Faulty Anchors: Individual Investor Order Intensity and Order Type at the 52 Week High

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Abstract

We present clear and economically significant evidence that individual investors are paying upwards of seven percent in lost returns due to their strong contrarian anchoring at the 52 week high day. We investigate the importance of the 52 week high as an anchor for individual investors to trade with institutions. We show that stock price nearness to the 52 week causes a sharp and monotonic increase in selling by individuals with increased limit orders.

Using event study methodology we find that around the 52 week high day selling intensity and limit order use sharply increases from up to 5 days prior, resulting in large abnormal returns and household selling preceding the 52 week high. This effect is intensified by volatility and time since the last 52 week high being crossed. This suggests that individuals rely more heavily on anchors when stock values are uncertain and that they are relatively indifferent to adverse selection risk when responding to anchors.

Keywords: 52 Week High, Investor Behavior, Limit Orders

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1. Introduction

1.1. Informed and Uninformed Investors

The relationship between investor group trading and price changes are of significant concern within an efficient market. There has been substantial investigation of this relationship going as far back as Kyle (1985). He groups the market as consisting of three groups: informed traders, uninformed/noise traders and the market makers. Considering these distinct categories, it is of key importance to investigate the trading interaction between informed and uninformed traders and the effect this has on future prices.

Firstly, researchers have attempted to identify whom exactly are characterized as informed traders and those that are uninformed traders. Black (1986) suggests that uniformed traders place trades based on either an exogenous liquidity requirement or on noise that is immaterial to the true fair value of an asset. This noise may come in many forms, be it company or stock specific (Barber and Odean 2012) or specific to their own utility preferences (Narasimhan Jegadeesh and Titman 1993; Odean 1998; Strahilevitz, Odean and Barber 2011). Despite the noise having a material effect on the single noise trader -i.e induces them to trade, it should not have any primary order effect on the asset price.

According to Black (1986), this causes noise traders to make poor investment decisions, in which they buy stocks that subsequently under perform and sell stocks that over perform. This finding is supported by Kelley and Tetlock (2013) whereby they identify household investors as far more likely to trade on noise, stating that the noise traders buy overvalued stocks from informed/institutional investors and sell undervalued stocks. Informed traders conversely trade based on information that is/or reasonably expected to be material to a stock's fair value. They do so by inputting information into the market via trading or responding to mispricing to generate arbitrage profits (Kaniel et al. 2008). The informed versus uninformed debate based on the preceding research (Kaniel et al. 2008; Stoffman 2014; Strahilevitz, Odean and Barber 2011) tends to place institutional investors as informed and individual investors/households as uninformed. As such, we will continue to use this distinction to identify these two separate groups.

1.2. Intergroup Trading

Stoffman (2014) found that there is no significant effect on prices and mean reversion when within group trading occurred (i.e households with households), despite it being quite common. He found that when between group trading occurs such as when individuals are selling to institutions the price increases while vice versa the price decreased when individuals buy from institutions. Utilizing daily returns he found that prices generally follow institutional trading direction. When individuals trade with institutions, in the short term this pushes prices in the individuals trade direction however it generally mean reverts in the medium term and has limited effect in longer term horizons. These results are consistent with the earlier findings of (Kaniel et al. 2008) and (Kelley and Tetlock 2013).

1.3. Noise, Anchoring, and the 52 Week high

Households are sensitive to key attention events and respond with contrarian, prospect theory/ mental accounting behavior. Households tend to trade on average sell stocks that announce positive news and buy those which announce negative news (Kaniel et al. 2008). Hirshleifer et al. (2008) found that individual net buying the five days post extreme earnings surprise is strongly associated with future negative abnormal returns. Individual investors tend to trade inversely to key earnings announcements (Hirshleifer et al. 2008) and past performance (Odean 1998). This effect is strongest in short term horizons (Grinblatt and Keloharju 2001). It is present in longer term 6-12 month trading behaviors in momentum periods as well (Novy-Marx 2012).

Not only do individuals respond to noise they also heavily anchor their trades to key market prices (Huddart, Lang and Yetman 2009). Anchoring in financial markets has been observed by multiple theorist (Bhootra and Hur 2012; Narasimhan Jegadeesh and Titman 1993; Li and Yu 2012) with multiple anchors identified that are able to predict investor behavior or future asset returns. A key anchor in stock prices is the 52 week high (52WH)(George and Hwang, 2004). They identified the importance of the 52WH price and the 52WH ratio as key anchors in stock price behavior.

$$52WeekHighRatio = \frac{P_{i,t}}{high_{i,t}}. \tag{1}$$

Where $high_{i,t}$ is the highest price the share has traded for over the past year, while $P_{i,t-1}$ is the current price, the ratio therefore represents the nearness in percentage terms the current price is to its 52WH.

George and Hwangs (2004) two key findings were that when stocks were trading near their 52WH price they were less sensitive to positive information and more sensitive to negative information. They also found that the 52 week high ratio is a more economically significant positive predictor of future returns than past returns. Anchoring and the 52WH has been shown to play a key role on both future returns and investor behavior. Huddart, Lang and Yetman (2009) found that past price extremes influence investor trading.In particular they found that there were volume spikes when a stock crossed the 52WH price.

The underlying cause of the 52WH effect is not yet well known, there are a few potential explanations. Nearness to the 52WH price or the 52WH price may be proxy measure for the level of accumulated capital gain within a market (Grinblatt and Han 2005). High levels of accumulated capital gain should cause on aggregate individual investors to exhibit disposition effect trading that is to sell winners and hold losers (Narasimhan Jegadeesh and Titman 1993). This effect should not be present within institutional investors, however they are the natural counterparty to this disposition effect trading. The importance of the 52WH is not just limited to the level of accumulated capital gains but also the 52WH day is a key attention grabbing event. Barber and Odean (2012) explored the role of investor attention in stock trading and stock return, they

found that individual investors are more likely to buy/sell stocks that have caught their attention. They measured the order imbalance of individual investors and found that individual investors were more likely to buy attention grabbing stocks. This attention grabbing effect caused greater trading and poorer performance. Peng and Xiong (2006) earlier suggest that with the existence of limited attention, investors will prioritize certain anchors and noise events over others. As the 52WH price is a conspicuous piece of information provided by brokers and has been shown to influence both stock returns and volume a more granular investigation is needed to explore how individual investors are responding to and if they are suffering as a result.

1.4. Types of Trades

Once an investor has decided to engage in a trade they must then select them mechanism of how the enter the market- via limit or market order. This decision is not trivial and can have effects on the profitability and execution probability of the trade (Ranaldo 2004). Limit order (LO) trading is functionally the same as writing a free call (put) on the market. Thus an open LO provides free liquidity to the market. Individual investors have been found to trade heavily using limit orders (Linnainmaa, 2010) and very rarely post concurrent two sided trades.

Kelley and Tetlock (2013) suggest that individual investors supply liquidity to a market via limit orders thus supplying immediacy to institutional investors trading via market orders. Individuals tend to have latent limit orders, these are prices which they plan to buy or sell a stock at in the future. This latent price is of key importance as it suggests that individuals could place latent limit orders at key anchors such as the 52WH. Alternatively, Handa and Schwartz (1996) state that the critical choice between trading via limit or market order is the belief that probability their limit order can be executed against a liquidity or uninformed investor.

Linnainmaa (2010) states that regardless of whether an individual is indifferent to buying winners or losers the use of limit orders create the appearance of disposition effect trades. If an individual was to place a sell limit order it must be placed above the current bid, therefore if the price was to track up it creates the story that the individual is selling an upward trending asset. Linnainmaa (2010) utilizes trading simulation, based on (Goettler, Parlour and Rajan 2009) and trading records from Finnish investors to explore individual investors tendencies to: misinterpret new information, show poor stock picking skills, exhibit the disposition effect and trade as contrarians. He finds that these behaviors are caused in large part by the mechanics of using limit orders as they are price contingent and suffer from adverse selection. Handa and Schwartz 1996) identify two key risks of limit order use, an adverse event can trigger an undesirable execution or favorable news can cause a desirable trade to not be executed. Thus limit orders placed at the 52WH price have an expectation that the price should meet but not significantly exceed that price.

Bloomfield, OHara and Saar (2009) utilize taking rate as a measure of order type as:

$$TakingRate_{i,t} = \frac{ExecutedMarketOrders_{i,t}}{(ExecutedMarketOrders_{i,t} + ExecutedLimitOrders_{i,t})}. \quad (2)$$

They suggest that the higher the taking rate the more the investor trades by demanding liquidity rather than supplying it. Also, the higher (lower) the TR the more aggressive (passive) the investor is. In their experimental study in which they designated three groups of traders with appropriate constraints: informed, liquidity and uninformed they found that liquidity traders utilized much more limit orders to start trading and then switched to market orders, the reverse pattern was true for uninformed investors that began utilizing market orders and ended the day with limit orders. Overall, uninformed investors tended to utilize more LO than MO and have strong contrarian tendencies.

1.5. Trading at the 52WH

The study looks to determine the effect of the 52WH on trading between individual and institutional investors. Previous literature shows the effect of the 52WH as a predictability factor and as a proxy for disposition effect, this research looks to identify the role of intergroup trading based on the 52WH ratio and at the 52WH day, how this contributes to the observed 52WH anomaly. Additionally, we look to explore the types of orders individuals are using at the 52WH, whether they are passively engaging via limit orders or actively trading on the 52WH - this provides support to the role of the 52WH as a sell anchor which institutional investors profit on as the counter party.

We provide several contributions to the literature, the prior literature on between group trading focuses on it as a general rather than specific phenomena we are the first to examine trading at key anchoring events i.e the 52WH. We also go beyond previous research on the 52WH which looks at it as a predictability measure or have simply explored volume around the 52WH. We utilize trade data to identify the trading patterns and order types utilized by individuals and find strong contrarian pre-event trading which are aggressively traded with market orders.This paper will proceed as follows section 2 introduces the data and the method utilized to measure 52WH and Trade Imbalance. Section 3 reports the key findings of the study and discusses their significance in relation to the literature. Lastly section 4 presents the conclusions and offers an outline of future studies.

2. Data and Methods

The data set in this study comes directly from trades on the Helsinki NASDAQ OMXH. The data was obtained from the Nordic Central Securities Depository (NCSD). This data set contains the official record of trades including identifiers that designates trader type (domestic institutions, foreign institution, household, other). This data set has been previously utilised by Grinblatt and

Keloharju (2001) and Stoffman (2014) among others. The Volatility Index (VIX) was acquired through Compustat for the period.

The data is the raw daily trades from 1 January 2004 to 31 December 2009 on the OMXH. It is filtered to include only the top 100 companies based on market capitalization. Additionally, the data is aggregated to the daily level by group, trading is then split into either Household (HH) or institutional (I) trades (this includes foreign institutions, domestic institutions and other investors) to gauge the interaction between classes as suggested by Stoffman (2014). Days with less than 50 securities traded per stock were excluded from the data.

Table 1: Allocations of between groups

Group 1: Households	**Group 2 Institutions**
Households	Foreign Institutions
	Domestic Institutions
	Trusts
	Others

The table shows the allocation of the investor groups to group 1 (Households) and group 2 (Institutions). The two groups are identified in the data and all trades within groups net to zero, all between groups trades are recognized in the data.

Trade imbalance (TI) is a measure of the relative buys of a particular asset over a cross section or time series. It is an extension of the measure used by Chordia, Roll and Subrahmanyam (2002) which is is a well-accepted metric to measure buying and selling intensity. There has been fairly limited analysis on TI as most transaction databases do not provide the identify of buyers and sellers, this dataset providing this information makes for unique and potentially impactful findings. As such TI is a useful metric to investigate the relative buying and selling when the trading is between Households and Institutions.

To determine the between group use of limit orders, taking rate as above mentioned in equation 1 is utilized by between group to show the relative amount of limit orders as a percentage of total orders. Initial analysis is undertaken to determine the effect of the 52week high ratio on the order imbalance and taking rate on the cross section of stocks.

Portfolio sorts are first undertaken to determine the importance of the 52WH price, secondly portfolios of stocks are sorted based on if they are at the 52WH maximum price, additionally if the 52WH max price has been set in the previous 30 days (new 52WH) or not (old 52WH). Portfolios are then double sorted on VIX and 52WH max to explore the role of uncertainty on strengthening the role of anchors. Subsequently, event study methodology is utilized around the 52WH max, the new 52WH max day and finally incorporating VIX to observe the effect of the 52WH on between groups trading, abnormal returns and the varying nature of the 52WH price.

3. Results

3.1. Introduction

The analysis begins by reporting the summary statistic on the investor behavior in the sample period, secondly on the effect of the 52WH ratio on investor, then finally reports the event study of the 52WH day and its effect on Abnormal returns and investor behavior.

Table 2: Summary statistics of Investor behavior.

Variable	Mean	Median	Std dev
HH Trade Imbalance	-2.85	-2.54	0.65
HH Sell Taking Rate	53.26	52.5	3.14
HH Buy Taking Rate	52.65	52.50	3.12

Table 2 reports the summary of the key investor metrics on the daily level, it shows that HH tended to be slight net sellers on a daily basis over the period. Additionally, HH were more likely to buy with and sell with market orders. These findings show that individuals are less inclined to cross the spread when selling and relatively speaking buying is more active process than selling.

3.2. The 52 Week High Ratio

Portfolio sorts as shown in table 3 were undertaken in line with common practice (Bhootra and Hur 2013; Novy-Marx 2012; Moskowitz and Grinblatt 1999). This involves sorting portfolios into deciles based on the 52 WH ratio. We find a diminishing TI as the share price approaches the 52WH. This household selling is in line with the predictions of Jegadeesh and Titman (1993) and George and Hwang (2004) which suggest that as investors enter the gain domain the likelihood of selling increases. The greatest relative change is between the 8 portfolio to the near portfolio (-9.92%), this suggests a strong anchoring effect in excess of the disposition effect. This supports earlier suggestions from Ben-David and Hirshleifer (2012) who find that individual investor TI follows a V pattern. The key finding however is that much of the TI differences is concentrated at the extremes of the distributions which suggests that it is not solely a monotonic effect but also a specific extreme effect.

Table 3: Summary statistics of Investor behavior.

We first sort the 52 week high into deciles and sort the relevant stocks and track the HH between groups trading on a stock by stock basis. Panel A reports the mean daily rate over the sample period 2004-2009 for HH trading based on the relevant 52WH decile. Panel B reports the difference between the near minus far decile and the near minus eight for their respective HH trading.

52 Week High	Order Imbalance	Sell Taking Rate	Buy Taking Rate
Far	14.24	55.14	48.17
1	6.80	55.12	50.60
2	2.28	53.94	51.46
3	-0.42	54.15	51.08
4	-2.10	54.13	52.00
5	-1.59	53.70	52.67
6	-2.61	53.26	53.50
7	-8.91	52.19	54.46
8	-12.63	51.18	55.14
Near	-22.55	50.03	57.53
Near-Far	-36.79**	-5.10**	9.36**
Near -8	-9.92**	-1.14	2.39*

There is also a significant increase in the use of household limit orders as prices approached the 52 week high for selling and a sharp increase in market orders for buying. In regards to selling, the near minus eight ranked portfolio saw an increase of 5.1% points which suggests that individual investors are very sensitive to the 52 week high as an anchor. As selling is far more common at the 52 WH this effect is also largely economically significant. This extreme of effect is also found with buys which show a steep increase in market order use as prices reach the 52 WH maximum price. As with TI this preliminary analysis shows that the 52WH ratio has a monotonic effect on the investor behavior, however at the extremes, the 52WH and the 52 week low individual investors are anchoring and trading aggressively around these extreme high and low deciles.

3.3. The 52 Week High Day

Once we established a general relationship between the 52WH ratio and investor behavior a more granular analysis is undertaken at the 52 week high day. The 52WH day is recognized if the current days price has crossed or is within 3% of the 52WH price. Table 4 compares investor behavior on the day of the 52 WH with non 52WH days. This shows the individual investors are very sensitive to the 52 week day itself, with HH selling at a TI rate of 16.20% points lower, indicative of substantial net selling to institutions. Additionally, there is an increase in the use of limit orders sells and higher market order buys.This finding expands on the general effect of the 52WH and clearly shows the added anchoring effect that occurs at the 52WH max.

Additional tests to ensure the robustness of the findings were undertaken to both factor in whether the 52 WH point was recently reached or was a continuation of upwards movement i.e. new versus old 52WH. The new 52WH occurs when a 52WH has not been reached in the 30 days

Table 4: Investor behavior at the 52 Week High.

The table sorts each asset by each day on whether it is or is not at the 52WH. The results show the daily mean and standard deviation of each of the HH trading activities over the sample period.

At 52 Week High	Trade Imbalance	Sell Taking Rate	Buy Taking Rate
No	0.00	53.76	51.63
Yes	-16.20	51.00	57.41
Yes-No	-16.20**	-2.76*	5.77**

prior to the observed 52 WH and vice versa when it has for the old 52 WH. A significant result for the new 52WH would lend support to either Grinblatt and Han (2005) suggestion of maximum accumulated capital gains or alternatively investors would not be as sensitive to new 52 week high relative to an old 52 WH and use both roughly evenly to anchor (Luchini and Watson 2013).

Table 5: Investor behavior at the New 52 Week High.

The table classifies each asset by each day on whether it is at the New 52WH or old 52WH. A new 52WH means that the asset has not reached the 52 week high in the last 30 days, while an old 52WH refers to an asset that has been reached or broken through the 52WH in the last 30 days. The results show the daily mean and standard deviation of each of the HH trading activities over the sample period

52 Week High	Trade Imbalance	Sell Taking Rate	Buy Taking Rate
Old	-13.21	51.31	57.51
New	-27.83	49.73	56.98
New - Old	-14.54**	-1.58*	-0.53

Portfolios were first sorted on whether the stock had been at a 52 WH on the 30 days prior to the 52WH being reached, then on whether it was at the 52WH on the current day. Table 5 shows that there is a significant effect of the New 52 WH, this results in a mean difference of -14.54% in TI, between the new and the old 52WH. This finding is repeated in the taking rate for sells which we find a -1.58% point lower taking rate, thus investors are utilizing passive limit order selling at a far greater rate both compared to the mean non 52WH day and the old 52WH. This is of key importance as it shows that households are using the price as a key anchor to place uniformed limit order sells in which institutional investors are taking advantage of.

If anchoring were to be the primary motivator surrounding trading at the 52 WH day then we should see an increase in anchoring behavior when uncertainty is high (Luchini and Watson 2013). Thus, a double sort utilizing a VIX factor was introduced to represent market sentiment and uncertainty. We sorted stocks placed into 4 quartiles based on its trailing 30 day VSTOXX level (VIX) on an annual basis and after which stocks were sorted on whether they had reached the 52WH on the day.

Table 6 shows that VIX is a strongly related to the effect of the 52 WH as shown by the Hi - Lo mean difference on TI (-7.96%). This finding greatly supports the anchoring discussion of Luchini and Watson (2013) that states that when uncertainty is high anchors are more salient pieces of

Table 6: Investor behavior at the New 52 Week High.

The table firstly ranks VIX by year into 4 classes then classifies each asset by its respective VIX rank. Then subsequently the table sorts each asset by each day on whether it is or is not at the 52WH. The results show the daily mean and standard deviation of each of the HH trading activities over the sample period.

VIX	Trade Imbalance	Sell Taking Rate	Buy Taking Rate
Lo	-14.21	53.54	54.91
2	-14.22	48.30	53.56
3	-26.89	47.92	52.38
Hi	-22.16	53.15	57.28
Hi - Lo	-7.96**	-0.38	*2.36

information to a decision maker. This is what is clearly shown in Table 6 and Figure 2. This finding does not necessarily support the disposition effect argument regarding accumulated capital gains but rather shows the importance of anchors at the 52WH and suggests that individuals rely on anchors when uncertainty in a market is higher, this is supported by earlier theories of decision making under uncertainty by Tversky et al. (1974). We find that households do not use more limit orders during high volatility periods to sell, instead they rely more so on market orders and despite a theoretically higher spread costs undertake market order trades to potentially counteract the uncertainty of trade execution. An alternative explanation is that institutions are utilizing increasing limit order use to profit from increasing spreads with limited adverse selection risk, however that is beyond the scope of this paper.

Overall, the portfolio sorts showed the monotonic role of the 52WH ratio leading to household disposition style selling. Additionally, limit order sells and market order buys increased as the 52WH approached and kinked at the 52WH Max, these findings suggest that the 52WH anchoring effect is in excess of previous disposition effect explanations. In addition we analyzed variations of the 52WH day explicitly, the new 52WH resulted in significantly greater household selling behavior and limit order selling, thus the anchor remains stronger when it has not been reached recently. Lastly, when uncertainty was increased via VIX households selling was far higher resulting in stronger anchoring use, unexpectedly households utilized market order sells despite potentially widening spreads.

3.4. Event Study at the 52WH Day

To determine the importance of the 52WH day as an attention event/anchor we employed the methodology of MacKinlay (1997) to observe the abnormal returns and investor behavior pre and post event windows. Firstly, we set the pre and post event windows to be five days respectively either side of the 52WH Event day as per figure 1.

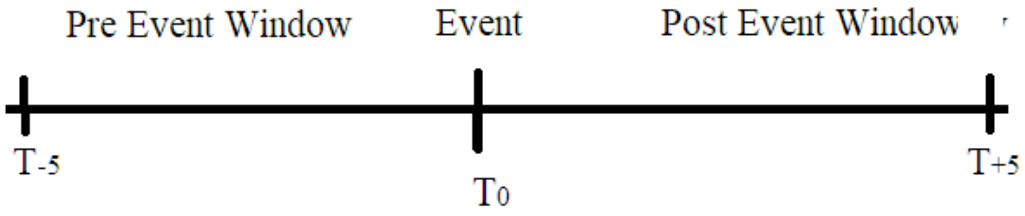

Figure 1: Event Windows

Figure 1 identifies the pre-event and post-event windows for the study, it specifies the discrete day in which the price reaches the 52WH and presents the test variables for the pre and post event window. Continuing the previous findings TI and Taking rate are of key importance, additionally we introduce Abnormal return and Cumulative Abnormal Return for the event windows

$$AR_{i,t} = R_{i,t} - R_{m,t} \tag{3}$$

AR refers to the abnormal return in stock i at time t, R refers to the daily return on stock i at time t, while Rm is the daily return on the OMXH market at time t. AR allows us to determine for the excess return of the stock above the market return (OMXH Helsinki index), as is the case in most event studies.

$$CAR_{i,t} = \sum_{t=1}^{5} AR_{i,t} \tag{4}$$

CAR refers to the Cumulative abnormal return for stock i for the event window T_n to $T_n + 5$. To determine the importance of the event window the abnormal returns need to be aggregated in order to draw any conclusions regarding the event of interest. The reported CAR is the equal weighted aggregated AR by stock surrounding the 52WH day event.

Table 7: Stock Returns and Investor behaviour at New Vs Old 52WH.

Panel A of the Table presents the 5 day daily lead and lag Abnormal Return (Stock Return less Market Return), HH Trade Imbalance and the Taking Rate sells of the respective stocks sorted based on whether they are at the new or old 52WH at time T. Panel B reports the cumulative lead and lag Abnormal Return (Stock Return less Market Return), HH Trade Imbalance and the Taking Rate sells of the respective stocks sorted based on whether they are at the new or old 52WH at time T.

Panel A: Descriptive Statistics

Time	Abnormal Returns		Trade Imbalance		Sell Taking Rate	
	Old52WH	New52WH	Old52WH	New52WH	Old52WH	New52WH
T-5	0.383	0.159	-0.139	-0.200	0.516	0.525
T-4	0.433	0.197	-0.138	-0.200	0.515	0.525
T-3	0.474	0.219	-0.141	-0.211	0.514	0.524
T-2	0.515	0.357	-0.144	-0.219	0.514	0.522
T-1	0.492	1.017	-0.141	-0.255	0.515	0.510
T	0.038	0.017	-0.133	-0.278	0.513	0.497
T+1	0.080	0.089	-0.097	-0.190	0.523	0.522
T+2	0.075	0.124	-0.091	-0.170	0.526	0.526
T+3	0.061	0.118	-0.089	-0.172	0.529	0.532
T+4	0.080	0.057	-0.086	-0.173	0.529	0.528
T+5	0.072	0.087	-0.084	-0.169	0.531	0.534

Panel B: Cumulative Lead and Lag Abnormal Returns

	Old 52WH	New 52WH	New - Old
CAR Pre Event Window (-5, -1)	2.299	1.949	-0.349*
AR Event (0)	0.038	0.017	-0.021
CAR Post Event Window (1, 5)	0.368	0.476	0.108*
Pre - Post Event	1.931**	1.474**	

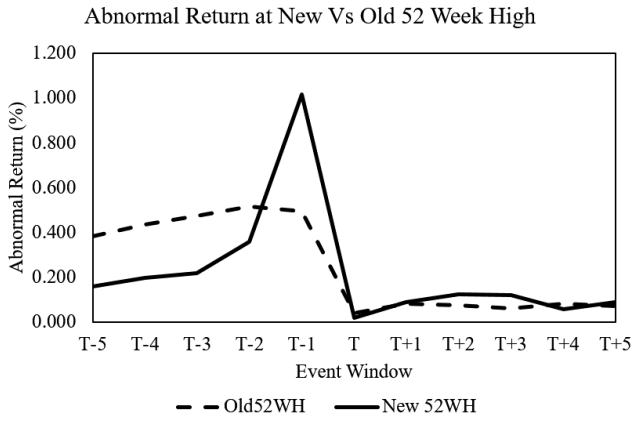

Figure 2: Abnormal returns around the 52WH

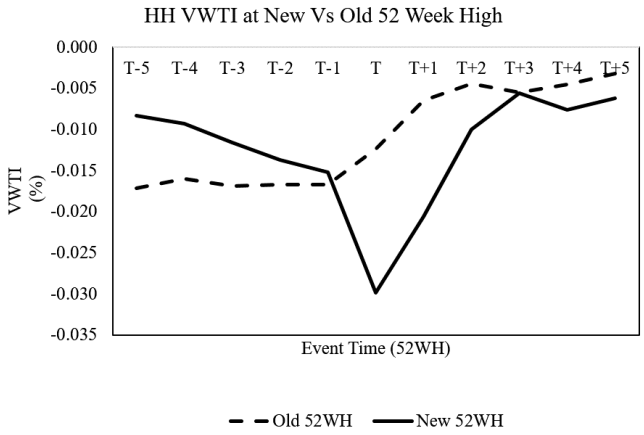

Figure 3: Volume weighted trade imbalance at the 52WH

3.5. Event Study: The New 52 Week High

The results of the event study as shown in table 7 show a clear lead up effect to the 52WH in the pre event window. There is substantial AR in the pre-event window for both new and old 52WH. The New 52WH exhibits a far steeper and pronounced AR in the 3 days preceding the 52WH in which it spikes relatively to the plateauing of the Old 52WH as exhibited in Figure 2. The subsequent drop off in AR at the New52WH is of significant note as it is clear the post event window is significantly different from the pre-event large positive AR.

The negative TI is notable for individuals for both 52WH measures, however it is far lower and spikes downwards with more intensity at the new 52WH. Both subsequently revert to above pre-event level. Despite this they still remain far below nil, this is most likely due to the latent effect of maintaining still being near the 52WH. This lead up AR as observed disappears as the price reaches the 52WH and as such the significant household selling seems to prevent the price breakthrough. This AR and TI pattern is consistent with our hypothesis and suggests that households are trading inversely to the price direction and are losing out significant economic profit in the lead up to the 52WH.

In regards to taking rate it is clear the amount of limit orders peak on the event day and are larger one day before and after. This shows that individual passive limit orders are being executed at the 52WH.This Inverse V shape differs from the TI results which suggest individual's limit order usage does not completely dissipate post event as investors still look to trade at or near the 52WH. This points to the 52WH as being an attention grabbing event and individuals are placing trades at and just above the 52WH.

Overall, the most important results is the clear lead up to the 52WH event in pre event window which is signified by a very strong negative TI by individuals, in which they are selling with latent limit orders, meanwhile there is strong AR within the same stocks. This phenomena has been displayed strongly and clearly and the implication is that individual investors are missing out on

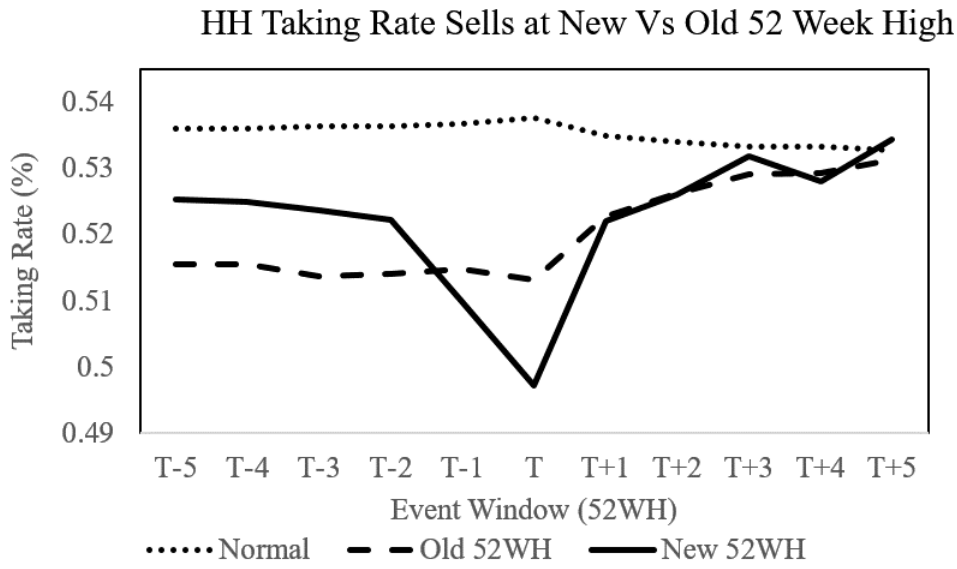

Figure 4: Event Windows

significant gains due to them anchoring to the 52WH event. The strength of the anchor is also intensified if the 52WH has not been reach within the last 30 days thus acting us a more salient piece of noise and acting as a stronger anchor.

3.6. Event Study: The role of VIX

Having already observed the effect of volatility on the strength of the 52WH day in previous analysis it is necessary to extend the study to investigate this in the pre and post event windows. As it was a very significant factor on the event day it is important to determine the patters in this event windows to see how volatility effects the strength of the anchor. We continued the methodology from the new vs old event study above, this time we sorted on VIX based on previous specifications. We find that volatility plays a key role on AR, particularly during high periods of VIX. During all VIX levels the 52WH day remains a significant event, however when VIX is high AR is at its highest in the pre event window and even mean reverts to some extent in the post event window. Additionally, during high VIX OI is veers towards much larger selling in the pre and post event window as shown in figure 4. The key implication from the effect of volatility is consistent with our previous suggestions of Luchini and Watson (2013) and our earlier findings that individuals rely on anchors more so during times of uncertainty and their natural contrarian/ disposition effect tendencies cause them to lose out on AR at the 52WH and when the 52WH ratio is strong.

Table 8: Stock Returns and Investor behavior at Low VS High VIX at 52WH.

Panel A of the Table presents the 5 day daily lead and lag Abnormal Return (Stock Return less Market Return), HH Trade Imbalance and the Taking Rate of the respective stocks sorted based on whether they are in the low or high quartile for VIX. Panel B reports the cumulative lead and lag Abnormal Return (Stock Return less Market Return), HH Trade Imbalance and the Taking Rate of the respective stocks sorted based on whether they are at the new or old 52WH at time T.

Panel A: Descriptive Statistics

	Abnormal Returns		Trade Imbalance		Sell Taking Rate	
Time	Low	High	Low	High	Low	High
T-5	0.368	0.398	-0.137	-0.144	0.504	0.531
T-4	0.442	0.405	-0.135	-0.140	0.506	0.526
T-3	0.474	0.350	-0.142	-0.138	0.503	0.526
T-2	0.513	0.429	-0.153	-0.140	0.503	0.528
T-1	0.590	0.720	-0.162	-0.140	0.501	0.535
T	0.102	-0.273	-0.121	-0.083	0.512	0.541
T+1	0.128	-0.086	-0.111	-0.074	0.518	0.539
T+2	0.147	-0.001	-0.113	-0.071	0.522	0.544
T+3	0.144	0.027	-0.114	-0.066	0.523	0.540
T+4	0.151	0.108	-0.114	-0.067	0.525	0.545
T+5	0.131	0.056	-0.113	-0.070	0.522	0.542

Panel B: Cumulative Lead and Lag Abnormal Returns

	Low	High	High - Low
CAR Pre Event Window (-5, -1)	2.388	2.339	-0.049
AR Event (0)	0.102	0.084	-0.018
CAR Post Event Window (1, 5)	0.701	0.393	-0.307*
Pre Post Event	1.68**	1.946**	

4. Conclusion

To understand the role and importance of the 52WH we explored the role of Individual and Institutional trading and how this created abnormal returns around the 52WH day.With unique investor class identified trade data we found that consistent with the intuition of previous research individual investors tend to sell at a far greater amount as the price of stocks approach the 52WH. Additionally, it was clear that individuals utilize latent limit orders to both buy and sells stocks at a far greater rate as the respective stocks near the 52WH. This general phoneme is consistent with the Prospect Theory/Mental Accounting of Grinblatt and Han (2005). At the 52WH day the level of household selling sharply increased, this suggests that individuals trade very actively as the 52WH day and perceive it as a negative signal, as such exhibit strong contrarian tendencies. When controlling for VIX the strength and intensity of selling also increased at the 52WH showing that the strength of the anchor is intensified when uncertainty is higher. There is clear indications that individuals anticipate the 52WH and begin selling down their positions as the 52WH day approaches and more or less act upon it until the 52WH after which abnormal trading subsides. This is even more pronounced if the price has not reached a 52WH within the last month and/or when volatility is higher.

This intensified individual selling is matched by strong positive abnormal returns preceding and on the 52WH, with no subsequent short term mean reversion. The implication of these findings are that individuals are missing out on significant economic returns as they intensify their selling behaviour around the 52WH. Individuals are losing out between 4% - 7% in the days preceding the 52WH and as such the anchoring bias is causing clear and significant economic loss for individual investors to the benefit of institutional investors. We also explored the role of order types around the 52WH and found the individual investors despite generally preferring to utilize market order trades as the 52WH approached they were far more likely to utilize limit orders and anchor to the 52WH max price. As the 52WH approaches individuals are willing to take significant adverse selection risk by placing market orders and are losing out on substantial economic gains.

Overall, our results show that individual investors are sensitive to the 52WH ratio and in particular to the 52WH day in so far as they act in a contrarian manner and as such lose out on significant positive AR that occur at and as a result of their trading. Additionally, they trade far more with limit orders at the 52WH and this is intensified when uncertainty is present suggesting individuals are relying more heavily on anchors when uncertainty exists. Future research in the role of liquidity and potential liquidity shocks that may occur at the 52WH could be addressed to understand the role of heavy individual investor trading around anchors. This would provide useful insight into the role of individual and between groups trading on the supply and cost of liquidity with the market.

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