on GameStop was featured on CNBC on December 23rd, 2020, approximately one month before the peak of GameStop stock price.

The CNBC coverage of options trades presents a nice setting for us to examine a number of interesting research questions. First, are UOAs informative? That is, do these large options trades have predictive power of future stock returns? Second, how does the market react to CNBC coverage of UOAs? Given that CNBC audience is mostly retail investors, it provides an ideal setting to examine the reaction of retail investors. Moreover, can investors profit from trading the stocks by simply following the CNBC coverage of UOAs? Third, what is the impact

[1] As reported in https://www.cnbc.com/2021/12/22/options-trading-activity-hits-record-powered-by-retail-investors.html, options trading volume increased by 35% in 2021, while 25% of options volume now comes from retail trading.

[2] Jon Najarian and Pete Najarian are experienced options traders and appear regularly on CNBC's "Fast Money: Halftime Report". They started covering 'Unusual Options Activity' periodically once or twice a week and now make multiple recommendations on a daily basis. See https://www.cnbc.com/video/2020/12/23/options-bulls-bet-on-gamestop.html. CNBC coverage of UOAs is becoming so popular that there are multiple subscription-based services to buy real time UOAs data.

of CNBC coverage on underlying stock price discovery? Does investor reaction to CNBC reporting of UOAs promote stock price discovery or destabilize stock prices? Below we state and motivate each of our research questions.

*RQ1: Are UOAs informative? That is, do these large options trades have predictive power of future stock returns?*

The literature has shown that options trades are informative and have predictive power of the underlying stock prices (Easley, O'Hara, and Srinivas, 1998; Pan and Poteshman, 2006; Roll, Schwartz, and Subrahmanyam, 2010). There are a variety of reasons that the options market is an attractive venue for informed traders, chief among them is leverage (Black, 1975; and Chakravarty, Gulen and Mayhew, 2004). Option trades also have less price impact than stock trades so options market may be an ideal place for informed traders to "hide" their information (Kyle, 1985; and Back 1993). The literature has proposed various measures for the informativeness of option trades. For example, Easley, O'Hara and Srinivas (1998) show that "positive news" and "negative news" option volumes have predictive power for stock price movements. Pan and Poteshman (2006) find that put-call ratios can predict future stock return. It has also been shown that options trading volume can predict future stock returns (Roll, Schwartz and Subrahmanyam, 2010; Johnson and So, 2012; and Ge, Lin and Pearson, 2016). Cremers, Goyenko, Schultz and Szaura (2019) show that it is possible to predict future stock returns based on discrepancies between the spot price and the implied stock price from options. Hu (2014) finds that option-induced stock exposure imbalance predicts future stock returns and options order flow contains important information about the underlying stock price.

While it may seem intuitive that large option trades would indicate informed trades, Easley, Hvidkjaer and O'Hara (2002) show that in the equity market, large trades do not predict

future returns. In addition, Lee and Yi (2001) show that large informed investors trade directly on stocks, whereas small informed investors trade options. Given that CNBC commentators regularly cover the UOAs and advocate these trades as "smart money", we are interested in knowing whether identifying informed trades in the options market is as simple as finding very large trades. Moreover, if we can identify "smart money," we are interested in whether investors can profit by simply following these options trades.

*RQ2: How does the market react to CNBC coverage of UOAs? Specifically, if investors trade stocks by simply following CNBC coverage of UOAs, can they profit from these trades?*

There is a large set of literature that investigates the impact of news coverage on stock prices. Barber and Odean (2007) find that stocks that are in the news have high trading volumes. Hillert, Jacobs, and Muller (2014) show that news coverage exacerbates investor overconfidence and local bias. Frank and Sanati (2018) find that attention bias leads to stock market overreaction to good news and underreaction to bad news. In particular, a number of studies show that market reacts to CNBC coverage (Busse and Green, 2002; Datta and Rickett, 2016; and Kim and Meschke, 2013). More specifically, stock prices are affected by Jim Cramer's recommendations on the "Mad Money" show (Engelberg, Sasseville, and Williams, 2012; Neumann and Kenny, 2007; and Karniouchina, Moore, and Cooney, 2009). Engelberg, Sasseville, and Williams (2012) show that Jim Cramer has little skill in predicting future winners and losers although markets do react to his recommendations. Specifically, they document abnormal returns at the time of the coverage and poor returns in the following days.

There are several advantages to studying market reaction to CNBC coverage of UOAs relative to, e.g., the "Mad Money" show by Jim Cramer. First, UOAs are covered in the middle of the trading day around noon, which allows us to see the immediate market reaction at the time

of coverage, whereas "Mad Money" airs at 6:00 p.m. Eastern Time after market close. Second, Jim Cramer does not cover any specific news or trading strategy. UOAs represent a very clear trading strategy and allow us to identify similar UOAs that are not covered on CNBC. With the latter sample, we can examine the effect of CNBC coverage of UOAs on underlying stock prices.

If UOAs are indeed informative and market does react to the CNBC coverage of UOAs, we should expect the CNBC coverage to speed up the price discovery process of underlying stocks. We are interested in whether market reactions to media coverage promote stock price discovery or destabilize stock prices.

*RQ3: What is the impact of CNBC coverage of UOAs on the underlying stock price discovery? Does investor reaction to CNBC reporting promote stock price discovery or destabilize stock prices?*

Black (1975) notes that "even if a piece of information shows up first on the options market, hedgers will rapidly cause the information to be incorporated in stock price." The literature shows evidence that options traders generally promote price discovery and disseminate earnings news (Amin and Lee,1997). Chakravarty, Gulen, and Mayhew (2004) employ the method proposed by Hasbrouck (1995) and investigate the contribution of option markets to price discovery. They show that in general options contribute 17.5% to price discovery. They find that out-of-the-money (OTM) options contribute to 21.6% of price discovery. On the other hand, Anand and Chakravarty (2007) find that at-the-money (ATM) options have the highest information share. Several studies also argue that options do not contain economically significant information beyond what is already in the underlying stock prices because informed traders trade stocks not options (Muravyev, Pearson, Broussard, 2013; and Chan, Chung, and Fong, 2002). Given that CNBC audience is mostly retail investors, we expect that increase in retail trading

volume may increase stock price volatility (Foucault, Sraer, Thesmar, 2011; and Brandt, Brav, Graham Kumar, 2010).

To address the above research questions, we hand collect all UOAs covered by the CNBC "Fast Money: Halftime Report" during the period from January 2014 to December 2018. The data include the date and time of the coverage; stock ticker; whether the option is a put or a call; size of the "unusual" trade; strike price; approximate expiration date of the option; how long the CNBC commentators plan to hold the position; and whether or not the coverage is original or an update on a previous coverage. We use information from TAQ database to track immediate market reaction at the time of CNBC coverage. The cumulative abnormal returns (CARs) around CNBC coverage are computed using stock return data from CRSP. To identify the impact of media coverage of UOAs, we further construct a sample of UOAs from OptionMetrics that are not covered by CNBC during the same time period and using the same criteria as those of the CMBC commentators.[3] Specifically, we identify days during which option trading volume and changes in open interest are significantly larger than the 20-day moving average across all contracts on the underlying stock. The purpose of constructing a sample of UOAs from OptionMetrics is twofold. First, by contrasting UOAs covered by CNBC and those not covered by CNBC, we are able to see how CNBC coverage affects the price discovery and whether the coverage has a stabilizing or destabilizing effect on the underlying stock prices. Second, there is some concern of potential selection bias by CNBC commentators. Based on the size of options

[3] In the book "Follow the Smart Money" by Jon and Pete Najarian (Najarian and Najarian, 2018), they explain that in order to be considered UOAs, an option trade must meet certain criteria: First, an option trade must have unusually high volume. Second, the trader should be using straight calls or puts. Third, the option contract should be very short term. Finally, the option contract should be an OTM option. They also look at other information to determine if a trade is "meaningful," e.g., whether a trade is part of an inexpensive spread.

trades, we find that not all UOAs covered by CNBC have unusually large volume. By construction, the sample of UOAs from OptionMetrics all have unusually large volume. We acknowledge that since OptionMetrics only contains daily data, these "unusual" options activities are based on the volume of daily trades instead of single transactions.

Our main results are summarized as follows. For both UOAs covered by CNBC and those not covered by CNBC, we find large abnormal returns on the day of transaction. More importantly, based on the OptionMetrics sample, we find that UOAs does indeed predict future stock returns. We show evidence that an investor may follow these large option trades and earn abnormal returns. We find that the effect is more pronounced for deep OTM and near maturity options. We further find that the level of option volume does not predict future returns. However, the change in open interest compared to the 20-day moving average total open interest for a given type, put or call, of options does predict future returns. This suggests that it is not the option volume itself, but rather the unusualness of the option volume that drives the predictability of UOAs. In short, UOAs are indeed informed trades and have significant predictive power of future stock returns.

In addition, based on the CNBC sample, we find that there is an immediate spike in total stock trading volume at the minute of the coverage of UOAs on CNBC "Fast Money" show. We also find that much of the increase in trading volume is driven by retail investors for call option coverage. There is also clear evidence that the volume starts to increase prior to the media coverage and prior to the spike in retail trading volume. For put option coverage, we observe a much less dramatic spike in total trading volume and virtually no increase in retail trading. We also find a very large jump in abnormal stock returns at the minute of coverage.

However, we find that stock return patterns following the day of UOAs transaction differ dramatically between the two samples. Specifically, we find that following the day of CNBC coverage of UOAs, stocks experience negative abnormal future returns. While stocks with UOAs coverage tend to have significantly positive returns on the day of coverage, these stocks subsequently have negative cumulative abnormal returns over the two-month period following CNBC coverage. These results suggest that despite the informativeness of UOAs, news coverage induces investors to overreact and destabilize stock price discovery process. In contrast, based on the OptionMetrics sample, stocks continue to have significantly positive cumulative abnormal returns following UOAs. The results suggest that in the absence of media coverage, UOAs help promote stock price discovery.

This paper contributes to multiple strains of literature. First, we contribute to the literature on informed trading in options markets by documenting a simple way of identifying informed trading. Additionally, we add context to the literature on the price information of O/S ratio, by showing that it is not just volume of options but the unusualness of the volume, and our results are robust to controlling for option and stock volumes. Second, our study contributes to the literature on the impact of news coverage on stock prices. Our study focuses on the effect of media coverage of the trading of retail investors. Following Boehmer, Jones, Zhang, and Zhang (2020), we further identify retail trades and show that retail traders react immediately to news coverage. Third, our study contributes to the literature on the effect of media coverage of options trading on underlying stock price discovery. We show that informed trading in options markets has an immediate impact on the stock price and thus helps price discovery. However, media coverage of UOAs has a destabilizing effect on price discovery as investors overreact to the media coverage.

The rest of the paper is structured as follows: Section 2 discusses the data used in our study. Section 3 reports empirical results, with subsection A reporting the results for the media coverage of UOAs and subsection B reporting the results for the UOAs identified from OptionMetrics. Section 4 presents further analysis, and Section 5 concludes.

## 2. Data

We hand collected data on the coverage of UOAs on CNBC's "Fast Money: Halftime Report" from archive.org. The sample period is from January 2014 to December 2018.[4] The data includes date and time of the coverage; stock ticker; whether the option is a put or a call; size of the "Unusual" trade; strike price of the trade; approximate expiration date of the option; how long the CNBC commentators plan to hold the position; and whether or not the coverage is original or an update on a previous coverage. We also collect data about the underlying stocks and return information from the CRSP database from December 2013 to December 2018. We include December 2013 to have an estimation window for calculating Abnormal Returns. Any stocks that are not included in the CRSP Database are removed from our analysis. We use data from Trade and Quote (TAQ) from December 2013 to December 2018 to investigate intraday reaction to CNBC coverage. We also match the CNBC covered option trades to OptionMetrics, from December 2013 to December 2018.

In the second part of our analysis, we identify UOAs using our own criteria. In this analysis we use OptionMetrics from December 2013 to December 2018 and CRSP data from December 2013 to December 2018. Due to the fact that OptionMetrics does not contain intraday

[4] Prior to 2014, 'Unusual Option Activity' was not a regularly occurring segment on the show.

data, we use changes in the options' open interest from one day to the next as a proxy for directional trades. We then compare the change in open interest in the option contract to the 20-day moving average change in Total Option Open Interest for all option contracts of the same type, put or call, for a particular stock. We identify the activity as potentially unusual if one option contract has any change in Open Interest that is 10 standard deviations higher than the 20-day moving average for all option contracts of the same type, put or call, or stock. We also have a similar criteria for option volume, where the contract option volume must be 10 standard deviations greater than the 20-day moving average of volume for all option contracts of the same type, put or call. While 10 standard deviations may seem statistically excessive, we use 10 standard deviations to ensure economic significance of the trades. For example, one could imagine a hypothetical option contract that has an average daily volume of 500 with a standard deviation of 50 over the previous 20-day period. While a two standard deviation increase in the contract's daily volume would be statistically significant, an increase in daily volume from 500 to 600 may not be economically interesting. However, a 10 standard deviation increase from 500 to 1000 would be economically meaningful.[5] Furthermore, we require that volume on the contract must be at least five times the open interest on the same contract. Also, to eliminate potentially economically insignificant activity we remove any activity with option volume and the change in Open Interest fewer than 1,000 contracts. By having these criteria, we can identify "Unusual" trades.

## 3. Empirical Analysis

[5] In further analysis we weaken this criteria and find that our results are robust to the weaker criteria, though the change in open interest is still a driving factor in the predictiveness of UOA.. *See Section* 4.B.

## A. Abnormal Returns around Media Coverage

We first look at UOAs that were identified and reported on by commentators on CNBC to see if it is profitable to follow UOAs and how markets react to media coverage of UOAs. Table 1 reports summary statistics for CNBC coverage of UOAs. Panel A shows since 2014, the commentators have covered 1,164 instances of UOAs. Of those, 1,001 were call options, with 63 put options among 465 unique underlying stocks. 909 times the commentators said that they either previously owned the stock or the option, or that they followed the UOAs by buying the stock or the option after they observed the activity. Panel B reports the number of covered trades in each year. We see that the number of covered trades has increased in recent years as the UOAs segment has become more popular.

Panel C reports the summary statistics of the options positions. The average number of contracts traded as part of the UOAs is 11,408, with a median of 8,000 and standard deviation of 12,628. The average strike price was $65.96, and the average option price was $1.63. *Holding Period* is 3.99 weeks, which measures the number of weeks that the commentators either plan to hold or suggest holding the position. The average same day option return based on the price quoted on CNBC and the end of day midpoint price is 16.3%. The average moneyness is 0.97 where moneyness is the stock price divided by the strike price of the option. The average time to maturity of the option is 62.5 days. We calculate *Estimation Window Volume* by finding the rolling average total call (put) volume for each firm for a 20-day estimation window with a 7-day gap period. The average estimation window volume is 23,768.16 contracts.

Stock level summary statistics are reported in Panel D. The mean same day stock return for covered stocks is 1.9% with a standard deviation of 9.6%. The average stock volume on the day of coverage is 15.23 million. The average market capitalization is 66.62 million.

As previously stated, the two of the criteria that the commentators use to identify UOAs is that the option contract is OTM and near maturity. Panel E reports the number of options positions that meet the UOAs selection criteria specified by the commentators, where moneyness is defined by *Stock Price* divided by the *Strike Price* for call options and the inverse for put options. About half of all the covered trades are what we consider deep OTM, but when we restrict the sample to near term options (< 2 weeks) only 19 trades meet the criteria.

To understand how the market reacts to media coverage of UOAs we collect Trade and Quote (TAQ) data and view how the underlying stock moves the minute of the coverage. To analyze the intraday impact of media coverage we calculate the following variables: *Stock Volume,* which is the sum of all volume that happens in minute *t*; *Max Transaction Stock Volume,* which is the largest trade that happens in minute *t,* which we use as a proxy for informed or institutional trades; *Retail Stock Volume*, which is the volume of all trades identified as a retail trade using Boehmer, Jones, Zhang an Zhang (2019) identification and *Stock Return,* which is the one minute stock return in minute *t*. Then we calculate the abnormal levels of each variable using the mean adjusted model with an estimation window from [-10, -4]. Finally, we calculate CAR using the *Abnormal Stock Return*. We use *Max Transaction Stock Volume* as a proxy for informed or institutional trades.

Figure 1 plots the variables for call options that are covered by CNBC on the day of coverage from minute *t=-150 to t=150*, where *t=0* at the time of coverage. Panel A plots the *Abnormal Stock Volume*, we observe a spike in volume in minute of coverage where *Abnormal Stock Volume* is greater than 200,000. Panel B plots the *Abnormal Retail Stock Volume,* we observe a significant spike in retail trading volume here as well, as Abnormal Retail Stock Volume is greater than 50,000, suggesting that much of the spike in trading volume is driven by

retail investors who are watching CNBC at the time of coverage. Panel C plots *Abnormal Max Transaction Stock Volume*. Although the *Abnormal Max Transaction Stock Volume* is relatively high at the time of coverage compared to other parts of the day, the largest spikes come almost 2 hours prior to the coverages, suggesting that institutional trades are happening earlier in the day and the spike in *Abnormal Stock Volume* in Panel A is driven by multiple smaller trades. Panel D plots the *Cumulative Abnormal Stock Returns*, we see that there while returns are positive prior to the coverage, which could be due to the UOAs, there is an obvious spike in returns at the time of coverage and that within a few minutes of coverage the returns begin to taper off. Interestingly we also observe that while *Abnormal Stock Volume* in Panel A does not spike until the minute of coverage, *Abnormal Stock Returns* begin to move a few minutes prior to the coverage. These results suggest that while the large abnormal returns on the day of coverage are driven in part due to trades happening prior to the coverage, including the UOAs, a large portion of the returns are driven by the coverage of the UOAs. Also, we observe that coverage of unusual call trades creates a destabilizing effect on the underlying stocks prices.

An interesting result is that there is a smaller spike in *Abnormal Stock Volume* a few minutes before coverage. However, this spike in volume is not present for *Abnormal Retail Stock Volume*, but is present in *Abnormal Max Transaction Stock Volume*. Furthermore, *Abnormal Stock Returns* also start to move higher a few minutes before coverage. This seems to suggest that some large trades by non-retail investors occurred right before the CNBC coverage.

Moreover, due to the fact that a gamma squeeze can take place when option traders purchase a large amount of OTM option, our results beg the question of whether UOAs could induce a gamma squeeze. Gamma squeezes can occur when a large portion of stock trading activity is a result of delta hedging strategies. If delta hedging does occur due to UOAs we would

expect U-shaped intraday volume, as some hedging would occur at the time of the trade and some would occur at the end of the day (Clewlow and Hodges, 1997). A large portion of hedging takes place in the last 30-minutes of the trading day as market makers close out their positions (Cheng and Madhavan, 2009; Shum, Hejazi, Haryanto and Rodier, 2016; Brock and Kleidon, 1992; and Hong and Wang, 2000). Market makers with gamma exposure must purchase more of the underlying stock to hedge positions which can result in 'market intraday momentum' particularly at the end of the day (Baltseen, Da, Lammers, and Martens, 2021).

To test if delta hedging is occurring, we look at the intraday volume of stocks with CNBC coverage of UOAs of call options from the open to close of the stock market and after-hours. We calculate the abnormal volume and abnormal max volume, on both the day of coverage and the day before. Figure 3 reports the abnormal volume on the day of coverage. In Panels A and B, we do observe U-Shaped volume, which show the total abnormal trading volume and the abnormal nonretail trading volume. We see in the morning abnormal volume and abnormal max volume are both relatively high, then decrease throughout the day. Abnormal volume spikes from 12:00pm to 1:00 pm during the time that "Fast Money Halftime Report" is airing on CNBC, then goes back down, followed by another dramatic spike at the end of the day. In Panels C shows abnormal retail trading volume, where we see a large spike in trading volume during the time that "Fast Money: Halftime Report" is airing, but we do not see the U-shaped retail volume, or a dramatic spike in retail trading at the close. Panels D-E show the abnormal trading volume on the day before CNBC coverage. We do not observe U-shaped trading volume on the day before CNBC coverage of UOAs suggesting that large hedging activities are not occurring on the day before UOAs occurs.

These results show that delta hedging activity does occur as a result of UOAs. This gives way to the possibility that UOAs could be used as a tool to create a gamma squeeze.

In contrast, Figure 2 plots the results for put trades that are covered on CNBC on the day of coverage from minute *t=-150 to t=150*, where *t=0* at the time of coverage, though it is hard to find meaningful results for put trades given how few put options are actually covered on CNBC leading to a very small sample size. Panel A shows a slight increase in *Abnormal Stock Volume* at the time of coverage; however, the increase here is not even the highest level of the day. Panel B plots the *Abnormal Retail Stock Volume* using Boehmer et al (2019) identification of retail trades. In contrast with Call option coverage there is no spike in retail trading volume around the time of CNBC coverage. In Panels C and D we observe no change at the time of coverage for *Abnormal Max Transaction Stock Volume*, or *Abnormal Stock Returns.* Again, these results for put options make economic sense as viewers of CNBC tend to by retail investors with little means to take a short position.

The argument that informed traders are likely to trade in options markets has long been established in the finance literature. Black (1975) states that an informed trader would use options to trade for a variety of reasons, ie. leverage and more accessibility to taking short positions. Back (1993) extends Kyle's (1985) work by allowing informed traders to trade in options. Back finds that trades in options have different information than trades in stocks, as such options lead to a 'richer class of signals' being assimilated into the market. While it may seem intuitive that large option trades would indicate informed trades, Easley, Hvidkjaer and O'Hara (2002) show that in equity markets, large trades do not predict future returns, adding some empirical support to the Kyle model. Furthermore, while large, informed investors trade in stocks, small informed investors use options to trade particularly options with greater financial

leverage (Lee and Yi, 2001). While informed option traders take short positions before scheduled news, option trading predicts future returns ahead of unscheduled events (Weinbaum, Fodor, Muravyev, and Cremers, 2020). Furthermore, the difference between the implied price from the options and the underlying stock price reaches a peak two weeks before short selling peaks, suggesting that informed traders use options to trade on negative information (Kang and Park, 2014).High option activity prior to important news and events is evidence that option traders are informed (Cao, Chen, and Griffin, 2005; Poteshman, 2006; Augustin, Brenner, and Subrahmanyam, 2015; Amin and Lee, 1997; and Weinbaum, Fodor, Muravyev, and Cremers, 2020). However, The informativeness of the option trades depends on whether the news announcement was scheduled or unscheduled (Weinbaum, Fodor, Muravyev, and Cremers, 2020). Meanwhile, retail traders lose money of options purchased before earnings announcements (de Silva, Smith, So, 2022). Furthermore, Bergsma, Fodor, Singal and Tayal (2019) document that options trading in the first 30 minutes of the day predicts future returns for the rest of the day.

The literature has proposed various measures for the informativeness of option trades. For example, Easley, O'hara and Srinivas (1998) show that 'positive news' and 'negative news' option volumes have predictive power for stock price movements. Pan and Poteshman (2006) find that put-call ratios can predict future return. Roll, Schwartz, and Subrahmanyam (2010) introduce Option to Stock Volume (O/S) ratio and find that the O/S ratio predicts future returns. Johnson and So (2012) document similar findings. Furthermore, Ge, Lin, and Pearson (2016) decompose the O/S ratio into signed option and find that buying of OTM options predicts future returns. Cremers, Goyenko, Schultz and Szaura (2019) show that it is also possible to predict future stock returns by finding discrepancies between the spot price of a stock and the implied

stock price from options. Hu (2014) finds that option-induced stock exposure imbalance predicts future stock returns, and options order flow contains important information about the underlying stock price.

One advantage that UOA has over many of these previously proposed measures is that it is a relatively simple measure and those covered on CNBC are also available in real time. In addition, existing studies have documented that abnormal option volume is often associated with corporate events such as: corporate earnings announcements (Amin and Lee, 1997; Goncalves-Pinto, Grundy, Hameed, Heijden and Zhu, 2020; Golez and Goyenko, 2022), mergers and acquisitions (Augustin, Brenner, and Subrahmanyam, 2019; Cao Chen and Griffin, 2005; Lowry, Rossi, and Zhu, 2019; Kacperczyk and Pagnotta, 2019), financial analyst revisions (Hayunga and Lung, 2014), and scheduled and unscheduled news announcements (Weinbaum, Fodor, Muravyev, and Cremers, 2020). Our research design focuses whether UOAs on average have predictive power of future stock regardless specific news events.

Moreover, if it is possible to identify informed trades, we would expect the information from these trades to quickly assimilate into stock prices (Black, 1975). Multiple studies have shown options trading contribute to price discovery (Amin and Lee, 1997; Chakravarty, Gulen, and Mayhew, 2004; Anand and Chakravarty, 2007) However, some have argued that options do not contain economically significant information beyond what is already in the underlying stock prices, because informed traders trade stocks not options (Muravyev, Pearson, Broussard, 2013; and Chan, Chung, and Fong, 2002).

To test if there is information content in UOAs we will use cumulative abnormal returns (CAR) to see how the markets act leading up to, during, and after CNBC coverage. We use the Market Model with a 20-trading day estimation period from [-28, -8] and a 2-trading day gap

period, then calculate abnormal returns for each trading day from [-5, 50]. We then calculate the total period CAR from [-5, 50] and the post-event CAR from [1, 50].

Table 2 reports abnormal returns around CNBC coverage of UOAs. Panel A shows the abnormal returns for all call options on the day of coverage. We see a slight but statistically positive abnormal return leading up to the day of coverage. On the day of coverage, the abnormal return is 1.52%. We also observe post-event CAR of -2.98%. Panel B shows the abnormal returns for all put options; we observe that there are no statistically significant results for coverage of put options. There are a number of explanations why we see no reaction for put options: first, the CNBC seldom covers put option trades so the number of observations is very low; second, as explained by Engelberg, Sasseville, and Williams (2012), people who watch CNBC are mostly retail investors who do not have the ability to short a stock and thereby follow negative news; third, when the commentators do talk about put trades they often talk about them as being part of a spread or state that they believe the trade to be part of a hedging strategy.

Occasionally, in the days following coverage of UOAs the commentators will follow-up on how a stock has performed since the coverage. We examine the abnormal returns for these *Follow-up Coverage* stocks and those *Without Follow-up Coverage*. Panel C reports the abnormal returns for *Follow-up Coverage*. Panel D reports the abnormal returns for Calls *Without Follow-up Coverage*. In the days leading up to coverage the is no significant CAR for calls that have *Follow-up Coverage*. On the day of coverage, we see a larger jump for stock with *Follow-up Coverage* than the average Call in our sample. *Follow-up Coverage* stocks also experience positive CAR in the post-event period. Additionally, Panel E reports abnormal returns around the day of the *Follow-up Coverage*, not the day of the original coverage. We observe massive positive CARs in the days leading up to the update as well as an average abnormal

return of 6.68% on the day of coverage, while the post-update CAR is negative and significant. This suggests that while following the CNBC coverage of 'Smart Money' on average leads to negative returns, in the cases that stocks had covered UOAs prior to significant positive returns the CNBC commentators tend to point out that they are right.

As stated previously, the commentators suggest following UOAs that are both deep OTM and near maturity. Given that the majority of covered trades are not informative, we want to see if OTM and near maturity trades are informative. Our results are reported in Table 3. Panel A reports trades that are in option contracts that have a *Moneyness* of less than 0.95, and a *Time to Maturity* of less than two weeks. While we see post-event CAR that is positive, the results are not statistically significant. We also observe an insignificant abnormal return on the day of coverage. Due to the inconclusive results, we weaken our criteria by limiting the observations to contracts with *Moneyness* less than 0.97 and *Time to Maturity* of less than 3 weeks. The results are reported in Panel B. With the weaker criteria we do have significant abnormal returns on the day of coverage and again the post-event CAR is positive but insignificant.

**B. Abnormal Returns from 'Unusual Option Activity' identified from OptionMetrics**

Despite our findings that CNBC coverage of UOAs does not predict positive future returns, there is theoretical support for informed traders using options to trade (Black 1975 and Back 1993), and many papers have shown empirical evidence that informed traders do trade in the options market. We further investigate whether stocks that have abnormally large option volume that is not covered by CNBC have positive future returns.

We take the following steps to identify UOAs. We use all options that are found in OptionMetrics database from December 2013 to December 2018. We then calculate the *Total*

*Option Volume* and *Total Open Interest*[6] for calls and puts for each stock by summing the *Option Volume* and *Open Interest* for calls and puts for each stock *i* on each day *t*. We then calculate the *Total Change in Open Interest (*$T\Delta OI$*)* from the previous day. Next, we calculate the 20-day moving average and standard deviation of *Total Option Volume and* $T\Delta OI$ with a 7-day gap period, where our 20-day estimation window corresponds to the 20-day estimation window used in our event study. After finding the *Total Option Volume* and $T\Delta OI$, we find the *Change in Open Interest (*$\Delta OI$*)* for each individual contract. At this point we also eliminate any individual contracts that have more than 90 days to maturity. Finally, we use the following criteria to identify UOAs:

1) Volume is 10 standard deviations higher than the average total volume during the 20-day estimation window
2) $\Delta OI$ is 10 standard deviations higher than the average $T\Delta OI$
3) Contract Option Volume>5×$OI_{t-1}$
4) Volume >1000
5) $\Delta OI$>1000

Using these filters, we find 2,295 call trades and 2,846 put trades qualify as UOAs. However, after removing spreads, where more than one option contract is identified as being unusual for the same underlying stock on the same day, and after merging with CRSP, we have a total of 1,745 call trades and 2,137 put trades. Only 23 of these trades are also found in the CNBC sample. Table 4 reports the summary statistics for our sample of UOAs; this table corresponds to Table 1. Panel A reports the number of option contracts that we identify as

[6] It is important to note that in OptionMetrics, *Open Interest* is reported from the previous day's end of day *Open Interest*. Because of this, *Open Interest* has a one day lag in our identification process.

"Unusual" both before and after merging with CRSP. *Overlap* is the number of trades that we identify as "Unusual" that are also covered by CNBC. Panel B reports the number of observations by year, where each year has roughly the same number of observations. Panel C reports option level summary statistics that is like the information covered during the "Unusual Activity" segment on CNBC. *Option Volume* and *Change in Open Interest* is used in place of # *of contracts* because we are using end of day option volume so we cannot see individual trades. *Strike* is the reported strike price of the contract and *Closing Option Price* is the end of day price for the option. *Moneyness* is *Stock Price/Strike Price* for call options and the inverse for put options, *Maturity* is the number of days until the contract matures, and *Estimation Window Volume* is the 20-day rolling average total call (put) volume for the firm during the estimation window. Panel D reports the summary statistics for stock level information for the firms. *Market Cap* is the market capitalization of the firm reported in millions; *Volume* is the volume of the stock reported in millions. Panel E reports the number of contracts that meet the CNBC selection criteria for UOAs and the number of contracts in each moneyness category and the number of contracts that have less than 2 weeks to maturity in each of the moneyness categories.

There are only 23 observations that are in both our sample and the CNBC sample, these trades are removed from subsequent analysis.

Table 5 reports abnormal returns for all stocks in our sample. In Panel A, we do not see a significant increase in returns prior to the option activity, though we do observe an abnormal return of 1.48% on the day of the activity. We also report a 50-day post-event CAR of 1.85%, showing that UOAs predicts future returns. Panel B reports the abnormal returns for stocks with unusual put activity. There is a -0.04% abnormal return on the day of the event, while having 50-day post-event CAR of -1.85% . These results are similar to the results for call options.

We now investigate what determines the predictability of UOAs. To do this we report the results of the following regression analysis in Table 6:

$$Return_i = \beta_1\, Market\ Capitalization_i + \beta_2\, Stock\ Volume_i + \beta_3\, Moneyness_i + \beta_4 TimeToMaturity_i + \beta_5 Option\ Volume_i + \beta_6\, \Delta OpenInterest\sigma_i + \beta_7\, Call(put)Spread_i + \alpha \quad (1)$$

$Return_i$ is the CAR leading up to the activity and *Abnormal Return* on the day of the activity or CAR after the activity. Each of the independent variables are measured on the day of the activity, where $MarketCapitalization_i$ is the Market Capitalization of the firm *i* on day 0 in millions and $Moneyness_i$ is an ordinal variable that equals 1 stocks with *Moneyness* in the lowest 30% of the observations, equals 2 for the next 40%, and 3 for the highest 30% of observations where *Moneyness* is equal to *StockPrice*/*StrikePrice* for call options and *StrikePrice*/*StockPrice* for Put options for option contract *k* on day 0. $Maturity_i$ is an indicator variable that is equal to 1 if the time to maturity is greater than the median time to maturity for all observations, and 0 otherwise, for option contract *k* on day 0. $\Delta OpenInterest\sigma_i$ is the change in open interest for option contract *k* in standard deviations of the total change in open interest for firm *i* on day 0, multiplied by 1,000. $OptionVolume_i$ is the option volume of option contract *k* for firm *i,* on day 0 in millions. $StockVolume_k$ is the stock volume for the underlying stock *i* on day 0 in millions. $Call(put)Spread_i$ is an indicator variable equal to one if firm *i* has multiple call(put) options with UOAs on day 0.

We can see that the one predictor of whether stock will have future returns is the level of the moneyness and the time to maturity of the option. Although that result is not significant across all the regressions there is enough evidence that we want to explore these variables further. Additionally we note that $\Delta OpenInterest\sigma_i$ is not statistically significant in the majority

of these regressions, however, this is unsurprising given that all the observations in this sample were chosen because they all had high $\Delta OpenInterest\sigma_i$. We also note that $OptionVolume_k$ seems to have a negative relation with cumulative abnormal return, which is supprising considering the results in previous literature that shows that option volumes predict future returns (Roll, Schwartz and Subrahmanyam, 2010; Johnson and So, 2012; and Ge, Lin and Pearson, 2016). However, as with $\Delta OpenInterest\sigma_i$, each observation in the sample does have higher option volume, which makes it difficult to interpret these results.[7] Due to these findings, we further explore our results by repeating our abnormal return analysis for separate subsamples based on moneyness and time to maturity.

In Table 7, we separate the sample into subsamples based on the moneyness of the options. Panel A, reports the abnormal returns for stocks with UOAs in call options that are Far OTM or moneyness that is in the lowest 30% of the sample in a given year. Panel B reports the abnormal returns when call options are OTM but not far OTM or the moneyness is in the middle 40% of the sample in a given year. Panel C reports the abnormal returns when call options are in the other category or in the top 30% of moneyness in a given year, which includes ATM and in-the-money (ITM) options. Panels D, E, and F report the same moneyness categories for put option activity.

We find in Panel A that the stocks with Far OTM UOAs have post-activity CAR of 3.15% over the following 50-days. Panel B reports similar, but less dramatic, predictability among stocks with options that are OTM but not as deep OTM, while in Panel C, stocks with options in the other category do not have significant CAR in the post-activity window. It is also

[7] Further analysis is done in Table 13 with a larger sample size, which makes these results easier to interpret. See section 4. Further Analysis part B. Abnormal Returns with Weaker Selection Criteria.

important to note that as the moneyness of options with UOAs gets deeper and deeper OTM, the same day abnormal return gets lower and lower. Suggesting that deep OTM options have less price impact than other options, but greater future returns, and that the information in these trades is slower to move into the market. While option trades that are ATM or ITM have a higher price impact with less predictability, suggesting that information in these trades is very quick to assimilate into the market.

For Put options, the Far OTM sample has positive returns leading up to the activity, followed by negative and insignificant returns, this result could be explained by investors using put options to hedge positions in stocks that have had large sudden positive returns. For the OTM sample, Panel E, we find insignificant results throughout, with the exception of the day of the event, showing that these large trades did have an impact on the prices discovery of the underlying stocks. However, in Panel F, which contains all other put options, we see a similar but more exaggerated result, with a large -1.44%, abnormal return on the day of the activity. Similar to the call options, options that are not OTM have a larger immediate price impact and very little movement afterwards. Suggesting that information from these trades move quickly into the market.

Next, we investigate the impact of the time to maturity of the options. We separate all UOAs trades in our sample into subsamples based on the time to maturity. The options with the 30% lowest time to maturity in a given year are put into the *Near Maturity* subsample. The options with the middle 40% are labeled as *Medium Maturity* and the highest 30% are labeled as *Far from Maturity*. Table 8 reports the results. In Panel A, we see that the *Near Maturity* subsample has an abnormal return of 2.18% on the day of the activity and has a post-activity CAR of 3.34%. The *Medium Maturity* subsample has an abnormal return of 1.38% on the day of

the activity, with a post-activity CAR of 2.08%. It is also of note that the whole-period CAR is for *Near Maturity* and *Medium Maturity* is very close 6.16% and 4.14% respectively. This suggests that information from near maturity options assimilates into the market more quickly than other options. In Panel C, we see that for Options that are far from maturity, there are slight positive abnormal returns leading up to the activity but no abnormal returns in the post-activity period. This again suggest that UOAs that is far from maturity is reactionary and has little useful long-term information.

For the stocks with put options in the *Near Maturity* subsample, Panel D, there are no significant immediately following the UOAs, but the post-period CAR is -2.28%. However, in Panel E and F, we see we see similar results for the *Medium Maturity* and *Far from Maturity* subsample

Given our results when we created subsamples based on the *Moneyness* and *Time to Maturity* of the options, we further investigate by creating subsamples based on both *Moneyness* and *Time to Maturity*. We look only at stocks with options that are in the *Far OTM* subsample and create new subsamples based on the *Time to Maturity*. Like before the options with the 30% lowest time to maturity in a given year are put into the *Near Maturity* subsample. The options with the middle 40% are labeled as *Medium Maturity* and the highest 30% are labeled as *Far from Maturity*. The results are reported in Table 9. As reported in Panel A, for these stocks with UOAs in call options that are both deep OTM and near maturity, we see abnormal returns of 1.97%, followed by a post-activity CAR of 10.67%. In Panel B and C, we see that stocks in the *Medium Maturity* and *Far From Maturity* subsamples have insignificant CAR throughout. For put options, Panels D and E, we see significant positive abnormal returns around the day of the UOAs, and significantly negative abnormal returns in the post-activity period. In Panel F, *Puts*

*that are Far From Maturity* do not have any significant results. These results suggest that for options, both Calls and Puts, that are deep OTM and are close to maturity do predict future returns.

Given the difference in results between our sample and the CNBC sample, a natural question is "what drives the differences?" As previously stated, there are only 23 observations in both our sample and the CNBC sample, suggesting that there could be apparent variations in sample identification. As shown in Table 1 and Table 4, the average *Estimation Window Volume* for the CNBC sample is 23,768.16 and the average *Number of Contracts* in the UOAs trade is 11,408. In our sample the average *Estimation Window Volume* is only 161.56 contracts compared to an *Option Volume* of 6,247. That is trades covered by CNBC are not particularly "Unusual". In comparison, the trades identified in our sample are more likely "Unusual" than those covered by CNBC.

## 4. Further Analysis

### A. Returns from Trading Options

Due to the unique payoff structure of option contracts profit from trading options can be very different than the profit from trading the underlying stock. For example, because of the limited downside risk of call options, a speculator could buy call options on multiple stocks and profit even if on average the stock price goes down, as long as one or two of the stocks have high returns. For this reason, it is a possibility that investors could gain abnormal returns by following the CNBC's UOAs even though stocks usually have negative CAR after CNBC coverage. One of the potential problems from testing returns of the options contracts is that the options contracts are only available for a small-time window. For example, if the activity happens on a contract

that is close to maturity, 2-weeks, we cannot find the return of that contract 50 days after the activity. Conversely if a contract is very far from maturity, it is likely to be a newly issued contract without enough days prior to the activity to successfully create an estimation window. To get around these potential issues we test a buy-and-hold strategy to see if it is possible to make profits by following the smart money using call options instead of the underlying stock, Table 10 reports the results. Returns are calculated using the end of day midpoint for the option contract over the period from [-5, 30] and [0, 30]. Panel A reports the daily return of the call option. Panel B reports returns using a buy-and-hold strategy where the call option is bought at the midpoint on day *t*-5 and sold on the observation date. Panel C reports returns using a buy-and-hold strategy where the call option is bought at the midpoint on day 0 and sold on the observation date.

We see that the returns from options are extremely high on the day of coverage, however, in the post-activity period there are significant negative returns, suggesting that investors cannot follow CNBC coverage of UOAs in either the stock or the options markets. We next report option returns for both put and call options in our sample of UOAs in Table 11.Panel A reports the call option return of the option. Panel B reports call option returns using a buy-and-hold strategy where the option is bought at the midpoint on day *t*-5 and sold on the observation date. Panel C reports call option returns using a buy-and-hold strategy where the option is bought at the midpoint on day 0 and sold on the observation date. Panel D reports the put option return of the option. Panel E reports Put option returns using a buy-and-hold strategy where the option is bought at the midpoint on day t-5 and sold on the observation date. Panel F reports put option returns using a buy-and-hold strategy where the option is bought at the midpoint on day 0 and sold on the observation date. In Panel A, we see a return of 48.2% on the day of the activity

followed by positive returns for the first 30 days of the post-activity period, in Panel C. In Panel D we see returns of 31.34% on the day of the activity, however, in Panel F there are only significant returns for the first 3 days. These results show that taking a levered position in the options market as opposed to the underlying stock market will amplify returns but will not change the direction of the returns.

**B. Abnormal Returns with Weaker Selection Criteria**

It is possible that our results are driven by some other factor other than our selection criteria for UOAs to investigate this concern we create a sample with a weaker selection criteria and then rerun our main results. In our 'weak' sample we eliminate the requirement that *Volume* is 10 standard deviations higher than the average total volume during the 20-day estimation window and $\Delta OI$ is 10 standard deviations higher than the average $T\Delta OI$. We also lower the criteria so that *Contract Option Volume* must only be greater than $OI_{t-1}$ we are left with the following criteria:

1) Contract Option Volume>$OI_{t-1}$
2) Volume >1000
3) $\Delta OI$>1000

This larger sample includes all of our trades from before as well as 452 of the CNBC sample.

Table 12 reports the abnormal returns around these trades. Panel A reports abnormal returns around call trades in the 'Weak' sample. In Panel A we see that there is an abnormal return of 0.29% on the day of the event. We also see a statistically significant but economically insignificant positive post-activity CAR of 0.29%. Panel B reports abnormal returns around put

trades in the 'weak' sample. In this sample we see that on the day of the activity there is a statistically significant but economically small negative abnormal return followed by negative post-activity CARs.

We now revisit the regression analysis using the 'weak' sample. Again, we estimate the following regression with the much larger sample:

$$Return_i = \beta_1\, Market\ Capitalization_i + \beta_2\, Stock\ Volume_i + \beta_3\, Moneyness_k + \beta_4 TimeToMaturity_k + \beta_5 Option\ Volume_k + \beta_6\, \Delta OpenInterest\sigma_k + \beta_7\, Call(put)Spread_i + \alpha_{ik} + \epsilon_{ik} \quad (2)$$

Table 13 reports the results from the regression. It is important to note that, as within Table 8, *Option Volume* has very little predictive power, suggesting that just because a stock has higher option volume on a given day, that stock does not necessarily have high returns in the future. However, $\Delta OpenInterest\sigma_k$ has very high predictive power, this is in contrast to Table 8 where $\Delta OpenInterest\sigma_k$ was not statistically significant. We can reconcile this difference by noting that the sample used in Table 8 consisted entirely of stocks with very high $\Delta OpenInterest\sigma_k$, whereas the sample used in Table 13 has a much larger distribution of $\Delta OpenInterest\sigma_k$.

When using the weaker identification of UOAs we see that the unusualness of the option activity is what key to identifying option trades that predict future returns. Adding context to the literature (Roll, Schwartz and Subrahmanyam, 2010; Johnson and So, 2012; and Ge, Lin and Pearson, 2016), simply having large option trades does very little to predict returns. $\Delta OpenInterest\sigma_i$ is statistically significant, even when controlling for option and stock volume. However, we can confirm that by having truly UOAs compared to recent total option volume for

a stock, we can predict future returns. Furthermore, in an unreported test, we found that large option trades that are not statically unusual do not predict unusual returns. To do this we also created a sample of 'Not Unusual' trades, where we include the criteria above, i.e., large trades, but exclude trades that have high levels of volume and change in open interest compared to their normal levels. Particularly, we require: Volume is less than 2 standard deviations higher than the average total volume during the 20-day estimation window and $\Delta OI$ is less than 2 standard deviations higher than the average $T\Delta OI$.

## 5. Conclusion

The 'Unusual Option Activity' segment of CNBC's "Fast Money: Halftime Report" tries to identify 'Smart Money' by identifying large trades in the options markets. The explanation for covering these trades is that only informed investors would take such large and highly levered positions. Thus, by identifying and following UOAs non-informed investors can earn abnormal returns. We test these predictions to see if retail investors really can follow these trades and make abnormal returns. We find that while options trades significantly predict stock returns prior to the CNBC coverage, there is a significant reversal in underlying stock prices following the CNBC coverage. We document a large spike in trading volume and abnormal returns in the underlying stock at the time of the coverage, suggesting that the coverage of these trades has a destabilizing effect on stock prices.

We continue our analysis by identifying a larger sample of unusually large option trades or UOAs from OptionMetrics. These trades are not covered by CNBC. Like the results based on option trades covered by CNBC, we find significant abnormal stock returns on the day of options trading. However, in contrast to the results based on option trades covered by CNBC, we find

that stocks with UOAs in call options continue to have positive abnormal returns in the weeks following options trading. These effects are more pronounced when the UOAs happens in call options that are deep OTM and near maturity. Our findings suggest that UOAs indeed contains information of underlying stock prices. However, there is a significant overreaction to media coverage of UOAs, which facilitates copycat trading and destabilizes stock prices. As a result, investors cannot earn abnormal returns by following UOAs covered by the media.

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**Table 1: Summary Statistics: "Unusual Option Activity" Covered by CNBC**

This table reports summary statistics of "Unusual Option Activity" covered by CNBC. Panel A reports the number of observations for each option type. *Commentator Own* is the number of options activities where one of the commentators had positions in the options or underlying stocks. *Follow-up* is the number of positions covered by CNBC as a follow-up of a previous coverage. *Unique Tickers* is the number of unique firms in the sample. Panel B shows the number of observations in each year. Panel C reports the information of options positions covered by CNBC. *# of contracts* is the Option Volume, *Strike* is the reported strike price of the contract, *Option Price* is the reported price that the traders were paid for the option, and *Holding Period* is the time in weeks that the commentators suggested to hold the position. *Option Return (t=0)* is the return in percent calculated based on the reported Option Price and the end of day price, *Moneyness* is defined as Stock Price/Strike Price, *Maturity* is the number of days until maturity of the contract, *Est. Window Volume* is the average total call (put) volume for the firm during the 20-day estimation window. Panel D reports the information for the underlying stocks. Stock Return is the daily stock return as reported by CRSP on the day of coverage, Volume is the trading volume of the stock reported in millions, and Market Cap is the market capitalization of the firm reported in millions. Panel E reports the number of options positions that meet the 'Unusual Option Activity' selection criteria specified by the CNBC commentators. It reports the total number of positions in each moneyness category and the number of contracts that have less than 2-weeks to maturity in each of the moneyness categories.

Panel A: Number of Positions

| | Total | Calls | Puts | Commentator Own | Follow-up | Unique Tickers |
|---|---|---|---|---|---|---|
| # of Obs | 1,164 | 1,001 | 63 | 909 | 124 | 465 |

Panel B: By Year

| Year | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|
| # of Obs | 128 | 107 | 134 | 346 | 449 |

Panel C: Summary Statistics of Option Positions

| | N | Mean | Median | Mode | St.Dev. | 5th | 95th |
|---|---|---|---|---|---|---|---|
| # of contracts | 807 | 11,408 | 8,000 | 5,000 | 12,628 | 3,000 | 30,000 |
| Strike | 999 | 65.96 | 45 | 55 | 104.66 | 11 | 185 |
| Option Price | 412 | 1.63 | 1 | 1 | 3.75 | 0.22 | 5 |
| Holding Period (Weeks) | 792 | 3.99 | 3 | 4 | 4.13 | 0.5 | 12 |
| Option Return (*t=0*) | 217 | 16.30% | 9.20% | 0.00% | 46.30% | -33.00% | 90.00% |
| Moneyness | 770 | 0.97 | 0.96 | 1 | 0.19 | 0.84 | 1.02 |
| Maturity | 1008 | 62.5 | 42 | 30 | 65.7 | 7 | 190 |
| Est. Window Volume | 503 | 23,768 | 7,399 | 2,381 | 55,160.80 | 357 | 127,924 |

Panel D: Summary Statistics of Underlying Stocks

| | N | Mean | Median | Mode | Std Dev | 5th | 95th |
|---|---|---|---|---|---|---|---|
| Stock Return | 1158 | 1.90% | 1.00% | 0.00% | 9.60% | -2.40% | 7.20% |
| Stock Volume | 1158 | 15.23 | 8.29 | 23.59 | 23.24 | 2 | 51.53 |
| Market Cap | 1158 | 66.62 | 18.42 | 2.44 | 135.78 | 1.96 | 283.49 |

Panel E: Options Meeting Selection Criteria

| Moneyness | <0.95 | 0.95-0.97 | 0.97-1 | 1-1.03 | 1.03-1.05 | >1.05 |
|---|---|---|---|---|---|---|
| # of Obs | 534 | 149 | 280 | 131 | 32 | 50 |
| # of Obs Short-Term | 19 | 12 | 51 | 33 | 11 | 6 |

**Table 2: Cumulative Abnormal Returns: "Unusual Option Activity" Covered by CNBC**

This table reports abnormal stock returns around CNBC coverage of "Unusual Option Activity." Abnormal Returns are calculated using the market model estimated over a 20-day estimation window with a two-day gap period on days t-6 and t-7. Average Daily abnormal returns (*Daily AR*) are reported over the period [-5, 50] and cumulative abnormal returns (CAR) are reported over the period [-5, 50] and [1, 50]. Panel A reports the returns for all call options positions covered by CNBC. Panel B reports the returns for all put options positions covered by CNBC. Panel C reports the returns for call options positions that have *follow-up coverage* by the CNBC commentators at a later date. Panel D reports the returns for call options positions *Without Follow-up Coverage* by the CNBC commentators. Panel E reports the returns for call options around the day of the *follow-up coverage*.

Panel A: All Calls

| (N=849) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.02% | 0.18% | 0.26% | 1.52% | -0.08% | -0.10% | -0.26% | -0.22% | -0.11% | -0.09% | 0.02% | -0.11% | -0.04% |
| T-Stat | (0.31) | (2.76) | (3.41) | (12.19) | (-1.14) | (-1.39) | (-1.97) | (-3.55) | (-1.44) | (-1.23) | (0.32) | (-1.45) | (-0.51) |
| Average CAR | 0.02% | 0.19% | 0.40% | 1.92% | 1.83% | 1.55% | 1.14% | 0.96% | 0.71% | 0.42% | -0.06% | -0.66% | -1.16% |
| T-Stat | (0.31) | (1.57) | (2.29) | (8.44) | (7.55) | (5.33) | (3.54) | (2.77) | (1.88) | (0.75) | (-0.08) | (-0.77) | (-1.11) |
| Average CAR | . | . | . | . | -0.09% | -0.34% | -0.74% | -0.93% | -1.17% | -1.45% | -1.91% | -2.49% | -2.98% |
| T-Stat | . | . | . | . | (-1.25) | (-2.28) | (-3.53) | (-4.00) | (-4.41) | (-3.19) | (-3.10) | (-3.25) | (-3.15) |

Panel B: All Puts

| (N=37) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.03% | 0.10% | 0.16% | -0.17% | 0.15% | 0.15% | 0.18% | -0.12% | 0.56% | 0.32% | -0.18% | 0.40% | -0.17% |
| T-Stat | (-0.14) | (0.38) | (0.78) | (-0.43) | (0.71) | (0.76) | (0.75) | (-0.61) | (1.51) | (1.63) | (-0.83) | (1.46) | (-0.56) |
| Average CAR | -0.03% | -0.55% | -0.26% | -0.43% | -0.27% | 0.27% | 0.28% | 0.16% | -0.21% | 1.14% | 1.36% | 1.58% | 1.83% |
| T-Stat | (-0.14) | (-1.31) | (-0.40) | (-0.56) | (-0.37) | (0.28) | (0.26) | (0.14) | (-0.15) | (0.53) | (0.40) | (0.37) | (0.36) |
| Average CAR | . | . | . | . | 0.15% | 0.69% | 0.71% | 0.59% | 0.48% | 1.83% | 2.04% | 2.38% | 2.74% |
| T-Stat | . | . | . | . | (0.71) | (1.17) | (1.04) | (0.72) | (0.42) | (0.89) | (0.61) | (0.56) | (0.55) |

Panel C: Calls with Follow-up Coverage

| (N=75) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.28% | 0.32% | 0.33% | 2.07% | 0.32% | 0.67% | -0.02% | -0.08% | 0.05% | 0.24% | 0.28% | 0.14% | 0.03% |
| T-Stat | (1.44) | (1.27) | (1.28) | (4.67) | (1.06) | (2.35) | (-0.05) | (-0.24) | (0.27) | (1.19) | (1.11) | (0.60) | (0.13) |
| Average CAR | 0.28% | 0.45% | 0.82% | 2.90% | 3.22% | 4.74% | 5.07% | 5.29% | 5.38% | 5.08% | 6.75% | 5.95% | 6.28% |
| T-Stat | (1.44) | (1.07) | (1.38) | (3.69) | (3.94) | (4.48) | (4.92) | (4.84) | (4.16) | (2.66) | (2.64) | (2.13) | (1.92) |
| Average CAR | . | . | . | . | 0.30% | 1.94% | 2.27% | 2.49% | 2.58% | 2.28% | 3.95% | 3.53% | 3.64% |
| T-Stat | . | . | . | . | (0.97) | (2.76) | (2.69) | (2.94) | (2.70) | (1.54) | (1.85) | (1.44) | (1.27) |

Panel D: Calls without Follow-up Coverage

| (N=632) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.04% | 0.20% | 0.31% | 1.33% | -0.12% | -0.19% | -0.27% | -0.17% | -0.14% | -0.16% | -0.02% | -0.09% | 0.05% |
| T-Stat | (0.43) | (1.83) | (3.48) | (10.33) | (-1.43) | (-2.42) | (-2.75) | (-2.49) | (-1.53) | (-1.84) | (-0.19) | (-1.07) | (0.53) |
| Average CAR | 0.04% | 0.24% | 0.66% | 1.99% | 1.87% | 1.46% | 0.94% | 0.92% | 0.67% | 0.25% | -0.65% | -0.94% | -1.26% |
| T-Stat | (0.43) | (1.54) | (2.96) | (7.12) | (6.28) | (4.23) | (2.44) | (2.21) | (1.42) | (0.36) | (-0.74) | (-0.89) | (-0.97) |
| Average CAR | . | . | . | . | -0.13% | -0.51% | -1.03% | -1.04% | -1.28% | -1.67% | -2.48% | -2.73% | -3.01% |
| T-Stat | . | . | . | . | (-1.51) | (-3.35) | (-5.02) | (-4.40) | (-4.26) | (-3.09) | (-3.38) | (-2.95) | (-2.61) |

Panel E: Calls Around Follow-up Coverage

| (N=115) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.53% | 0.68% | 1.52% | 6.68% | -0.55% | -0.08% | -0.03% | -0.14% | 0.15% | -0.11% | -0.09% | 0.25% | -0.20% |
| T-Stat | (2.07) | (1.42) | (5.38) | (2.53) | (-1.64) | (-0.48) | (-0.15) | (-0.89) | (0.74) | (-0.55) | (-0.46) | (1.27) | (-0.93) |
| Average CAR | 0.53% | 1.41% | 3.67% | 10.35% | 9.80% | 9.96% | 10.02% | 10.04% | 9.96% | 8.30% | 7.05% | 7.53% | 6.11% |
| T-Stat | (2.07) | (2.38) | (4.84) | (3.89) | (3.77) | (3.84) | (3.67) | (3.55) | (3.42) | (2.62) | (2.08) | (2.06) | (1.50) |
| Average CAR | . | . | . | . | -0.55% | -0.39% | -0.33% | -0.31% | -0.39% | -2.16% | -2.80% | -2.37% | -3.78% |
| T-Stat | . | . | . | . | (-1.64) | (-0.99) | (-0.76) | (-0.61) | (-0.56) | (-1.82) | (-1.71) | (-1.18) | (-1.44) |

**Table 3: Cumulative Abnormal Returns: Subsamples based on Moneyness and Time to Maturity.**

This table reports abnormal stock returns around CNBC coverage for subsamples of "Unusual Option Activity" based on the Moneyness and Time to Maturity, where *TimeToMaturity* is equal to the number of days between the event day and the expiration date of the option and *Moneyness* is defined as spot price of the underlying stock over the strike price of the option. Abnormal Returns are calculated using the market model estimated over a 20-day estimation window with a two-day gap period on days t-6 and t-7. Average Daily abnormal returns (*Daily AR*) are reported over the period [-5, 50] and cumulative abnormal returns (CAR) are reported over the period [-5, 50] and [1, 50].Panel A reports the returns for call options positions with *TimeToMaturity* less than 14 days and *Moneyness* of <0.95. Panel B reports call options positions with *TimeToMaturity* less than 21 days and Moneyness <0.97.

Panel A: Deep OTM Calls Near Maturity

| (N=17) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.35% | -0.07% | -0.37% | 0.91% | -0.35% | 1.03% | -1.92% | -0.96% | 1.22% | -0.38% | -0.33% | -0.06% | 0.49% |
| T-Stat | (-0.88) | (-0.23) | (-0.84) | (1.61) | (-0.37) | (1.16) | (-1.93) | (-1.96) | (1.96) | (-1.65) | (-0.82) | (-0.18) | (1.23) |
| Average CAR | -0.35% | -1.00% | -1.19% | -0.27% | -0.63% | 2.07% | 0.37% | -0.06% | 1.38% | 3.37% | 3.55% | 2.19% | 2.62% |
| T-Stat | (-0.88) | (-1.38) | (-1.25) | (-0.21) | (-0.35) | (0.86) | (0.14) | (-0.02) | (0.40) | (1.08) | (0.79) | (0.43) | (0.41) |
| Average CAR | . | . | . | . | -0.35% | 2.34% | 0.64% | 0.22% | 1.66% | 3.65% | 3.82% | 2.47% | 2.90% |
| T-Stat | . | . | . | . | (-0.37) | (1.03) | (0.24) | (0.08) | (0.49) | (1.15) | (0.87) | (0.51) | (0.47) |

Panel B: OTM Calls Near Maturity

| (N=52) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.22% | -0.08% | 0.09% | 0.97% | 0.11% | 0.14% | -0.84% | 0.28% | 0.26% | -0.02% | -0.26% | -0.17% | 0.49% |
| T-Stat | (0.95) | (-0.34) | (0.37) | (3.00) | (0.29) | (0.33) | (-1.44) | (0.90) | (0.88) | (-0.09) | (-0.97) | (-0.68) | (1.70) |
| Average CAR | 0.22% | 0.48% | 0.47% | 1.44% | 1.55% | 2.26% | 1.21% | 1.84% | 2.58% | 3.24% | 3.65% | 2.46% | 2.68% |
| T-Stat | (0.95) | (0.87) | (0.76) | (1.75) | (1.67) | (2.05) | (0.97) | (1.26) | (1.52) | (1.71) | (1.56) | (0.95) | (0.83) |
| Average CAR | . | . | . | . | 0.11% | 1.07% | 0.02% | 0.66% | 1.27% | 1.94% | 2.35% | 1.16% | 1.38% |
| T-Stat | . | . | . | . | (0.29) | (1.25) | (0.02) | (0.54) | (0.85) | (1.19) | (1.11) | (0.49) | (0.46) |

**Table 4: Summary Statistics: "Unusual Option Activity" Identified from OptionMetrics**

This table reports summary statistics of "Unusual Option Activity" identified from OptionMetrics using the selection criteria specified in Section 3.B. Panel A reports the number of observations for each option type in the sample. *Unique Tickers* is the number of unique firms in the sample. Panel B shows the number of observations in each year. Panel C reports option level information of "Unusual Activity. *Option Volume* is the number of traded contracts, *Change in Open Interest* is the one-day change in open interest on the day of the event. *Strike* is the reported strike price of the contract; *Closing Option Price* is the end of day price for the option *Moneyness* is defined as Stock Price/Strike Price, *Maturity* is the number of days until maturity of the contract, *Est. Window Volume* is the average total call (put) volume for the firm during the 20-day estimation window.. Panel D reports the information for the underlying stocks. *Stock return* is the daily stock return as reported by CRSP on the day of coverage, *Volume* is the trading volume of the stock reported in millions, and *Market Cap* is the market capitalization of the firm reported in millions. Panel E reports the number of option positions that meet the selection criteria specified by the commentators for "Unusual Option Activity." It reports the total number of positions in each moneyness category and the number of contracts that have less than 2 weeks to maturity in each of the moneyness categories.

Panel A: Number of Positions

| | Total | Calls | Puts | Overlap | Unique Tickers |
|---|---|---|---|---|---|
| # of Obs | 5,141 | 2,295 | 2,846 | 23 | 1,816 |
| # of Obs With CRSP Data | 3,882 | 1,745 | 2,137 | 23 | 1,797 |

Panel B: By Year

| Year | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|
| # of Obs | 889 | 1046 | 1062 | 1073 | 1070 |

Panel C: Summary Statistics of Option Positions

| | N | Mean | Median | Mode | St.Dev. | 5th | 95th |
|---|---|---|---|---|---|---|---|
| Option Volume | 5141 | 6,247 | 2,863 | 1,000 | 13,450 | 1,020 | 20,505 |
| Change in Open Interest | 5141 | 5,658 | 2,582 | 1,000 | 12,211 | 1,005 | 19,595 |
| Strike Price | 5141 | 39.899 | 27 | 25 | 47.897 | 5 | 110 |
| Closing Option Price | 5141 | 1.302 | 0.8 | 0.4 | 2.16 | 0.15 | 4 |
| Moneyness | 4246 | 0.97 | 0.96 | 1 | 0.28 | 0.81 | 1.1 |
| Maturity | 4415 | 34.36 | 31 | 23 | 19.02 | 8 | 74 |
| Est. Window Volume | 5119 | 161.56 | 54 | 21.9 | 534.74 | 4 | 606.65 |

Panel D: Summary Statistics of Underlying Stocks

| | N | Mean | Median | Mode | Std Dev | 5th | 95th |
|---|---|---|---|---|---|---|---|
| Stock Return | 4246 | 0.94% | -0.06% | 0.00% | 17.23% | -6.12% | 6.51% |
| Stock Volume | 4246 | 3.26 | 1.3 | 0.84 | 8.54 | 0.21 | 10.48 |
| Market Cap | 4246 | 5.76 | 2.77 | 0.38 | 8.93 | 0.24 | 22.3 |

Panel E: Options Meeting Selection Criteria

| Moneyness | <0.95 | 0.95-0.97 | 0.97-1 | 1-1.03 | 1.03-1.05 | >1.05 |
|---|---|---|---|---|---|---|
| # of Obs | 1,936 | 607 | 975 | 445 | 113 | 339 |
| # of Obs Short-Term | 162 | 61 | 123 | 61 | 20 | 60 |

**Table 5: Cumulative Abnormal Returns: 'Unusual Option Activity' Identified from OptionMetrics**

This table reports abnormal stock returns around "Unusual Option Activity" identified from OptionMetrics. Abnormal Returns are calculated using the market model estimated over a 20-day estimation window with a two-day gap period on days t-6 and t-7. Average Daily abnormal returns (*Daily AR*) are reported over the period [-5, 50] and cumulative abnormal returns (CAR) are reported over the period [-5, 50] and [1, 50]. Panel A reports the returns for all call options. Panel B returns for all put options.

Panel A: All Calls

| (N=1,745) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.05% | 0.01% | 0.47% | 1.48% | 0.15% | 0.07% | 0.14% | 0.09% | 0.04% | 0.04% | 0.01% | 0.04% | 0.07% |
| T-Stat | (0.81) | (0.13) | (1.99) | (5.04) | (1.53) | (0.97) | (1.83) | (1.10) | (0.67) | (0.67) | (0.17) | (0.67) | (0.93) |
| Average CAR | 0.05% | 0.06% | 0.60% | 2.08% | 2.24% | 2.27% | 2.41% | 2.56% | 2.75% | 2.99% | 3.35% | 3.44% | 3.90% |
| T-Stat | (0.81) | (0.49) | (2.13) | (5.02) | (5.29) | (5.30) | (5.31) | (5.47) | (5.64) | (5.41) | (5.18) | (4.66) | (4.55) |
| Average CAR | . | . | . | 1.49% | 1.64% | 1.67% | 1.81% | 1.96% | 2.15% | 2.39% | 2.74% | 2.87% | 3.33% |
| T-Stat | . | . | . | (5.05) | (5.19) | (5.19) | (5.29) | (5.39) | (5.53) | (5.18) | (4.89) | (4.35) | (4.27) |
| Average CAR | . | . | . | . | 0.16% | 0.19% | 0.32% | 0.48% | 0.67% | 0.90% | 1.26% | 1.38% | 1.85% |
| T-Stat | . | . | . | . | (1.55) | (1.20) | (1.74) | (2.23) | (2.60) | (2.57) | (2.65) | (2.36) | (2.56) |

Panel B: All Puts

| (N=2,137) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.01% | 0.08% | 0.21% | -0.04% | -0.11% | -0.09% | 0.10% | 0.08% | 0.01% | -0.03% | -0.06% | -0.07% | -0.13% |
| T-Stat | (-0.21) | (1.05) | (1.49) | (-0.12) | (-1.08) | (-1.34) | (1.67) | (1.06) | (0.15) | (-0.45) | (-1.17) | (-1.21) | (-2.25) |
| Average CAR | -0.01% | 0.03% | 0.22% | 0.18% | 0.07% | -0.15% | -0.03% | 0.12% | -0.07% | -0.54% | -0.96% | -1.14% | -1.72% |
| T-Stat | (-0.21) | (0.23) | (0.94) | (0.47) | (0.17) | (-0.37) | (-0.08) | (0.26) | (-0.15) | (-0.99) | (-1.56) | (-1.59) | (-2.11) |
| Average CAR | . | . | . | -0.04% | -0.15% | -0.37% | -0.25% | -0.10% | -0.29% | -0.76% | -1.14% | -1.32% | -1.90% |
| T-Stat | . | . | . | (-0.12) | (-0.50) | (-1.18) | (-0.77) | (-0.28) | (-0.76) | (-1.68) | (-2.17) | (-2.11) | (-2.60) |
| Average CAR | . | . | . | . | -0.11% | -0.34% | -0.22% | -0.06% | -0.25% | -0.72% | -1.10% | -1.27% | -1.85% |
| T-Stat | . | . | . | . | (-1.08) | (-2.23) | (-1.19) | (-0.31) | (-1.01) | (-2.05) | (-2.48) | (-2.28) | (-2.77) |

**Table 6: Regressions of Cumulative Abnormal Returns on Options and Firm Characteristics**

This table reports results of the following regressions:

$$\begin{aligned}\text{Return}_{\text{i}} = \beta_1 + \text{MarketCapitalization}_{\text{i}} + \beta_2\text{StockVolume}_{\text{i}} + \beta_3\text{Moneyness}_{\text{i}}\text{T} + \beta_4\text{TimeToMaturity}_{\text{k}} + \beta_5\text{OptionVolume}_{\text{k}} \\ + \beta_6\Delta\text{OpenInterest}\sigma_{\text{k}} + \beta_7\text{Call(Put)Spread}_{\text{i}} + \alpha_{\text{ik}}\end{aligned}$$

where $MarketCapitalization_i$ is the Market Capitalization of firm $i$ on day 0 in $millions, $StockVolume_k$ is the number of contracts traded of the underlying stock $i$ on day 0 in millions. $Moneyness_k$ is an ordinal variable that equals 1 stocks with *Moneyness* in the lowest 30% of the observations, equals 2 for the next 40%, and 3 for the highest 30% of observations where Moneyness is equal to StockPrice/StrikePrice for Call options and StrikePrice/StockPrice for Put options, for option contract $k$ on day 0. $Maturity_k$ is an indicator variable that is equal to 1 is the time to maturity is greater than the median time to maturity for all observations, and 0 otherwise, for option contract $k$ on day 0. $\Delta OpenInterest\sigma_k$ is the change in open interest for option contract $k$ in standard deviations of the total change in open interest for firm $i$ on day 0, multiplied by 1000. $OptionVolume_k$ is the option volume of option contract $k$ for firm $i$, on day 0 in millions. $Call\ (put)Spread_i$ is and indicator variable equal to one if firm $i$ has multiple call(put) options with unusual option activity on day 0. Models 1 through 5 are based on call options while models 6 through 10 are based on put options. Models 2 and 7 use abnormal returns on the event day (CAR [0]) as the dependent variable, all other models use CAR over various event windows as the dependent variables. We compute statistical significance using White standard errors.

| | Call | | | | | Put | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| VARIABLES | CAR [-5,-1] | CAR [0] | CAR [1,1] | CAR [1,20] | CAR [1,50] | CAR [-5,-1] | CAR [0] | CAR [1,1] | CAR [1,20] | CAR [1,50] |
| $MarketCap_i$ | -0.038* | -0.103*** | 0.0004 | 0.037 | 0.042 | -0.049** | -0.097** | -0.002 | -0.001 | 0.020 |
| | (-1.791) | (-4.391) | -0.0565 | -1.175 | -0.713 | (-2.192) | (-2.098) | (-0.181) | (-0.0434) | -0.413 |
| $Stock\ Volume_i$ | 0.117 | 0.501*** | -0.048 | -0.021 | 0.059 | 0.435*** | 1.158*** | -0.098*** | 0.003 | -0.002 |
| | -1.07 | -3.52 | (-1.302) | (-0.186) | -0.316 | -3.81 | -3.073 | (-4.433) | -0.0548 | (-0.0301) |
| $Moneyness_k$ | -0.0204 | 0.949*** | -0.225 | -0.852* | -1.266 | -0.616* | -2.246*** | 0.185 | 0.921* | 1.951** |
| | (-0.0425) | -2.678 | (-1.641) | (-1.661) | (-1.146) | (-1.795) | (-4.521) | -1.209 | -1.784 | -1.997 |
| $Maturity_k$ | 0.858 | -0.492 | -0.487** | -0.593 | -2.127 | 0.0419 | -0.805 | 0.236 | 1.032 | 3.149** |
| | -1.411 | (-0.973) | (-2.343) | (-0.806) | (-1.423) | -0.0966 | (-1.510) | -1.156 | -1.497 | -2.383 |
| $OptVolume_k$ | -48.37 | -161.6*** | 20.76 | -22.29 | -77.89 | -64.27** | -142.3** | 28.06** | 23.78 | 66.12* |
| | (-1.172) | (-2.980) | -1.416 | (-0.381) | (-0.912) | (-2.272) | (-2.222) | -2.079 | -0.955 | -1.69 |
| $\Delta\ OI\sigma_k$ | -0.108 | -0.21 | -0.0105 | 3.48 | 4.48 | 0.764 | 3.19 | -0.519 | -0.827 | -5.60** |
| | (-0.162) | (-0.689) | (-0.0559) | -1.376 | -1.312 | -0.911 | -1.472 | (-1.204) | (-0.636) | (-2.134) |
| $Spread_i$ | -1.454* | 1.356 | 0.801*** | 5.138*** | 5.932** | 1.23 | 6.005*** | -0.566* | 0.876 | 2.858 |
| | (-1.833) | -1.192 | -2.61 | -3.413 | -2.167 | -1.182 | -3.138 | (-1.777) | -0.952 | -1.629 |
| *Constant* | 0.832 | -1.118 | 0.935** | 1.864 | 3.821 | 0.323 | 3.822** | -0.428 | -3.292** | -7.529*** |
| | -0.474 | (-1.234) | -2.087 | -1.262 | -1.248 | -0.395 | -2.45 | (-0.985) | (-2.386) | (-2.915) |
| Observations | 1,722 | 1,722 | 1,722 | 1,719 | 1,716 | 2,213 | 2,213 | 2,213 | 2,209 | 2,204 |
| Adjusted $R^2$ | 0.003 | 0.124 | 0.013 | 0.016 | 0.003 | 0.118 | 0.286 | 0.035 | -0.002 | 0.002 |

**Table 7: Cumulative Abnormal Returns: Subsamples based on Moneyness**

This table reports abnormal stock returns around subsamples of "Unusual Option Activity" identified from OptionMetrics. The sample is divided into subsamples based on the moneyness of the option, where moneyness is equal to StockPrice/StrikePrice for Call options and StrikePrice/StockPrice for Put options. Abnormal Returns are calculated using the market model estimated over a 20-day estimation window with a two-day gap period on days t-6 and t-7. Average Daily abnormal returns (*Daily AR*) are reported over the period [-5, 50] and cumulative abnormal returns (CAR) are reported over the period [-5, 50] and [1, 50]. Panel A reports the returns for Far OTM call options with moneyness in the lowest 30 percent. Panel B reports the returns for OTM call options, i.e., those with moneyness in the middle 40 percent. Panel C reports the returns for ITM call options, i.e., those with moneyness in the highest 30 percent. Panel D reports the returns for Far OTM put options, i.e., those with moneyness in the lowest 30 percent. Panel E reports the returns for OTM put options, i.e., those with moneyness in the middle 40 percent. Panel F reports the returns for ITM put options, i.e., with moneyness in the highest 30 percent.

Panel A:Far OTM Calls

| (N=491) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.14% | -0.22% | 0.54% | 0.72% | 0.40% | 0.24% | 0.13% | 0.03% | 0.13% | -0.03% | 0.22% | -0.02% | -0.06% |
| T-Stat | (1.17) | (-1.42) | (1.00) | (2.46) | (1.85) | (1.47) | (0.73) | (0.19) | (1.12) | (-0.20) | (1.06) | (-0.18) | (-0.27) |
| Average CAR | 0.14% | -0.02% | 0.62% | 1.34% | 1.75% | 2.11% | 2.26% | 2.48% | 2.88% | 3.34% | 4.05% | 4.21% | 4.52% |
| T-Stat | (1.17) | (-0.08) | (0.97) | (1.77) | (2.26) | (2.50) | (2.61) | (2.81) | (3.05) | (2.92) | (2.83) | (2.50) | (2.28) |
| Average CAR | . | . | . | 0.72% | 1.12% | 1.48% | 1.64% | 1.86% | 2.26% | 2.72% | 3.40% | 3.56% | 3.87% |
| T-Stat | . | . | . | (2.46) | (3.03) | (3.09) | (3.06) | (3.24) | (3.48) | (3.05) | (2.78) | (2.40) | (2.20) |
| Average CAR | . | . | . | . | 0.40% | 0.76% | 0.92% | 1.14% | 1.54% | 2.00% | 2.68% | 2.85% | 3.15% |
| T-Stat | . | . | . | . | (1.85) | (2.08) | (2.11) | (2.35) | (2.78) | (2.49) | (2.38) | (2.03) | (1.87) |

Panel B: OTM Calls

| (N=676) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.07% | 0.03% | 0.13% | 0.85% | 0.10% | 0.06% | 0.02% | 0.05% | 0.03% | 0.08% | -0.03% | 0.10% | 0.09% |
| T-Stat | (0.91) | (0.38) | (0.86) | (3.19) | (0.79) | (0.66) | (0.19) | (0.64) | (0.30) | (1.05) | (-0.36) | (1.32) | (1.18) |
| Average CAR | 0.07% | 0.10% | 0.34% | 1.19% | 1.29% | 1.33% | 1.26% | 1.44% | 1.54% | 1.78% | 2.04% | 2.43% | 2.63% |
| T-Stat | (0.91) | (0.69) | (1.37) | (3.07) | (3.34) | (3.23) | (2.74) | (2.95) | (2.95) | (2.85) | (2.71) | (2.78) | (2.64) |
| Average CAR | . | . | . | 0.86% | 0.96% | 1.00% | 0.94% | 1.11% | 1.21% | 1.45% | 1.71% | 2.19% | 2.39% |
| T-Stat | . | . | . | (3.22) | (3.53) | (3.29) | (2.57) | (2.85) | (2.80) | (2.68) | (2.56) | (2.72) | (2.57) |
| Average CAR | . | . | . | . | 0.11% | 0.15% | 0.09% | 0.26% | 0.36% | 0.60% | 0.87% | 1.35% | 1.54% |
| T-Stat | . | . | . | . | (0.83) | (0.72) | (0.33) | (0.89) | (1.03) | (1.24) | (1.38) | (1.77) | (1.72) |

Panel C: ITM Calls

| (N=504) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.14% | 0.10% | 0.63% | 2.56% | -0.03% | -0.05% | 0.28% | 0.03% | -0.18% | 0.09% | -0.02% | 0.01% | 0.16% |
| T-Stat | (-0.98) | (0.91) | (1.15) | (3.57) | (-0.20) | (-0.41) | (2.08) | (0.30) | (-1.36) | (0.85) | (-0.27) | (0.12) | (1.38) |
| Average CAR | -0.14% | -0.06% | 0.59% | 3.15% | 3.12% | 3.06% | 3.35% | 3.26% | 3.24% | 3.48% | 3.64% | 3.34% | 4.07% |
| T-Stat | (-0.98) | (-0.24) | (0.93) | (3.50) | (3.49) | (3.51) | (3.57) | (3.38) | (3.23) | (3.01) | (2.81) | (2.27) | (2.37) |
| Average CAR | . | . | . | 2.56% | 2.53% | 2.47% | 2.75% | 2.67% | 2.64% | 2.88% | 3.05% | 2.74% | 3.47% |
| T-Stat | . | . | . | (3.57) | (3.48) | (3.44) | (3.75) | (3.35) | (3.16) | (2.93) | (2.71) | (2.10) | (2.18) |
| Average CAR | . | . | . | . | -0.03% | -0.09% | 0.18% | 0.10% | 0.07% | 0.31% | 0.47% | 0.17% | 0.90% |
| T-Stat | . | . | . | . | (-0.20) | (-0.28) | (0.52) | (0.26) | (0.15) | (0.48) | (0.55) | (0.16) | (0.62) |

Panel D: Far OTM Puts

| (N=620) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.02% | 0.17% | 0.66% | 1.29% | -0.22% | -0.25% | 0.17% | 0.34% | 0.18% | -0.08% | -0.08% | -0.06% | -0.32% |
| T-Stat | (0.14) | (0.79) | (1.77) | (1.56) | (-1.02) | (-1.67) | (1.35) | (1.99) | (1.23) | (-0.50) | (-0.80) | (-0.49) | (-2.42) |
| Average CAR | 0.02% | 0.06% | 0.84% | 2.14% | 1.92% | 1.36% | 1.55% | 1.87% | 1.40% | 0.37% | -0.48% | -0.88% | -2.10% |
| T-Stat | (0.14) | (0.21) | (1.37) | (1.98) | (1.85) | (1.26) | (1.42) | (1.57) | (1.10) | (0.26) | (-0.31) | (-0.51) | (-1.09) |
| Average CAR | . | . | . | 1.29% | 1.07% | 0.52% | 0.71% | 1.03% | 0.56% | -0.48% | -1.19% | -1.60% | -2.82% |
| T-Stat | . | . | . | (1.56) | (1.33) | (0.62) | (0.84) | (1.11) | (0.57) | (-0.42) | (-0.94) | (-1.09) | (-1.65) |
| Average CAR | . | . | . | . | -0.22% | -0.78% | -0.58% | -0.27% | -0.73% | -1.77% | -2.49% | -2.89% | -4.12% |
| T-Stat | . | . | . | . | (-1.02) | (-2.29) | (-1.45) | (-0.58) | (-1.31) | (-2.23) | (-2.50) | (-2.41) | (-2.78) |

Panel E: OTM Puts

| (N=852) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.00% | 0.04% | -0.08% | -0.41% | -0.15% | -0.07% | 0.09% | -0.10% | -0.09% | -0.06% | -0.03% | -0.10% | -0.13% |
| T-Stat | (0.06) | (0.51) | (-0.89) | (-2.92) | (-1.14) | (-0.83) | (1.15) | (-1.44) | (-1.49) | (-0.93) | (-0.40) | (-1.41) | (-1.73) |
| Average CAR | 0.00% | 0.05% | -0.15% | -0.56% | -0.71% | -0.90% | -0.77% | -0.81% | -0.83% | -0.98% | -1.19% | -1.36% | -1.79% |
| T-Stat | (0.06) | (0.44) | (-0.81) | (-2.30) | (-2.60) | (-2.97) | (-2.38) | (-2.37) | (-2.12) | (-1.98) | (-1.94) | (-1.80) | (-2.06) |
| Average CAR | . | . | . | -0.41% | -0.56% | -0.75% | -0.62% | -0.66% | -0.68% | -0.83% | -1.04% | -1.22% | -1.65% |
| T-Stat | . | . | . | (-2.92) | (-2.99) | (-3.19) | (-2.34) | (-2.30) | (-1.98) | (-1.85) | (-1.81) | (-1.71) | (-1.99) |
| Average CAR | . | . | . | . | -0.15% | -0.34% | -0.21% | -0.25% | -0.27% | -0.42% | -0.63% | -0.75% | -1.19% |
| T-Stat | . | . | . | . | (-1.14) | (-1.77) | (-0.92) | (-1.00) | (-0.86) | (-1.01) | (-1.16) | (-1.11) | (-1.49) |

Panel F: ITM Puts

| (N=641) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.07% | 0.01% | 0.07% | -1.44% | -0.10% | 0.07% | 0.04% | -0.09% | -0.18% | 0.12% | 0.04% | -0.10% | 0.05% |
| T-Stat | (-0.90) | (0.05) | (0.32) | (-7.27) | (-0.51) | (0.55) | (0.31) | (-0.91) | (-1.14) | (0.93) | (0.40) | (-0.70) | (0.58) |
| Average CAR | -0.07% | -0.05% | 0.04% | -1.40% | -1.50% | -1.36% | -1.37% | -1.29% | -1.71% | -1.88% | -2.21% | -2.30% | -2.60% |
| T-Stat | (-0.90) | (-0.23) | (0.10) | (-3.06) | (-2.81) | (-2.31) | (-2.19) | (-1.93) | (-2.42) | (-2.08) | (-2.12) | (-1.77) | (-1.72) |
| Average CAR | . | . | . | -1.44% | -1.54% | -1.40% | -1.41% | -1.32% | -1.75% | -1.92% | -2.25% | -2.34% | -2.64% |
| T-Stat | . | . | . | (-7.27) | (-5.23) | (-3.90) | (-3.35) | (-2.84) | (-3.35) | (-2.66) | (-2.56) | (-2.06) | (-1.95) |
| Average CAR | . | . | . | . | -0.10% | 0.04% | 0.03% | 0.11% | -0.31% | -0.49% | -0.81% | -0.90% | -1.20% |
| T-Stat | . | . | . | . | (-0.51) | (0.13) | (0.08) | (0.29) | (-0.68) | (-0.72) | (-0.96) | (-0.82) | (-0.91) |

**Table 8: Cumulative Abnormal Returns: Subsamples based on Maturity.**

This table reports abnormal stock returns around subsamples of "Unusual Option Activity" identified from OptionMetrics. The sample is divided into subsamples based on the Time to Maturity of the option, where TimeToMaturity is equal the number of days between the event day and the expiration date of the option. Abnormal Returns are calculated using the market model estimated over a 20-day estimation window with a two-day gap period on days t-6 and t-7. Average Daily abnormal returns (*Daily AR*) are reported over the period [-5, 50] and cumulative abnormal returns (CAR) are reported over the period [-5, 50] and [1, 50]. Panel A reports the returns for near maturity call options, i.e., those with TimeToMaturity in the lowest 30 percent. Panel B reports the returns of medium maturity call options, i.e., those with TimeToMaturity in the middle 40 percent. Panel C reports the return of far from maturity call options, i.e., with TimeToMaturity in the highest 30 percent. Panel D reports the returns of near maturity put options, i.e., those with TimeToMaturity in the lowest 30 percent. Panel E reports the returns from medium maturity put options, i.e., those with TimeToMaturity in the middle 40 percent. Panel F reports the returns of far from maturity put options, i.e., with TimeToMaturity in the highest 30 percent.

Panel A: Near Maturity Calls

| (N=486) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.09% | -0.01% | 0.64% | 2.18% | 0.44% | 0.20% | 0.16% | -0.04% | 0.09% | 0.01% | 0.00% | 0.10% | 0.02% |
| T-Stat | (-0.60) | (-0.12) | (1.18) | (3.21) | (1.80) | (1.22) | (0.95) | (-0.39) | (0.89) | (0.13) | (-0.03) | (0.99) | (0.14) |
| Average CAR | -0.09% | -0.21% | 0.61% | 2.79% | 3.23% | 3.19% | 3.43% | 3.54% | 4.03% | 4.20% | 5.34% | 5.90% | 6.16% |
| T-Stat | (-0.60) | (-0.93) | (0.98) | (3.12) | (3.61) | (3.61) | (3.77) | (3.74) | (4.20) | (3.82) | (4.40) | (4.27) | (3.99) |
| Average CAR | . | . | . | 2.18% | 2.62% | 2.58% | 2.82% | 2.93% | 3.42% | 3.59% | 4.70% | 5.26% | 5.52% |
| T-Stat | . | . | . | (3.21) | (3.72) | (3.76) | (3.88) | (3.73) | (4.28) | (3.73) | (4.31) | (4.24) | (4.06) |
| Average CAR | . | . | . | . | 0.44% | 0.40% | 0.64% | 0.75% | 1.24% | 1.41% | 2.52% | 3.08% | 3.34% |
| T-Stat | . | . | . | . | (1.80) | (0.99) | (1.38) | (1.53) | (2.22) | (1.93) | (2.79) | (2.81) | (2.60) |

Panel B: Medium Maturity Calls

| (N=677) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.09% | 0.00% | 0.44% | 1.38% | -0.14% | 0.13% | 0.08% | 0.05% | -0.05% | 0.07% | 0.15% | -0.02% | 0.26% |
| T-Stat | (1.01) | (-0.04) | (1.02) | (3.34) | (-1.09) | (1.20) | (0.66) | (0.43) | (-0.41) | (0.66) | (1.02) | (-0.19) | (2.34) |
| Average CAR | 0.09% | 0.17% | 0.77% | 2.15% | 2.01% | 2.19% | 2.26% | 2.33% | 2.41% | 3.01% | 3.41% | 3.78% | 4.14% |
| T-Stat | (1.01) | (0.94) | (1.57) | (3.28) | (3.10) | (3.33) | (3.14) | (3.20) | (3.12) | (3.25) | (3.10) | (3.09) | (3.04) |
| Average CAR | . | . | . | 1.39% | 1.25% | 1.43% | 1.50% | 1.57% | 1.65% | 2.25% | 2.65% | 3.10% | 3.47% |
| T-Stat | . | . | . | (3.36) | (2.94) | (3.15) | (3.10) | (3.07) | (2.91) | (3.09) | (2.87) | (2.90) | (2.81) |
| Average CAR | . | . | . | . | -0.13% | 0.05% | 0.11% | 0.19% | 0.26% | 0.86% | 1.26% | 1.71% | 2.08% |
| T-Stat | . | . | . | . | (-1.04) | (0.25) | (0.44) | (0.64) | (0.68) | (1.54) | (1.62) | (1.84) | (1.86) |

Panel C: Far from Maturity Calls

| (N=481) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.08% | -0.01% | 0.21% | 0.93% | 0.19% | -0.11% | 0.13% | 0.09% | -0.04% | 0.05% | -0.04% | 0.07% | -0.17% |
| T-Stat | (0.84) | (-0.09) | (1.60) | (3.61) | (1.64) | (-1.06) | (1.01) | (0.79) | (-0.41) | (0.45) | (-0.40) | (0.70) | (-0.82) |
| Average CAR | 0.08% | 0.16% | 0.28% | 1.21% | 1.40% | 1.32% | 1.28% | 1.37% | 1.27% | 1.25% | 0.85% | 0.08% | 0.72% |
| T-Stat | (0.84) | (0.75) | (0.83) | (2.68) | (2.97) | (2.47) | (2.27) | (2.27) | (1.92) | (1.52) | (0.79) | (0.06) | (0.42) |
| Average CAR | . | . | . | 0.93% | 1.12% | 1.04% | 1.00% | 1.09% | 1.00% | 0.98% | 0.59% | -0.19% | 0.45% |
| T-Stat | . | . | . | (3.61) | (3.92) | (2.97) | (2.50) | (2.44) | (1.91) | (1.41) | (0.60) | (-0.15) | (0.28) |
| Average CAR | . | . | . | . | 0.19% | 0.11% | 0.07% | 0.16% | 0.07% | 0.05% | -0.34% | -1.11% | -0.47% |
| T-Stat | . | . | . | . | (1.64) | (0.51) | (0.26) | (0.45) | (0.15) | (0.07) | (-0.38) | (-0.94) | (-0.30) |

Panel D: Near Maturity Puts

| (N=619) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.05% | 0.14% | 0.39% | 0.49% | -0.39% | 0.00% | -0.08% | 0.12% | 0.07% | 0.01% | -0.03% | -0.13% | -0.11% |
| T-Stat | (0.47) | (0.97) | (1.08) | (0.60) | (-1.59) | (-0.00) | (-0.67) | (0.70) | (0.56) | (0.07) | (-0.31) | (-1.33) | (-0.93) |
| Average CAR | 0.05% | 0.11% | 0.72% | 1.21% | 0.83% | 0.80% | 0.64% | 0.82% | 0.83% | 0.27% | -0.27% | -0.46% | -1.07% |
| T-Stat | (0.47) | (0.55) | (1.27) | (1.14) | (0.80) | (0.76) | (0.60) | (0.72) | (0.69) | (0.20) | (-0.19) | (-0.29) | (-0.61) |
| Average CAR | . | . | . | 0.49% | 0.11% | 0.08% | -0.08% | 0.11% | 0.11% | -0.45% | -0.99% | -1.18% | -1.78% |
| T-Stat | . | . | . | (0.60) | (0.13) | (0.10) | (-0.09) | (0.11) | (0.11) | (-0.43) | (-0.85) | (-0.86) | (-1.13) |
| Average CAR | . | . | . | . | -0.39% | -0.41% | -0.57% | -0.39% | -0.38% | -0.95% | -1.48% | -1.67% | -2.28% |
| T-Stat | . | . | . | . | (-1.59) | (-1.22) | (-1.42) | (-0.88) | (-0.76) | (-1.42) | (-1.76) | (-1.55) | (-1.73) |

Panel E: Medium Maturity Puts

| (N=833) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.11% | 0.16% | 0.08% | -0.03% | 0.03% | -0.18% | 0.08% | 0.13% | -0.07% | 0.01% | -0.12% | -0.04% | -0.15% |
| T-Stat | (-1.28) | (0.97) | (0.48) | (-0.05) | (0.21) | (-1.82) | (0.74) | (1.11) | (-0.56) | (0.13) | (-1.52) | (-0.38) | (-1.87) |
| Average CAR | -0.11% | 0.06% | 0.07% | 0.05% | 0.08% | -0.27% | -0.13% | 0.11% | -0.23% | -0.77% | -1.44% | -1.80% | -2.54% |
| T-Stat | (-1.28) | (0.28) | (0.21) | (0.07) | (0.11) | (-0.38) | (-0.18) | (0.14) | (-0.27) | (-0.79) | (-1.38) | (-1.48) | (-1.86) |
| Average CAR | . | . | . | -0.03% | 0.00% | -0.35% | -0.21% | 0.04% | -0.31% | -0.84% | -1.42% | -1.78% | -2.52% |
| T-Stat | . | . | . | (-0.05) | (0.01) | (-0.60) | (-0.35) | (0.06) | (-0.44) | (-1.04) | (-1.59) | (-1.66) | (-2.08) |
| Average CAR | . | . | . | . | 0.03% | -0.32% | -0.18% | 0.07% | -0.28% | -0.81% | -1.39% | -1.75% | -2.48% |
| T-Stat | . | . | . | . | (0.21) | (-1.39) | (-0.60) | (0.20) | (-0.67) | (-1.37) | (-1.93) | (-1.92) | (-2.31) |

Panel F: Far from Maturity Puts

| (N=602) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.03% | -0.02% | 0.18% | -0.32% | -0.26% | -0.03% | 0.24% | -0.07% | -0.04% | -0.11% | 0.06% | -0.08% | -0.15% |
| T-Stat | (-0.32) | (-0.15) | (0.89) | (-1.36) | (-1.90) | (-0.29) | (2.27) | (-0.66) | (-0.46) | (-0.70) | (0.64) | (-0.74) | (-1.39) |
| Average CAR | -0.03% | -0.07% | -0.01% | -0.33% | -0.59% | -0.89% | -0.71% | -0.69% | -1.15% | -1.57% | -1.76% | -1.79% | -2.49% |
| T-Stat | (-0.32) | (-0.38) | (-0.02) | (-0.86) | (-1.44) | (-1.87) | (-1.42) | (-1.33) | (-1.98) | (-2.06) | (-1.86) | (-1.61) | (-1.88) |
| Average CAR | . | . | . | -0.32% | -0.58% | -0.88% | -0.70% | -0.69% | -1.14% | -1.57% | -1.76% | -1.81% | -2.51% |
| T-Stat | . | . | . | (-1.36) | (-2.12) | (-2.62) | (-1.91) | (-1.74) | (-2.41) | (-2.33) | (-2.02) | (-1.75) | (-2.02) |
| Average CAR | . | . | . | . | -0.26% | -0.56% | -0.38% | -0.37% | -0.82% | -1.25% | -1.44% | -1.42% | -2.12% |
| T-Stat | . | . | . | . | (-1.90) | (-2.33) | (-1.35) | (-1.15) | (-2.05) | (-2.01) | (-1.71) | (-1.42) | (-1.75) |

**Table 9: Cumulative Abnormal Returns: Subsamples based on Moneyness and Maturity.**

This table reports abnormal stock returns around subsamples of "Unusual Option Activity" identified from OptionMetrics. The sample is divided into subsamples based on the Moneyness and Time to Maturity of the option, where TimeToMaturity is equal the number of days between the event day and the expiration date of the option. We include only far OTM options, i.e., those with the lowest 30 percent Moneyness, then further sort them into groups based on Time to Maturity. Abnormal Returns are calculated using the market model estimated over a 20-day estimation window with a two-day gap period on days t-6 and t-7. Average Daily abnormal returns (*Daily AR*) are reported over the period [-5, 50] and cumulative abnormal returns (CAR) are reported over the period [-5, 50] and [1, 50]. Panel A reports the returns for near maturity call options, i.e., those with TimeToMaturity in the lowest 30 percent. Panel B reports the returns of medium maturity call options, i.e., those with TimeToMaturity in the middle 40 percent. Panel C reports the return of far from maturity call options, i.e., with TimeToMaturity in the highest 30 percent. Panel D reports the returns of near maturity put options, i.e., those with TimeToMaturity in the lowest 30 percent. Panel E reports the returns from medium maturity put options, i.e., those with TimeToMaturity in the middle 40 percent. Panel F reports the returns of far from maturity put options, i.e., with TimeToMaturity in the highest 30 percent.

Panel A: OTM Near Maturity Calls

| (N=153) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.16% | -0.21% | 2.22% | 1.97% | 0.56% | 0.69% | 0.43% | -0.31% | 0.14% | 0.34% | 0.35% | -0.17% | 0.24% |
| T-Stat | (0.72) | (-0.77) | (1.33) | (3.25) | (0.96) | (1.70) | (1.09) | (-1.14) | (0.57) | (1.22) | (1.15) | (-1.03) | (0.75) |
| Average CAR | 0.16% | -0.21% | 2.75% | 4.72% | 5.29% | 6.12% | 6.90% | 6.94% | 7.84% | 9.31% | 11.69% | 13.02% | 15.49% |
| T-Stat | (0.72) | (-0.48) | (1.51) | (2.30) | (2.55) | (2.82) | (3.16) | (3.21) | (3.51) | (3.68) | (4.10) | (4.08) | (4.13) |
| Average CAR | . | . | . | 1.97% | 2.54% | 3.37% | 4.15% | 4.19% | 5.09% | 6.56% | 8.85% | 10.17% | 12.64% |
| T-Stat | . | . | . | (3.25) | (2.90) | (3.07) | (3.48) | (3.47) | (3.82) | (3.82) | (4.06) | (3.97) | (4.25) |
| Average CAR | . | . | . | . | 0.56% | 1.40% | 2.17% | 2.22% | 3.11% | 4.59% | 6.88% | 8.21% | 10.67% |
| T-Stat | . | . | . | . | (0.96) | (1.49) | (2.07) | (2.04) | (2.64) | (2.89) | (3.42) | (3.42) | (3.75) |

Panel B: OTM Medium Maturity Calls

| (N=197) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.16% | -0.27% | -0.28% | 0.16% | 0.50% | -0.01% | 0.03% | 0.13% | 0.21% | 0.01% | 0.17% | -0.02% | -0.03% |
| T-Stat | (0.86) | (-0.97) | (-1.03) | (0.39) | (2.03) | (-0.03) | (0.13) | (0.52) | (1.25) | (0.03) | (0.39) | (-0.13) | (-0.14) |
| Average CAR | 0.16% | -0.02% | -0.24% | -0.08% | 0.43% | 0.40% | 0.36% | 0.39% | 0.93% | 1.38% | 1.66% | 2.60% | 2.55% |
| T-Stat | (0.86) | (-0.05) | (-0.47) | (-0.11) | (0.57) | (0.47) | (0.38) | (0.40) | (0.85) | (0.93) | (0.84) | (1.12) | (0.96) |
| Average CAR | . | . | . | 0.16% | 0.67% | 0.64% | 0.60% | 0.64% | 1.18% | 1.62% | 1.91% | 2.84% | 2.79% |
| T-Stat | . | . | . | (0.39) | (1.38) | (1.06) | (0.85) | (0.78) | (1.33) | (1.25) | (1.06) | (1.32) | (1.12) |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average CAR | . | . | . | . | 0.50% | 0.48% | 0.43% | 0.47% | 1.01% | 1.46% | 1.74% | 2.68% | 2.62% |
| T-Stat | . | . | . | . | (2.03) | (1.21) | (0.80) | (0.71) | (1.39) | (1.26) | (1.04) | (1.31) | (1.09) |

Panel C: OTM Far from Maturity Calls

| (N=146) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.06% | -0.18% | -0.13% | 0.18% | 0.04% | 0.11% | 0.00% | 0.26% | 0.04% | -0.47% | 0.09% | 0.18% | -0.38% |
| T-Stat | (0.30) | (-0.79) | (-0.47) | (0.38) | (0.19) | (0.44) | (0.02) | (1.03) | (0.19) | (-1.92) | (0.36) | (0.84) | (-0.62) |
| Average CAR | 0.06% | 0.14% | -0.48% | -0.30% | -0.26% | 0.11% | -0.09% | 0.44% | 0.15% | -0.29% | -0.82% | -2.89% | -4.38% |
| T-Stat | (0.30) | (0.30) | (-0.63) | (-0.32) | (-0.27) | (0.09) | (-0.07) | (0.33) | (0.10) | (-0.15) | (-0.31) | (-0.90) | (-1.14) |
| Average CAR | . | . | . | 0.18% | 0.22% | 0.59% | 0.38% | 0.91% | 0.63% | 0.19% | -0.34% | -2.41% | -3.90% |
| T-Stat | . | . | . | (0.38) | (0.42) | (0.77) | (0.45) | (0.97) | (0.54) | (0.12) | (-0.14) | (-0.81) | (-1.08) |
| Average CAR | . | . | . | . | 0.04% | 0.40% | 0.20% | 0.73% | 0.45% | 0.01% | -0.52% | -2.59% | -4.08% |
| T-Stat | . | . | . | . | (0.19) | (0.78) | (0.33) | (0.96) | (0.45) | (0.01) | (-0.24) | (-0.91) | (-1.16) |

Panel D: OTM Near Maturity Puts

| (N=190) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.29% | 0.02% | 0.99% | 4.86% | -1.09% | -0.13% | -0.16% | 0.82% | 0.56% | -0.17% | -0.28% | -0.02% | -0.41% |
| T-Stat | (1.11) | (0.05) | (0.97) | (1.87) | (-1.98) | (-0.37) | (-0.78) | (1.75) | (1.70) | (-0.92) | (-1.65) | (-0.11) | (-1.38) |
| Average CAR | 0.29% | 0.12% | 1.43% | 6.29% | 5.21% | 4.72% | 4.66% | 5.68% | 5.74% | 4.25% | 2.74% | 2.36% | 0.38% |
| T-Stat | (1.11) | (0.25) | (0.94) | (1.97) | (1.72) | (1.55) | (1.54) | (1.71) | (1.67) | (1.19) | (0.73) | (0.56) | (0.08) |
| Average CAR | . | . | . | 4.86% | 3.77% | 3.29% | 3.23% | 4.25% | 4.30% | 2.81% | 1.30% | 0.92% | -1.06% |
| T-Stat | . | . | . | (1.87) | (1.51) | (1.31) | (1.31) | (1.57) | (1.58) | (0.97) | (0.42) | (0.26) | (-0.27) |
| Average CAR | . | . | . | . | -1.09% | -1.57% | -1.63% | -0.61% | -0.55% | -2.05% | -3.56% | -3.93% | -5.92% |
| T-Stat | . | . | . | . | (-1.98) | (-2.04) | (-1.82) | (-0.60) | (-0.51) | (-1.45) | (-1.89) | (-1.68) | (-2.01) |

Panel E: OTM Medium Maturity Puts

| (N=250) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.22% | 0.40% | 0.59% | 1.96% | -0.03% | -0.27% | 0.11% | 0.30% | -0.06% | 0.12% | -0.14% | -0.07% | -0.20% |
| T-Stat | (-0.98) | (0.89) | (1.27) | (1.03) | (-0.11) | (-1.32) | (0.52) | (0.90) | (-0.29) | (0.67) | (-0.93) | (-0.40) | (-1.30) |
| Average CAR | -0.22% | 0.17% | 1.00% | 2.96% | 2.92% | 2.42% | 2.57% | 2.83% | 2.20% | 0.76% | -0.50% | -1.48% | -2.36% |
| T-Stat | (-0.98) | (0.31) | (1.01) | (1.33) | (1.37) | (1.11) | (1.20) | (1.19) | (0.89) | (0.28) | (-0.19) | (-0.51) | (-0.74) |
| Average CAR | . | . | . | 1.96% | 1.92% | 1.42% | 1.58% | 1.84% | 1.21% | -0.24% | -1.18% | -2.17% | -3.04% |
| T-Stat | . | . | . | (1.03) | (1.05) | (0.76) | (0.87) | (0.92) | (0.58) | (-0.11) | (-0.52) | (-0.86) | (-1.11) |
| Average CAR | . | . | . | . | -0.03% | -0.54% | -0.38% | -0.12% | -0.75% | -2.20% | -3.15% | -4.13% | -5.01% |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T-Stat | . | . | . | . | (-0.11) | (-1.10) | (-0.61) | (-0.17) | (-0.84) | (-1.76) | (-2.26) | (-2.47) | (-2.48) |

| Panel F: OTM Far from Maturity Puts (N=152) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | -0.07% | 0.27% | 0.68% | -0.35% | 0.15% | -0.26% | 0.52% | 0.22% | 0.14% | -0.28% | 0.11% | -0.03% | -0.40% |
| T-Stat | (-0.30) | (0.86) | (1.72) | (-1.21) | (0.57) | (-1.15) | (2.15) | (1.21) | (0.64) | (-0.59) | (0.48) | (-0.11) | (-1.56) |
| Average CAR | -0.07% | -0.07% | 0.50% | 0.15% | 0.29% | -0.69% | -0.39% | -0.17% | -1.11% | -1.45% | -1.45% | -0.98% | -2.24% |
| T-Stat | (-0.30) | (-0.18) | (0.78) | (0.21) | (0.39) | (-0.73) | (-0.37) | (-0.15) | (-0.84) | (-0.81) | (-0.63) | (-0.37) | (-0.70) |
| Average CAR | . | . | . | -0.35% | -0.20% | -1.18% | -0.88% | -0.66% | -1.60% | -1.95% | -1.94% | -1.47% | -2.74% |
| T-Stat | . | . | . | (-1.21) | (-0.51) | (-1.90) | (-1.23) | (-0.84) | (-1.54) | (-1.23) | (-0.94) | (-0.61) | (-0.92) |
| Average CAR | . | . | . | . | 0.15% | -0.83% | -0.53% | -0.32% | -1.25% | -1.60% | -1.59% | -1.12% | -2.39% |
| T-Stat | . | . | . | . | (0.57) | (-1.49) | (-0.83) | (-0.43) | (-1.27) | (-1.05) | (-0.78) | (-0.47) | (-0.82) |

**Table 10: Option Returns: "Unusual Option Activity" Covered by CNBC**

This table reports the call option returns around CNBC Coverage of "Unusual Option Activity." Returns are calculated using the end of day midpoint of the bid and ask of the option contract. Returns are calculated over the period from [-5, 30] and [1, 30]. Panel A reports the daily return of the option. Panel B reports returns using a buy-and-hold strategy where the option is bought at the midpoint of the bid and ask on day t-5 and sold on date t. Panel C reports returns using a buy-and-hold strategy where the option is bought at the midpoint of the bid and ask on day 0 and sold on the t(>0).

Panel A: Daily Return Calls [-5,30]

| | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Return | 1.99% | 3.33% | 11.12% | 57.55% | -3.49% | -3.61% | 1.07% | -3.36% | 0.44% | 3.63% | 2.92% |
| T-Stat | (1.31) | (1.85) | (3.61) | (12.55) | (-2.14) | (-2.23) | (0.23) | (-2.27) | (0.23) | (1.15) | (0.67) |
| N | 496 | 504 | 550 | 579 | 556 | 534 | 515 | 478 | 462 | 342 | 202 |

Panel B: Buy and Hold Return Calls [-5,30]

| | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Return | | 2.27% | 10.03% | 19.68% | 84.85% | 57.26% | 57.29% | 53.63% | 58.19% | 30.83% | 8.21% |
| T-Stat | | (1.40) | (2.52) | (4.17) | (8.10) | (7.26) | (6.29) | (5.42) | (3.97) | (2.54) | (0.62) |
| N | | 481 | 484 | 481 | 496 | 465 | 447 | 423 | 386 | 301 | 175 |

Panel C: Buy and Hold Return Calls [0,30]

| | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Return | | | | | -3.86% | -5.71% | -6.39% | -3.97% | -9.23% | -11.35% | -11.77% |
| T-Stat | | | | | (-2.39) | (-1.16) | (-1.08) | (-0.53) | (-2.03) | (-1.74) | (-1.37) |
| N | | | | | 551 | 529 | 511 | 473 | 457 | 338 | 198 |

**Table 11: Option Returns: "Unusual Option Activity" Identified from OptionMetrics**

This table report the option returns around subsamples of "Unusual Option Activity" identified from OptionMetrics. Returns are calculated using the end of day midpoint of the bid and ask of the option contract. Returns are calculated over the period from [-5, 30] and [1, 30]. Panel A reports the call option return of the option. Panel B reports call option returns using a buy-and-hold strategy where the option is bought at the midpoint on day t-5 and sold on date t. Panel C reports call option returns using a buy-and-hold strategy where the option is bought at the midpoint of the bid and ask on day 0 and sold on date t (>0). . Panel D reports the put option return of the option. Panel E reports Put option returns using a buy-and-hold strategy where the option is bought at the midpoint on day t-5 and sold on date t. Panel F reports put option returns using a buy-and-hold strategy where the option is bought at the midpoint on day 0 and sold on date t (>0).

Panel A: Daily Returns Calls [-5,30]

| | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Return | 17.70% | 28.50% | 8.10% | 48.20% | 6.60% | 1.40% | 9.40% | 3.80% | 8.00% | 9.20% | 11.10% |
| T-Stat | (1.47) | (1.32) | (5.30) | (10.09) | (4.33) | (1.37) | (1.86) | (2.30) | (1.56) | (3.89) | (2.69) |
| N | 2044 | 2089 | 2181 | 2244 | 2190 | 2148 | 2122 | 2039 | 1973 | 1394 | 796 |

Panel B: Buy and Hold Return Calls [-5,30]

| Panel B: | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Buy and Hold Return | | 5.98% | 16.45% | 61.86% | 65.87% | 58.57% | 62.02% | 67.53% | 60.40% | 55.39% | 45.08% |
| T-Stat | | (3.51) | (4.79) | (11.36) | (10.92) | (10.05) | (8.53) | (8.23) | (7.22) | (5.84) | (3.23) |
| N | | 1963 | 2002 | 2045 | 1996 | 1954 | 1936 | 1867 | 1793 | 1246 | 669 |

Panel C: Buy and Hold Return Calls [0,30]

| Panel C: | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Buy and Hold Return | | | | | 6.69% | 14.93% | 16.18% | 18.52% | 9.79% | 4.18% | 10.23% |
| T-Stat | | | | | (4.37) | (2.20) | (2.31) | (2.50) | (2.88) | (1.01) | (1.39) |
| N | | | | | 2190 | 2148 | 2122 | 2039 | 1973 | 1394 | 796 |

Panel D: Daily Return Puts [-5,30]

| | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Return | 1.25% | 3.97% | 4.95% | 31.34% | 1.51% | 4.86% | 4.94% | 1.19% | 4.01% | 13.86% | 26.51% |
| T-Stat | (1.73) | (3.47) | (5.00) | (12.78) | (1.32) | (3.25) | (1.34) | (1.34) | (2.55) | (3.70) | (1.68) |
| N | 2595 | 2612 | 2685 | 2776 | 2721 | 2636 | 2586 | 2516 | 2379 | 1500 | 804 |

Panel E: Buy and Hold Return Puts [-5,30]

| | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Buy and Hold Return | 7.56% | 12.70% | 41.82% | 42.22% | 42.94% | 42.69% | 40.50% | 39.23% | 16.03% | 14.16% | |
| T-Stat | (3.18) | (4.39) | (11.33) | (8.69) | (7.34) | (6.61) | (6.42) | (6.30) | (2.70) | (1.50) | |
| N | 2498 | 2516 | 2595 | 2542 | 2458 | 2414 | 2350 | 2216 | 1359 | 684 | |

Panel F: Buy and Hold Return Puts [0,30]

| | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Buy and Hold Return | | | | | 1.52% | 3.32% | 1.32% | 1.22% | 0.51% | -5.45% | 1.08% |
| T-Stat | | | | | (1.33) | (1.84) | (0.67) | (0.51) | (0.19) | (-1.52) | (0.18) |
| N | | | | | 2721 | 2636 | 2586 | 2516 | 2379 | 1500 | 804 |

**Table 12: Cumulative Abnormal Returns: 'Unusual Option Activity' Identified Using Weaker Criteria**

This table reports abnormal stock returns around subsamples of "Unusual Option Activity" identified from OptionMetrics with a weaker identification of what is 'Unusual.' Abnormal Returns are calculated using the market model estimated over a 20-day estimation window with a two-day gap period on days t-6 and t-7. Average Daily abnormal returns (*Daily AR*) are reported over the period [-5, 50] and cumulative abnormal returns (CAR) are reported over the period [-5, 50] and [1, 50]. Panel A reports the returns for all call options. Panel B reports the returns for call options that have an option contract volume that is greater than *Total Change in Open Interest*. Panel C reports the returns for all put options. Panel D reports the returns for put options that have an option contract volume that is greater than *Total Change in Open Interest*.

Panel A: All Calls

| (N=107,262) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.01% | 0.01% | 0.06% | 0.29% | 0.02% | -0.01% | 0.01% | 0.02% | 0.01% | 0.00% | -0.01% | 0.01% | 0.00% |
| T-Stat | (0.99) | (1.66) | (5.20) | (21.45) | (1.78) | (-1.09) | (0.68) | (2.94) | (0.81) | (0.61) | (-1.48) | (1.06) | (-0.16) |
| Average CAR | 0.01% | 0.04% | 0.11% | 0.40% | 0.42% | 0.42% | 0.43% | 0.47% | 0.47% | 0.55% | 0.59% | 0.65% | 0.69% |
| T-Stat | (0.99) | (2.44) | (5.00) | (14.80) | (14.34) | (12.82) | (11.89) | (11.90) | (10.64) | (9.28) | (7.77) | (7.04) | (6.29) |
| Average CAR | . | . | . | 0.29% | 0.31% | 0.31% | 0.32% | 0.36% | 0.36% | 0.44% | 0.48% | 0.54% | 0.58% |
| T-Stat | . | . | . | (21.45) | (18.13) | (14.40) | (12.54) | (12.29) | (10.44) | (8.75) | (7.16) | (6.46) | (5.73) |
| Average CAR | . | . | . | . | 0.02% | 0.02% | 0.03% | 0.07% | 0.07% | 0.15% | 0.19% | 0.25% | 0.29% |
| T-Stat | . | . | . | . | (1.78) | (1.32) | (1.37) | (2.67) | (2.18) | (3.21) | (2.96) | (3.12) | (2.96) |

Panel B: All Puts

| (N=96,723) | -5 | -3 | -1 | 0 | 1 | 3 | 5 | 7 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily AR | 0.01% | 0.03% | 0.02% | -0.16% | -0.05% | -0.01% | -0.01% | -0.01% | 0.00% | -0.01% | -0.01% | -0.01% | -0.01% |
| T-Stat | (0.84) | (3.08) | (1.48) | (-13.33) | (-5.20) | (-0.67) | (-1.73) | (-1.00) | (0.19) | (-1.13) | (-1.55) | (-1.41) | (-1.21) |
| Average CAR | 0.01% | 0.05% | 0.08% | -0.08% | -0.13% | -0.14% | -0.17% | -0.16% | -0.18% | -0.29% | -0.37% | -0.46% | -0.58% |
| T-Stat | (0.84) | (3.33) | (3.68) | (-3.12) | (-4.77) | (-4.56) | (-4.76) | (-4.18) | (-4.30) | (-4.95) | (-4.87) | (-5.00) | (-5.35) |
| Average CAR | . | . | . | -0.16% | -0.21% | -0.22% | -0.24% | -0.24% | -0.26% | -0.37% | -0.44% | -0.54% | -0.66% |
| T-Stat | . | . | . | (-13.33) | (-13.33) | (-10.87) | (-10.06) | (-8.48) | (-7.92) | (-7.44) | (-6.70) | (-6.47) | (-6.58) |
| Average CAR | . | . | . | . | -0.05% | -0.06% | -0.09% | -0.08% | -0.11% | -0.21% | -0.28% | -0.38% | -0.50% |
| T-Stat | . | . | . | . | (-5.20) | (-3.96) | (-4.19) | (-3.24) | (-3.47) | (-4.46) | (-4.45) | (-4.66) | (-5.07) |

**Table 13: Regressions of Cumulative Abnormal Returns on Options and Firm Characteristics: 'Unusual Option Activity' Identified Using Weaker Selection Criteria**

This table reports results of the following regressions:

$$Return_i = \beta_1 + MarketCapitalization_i + \beta_2 StockVolume_i + \beta_3 Moneyness_i T + \beta_4 TimeToMaturity_k + \beta_5 OptionVolume_k + \beta_6 \Delta OpenInterest\sigma_k + \beta_7 Call(Put)Spread_i + \alpha_{ik}$$

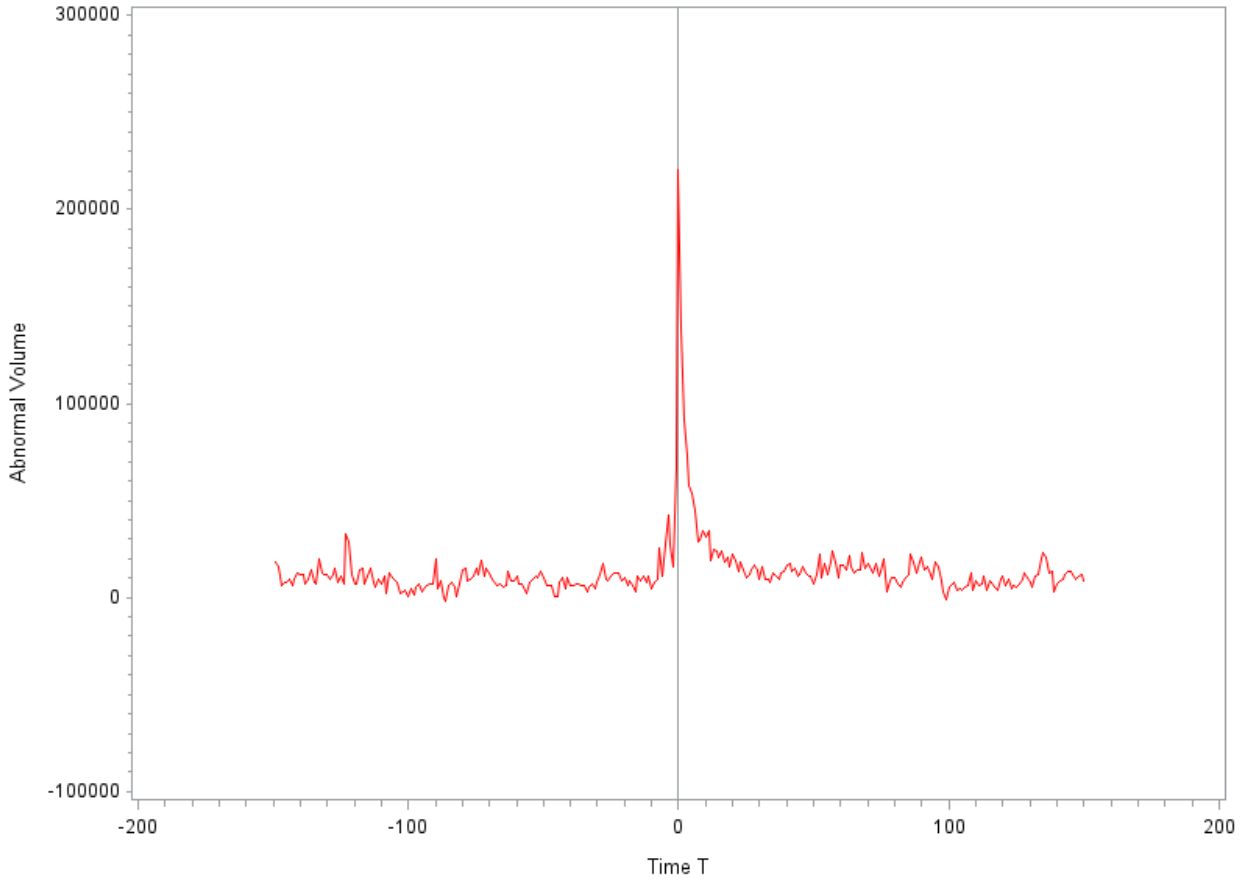
where $MarketCapitalization_i$ is the Market Capitalization of the firm *i* on day 0 in $TenThousands, $StockVolume_k$ is the number of contracts traded of the underlying stock *i* on day 0 in millions. $Moneyness_k$ is a ordinal variable that equals 1 stocks with *Moneyness* in the lowest 30% of the observations, equals 2 for the next 40%, and 3 for the highest 30% of observations where Moneyness is equal to StockPrice/StrikePrice for Call options and StrikePrice/StockPrice for Put options, for option contract *k* on day 0. $Maturity_k$ is an indicator variable that is equal to 1 is the time to maturity is greater than the median time to maturity for all observations, and 0 otherwise, for option contract *k* on day 0. $\Delta OpenInterest\sigma_k$ is the change in open interest for option contract *k* in standard deviations of the total change in open interest for firm *i* on day 0, multiplied by 1000. $OptionVolume_k$ is the option volume of option contract *k* for firm *i,* on day 0 in millions. $Call\ (put)Spread_i$ is and indicator variable equal to one if firm *i* has multiple call(put) options with unusual option activity on day 0. Models 1 through 5 are based on call options while models 6 through 10 are based on put options. Models 2 and 7 use abnormal returns on the event day (CAR [0]) as the dependent variable, all other models use CAR over various event windows as the dependent variables. We compute statistical significance using White standard errors.

| | Call | | | | | Put | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | -1 | -2 | -3 | -4 | -5 | -6 | -7 | -8 | -9 | -10 |
| VARIABLES | CAR [-5,-1] | CAR [0] | CAR [1,1] | CAR [1,20] | CAR [1,50] | CAR [-5,-1] | CAR [0] | CAR [1,1] | CAR [1,20] | CAR [1,50] |
| $MarketCap_i$ | -0.110* | -0.532*** | -0.0301 | -0.237** | -0.349 | 0.0233 | 0.209*** | 0.0364* | 0.010 | -0.291 |
| | (-1.827) | (-9.101) | (-1.117) | (-2.015) | (-1.445) | -0.489 | -5.619 | -1.73 | -0.0909 | (-1.360) |
| $Stock\ Volume_i$ | 0.0054 | 0.039*** | 0.010*** | 0.014 | -0.0068 | 0.011 | -0.008 | -0.002 | -0.034** | -0.045 |
| | -0.616 | -4.001 | -2.592 | -1.004 | (-0.257) | -1.411 | (-1.026) | (-0.608) | (-2.251) | (-1.476) |
| $Moneyness_k$ | -0.063 | 0.468*** | -0.0256 | -0.265* | -0.445 | -0.0852 | -0.407*** | 0.0306 | 0.0484 | 0.153 |
| | (-0.900) | -9.17 | (-0.830) | (-1.829) | (-1.515) | (-1.350) | (-11.24) | -0.826 | -0.342 | -0.524 |
| $Maturity_k$ | 0.14 | -0.126* | 0.00809 | 0.122 | -0.195 | -0.0359 | 0.0449 | -0.0463 | 0.289 | 0.624 |
| | -1.463 | (-1.922) | -0.187 | -0.598 | (-0.469) | (-0.413) | -0.897 | (-0.920) | -1.446 | -1.505 |
| $OptVolume_k$ | -20.60** | -2.559 | -7.311** | -32.89* | -54.36 | -9.991 | 2.661 | 7.518* | 17.61 | 35.97 |
| | (-2.001) | (-0.493) | (-2.174) | (-1.919) | (-1.629) | (-1.338) | -0.767 | -1.79 | -1.2 | -1.18 |
| $\Delta\ OI\sigma_k$ | 14.0*** | 3.24 | 0.667*** | 2.59*** | -1.37*** | -0.01.57 | -0629* | -0.729* | -2.21 | -6.73*** |
| | -8.005 | -1.052 | -5.124 | -4.797 | (-2.590) | (-0.0208) | (-1.845) | (-1.806) | (-1.442) | (-2.698) |
| $Spread_i$ | -0.066 | 0.231** | -0.0652 | -0.644* | -0.82 | -0.0891 | 0.126 | 0.0995 | -0.619** | -1.699*** |
| | (-0.456) | -1.997 | (-0.782) | (-1.788) | (-1.056) | (-0.705) | -1.227 | -1.382 | (-2.039) | (-2.672) |
| *Constant* | -0.155 | -0.620*** | 0.174* | 1.498*** | 3.531*** | 0.294 | 0.582*** | -0.0885 | 0.0501 | 0.667 |
| | (-0.686) | (-3.979) | -1.692 | -3.146 | -3.715 | -1.424 | -4.359 | (-0.741) | -0.106 | -0.703 |
| Observations | 28,623 | 28,623 | 28,621 | 28,608 | 28,593 | 23,937 | 23,937 | 23,933 | 23,933 | 23,917 |
| Adjusted $R^2$ | 0.044 | 0.015 | 0.001 | 0.001 | 0 | 0 | 0.009 | 0.001 | 0.001 | 0.001 |

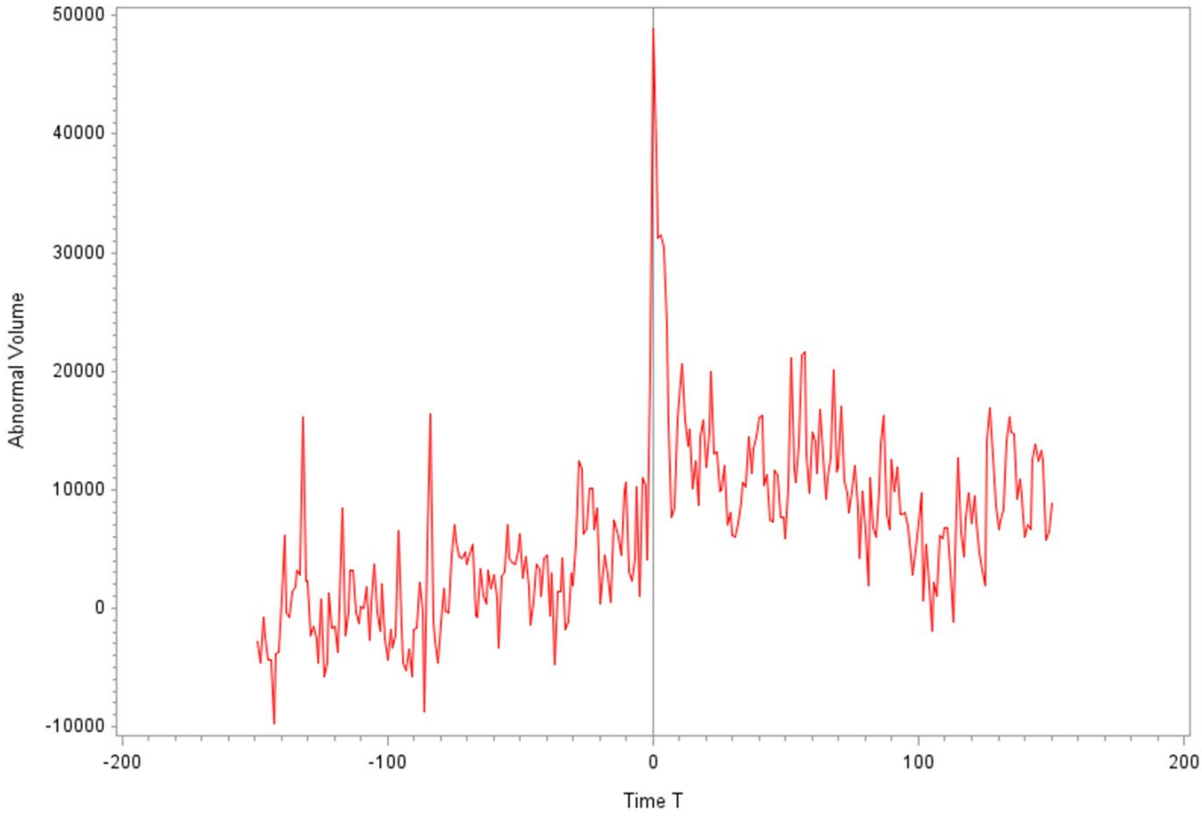
**Figure 1: Intraday Stock Reaction to CNBC Coverage of Unusual Call Option Activity**

This figure plots the stock market's reaction to CNBC coverage of Unusual Call Option Activity. Variables are calculated from TAQ and condensing all trades into 1-minute time frames. The Coverage takes place at Time *t*=0. Abnormal variables are calculated using a mean adjusted model with an estimation window from day *d*= -10 to -4. Panel A plots the abnormal stock volume. Panel B plots the retail trade volume (Boehmer, Jones, Zhang, and Zhang, 2019). Panel C plots the abnormal max transaction stock volume, which measures the largest trade to take place in minute *t*. Panel D plots the cumulative abnormal stock returns.

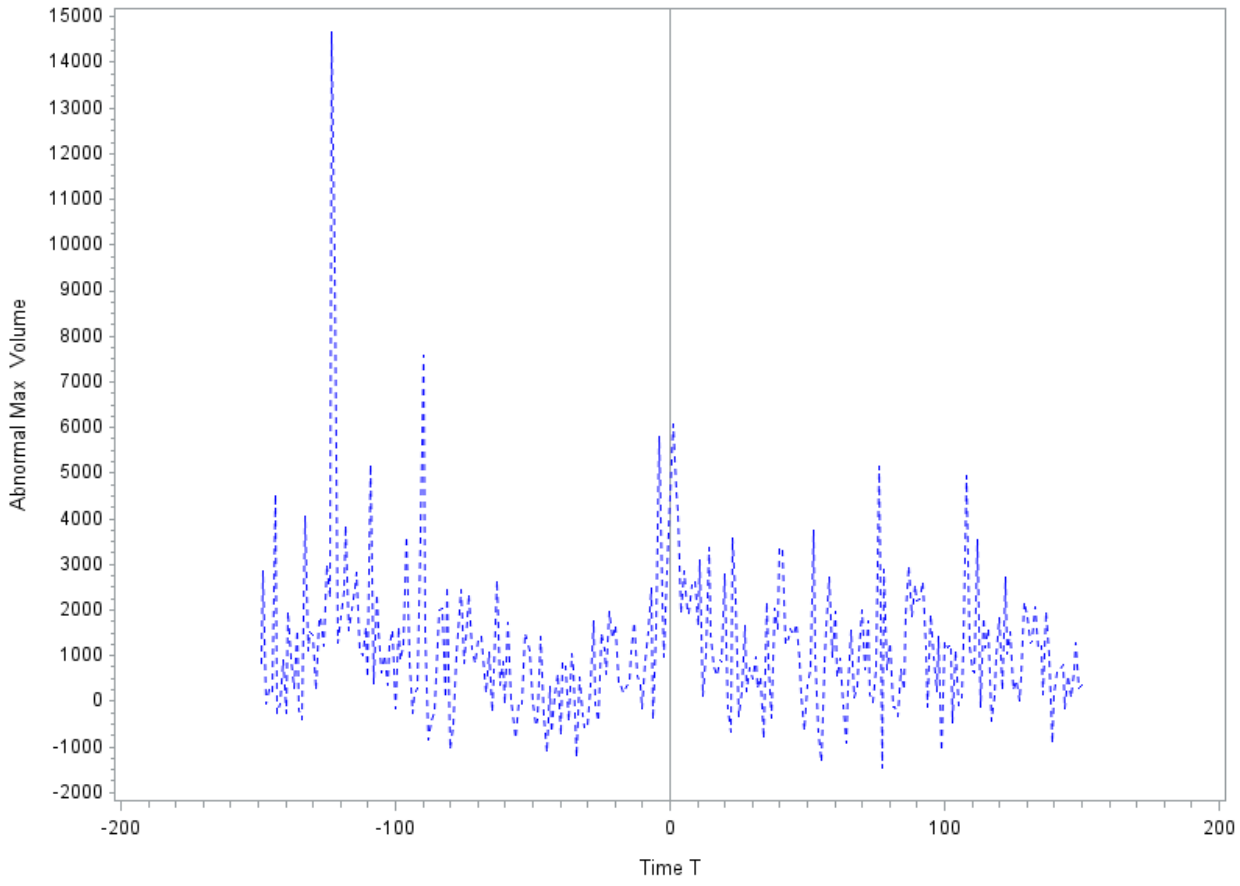
Panel A: Abnormal Stock Trading Volume



Panel B: Abnormal Retail Trading Volume



Panel C: Abnormal Max Transaction Stock Volume



Panel D: Cumulative Abnormal Stock Returns

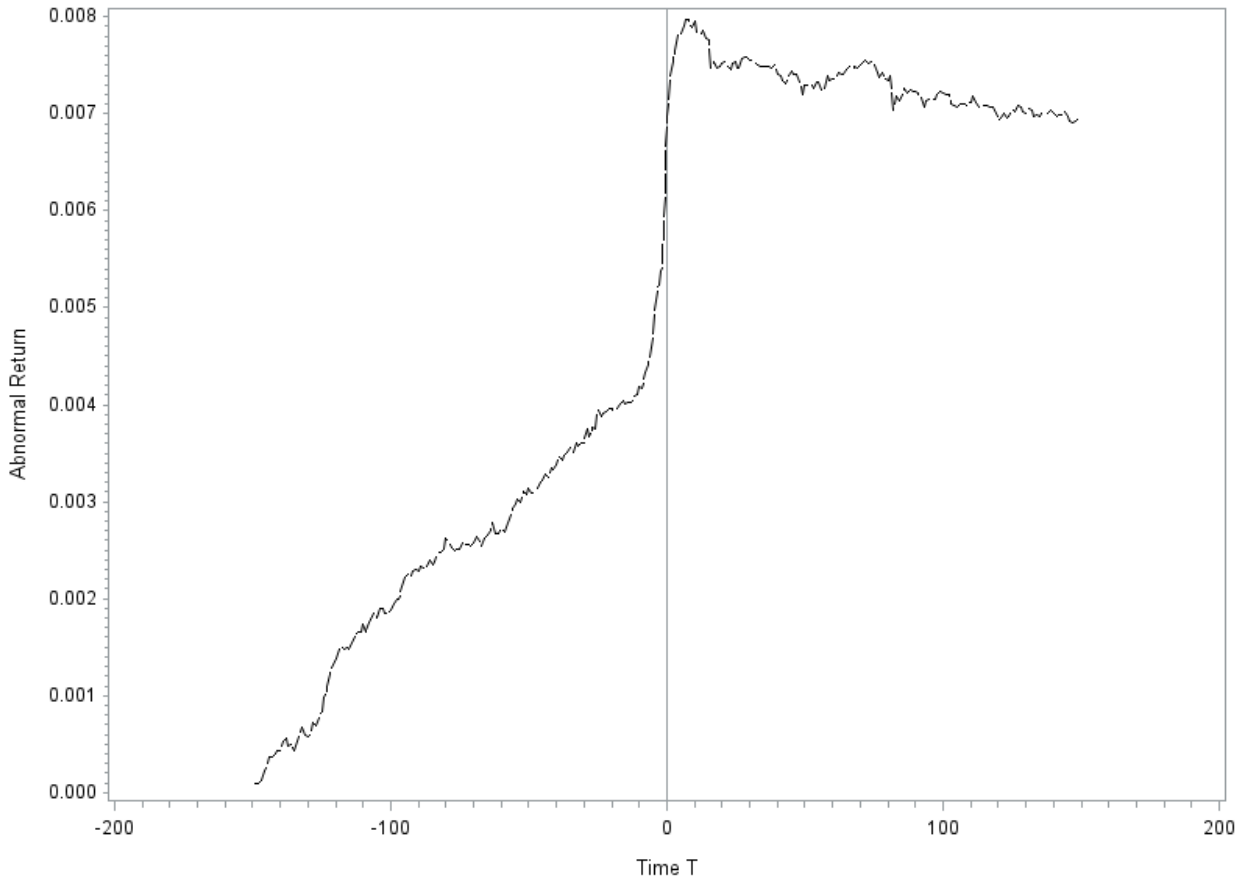
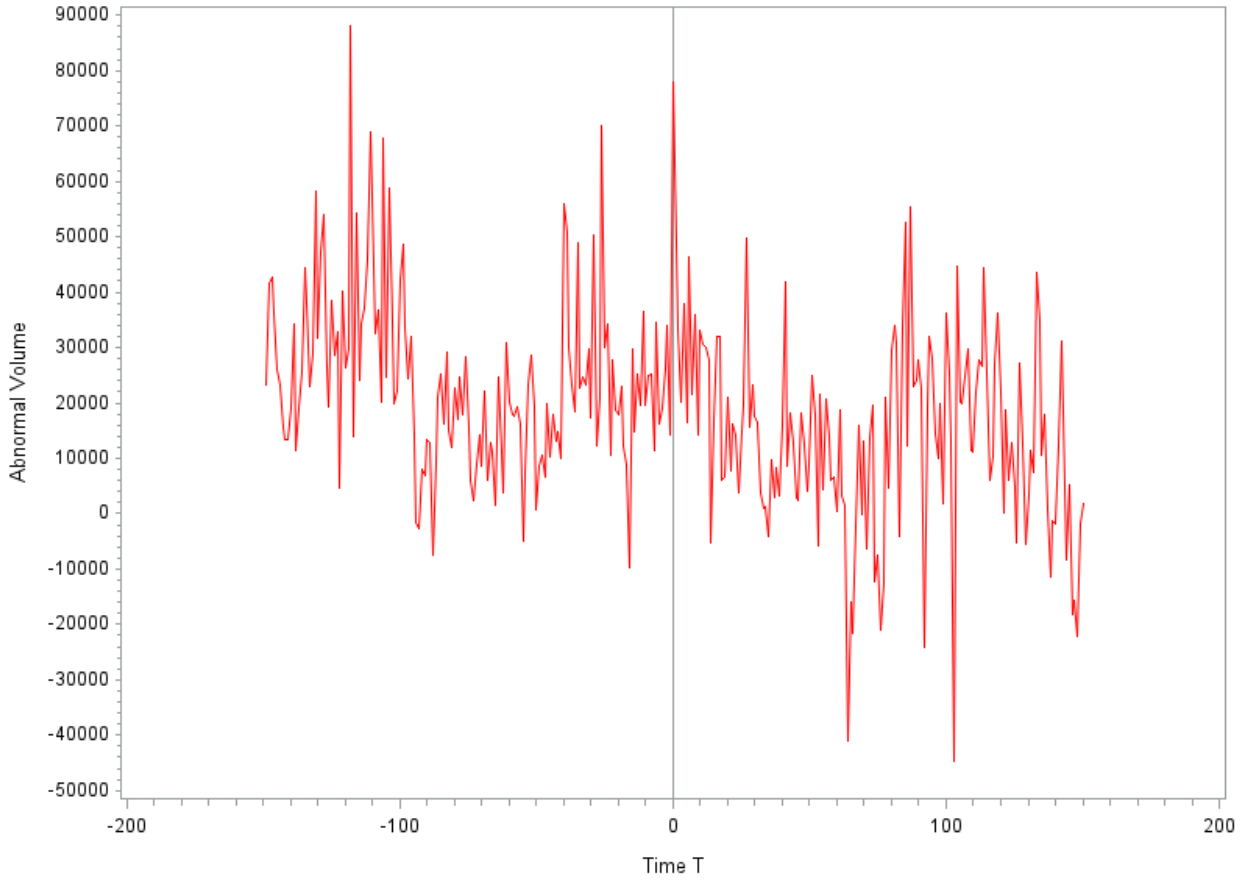


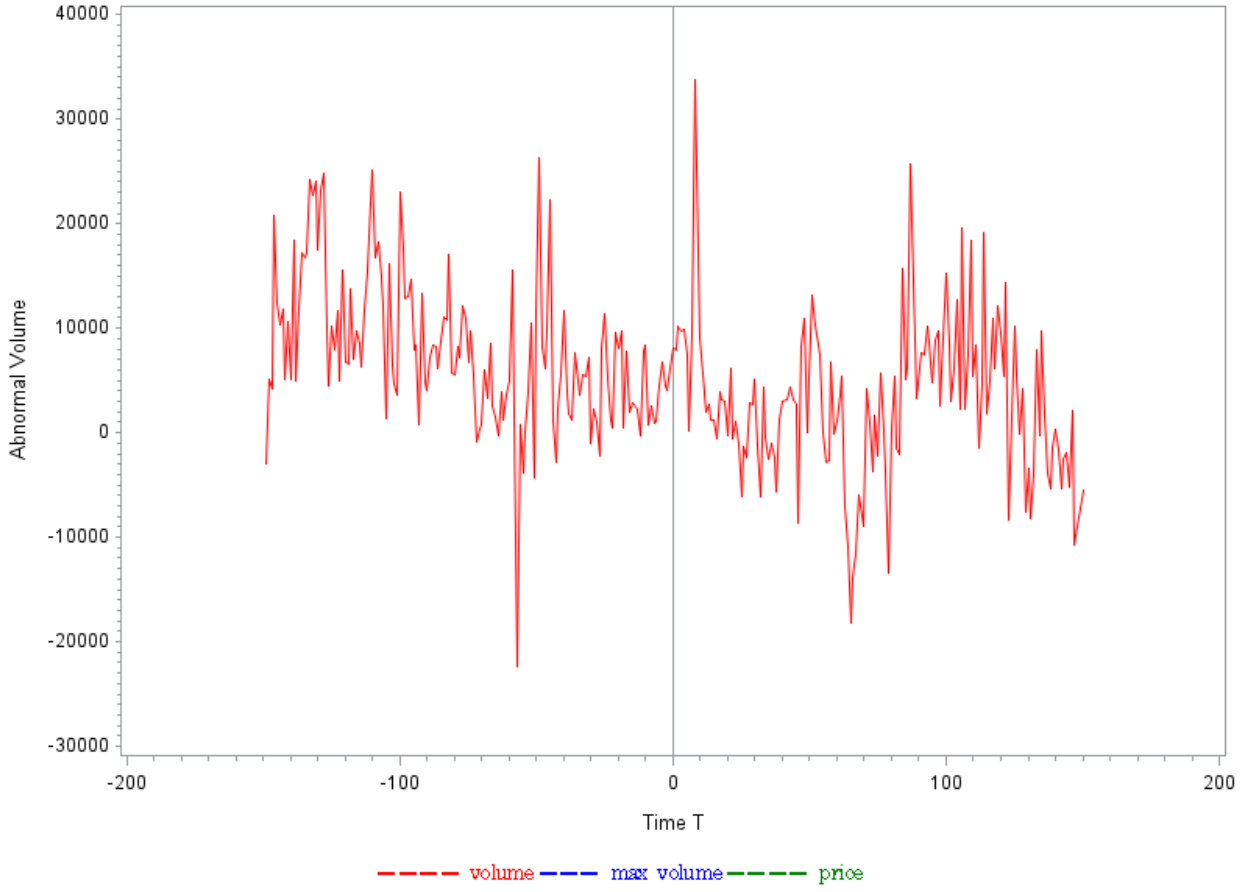
**Figure 2: Intraday Stock Reaction to CNBC Coverage of Unusual Put Option Activity**

This figure plots the stock market's reaction to CNBC coverage of Unusual Put Option Activity. Variables are calculated from TAQ and condensing all trades into 1-minute time frames. The Coverage takes place at Time $t$=0. Abnormal variables are calculated using a mean adjusted model with an estimation window from day $d$= -10 to -4. Panel A plots the abnormal stock volume. Panel B plots the retail trade volume (Boehmer, Jones, Zhang, and Zhang, 2019). Panel C plots the abnormal max transaction stock volume, which measures the largest trade to take place in minute $t$. Panel D plots the cumulative abnormal stock returns.

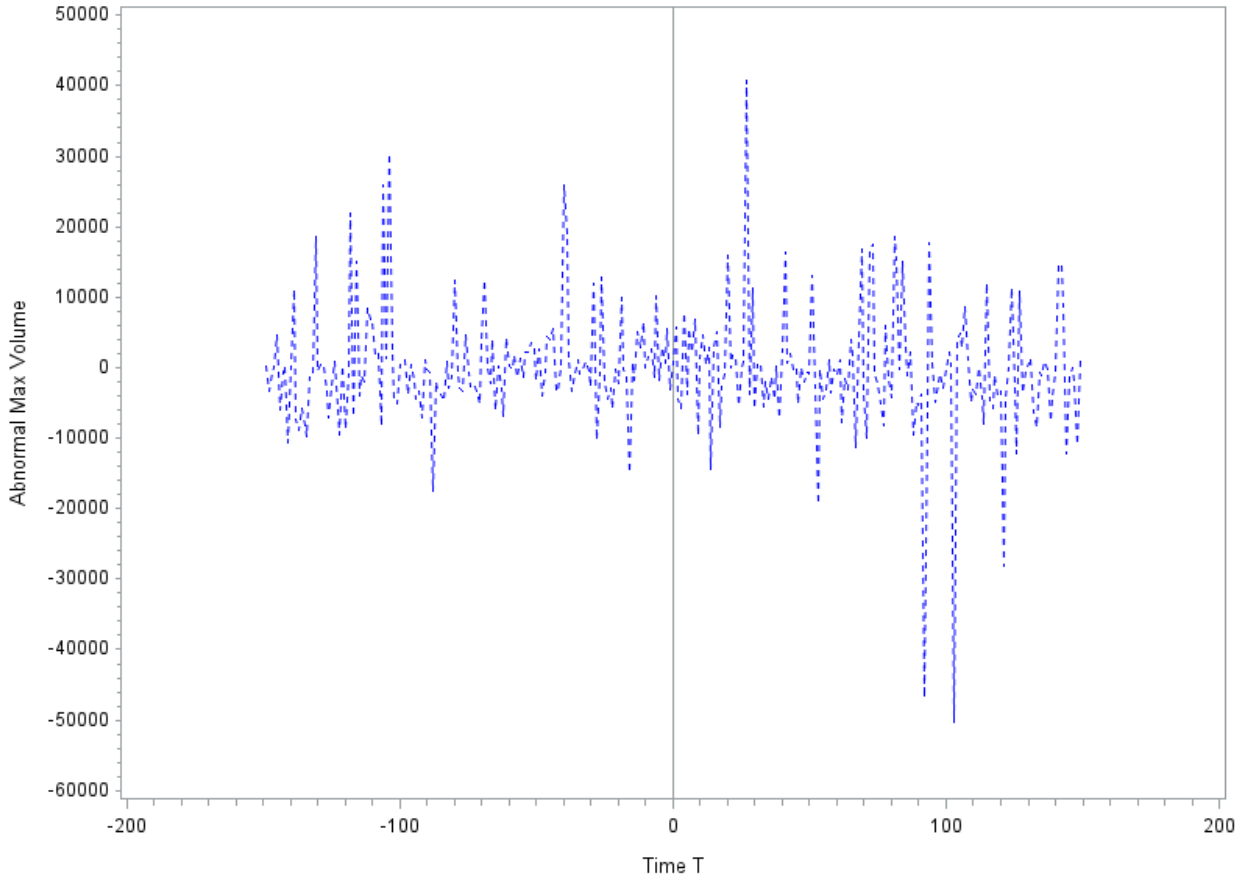
Panel A: Abnormal Stock Volume



Panel B:Abnormal Retail Stock Volume



Panel C:Abnormal Max Transaction Stock Volume



Panel D:Cumulative Abnormal Stock Returns

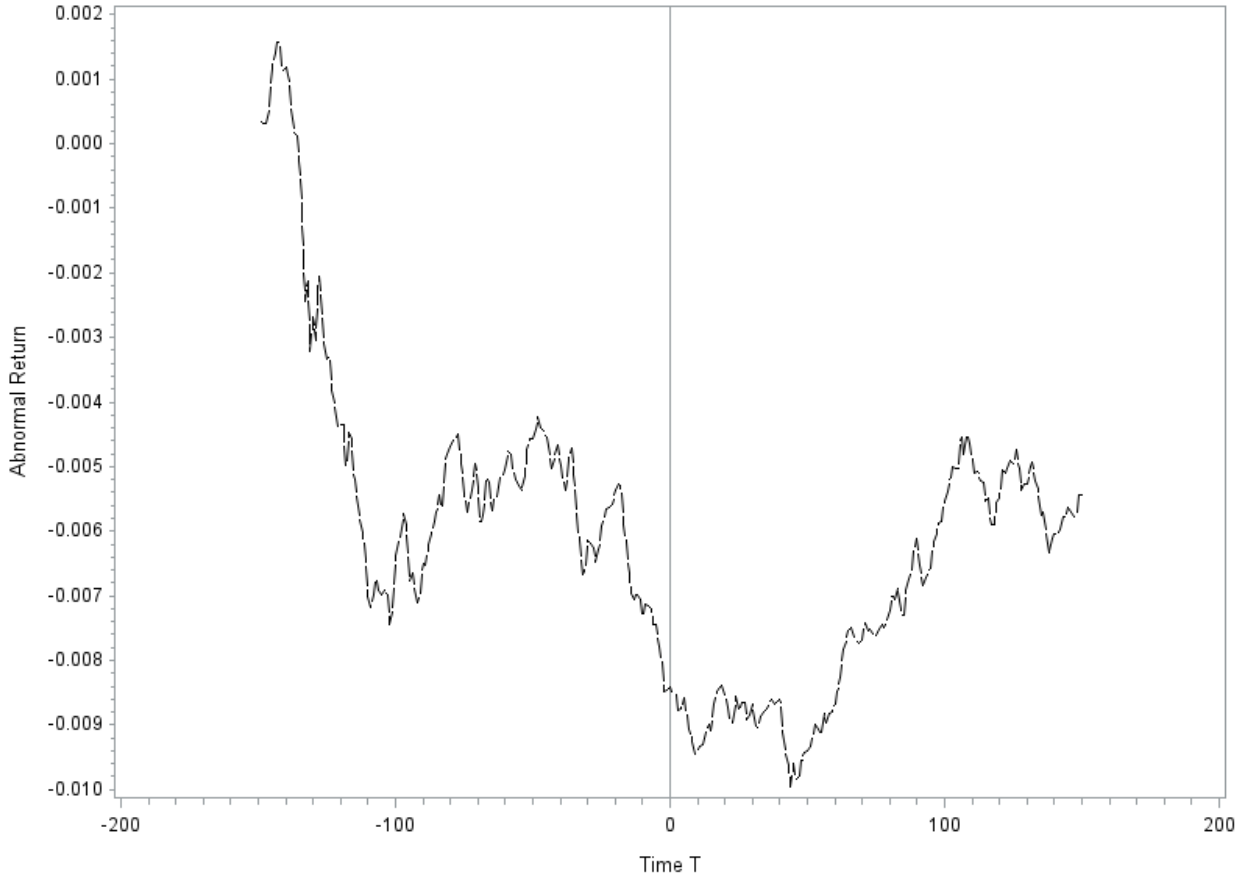
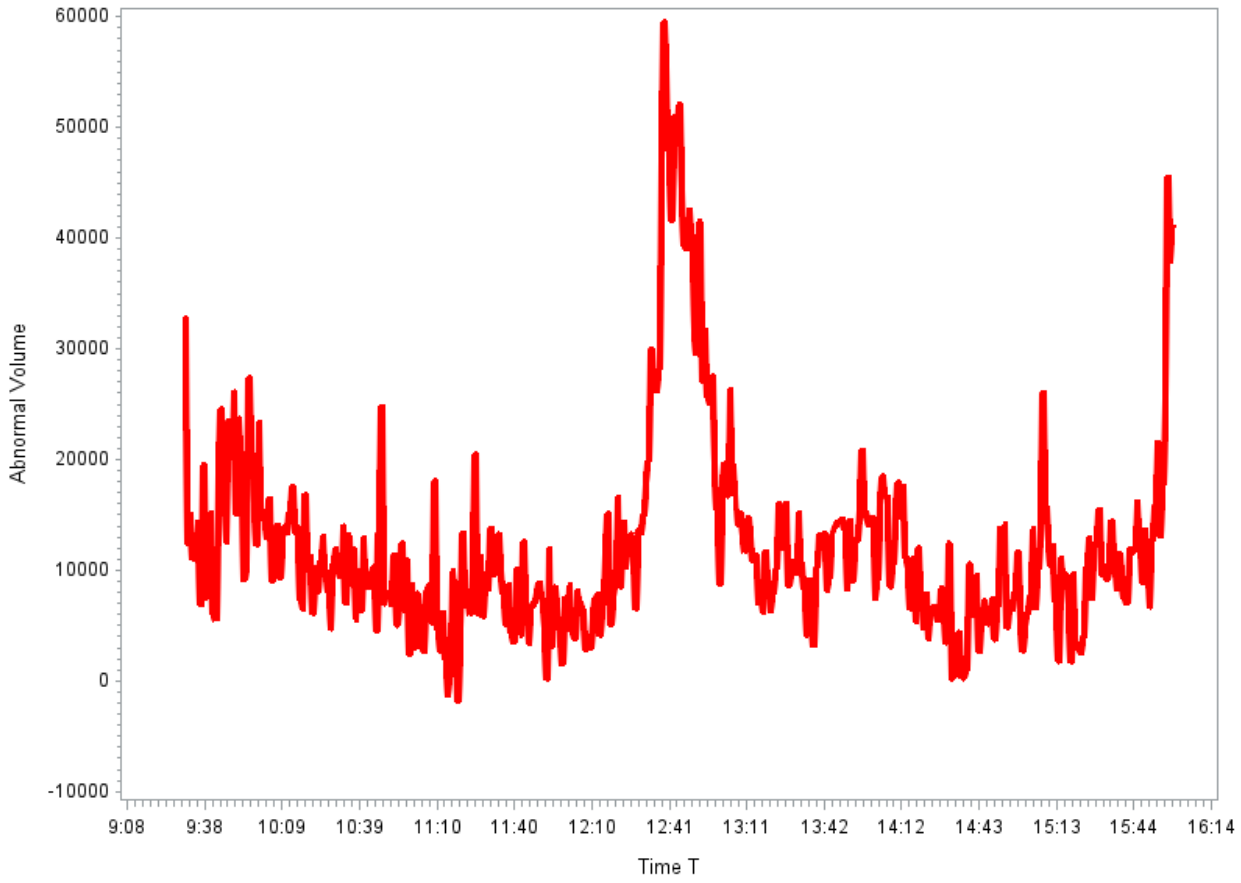


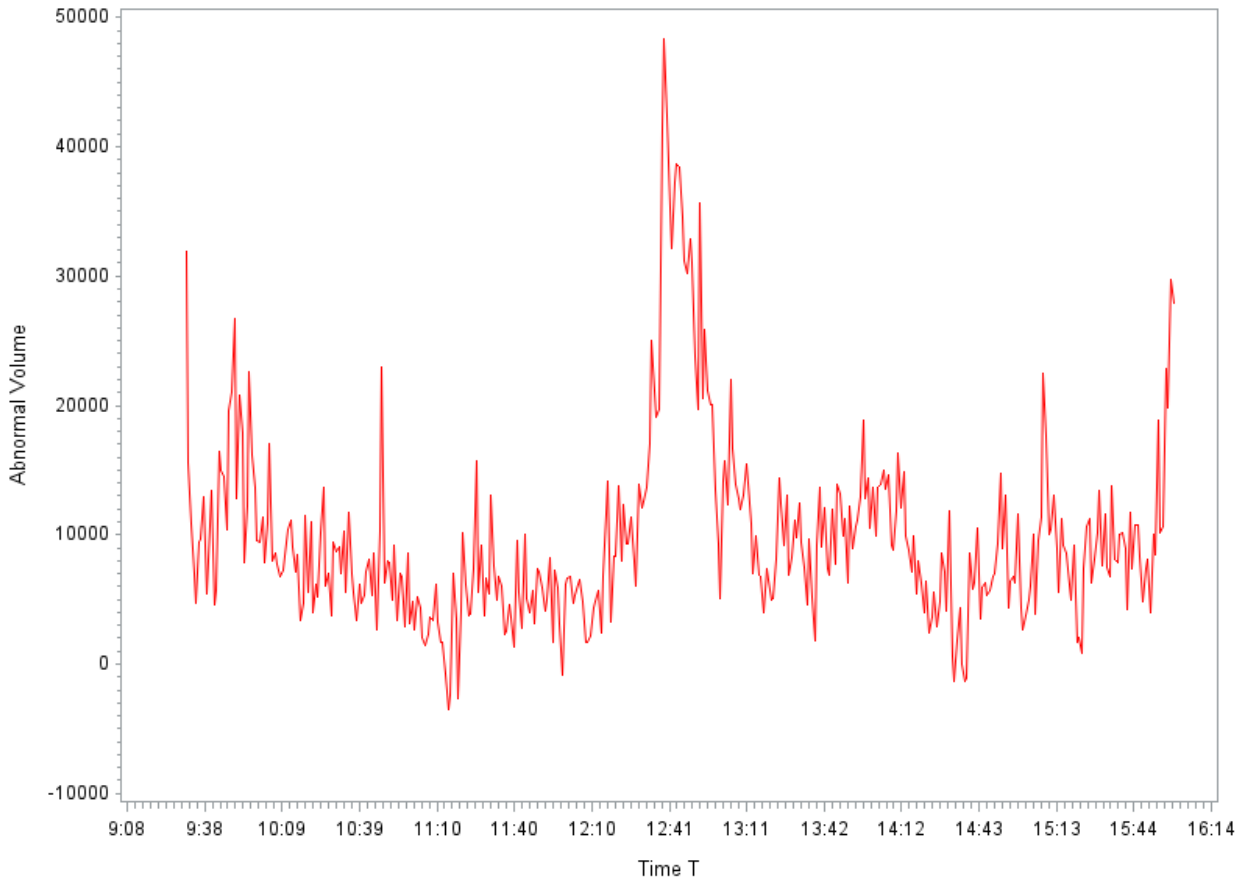
**Figure 3: Intraday Volume around CNBC Coverage of Unusual Call Option Activity**

This figure plots the stock volumes on the day of CNBC coverage of Unusual Call Option Activity. Variables are calculated from TAQ and condensing all trades into 1-minute time frames. Abnormal variables are calculated using a mean adjusted model with an estimation window from day *d*= -10 to -4. Panel A plots the abnormal stock volume on the day of coverage from the stock market open to close (9:30am-4:00pm). Panel B plots the abnormal non-retail stock volume on the day of coverage, from open to close. Panel C plots the abnormal retail stock volume on the day of coverage from open to close. Panel D plots the abnormal stock volume on the day before coverage from the stock market open to. Panel E plots the abnormal non-retail stock volume on the day before coverage, from open to close. Panel F plots the abnormal retail stock volume on the day before coverage from open to close.

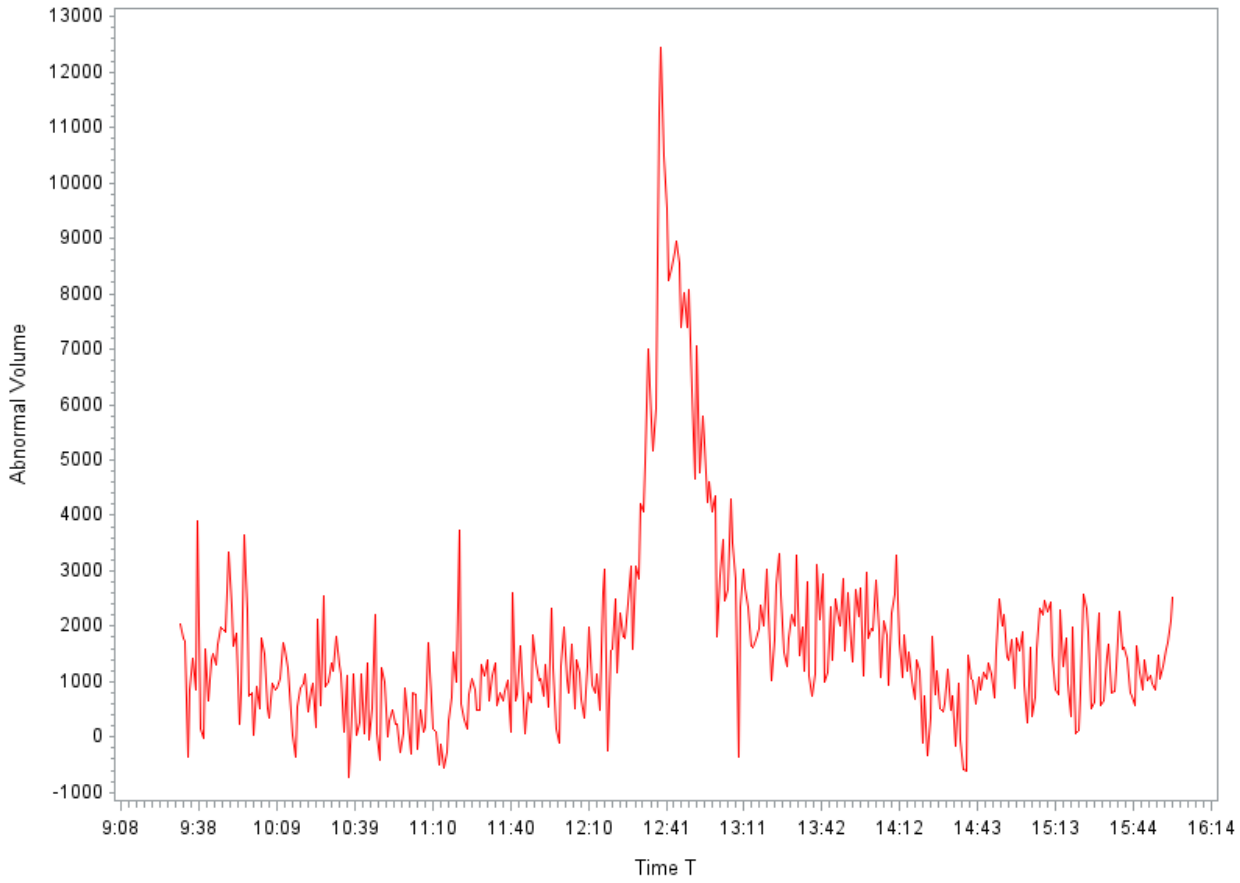
Panel A: Abnormal Stock Volume



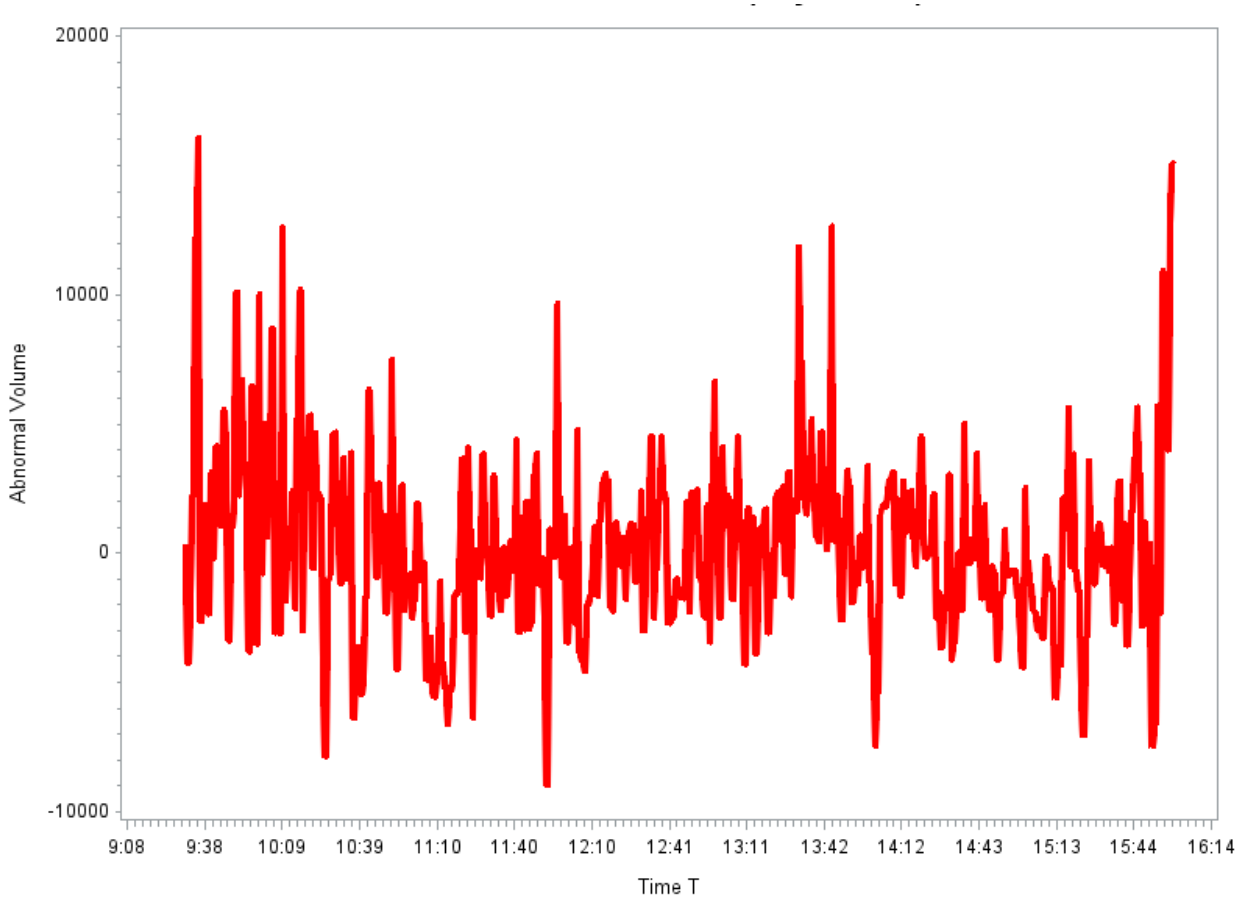
Panel B: Abnormal Non-Retail Stock Volume



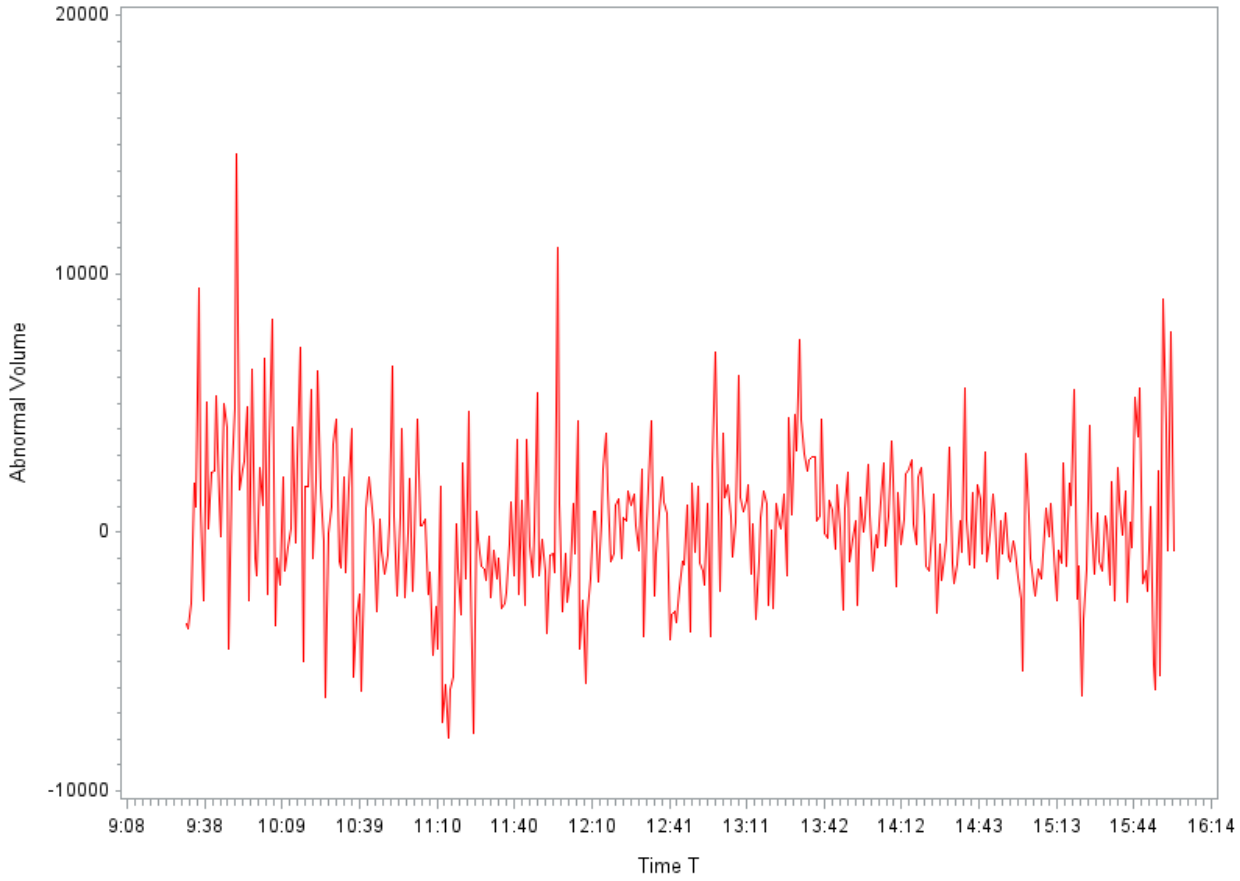
Panel C: Abnormal Retail Stock Volume



Panel D: Abnormal Stock Volume



Panel E: Abnormal Non-Retail Stock Volume



Panel F: Abnormal Retail Stock Volume