

AIDV

The Average Daily Volume (ADV) of equity securities plays a major role in asset management - probably more significant than most managers realize.

When Portfolio Managers select investments, they not only take into consideration the potential growth of the investment, but they also calculate the appropriate weight of the investment in the overall portfolio. Once they have the weight, they know the number of shares needed to achieve that target weight.

The next step is to work with the trading desk and potentially a broker to plan out the execution strategy of the investment.

Enter ADV

What is ADV really? ADV is a straightforward averaging model used to predict the trading volume of a security for the upcoming trading day. The investor calculates the average trading volume of the past several trading days of a given security (usually 20, we use 21 for this study) and uses that average as a proxy for the next day's volume. They then use that forecast as a measure to plan out the investment strategy. An example best illustrates the methodology.

Ex. An investor is enamored with the new management style at AZEK Company and wants to add \$50mm to its High Growth Fund. AZEK recently closed at \$37.20, so the investor must buy 1,344,086 shares to reach the investment goal. The 20-day average volume of AZEK is 1,252,914*, so the investment is roughly 107% of the stock's ADV. In the absence of a block liquidity situation, to trade this in the market would take several days of continuous trading. The broker recommends maintaining a 10% participation rate, so it is expected the investment will take almost 11 days.

From the above example, we can see the asset management process is heavily reliant on the ADV metric. If AZEK only traded ~ 100,000 shares per day, the investment above would take much longer and would probably not be feasible (or cause significant impact). Another factor is the variability of the daily volume. If the investor sends a broker an order for 125,000 shares (10% of expected volume) and the stock only trades 600,000 shares on that day, the order will be ~ 20% of the volume and may cause unintended impact or price movement.

Being so reliant on such a simple averaging predictive model, particularly in this age of data science and AI, seems a bit archaic, and in some cases, irresponsible. Failing to accurately predict the day's volume can cause over participation (excess impact) or under participation (opportunity cost) and, over time, eat away at an investor's return.

Enter AIDV

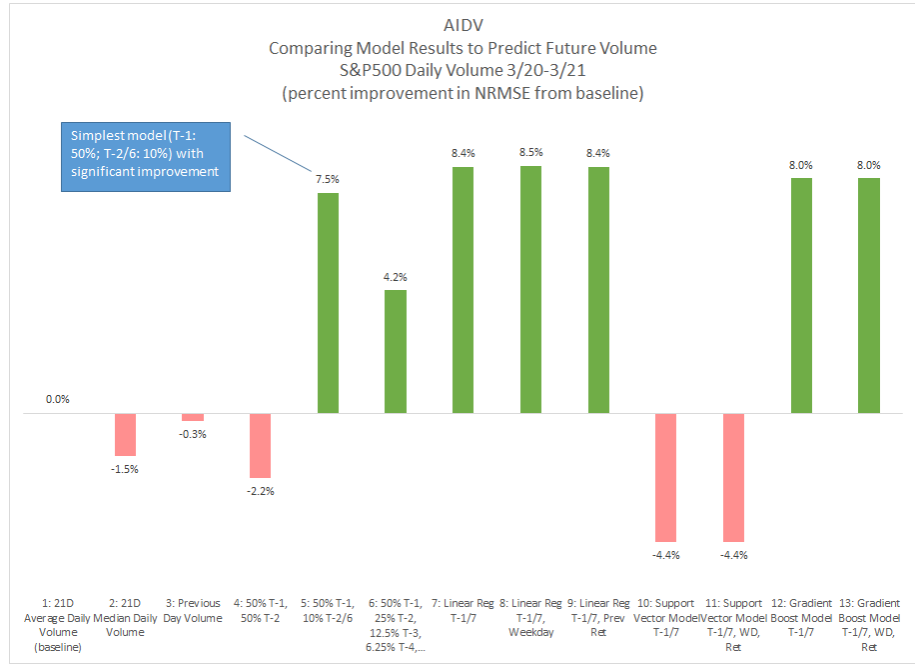
At 0 to 1 Analytics, we tested the accuracy of twelve (12) other models, from simpler, using just previous day's volume, to a much more advanced, Kaggle winning algorithm. We found, not surprisingly, that the previous

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day's volume was a significant component of predicting the next day's volume. We used the relative [normalized root mean squared error](#) (NRMSE) as a measure of accuracy with the 21-day average as a baseline.

With an 8.5% NRMSE improvement from the baseline, the most accurate model was a linear regression using the previous 7 days volume and "day of week" as independent variables. Looking at the graph, we see that neither "day of week" nor "previous day's return" had much effect on the accuracy of any model. 21-day median volume actually yielded worse results, as did the Support Vector Model.

But the Goldilocks winner, when factoring in simplicity and accuracy, was the "50-10" model or 50% of the previous day's volume and 10% of the following 5 previous days (T-2 to T-6). This model improved accuracy by 7.5% from the baseline but is remarkably simple to deploy.



While this may seem like a minor improvement in accuracy, when applied to millions of shares and billions in dollar value traded annually, the pickup in accuracy can have a major impact on returns to the end investor over time. This type of predictive improvement is worth implementing when considering an asset manager's fiduciary duty to its investor base.

Where Can I Get 50-10 Results?

At 0 to 1 Analytics, we generate the AIDV for the top 1,000 US securities using our patent pending 50-10 predictive model. Visit our website to download and learn more.

* Source: [Yahoo! Finance](#)