New Highs: Outperformance Increases with Lookback Window

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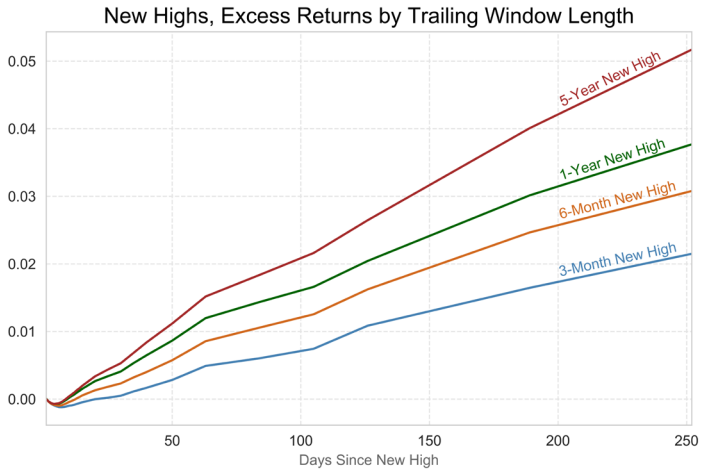


Figure 1: Cumulative excess returns by number of days since a new high event by trailing three months, six months, one year, and five years from 1995 to 2018. Results for new high events occurring on the same day are aggregated and liquidity weighted, then further averaged over time.

KEY FINDINGS:

- Positive excess returns on average for up to one year.
- Excess returns tend to increase with the length of the lookback window.
- New five-year highs had 5.3% average alpha after one year versus 2.2% for three-month highs.
- New high trade signals have been remarkably consistent through time.

EXECUTIVE SUMMARY

Bucking the conventional wisdom to 'buy low, sell high' with respect to historical trading ranges presents a source of potential opportunity for investors. To examine the performance of stocks that have hit new highs, we studied excess returns following a new high event over the trailing three months, six months, one year, and five years across U.S. equity markets from 1996 to 2018. Separate from market effects, **we found, on average, that stocks showed significant outperformance for up to one year following a new high**. We also found that **stock performance tends to increase with the length of the lookback window** used to define a new high, with stocks that hit new five-year highs performing the best. New highs tend to cluster in bull markets and were an important source of absolute returns during the volatile 1995–2000 Internet bubble. However, after adjusting for differences in volatility, **new highs as an indicator of performance have been remarkably consistent through time**. This paper discusses potential explanations for these results, drawing from expectations of investor behavior from behavioral finance theory.

"The Great Paradox in the stock market: What seems too high in price and risky to the majority usually goes higher, and what seems low and cheap usually goes lower."

–William J. O'Neil, *How to Make Money in Stocks*

INTRODUCTION

A new high arises when a stock's high or closing price on a given day is above that of any day over some trailing window of time. Daily aggregated lists of, for example, 52-week new highs are included in major financial publications, making them one of the most readily available features of stock price performance. Buying a stock when its price makes a new high, rather than a new low, is a cornerstone of our O'Neil Methodology.

Not surprisingly, there is a great deal of empirical evidence of the effects of new highs on investor behavior. One explanation for such effects is Anchoring Bias, whereby investors use previously traded prices as an estimate of relative value rather than a stock's complete fundamental picture. To a rational investor, a company's relative attractiveness should be a function of the probability-weighted present value of future cash flows, discounted with respect to both the cost of capital and the current market price of risk. Investors with Anchoring Bias would be inclined to sell when prices move above prior highs, despite the true value of the company changing materially in the face of new information. Such trading activity would delay the transmission of new information into prices and cause expected returns to diverge from those in an efficient market. This bias results in suboptimal returns to affected investors—and represents an opportunity for traders willing to make the economically equivalent and opposite trading decision. Harvesting opportunities of this type is an important driver of trading systems that incorporate elements of trend-following.

An additional explanation is the Disposition Effect (Grinblatt and Han, 2005; Shumway and Wu, 2007), in which investors prefer selling assets whose prices have risen since their purchase over those assets whose prices have fallen. This explanation is underpinned by Prospect Theory (Kahneman and Tversky, 1979, 1992), where an S-shaped value function creates behavioral biases that contribute to trading signals. Under this framework, investors consider potential transaction outcomes relative to their initial purchase and are risk-averse with respect to gains and risk-seeking with respect to losses. In other words, investors tend to quickly take profits at the first sign of gains but "double down" in the face of losses. Consider that a stock making a new high will have shed some or all of its investor base for whom it has fallen in value since being purchased and be dominated by those investors for whom the current price represents a small gain. The preferential trading activity by such investors on balance will, in a similar counterintuitive fashion, be expected to slow the price transmission mechanism and cause prices to trend.

METHODOLOGY

We empirically tested, over a range of trailing reference windows, the conditional, marginal expectations of cumulative excess returns[1] for the period January 1995 to July 2018. In our results, we measured and compared post-event average cumulative excess returns for stocks making new three-month, six-month, one-year, and five-year closing price highs. Each day, we aggregated all stocks in our U.S. universe[2] that made new highs with respect to each trailing window, with a total of approximately 4 million new high events during our study period. We measured cumulative excess returns, aggregated by days since the event, and volatility normalized the results. We then aggregated the normalized excess returns each day and weighted them by liquidity so that our results are driven by the most well-known companies and undue weight is not given to more volatile time periods. One noteworthy aspect of this methodology is that we treat each new high as an independent event, with no consideration as to the diversity of stocks forming our sample over time. In other words, it is both possible and likely that our sample results are driven in many cases by new high events from the same stock occurring in short succession, such that to harvest and replicate these observed results might involve accumulating highly concentrated positions that may not, in practice, deliver the desired risk-adjusted results.

1 Each day, for each stock in our universe, we apply a forward-looking beta estimate using our proprietary model that weights the results of multiple OLS regressions over various timeframes together with expectations of coefficient drift and mean reversion. Excess returns are equivalent to CAPM alphas under zero risk-free rate and zero dividend yield assumptions with the S&P 500 used as a proxy for market returns.

2 Our universe construction methodology is free of survivorship bias and considers each stock each day for inclusion on the basis of investability while excluding potential confounders such as penny stocks, ADRs, ETFs and corporate events. The bottom 20% of stocks by price and the bottom 40% by liquidity are removed, with the remaining stocks weighted by liquidity.

RESULTS

We found **consistently positive excess returns, on average**, for up to a full year following a new high event. Table 1 shows the average cumulative excess returns since new high events for each of the four lookback windows. **Used as a trading signal, five-year highs give the best results. Post-event excess returns are monotonically higher as a function of trailing window length**, reaching 5.3% after one year for five-year highs, compared with 2.2% for three-month highs. **The best performing new high is the five-year high**, which for many stocks is tantamount to an all-time high.

Table 1: New Highs, One-Year Post Event Performance by Lookback Window

	Lookback Window			
	3-Mo.	6-Mo.	1-Year	5-Years
Cumulative Return	3.32%	4.24%	4.74%	5.73%
Cumulative Alpha	2.17%	3.13%	3.84%	5.31%
Hit Rate	61.55%	62.37%	62.78%	64.08%
Average Gain	28.15%	28.14%	28.22%	27.69%
Average Loss	-26.81%	-25.96%	-25.53%	-24.49%
Average Maximum Favorable Excursion	28.80%	29.10%	29.25%	28.83%
Average Maximum Adverse Excursion	-21.91%	-21.10%	-20.65%	-19.49%
Average Daily Frequency	8.24%	6.15%	4.64%	2.22%

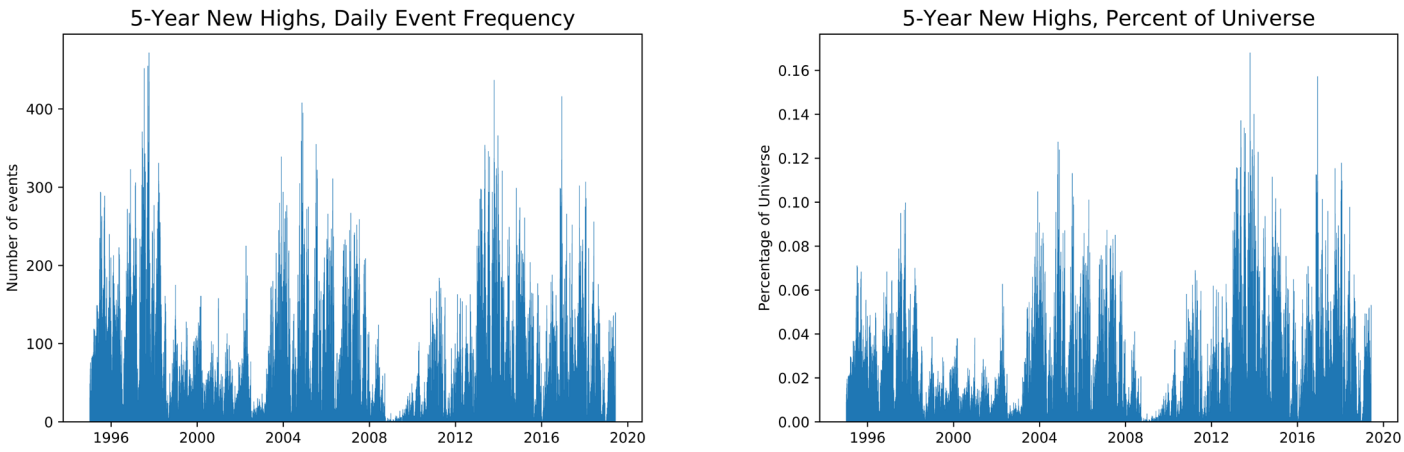
This table shows average post-event performance statistics one year following a new high by lookback window length from 1995 to 2018. Return and excess returns are statistically significant at the 99% confidence level. 'Cumulative Alpha' is based on the CAPM, with the S&P 500 as a proxy for market returns. 'Hit Rate' refers to the percentage of events on average yielding positive returns. 'Average Daily Frequency' is the average proportion of our investable U.S. equity universe experiencing a new high with respect to the given window length on a given day.

In explaining this effect, we should note that every five-year high is also a one-year high, each one-year high is also a six-month high, and so forth. When we exclude these intersecting events from the shorter-window events, differences in expected returns are likely to be starker still. In the context of the Disposition Effect and Prospect Theory, we reason that stocks making new one-year highs but not five-year highs, for example, are likely to retain some investors who purchased at higher prices and are thus not yet inclined to sell. New all-time highs, however, necessarily mean that all current holders of the stock are relatively more likely to sell than in a purely efficient market, slowing the price-transmission mechanism and counterintuitively leading to stronger trends.

HISTORICAL STABILITY

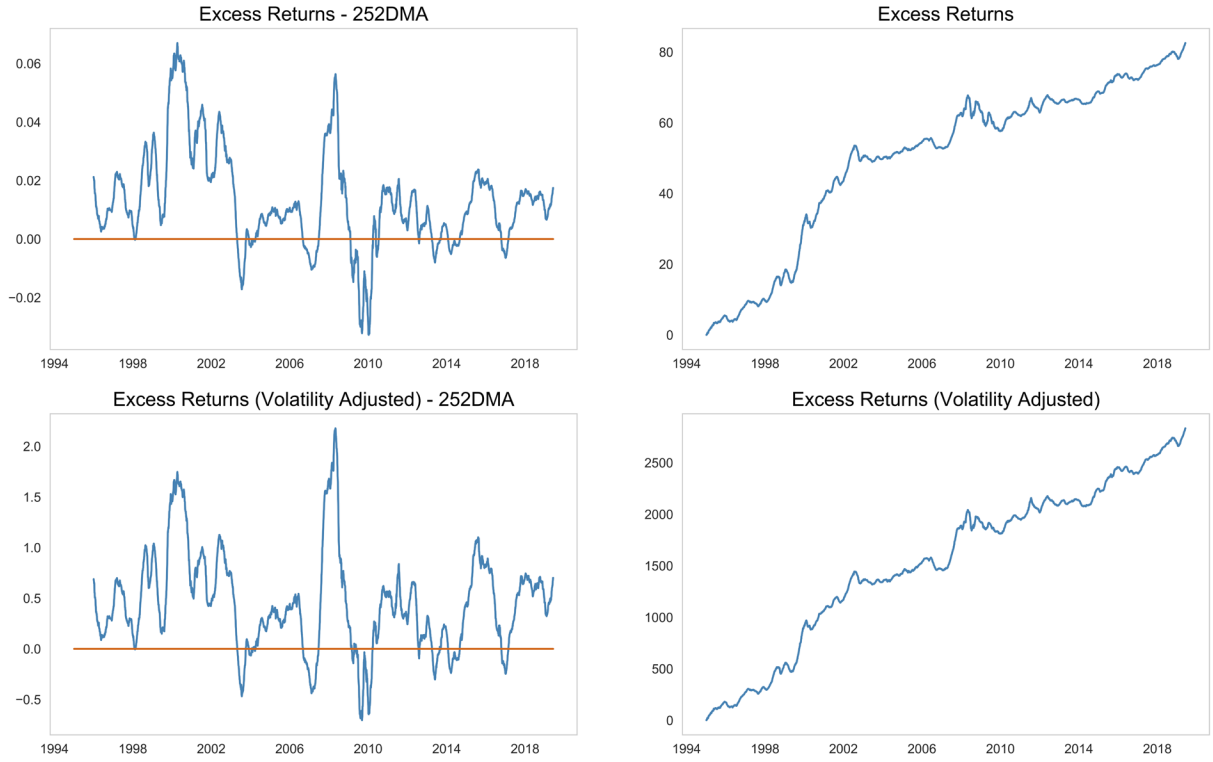
Historical average event performance can be misleading if such performance is due to unique market conditions that are unlikely to be repeated in the future. For this reason we must confirm that, while there are cyclical ebbs and flows, our general expectations for post-event excess returns are sufficiently stable over time such that we have a reasonable basis for using them to forecast new events.

To this end, we examined the historical daily frequency of new high events on both an absolute basis and relative to our universe size, as well as historical patterns in post-event performance. Not surprisingly, we found that new highs tend to cluster during bull markets. Figures 2 and 3 show the daily frequency and percent of universe experiencing new five-year highs. We can see clear spikes during the bull markets of 1995–1999 and 2004–2006, followed by respective lulls during the succeeding bear markets of 2000–2002 and 2007–2008.



Figures 2 and 3: Daily frequency counts and proportion of stock experiencing a new high across our U.S. equity universe.

Examining the historical performance charts, we see some indications that the results are disproportionately influenced by the speculative tech bubble of the late 1990s. Figures 4 through 7 show, respectively, the one-year rolling performance and cumulative performance each day of a strategy of buying a liquidity-weighted, beta-hedged portfolio of stocks making new highs. In figures 4 and 5, we see **disproportionately positive performance from 1995 to 2000**. In figure 4, excess returns are mostly well above zero. Note the sharp upward slope of cumulative performance in figure 5, which indicates considerably higher excess returns on average than in more recent time periods and implies results that are likely to be less than the sample averages. This was not an ordinary time period with respect to new highs, but rather a period of extreme speculation during the tech bubble. If our statistical inferences are too heavily dependent on a repeat of these market conditions, stock performance may be lower than expected.



Figures 4–7: Rolling one-year average returns and cumulative returns to liquidity-weighted, beta-hedged portfolios of stocks making new highs on both an absolute and a market-volatility adjusted basis.

However, the disproportionate performance contribution of the 1995–2000 period could simply reflect its higher volatility, in which case we can divide each realized excess return series by its respective standard deviation to make risk-adjusted comparisons. **When we normalize for volatility, the number of new highs has been remarkably consistent through time (see figures 6 and 7)**. Though there is some cyclical ebb and flow, buying new highs has been a consistently outperforming strategy as the rolling mean is mostly greater than zero (figure 6), reflected by the smooth upward slope of cumulative excess returns (figure 7).

CONCLUSION

Key findings:

- **Positive excess returns on average for up to one year.**
- **Excess returns tend to increase with the length of the lookback window.**
- **New high trade signals have been remarkably consistent through time.**

Counterintuitive as it may seem, our results show that, on average, **stocks reaching a new high can be expected to not only go higher, but outperform the market going forward**. It is perhaps this counterintuition that is itself the source of the excess returns. Trading in the opposing direction of most traders, who are guided by the invisible hand of investor psychology, presents a superior supply/demand curve for expected returns under conditions of uncertainty. These effects could be explained by Anchoring Bias, whereby investors use previously traded prices as an estimate of relative value rather than a stock's complete fundamental picture, as well as the Disposition Effect, further explained by Prospect Theory, where investors' risk aversion to gains and risk-seeking in losses leads them to sell winners and hold losers—activity predicted to generate momentum returns. These results also provide **validation and rationale for one of the tenets of our O'Neil Methodology—buy high, sell higher**.

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The O'Neil Capital Management Quantitative Services Group grew out of a desire to create quantitative research based on the work pioneered by Mr. O'Neil. The Quant Group develops quantitative research and systematic investment strategies for the O'Neil family of companies. The program comprises a global team of data scientists, software engineers, and investment professionals. Our research is composed primarily of factor studies for discretionary and quantitative portfolio managers, and our current interests include factor investing, time series analysis, and machine learning techniques.

The Quant Group provides quantitative research and data science expertise for O'Neil Global Advisors. The two benefit from a common heritage and passion for finding what leads to outperformance in global equity markets.

REFERENCES

1. Han, Bing and Grinblatt, Mark, Prospect Theory, Mental Accounting, and Momentum (August 2004). Yale ICF Working Paper No. 00-71; UCLA Anderson School Finance Working Paper No. 01-18; AFA 2003 Washington, DC Meetings. Available at SSRN: https://ssrn.com/abstract=288466 or http://dx.doi.org/10.2139/ssrn.288466

2. *Welfens, Frank and Weber, Martin, How do Markets React to Fundamental Shocks? An Experimental Analysis on Underreaction and Momentum (October 2007). Available at SSRN: https://ssrn.com/abstract=1022924 or http://dx.doi.org/10.2139/ssrn.1022924*

3. *Han, Bing and Grinblatt, Mark, The Disposition Effect and Momentum (January 2002). NBER Working Paper No. w8734. Available at SSRN: https://ssrn.com/abstract=298258*

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