

Breakouts: Pump up the Volume

QUANTITATIVE RESEARCH

O'NEIL GLOBAL ADVISORS INC.

Breakouts: Pump up the Volume

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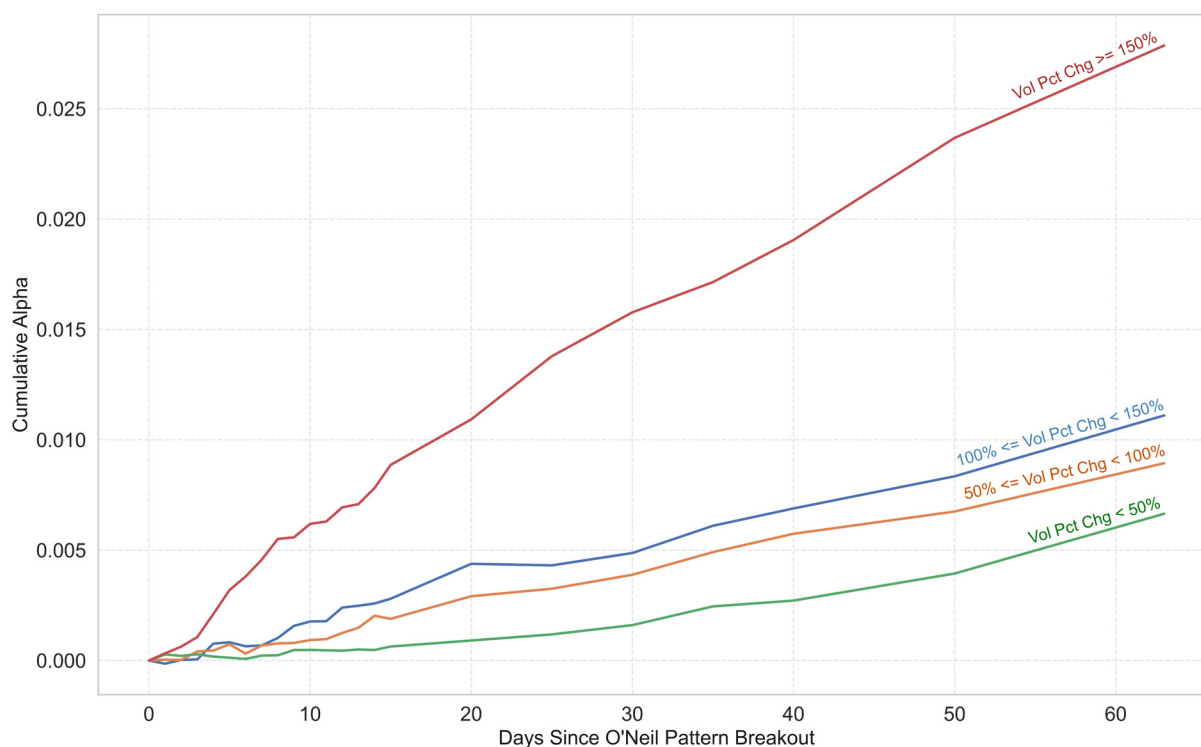


Figure 1: Average cumulative excess U.S. stock returns by number of days since a daily O'Neil pattern breakout event from 1995 to 2021 for different volume percentage change thresholds. Results for pattern breakout events occurring on the same day are aggregated and equally weighted, then averaged over time.

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KEY FINDINGS:

- O'Neil breakouts produce 1.1% in alpha and 3.2% in returns over 3 months.
- Breakouts accompanied by sharp volume increases significantly outperform.
- Alpha rises to 2.8% and returns to 5.0% when volume rate increases by 150% or more.

EXECUTIVE SUMMARY

We studied patterns of stock returns, following breakout events from an O'Neil pattern, across our U.S. universe from 1995-2021. We found generally that breakouts that were accompanied with high volume percentages led to post-event excess returns for up to 63 trading days (or approximately three months) afterward. While all breakouts were followed by positive alpha, breakouts with volume percentage changes in excess of 150% had cumulative alpha of 2.8% on average. These results suggest that breakouts with high volume percentage changes may signal demand from institutional investors that dominate trading volume on U.S. exchanges.

INTRODUCTION

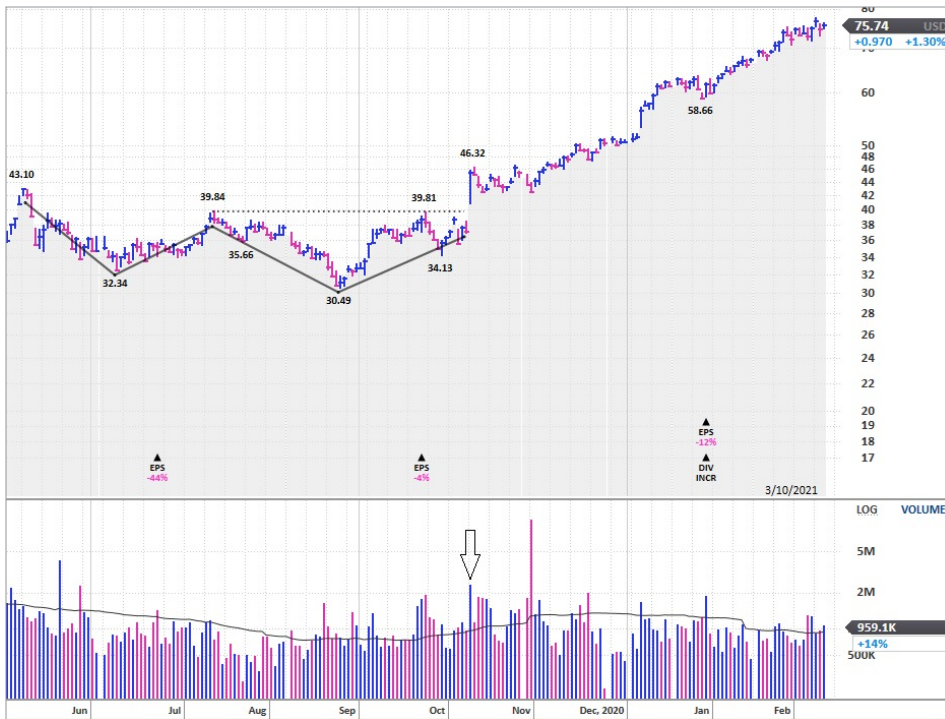


Figure 2: Price chart of East West Bancorp Inc (EWBC). Breakout from a double bottom pattern with high volume is observed in November 2020.

William O'Neil + Company founder William J. O'Neil began researching breakout stocks in the late 1950s. During more than a half century of research and investing, compiling charts on the best stock market winners of each market cycle, O'Neil found the biggest winners often started their moves the same way, with a stock breakout.

A breakout occurs when the high price for a day exceeds the pivot price as identified by our O'Neil Pattern Recognition software. Identified O'Neil patterns for this study include cup, cup-with-handle, double bottom, flat base, ascending base, saucer, saucer-with-handle, and IPO bases. The patterns themselves are displayed in William O'Neil + Company's PANARAY equity research platform. While the software identifies patterns for both daily and weekly charts, only daily patterns were used for this study. A more detailed discussion of these base types can be found in O'Neil's book "How to Make Money in Stocks." The pivot price varies by base type, with the pivot price in a cup-with-handle pattern, for example, corresponding with the high price in the handle part of the base; while the pivot price in a flat base corresponds to the highest price point in the base.

A breakout in general can be a signal that a stock has moved past prior resistance and can be a sign of increased demand for shares. O'Neil states in "How to Make Money in Stocks" that "In almost all cases, it's professional buy-

ing that causes big, above-average volume increases in the better-priced, better-quality growth-oriented stocks at pivot breakouts." In other words, when breakouts are accompanied by unusually high volume, it may be indicative of the informed trading of professional institutional buyers. O'Neil contrasts this with the emotion-laden trading decisions of retail traders, the majority of whom are averse to buying at such points; as to do so, would appear at odds with the conventional wisdom of buying low and selling high. As such institutions may need to build their positions over several trading days or weeks, and as retail traders remain prone to selling and averse to buying as a stock approaches the top of a base, a potential opportunity exists for the astute trader.

We can attempt to quantify such conditions by examining the volume percentage change on the day of the breakout. Volume percentage change is determined by comparing the stock's trading volume on its breakout day to its average volume for the past 50 trading days, with 0% equating to average volume and 100% equating to twice the average volume. A volume percent change of 150% means the stock experienced volume 2.5x its recent average. In this study, we hypothesize that breakouts with proportionally bigger volume percent changes will be followed by greater future returns, and that the breakouts with the biggest volume percent changes would lead to the most outperformance.

METHODOLOGY

We tested two scenarios for this study: all breakouts and breakouts segmented by volume percentage change. For the all breakouts scenario, we tested the conditional expectations of cumulative excess returns¹ for 63 trading days following breakouts from a daily base; for the period January 1995 to September 2021 in our U.S. universe². It should be noted that our universe excludes the stocks in the bottom 50% of liquidity. The study resulted in a total of approximately 197,000 breakout events during our study period. We measured cumulative excess returns each day over a subsequent 63-trading day window.

In the second scenario, we segmented the returns into four groups based on the volume percent change on the day of the breakout (less than 50%, 50-100%, 100-150%, and greater than 150%), and analyzed the excess returns of the segmented groups.

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 50% by liquidity are removed, with the remaining stocks weighted by liquidity.

RESULTS

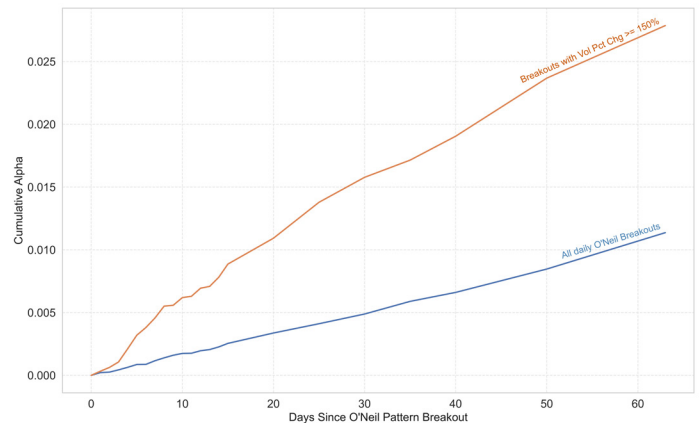


Figure 3: Average cumulative excess returns of all breakouts versus breakouts with high volume percent change.

Consistent with our original hypothesis, we found generally that, while the all-breakouts group was associated with some post-event excess return over a subsequent three-month horizon, the outperformance increases monotonically with volume percent change in volatility-normalized terms, with the most alpha in the >150% bucket.

In the all-breakouts group with no additional filters, we saw a linear alpha of 1.1% and an absolute return of 3.2% in returns for 63 days following the event. Meanwhile, for breakouts with volume percent changes greater than 150%, we found excess returns of 2.8% and absolute returns of 5.0% for the same 63-day trading day period. Such results reflect a monotonic relationship between the size of the volume percent change on the breakout day and expectations of future market outperformance over the ensuing 63 days. This also suggests that 150% is a good threshold for expectations of significantly positive alpha. This result provides solid evidence for the premise that the magnitude of demand for shares, expressed by volume percent change, carries important information about future excess returns.

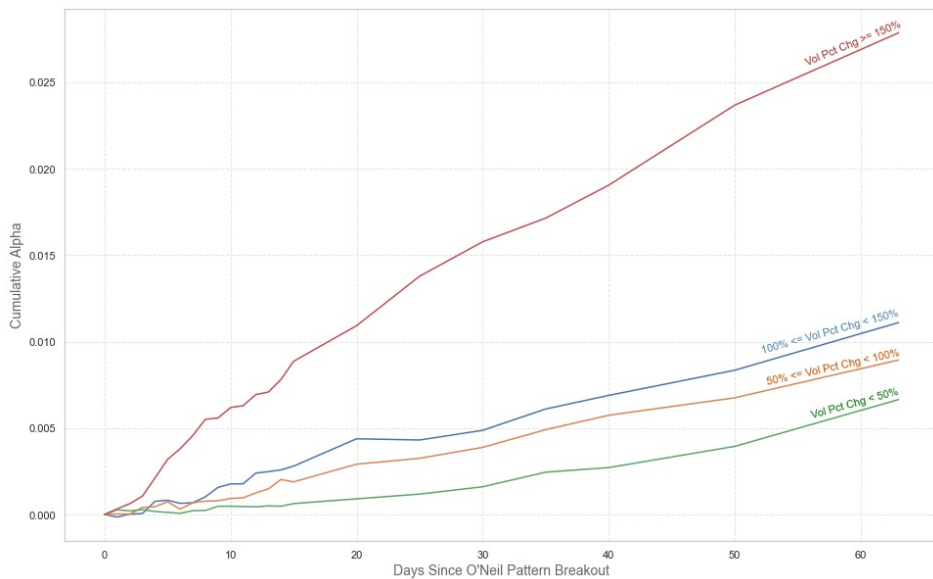


Figure 4: Average cumulative excess returns by number of days since a daily O'Neil pattern breakout for different volume percentage change thresholds.

	VolumePctChg<50	50<=VolumePctChg<100	100<=VolumePctChg<150	VolumePctChg>=150
Cumulative Log Return	2.61%	3.01%	3.12%	5.04%
Cumulative Alpha	0.67%	0.89%	1.11%	2.79%
Hit Rate	57.68%	56.85%	57.10%	56.86%
Average Gain	12.91%	14.97%	15.89%	19.90%
Average Loss	-11.42%	-12.75%	-13.87%	-14.53%
Average Maximum Favorable Excursion	11.11%	12.50%	13.34%	15.65%
Average Maximum Adverse Excursion	-11.04%	-12.35%	-13.33%	-14.02%

Table 1: This table shows average post-event performance statistics for 63 days following an O'Neil pattern breakout event in the U.S. from 1995 to 2021, segmented by volume percentage change size. Return and Alpha 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.

CONCLUSION

These results confirm our hypothesis of momentum effects relating to a breakout and its accompany volume percent change. We found generally that the size of the volume percent change was significantly related to post-event excess return for up to three months afterward. We can draw a general conclusion that breakouts, accompanied with high volume percent changes, have a reasonable baseline expectation for future outperformance. We theorize that a high-volume percentage change, accompanying a breakout, signals significant demand for shares that have broken through resistance. The weak holders of the shares have been "shaken out" by a period when shares pulled back in price or went sideways, setting up a demand-supply imbalance. The demand is most likely from institutional investors, who dominate trading volumes on U.S. exchanges and need to trade significant volumes to build their positions. While this study considered all O'Neil bases at once, in future studies we hope to separate results by base type and compare.

BIBLIOGRAPHY

O'Neil, William J. (2009). How to Make Money in Stocks. McGraw-Hill.

ABOUT THE O'NEIL GLOBAL ADVISORS QUANTITATIVE SERVICES GROUP

Over the years we have described the investment process used by William J. O'Neil as 'Qualitative Quant.' This type of investor looks at quantitative measures to accurately evaluate and efficiently compare companies but ultimately invests based on their own qualitative analysis of the data.

The O'Neil Global Advisors 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 William O'Neil + Co., an SEC Registered Investment Adviser that helps the world's leading institutional investment managers with global buy and sell recommendations, independent research, and market advice. The two benefit from a common heritage and passion for finding what leads to outperformance in global equity markets.

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The backtesting process assumes that the strategy would have been able to purchase the securities recommended by the model and the markets were sufficiently liquid to permit all trading. Changes in these assumptions may have a material impact on the backtested returns presented. Certain assumptions have been made for modeling purposes and are unlikely to be realized. No representations and warranties are made as to the reasonableness of the assumptions. This information is provided for illustrative purposes only.

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