Implications of Weekly Overbought/ Oversold (OBOS) Readings

EXECUTIVE SUMMARY /

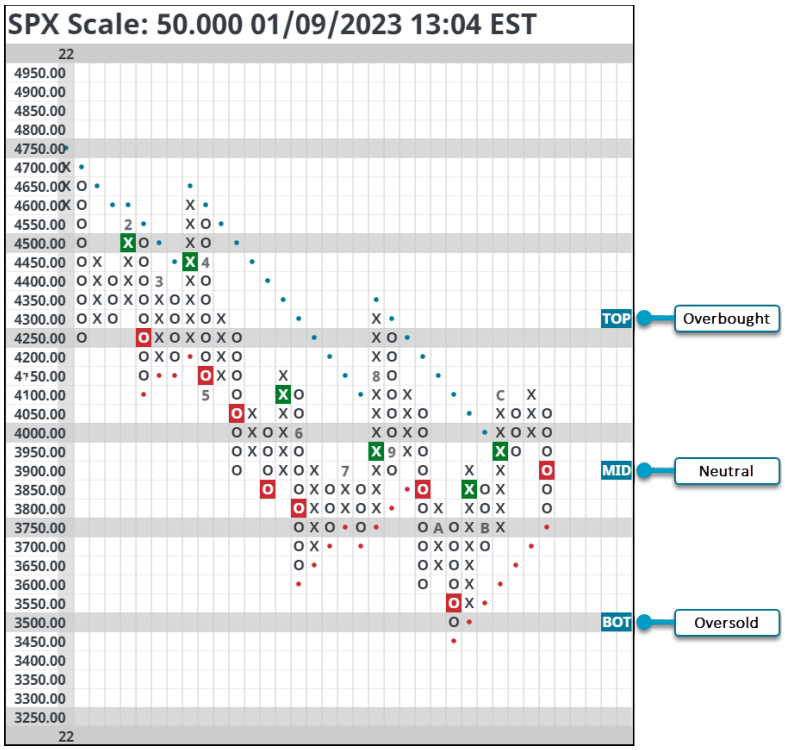
The following paper tests Nasdaq Dorsey Wright's weekly overbought/oversold (OBOS) indicator for stocks. The study found that OBOS levels offer material perspective on stock performance, specifically mean reversion potential, over one- and two-week timeframes. Furthermore, the study revealed that high momentum stocks (as defined in our Technical Attribute Stock Ranking System White Paper) tended to mean revert less frequently and severely when overbought compared to low momentum stocks, which tended to mean revert more often and severely when overbought. Conversely, high momentum stocks tended to mean revert more frequently and severely when oversold compared to low momentum stocks.

INTRODUCTION /

We at Nasdaq Dorsey Wright are known for a unique and broad-based application of momentum investing via Point & Figure charting. Although most of our strategies and analyses are shaped by intermediate- to long-term horizons, we do look towards shorter-term indicators to assist with entry/exit – one of which is the weekly overbought/oversold (OBOS) reading.

OBOS is currently viewed as a secondary tool to help pinpoint near-term overextension for a security by oscillating between oversold, neutral, and overbought territory. To compute an OBOS value, we take ten weeks (50 days) of price data and use that information, along with a volatility calculation, to compute a "trading band" for the security. The location of the current price on this trading band is then expressed as a percentage. If the current price reaches the top of the trading band it is 100% overbought and if it reaches the bottom, it is 100% oversold (note these can go beyond +/- 100% as we will see later). The image below helps articulate this concept:

Conventional wisdom says that we should expect greater downside risk when the indicator is in overbought

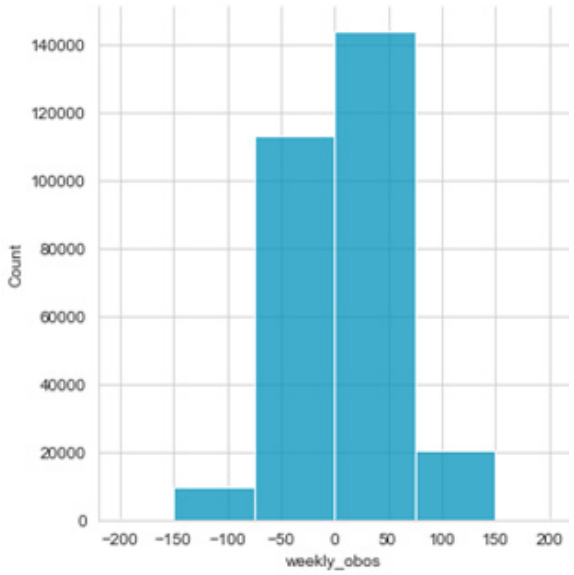


status and a similar tendency to rebound from oversold conditions. Historically, equity returns have not followed a perfectly normal distribution curve due to more frequent extreme events (fatter tails); however, the underlying assumptions about a normal probability distribution are still statistically relevant and conversationally helpful for our study.

We tested the validity of the OBOS indicator using historical performance data from the 1000 largest US-listed equities (by market capitalization) over the past 30 years (reconstituted annually). Note that the OBOS level for each stock in the universe was calculated weekly, resulting in approximately 1.56 million unique observations. We sought to answer questions like: What is an extreme overbought/oversold reading? What can we expect from stocks after they reach these levels? Does the technical attribute (TA) rating/technical strength of the underlying security impact behavior?

WHAT ARE EXTREME LEVELS? /

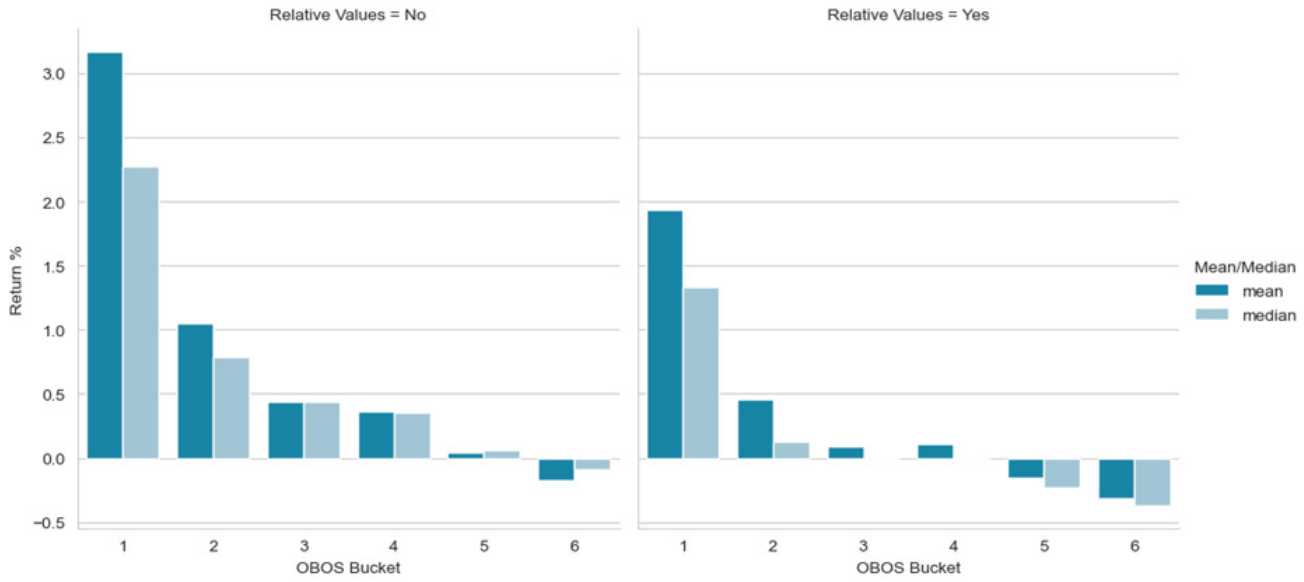
To begin, we grouped each observation into one of six buckets (-150 or lower, -150 to -75, -75 to 0, 0 to 75, 75 to 150, and 150 or higher) so we could understand the distribution of values, and, what counts as a statistically extreme reading. More specifically: Bucket 1 in the image below represents stocks with weekly OBOS values of -150 or lower, Bucket 2 contains stocks with OBOS values between -150 and -75, Bucket 3 houses stocks with OBOS values between -75 and 0, Bucket 4 contains names with OBOS values between 0 and 75, Bucket 5 houses stocks with OBOS values between 75 and 150, and Bucket 6 only holds stocks with weekly OBOS values over 150. As we can see, OBOS values loosely resemble the shape of a normal distribution with a slight rightward skew; the heavier right-tail could be partially explained by the upside bias of equity markets.



The data shows that OBOS values +/- 150% are extremely rare. Values +/- 75% were more prevalent than the +/- 150% bucket, but still far less frequent than the core -75 to +75 window, suggesting a more realizable “extreme” grouping of stocks.

BEHAVIOR AT EXTREME LEVELS /

Given the distribution of readings and general demarcation of overbought/oversold levels, we decided to analyze forward performance for each grouping. At the end of each trading week, we placed every stock into one of the six buckets based on their ending OBOS value, computed one-week and two-week returns for each name, and then averaged these returns for all six buckets independently. In addition to absolute returns, we calculated relative returns versus the S&P 500 (SPX) to see how the buckets did in comparison to the benchmark. The image below shows the results.



Data Consideration: As mentioned previously, we only took OBOS readings at the end of each trading week, but this value is computed daily – meaning that our results do not account for the potentially material intraweek movements. For example, say that it is a Tuesday afternoon and ABC stock is trading at the top of its trading band with a 100% OBOS value. On Wednesday, negative news about company ABC breaks and the stock falls 20%, closing the day beneath the middle of its ten-week trading band with an OBOS value of -20%. ABC stock does not move for the rest of the week. Other variables held constant, the study would put ABC in the -20% bucket despite its intra-week reading of 100% which preceded a material pullback in our example.

When comparing relative returns with absolute returns for each of the buckets, the biggest takeaways is that the general shapes are the same. Bucket 1 (less than -150%) has the highest returns and Bucket 6 (greater than 150%) has the worst returns - this is true for both relative and non-relative returns. Other observations include the similarity of returns in the middle two buckets (between -75% and 0%, and between 0% and 75%). Especially when looking at the relative returns with buckets 3 and 4, the data suggests little to no difference between the two.

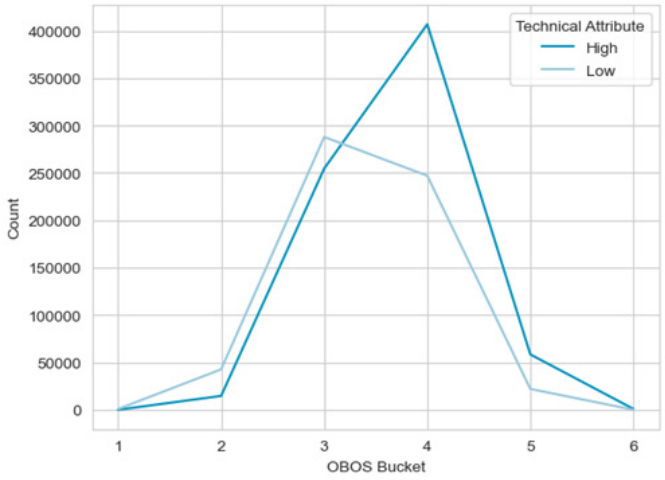
TECHNICAL STRENGTH OVERLAY /

The returns and analysis discussed up to this point considered all stocks equally (no filtering or added classification), but we know that not all stocks should be treated the same. In our Technical Attribute Stock Ranking System White Paper, we outlined the mechanics and benefits of using a rules-based, objective ranking system for evaluating individual securities. In short, stocks are rated based upon their ability to demonstrate absolute price strength (trade in a positive Point & Figure trend), relative price strength against the market (S&P 500 Equal Weight), and relative price strength against their peer group. If a stock successfully passes each of these five metrics, it is assigned a 5 rating; if a stock fails all five of these technical metrics, it is rated as a 0.

We found that allocating to stocks with higher technical attributes (rated as a 3, 4, or 5) has, historically, resulted

in greater risk adjusted returns and cumulative portfolio growth. Conversely, low technical attribute stocks (rated as a 0, 1, or 2) have exhibited greater volatility and historically underperformed their high attribute peers.

Given the knowledge of these results, we wanted to see if a stock behaved differently depending on its technical attribute rating at certain OBOS thresholds. To test this, we repeated our process by first studying the general distribution of occurrences for each attribute. Second, and perhaps more interestingly, we found that high technical attribute stocks carried larger OBOS values, on average, compared to low technical attribute names. Said differently, high momentum stocks were more likely to get and/or remain overbought compared to low momentum stocks - which makes sense given that a high momentum stock becomes classified as a high momentum stock by outperforming.

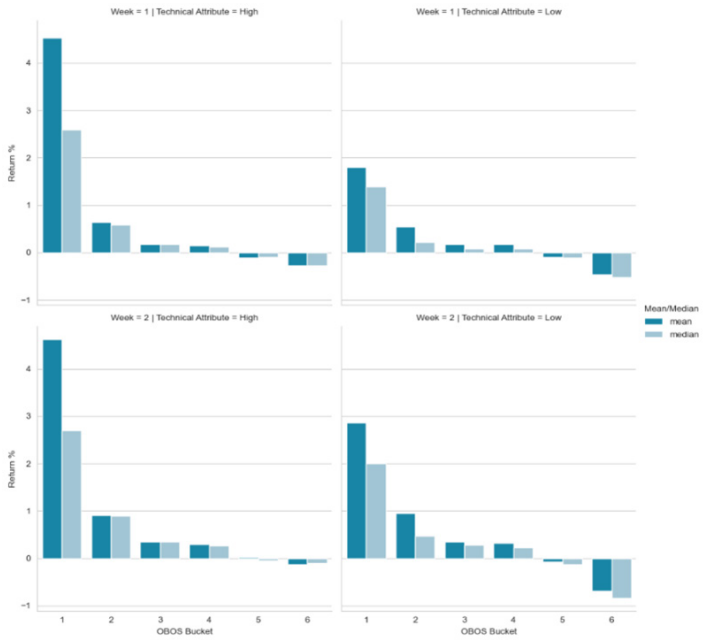


The below set of charts show returns for each of the OBOS buckets depending on whether the stocks being analyzed possessed a high or low technical attribute. For example, we took all high attribute stocks (rated as a 3,4, or 5), grouped them into a respective OBOS bucket, and then computed forward returns. On average, stocks with higher technical attributes had better returns in low OBOS situations and smaller losses in elevated OBOS scenarios.

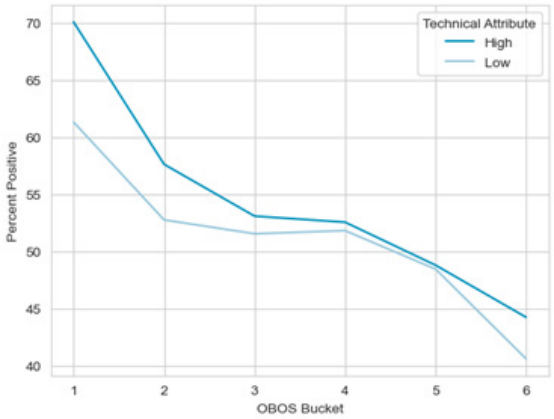
What happened if a stock changed technical attribute within the two-week study period? The best answer to this question is a reminder that we pulled data, including one-week and two-week forward returns, at the end of each week and treated the entries as independent. Admittedly this is not a perfect method, but it allowed for reconstitution.

Technical attributes seemed to matter less when viewing more “normalized” OBOS buckets such as 3 and 4, suggesting that the difference in technical attribute rating impacts behavior at the extreme OBOS readings to a greater degree.

When looking at the OBOS buckets with respect to how many of the stocks within each bucket have positive returns, the most obvious observation is that as OBOS increases, less stocks have positive one-week returns. There is a slight plateau at buckets 3 and 4, with very little difference in the percentage of stocks that are positive in each of these buckets.



However, when comparing stocks with high TA ratings to those with low TA rating, the range of percent positive is greater. With high TA stocks in bucket 1, the percent positive hits 70% while bucket 6 gets as low as 44%, leading to a range of 26%. With low TA stocks, the range is only ~20%. It is also worth noting that high TA stocks were more resilient on both ends of the spectrum.



BUCKET	PERCENT POSITIVE	TA
1	70.10	High
2	57.65	High
3	53.11	High
4	52.58	High
5	48.81	High
6	44.26	High
1	61.34	Low
2	52.78	Low
3	51.57	Low
4	51.84	Low
5	48.47	Low
6	40.63	Low

CONCLUSION /

OBOS is currently viewed as a secondary tool to help pinpoint near-term overextension for a security by oscillating between oversold, neutral, and overbought territory, and this study suggests that OBOS levels offer material perspective on stock performance, specifically mean reversion potential, over one- and two-week timeframes. The study also revealed that high momentum stocks (as defined in our Technical Attribute Stock Ranking System) tended to mean revert less frequently and severely when overbought compared to low momentum stocks, which tended to mean revert more often and severely when overbought, and vice versa.

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