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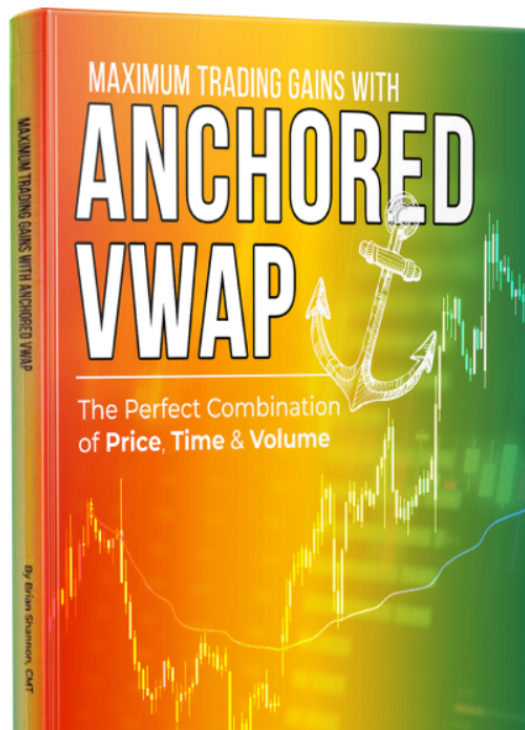
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# Anchored VWAP



## Anchoring the VWAP for better timing By Brian Shannon

This page is a detailed introduction to the Anchored VWAP, as developed by Brian Shannon.

For detailed information on how to successfully use the Anchored VWAP to improve your trading, read **MAXIMUM TRADING GAINS WITH ANCHORED VWAP**



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The Volume Weighted Average Price (VWAP) is the daily benchmark that measures the success of institutional buy and sell orders. It has been used since its introduction in 1988.

Over the last two decades, the use of VWAP as an intraday analysis tool has grown as more participants have come to recognize how institutional orders are based around the daily VWAP.



More recently, the “Anchored” VWAP (“AVWAP”) has become widely adopted as access to this tool has grown to be included in many popular charting platforms.

## Introduction

The **Volume Weighted Average Price (VWAP)** is the cumulative average price a stock traded for one day. The calculation of the VWAP begins when the market open, builds throughout the day, and concludes at the close of the session. For equities, users can choose whether to use pre/post market hours in the calculation. The daily VWAP resets at the start of each new day.

Because price is weighted by volume, not time, the VWAP is the true dollar average price for the period studied. Each share traded (by retail and institutional traders, long and short) receives equal weight in the calculation.

The VWAP is more responsive to volume trends than price action because of the volume weighting. Accordingly, as volume levels change throughout the day (the pace of trade), heavier volume periods have more impact on the movement of the VWAP, while lighter volume periods have less impact on the movement of the VWAP. The VWAP is a straightforward study. There are no settings, adjustments, or offsets to complicate its measurement.

The **ANCHORED VWAP (“AVWAP”)** is the same as the VWAP except the start point (the anchor) for the volume weighted average price calculation is set by the user at a specific meaningful point. That is, it is not simply the start of the trading day. When we start the VWAP calculation at a point other than the start of the current day it becomes “anchored” to that first point and we call it an “AVWAP.”

The AVWAP allows us to measure from any point, on any timeframe, for any interval. The trader chooses a start point to anchor the AVWAP and once it is anchored, from that point forward the AVWAP calculates the cumulative volume and price average of each transaction. The result is elegantly displayed like a traditional moving average along with price.

The “anchor point” is the most subjective part of our analysis. The AVWAP broadcasts the message of the market more clearly than any other technical tool I have studied in my 30+ year obsession with the stock market.



My book **Maximum Trading Gains with Anchored VWAP** explains in detail the AVWAP, its components, calculation, how to choose the anchor point, AVWAP strategies, and how you can use it to increase your profitability.

There are two (A)VWAP lines on this chart, the first one (light blue) is anchored to a large price movement event. Because it starts at a point other than the beginning of a new day, it is an AVWAP. The second one (dark blue) begins with the new day, this is the traditional VWAP calculation. We can measure AVWAP on any security or market where price and volume data are available. That includes individual stocks, ETFs, futures contracts, cryptocurrencies, and Forex markets.

[Watch AVWAP](#)

## VWAP History

The VWAP was first introduced to the trading community in the March 1988 Journal of Finance article, "The Total Cost of Transactions on the NYSE" by Stephen Berkowitz, Dennis Logue, Eugene Noser Jr. In that paper, the authors introduced the VWAP as a quality of execution benchmark for institutions.

The authors of the paper described the VWAP as "the volume weighted average price on any day represents the price a "naive" trader can expect to obtain." According to the authors, this benchmark measurement is the difference between the reported price of the trade, by a broker to the (institutional) client and the VWAP price during the time it took to fill the order.

If a buy order is filled above the VWAP, it is considered a bad fill and it is considered a good fill if the order was executed at a price below VWAP. If a sell order is executed below the VWAP, it is considered an unfavorable fill, whereas a sell order executed above the VWAP is a job well done.

To report an order fill at a price which is worse than VWAP brings into doubt the trading ability of the filling broker and may cause the manager to reevaluate the relationship and give their lucrative commission business to another firm. VWAP is a straightforward benchmark to compare to. You either beat it and did a good job or you failed to beat VWAP and did a bad job.

## Calculation

The average transaction price of an order over a specific period is easy to calculate, which is why the VWAP has become the standard execution benchmark.

The VWAP is the dollars traded for every transaction (price multiplied by the number of shares traded at each price) divided by the total shares traded during the period studied.

$$\text{VWAP} = \frac{\sum (\text{Share Price} \times \text{\# of Shares})}{\sum \text{Total Volume}}$$

To achieve the most accurate VWAP indicator, you want to utilize the shortest timeframe chart available without impacting the ability to see what is on the chart (too many data periods 'scrunched up' to see clearly on the chart.) Always use as short a timeframe as possible to get the most accurate measure of VWAP/AVWAP. As the candles become too compressed to see clearly, switch your analysis to the next longer/higher timeframe.

For intraday VWAP measurement, tick data is the absolute accurate number, but many platforms do not allow for such precise data, as it is resource intensive. For all but the most active of intraday scalpers, a 1-minute timeframe is short enough to understand the VWAP on an intraday basis.

## Analysis Tool

Today, the VWAP is still used in the benchmark capacity, but it has also morphed into a technical indicator that is used by discretionary and algorithmic market participants of all timeframes.

The AVWAP shows us the genuine relationship between price and volume over any time period. It shows us which side is in control, and gaining or losing control of the trend, the buyers (bulls), or the sellers (bears)?

Our job is to "objectively listen to the message of the market" for the timeframe we wish to engage in our trades. The AVWAP provides as much certainty as we can hope for in the study of price action.



- ▶ When a stock is above an advancing AVWAP, buyers are in control for that timeframe, as the average price is increasing.
- ▶ When prices are below a declining AVWAP, sellers are in control because the



This one-minute chart shows two different (A)VWAP levels. The purple (1) is the standard VWAP from the beginning of the day, the green (2) is from the low of the day made just after 11AM. The daily VWAP is easy to determine, the second AVWAP is drawn in only after it is obvious that it was an important low. Notice how the AVWAP anchored from the low was a level that was defended by buyers (acted as support) just after 2PM and again before the close (green arrows).

The AVWAP is determined, and moves not just based on a two-dimensional component of price and time that is common to traditional moving averages. Instead, it also takes into consideration the amount of trading activity (volume) associated with that time. It is the combination of price, time, and volume that makes the AVWAP so powerful.

The way the AVWAP combines price, volume, and time into one easy to understand indicator provides a blended view of whether it is the buyers or sellers who are; in control, losing, or gaining control of price action from any point.

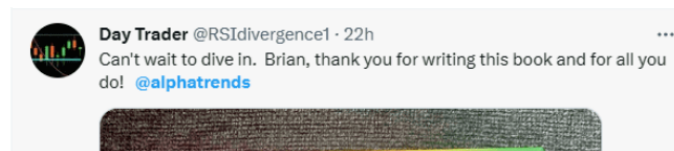
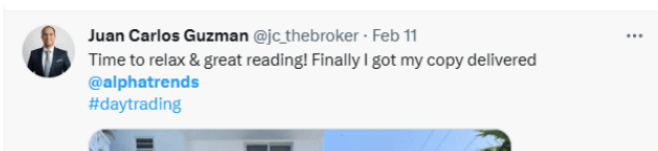
This information allows us to better; time our entries, cut our losers, hold our winners, or just to stand aside and let market action play out further before we decide to get involved.

average price is declining.

- When prices oscillate above and below the AVWAP it indicates indecision for that timeframe.

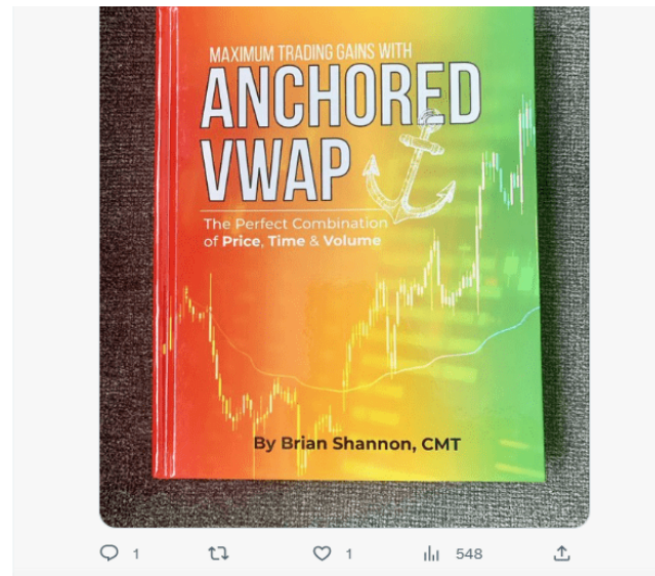


This daily chart shows how the sellers gained control of the trend in late January after the AVWAP from the December low broken and then offered resistance in early February (1). As the year progressed, price bounces in July (2) and September (3) were overwhelmed by supply near the declining AVWAP. As the AVWAP became a battlefield in October (4), the buyers were slowly regaining control as the AVWAP flattened out. At (5) the buyers had regained control as the price surged above the flat AVWAP. Always be aware of where the price is in relation to the AVWAP and the direction of the AVWAP for evidence of who has control of the trend, the buyers, or sellers.





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## Trend Recognition

All moving averages "slow down" when more data is brought to the equation. The "speed" of the AVWAP is determined by price, time, and volume. The biggest impact on AVWAP is the volume.

Each trading day begins at 9:30 AM Eastern, that is when the "regular hours session" begins. This first piece of price information is a natural place to begin our AVWAP measurement. An AVWAP can start at the beginning of a day, like the VWAP, but it will be calculated for longer than just one day. As trading continues through the day, the AVWAP builds, and we see trends develop around it.

The first things we want to be aware of include:

- ▶ Is the price above or below AVWAP?
- ▶ What is the direction of AVWAP?
- ▶ What is the slope of the AVWAP?

- Has price crossed above or below AVWAP?
- How does this tie in with a larger timeframe?
- How does price progress throughout the day?
- Does price find support or resistance at AVWAP?
- Does price break AVWAP support, which then turns to resistance, or vice versa?

While we really want to use AVWAP as a reference point (level of interest), it is surprising how often the exact VWAP/AVWAP level will halt a retracement of the prevailing trend. This tends to be more noticeable on shorter timeframes.



When prices are above a rising AVWAP the trend is “innocent until proven guilty”. When prices are below the declining AVWAP the trend is considered “guilty until proven innocent”, regardless of the timeframe.



The AVWAP calculation begins at the first datapoint (1). If you study a chart on a two-minute time frame, as in the chart above the AVWAP starts at the first trade of the day and builds with each new data point. The moving average (it is the cumulative average which moves with the introduction of new data) visually represents the combination of Price, Volume and Time elapsed. Notice how the AVWAP first acted as resistance (red arrows) and then later became support (green arrows) in the afternoon.

## Price, Volume & Time

Study of market action with AVWAP begins with a study of the three components of an auction market: price, volume, and time.

Price is how we keep score, it is how we determine the success or failure of our trades or investments, there is nothing subjective about its measurement. As I like to say, “Only Price Pays!”

Volume is the fuel that causes the price to change. For price to be transacted and recorded, there must be an agreement made between the buyer and seller. It is said that “volume is the cause and price is the effect.”

One of the most common questions about volume is whether the volume was buying or selling? Well, of course, it is both. For every buyer, there is a seller and vice versa. What we really want to know is “who is more aggressive and who is in control,” the buyers or sellers? AVWAP allows us to objectively answer that question quickly and objectively based on the slope of the AVWAP.

The more volume that trades at a certain price level, the greater the weighting (and more impact) that price has on AVWAP. Traditional volume analysis tells us that price should expand in the direction of the trend and diminish on retracements. These guidelines help us determine if the demand expands with price or if

it contracts then we should be alert to the potential of reversal. The AVWAP shows us the true relationship and who (buyers or sellers) have control from any anchor point.



The chart above shows 4 days of trading in a stock. On the left the daily candles with the largest two volume days occurring on down days. This is traditionally interpreted as bearish. On the right is the same 4 days constructed with 15-minute candles, the purple VWAP is anchored from the first day. The AVWAP on the right shows that even with the larger volume on down days, the buyers were in control for all but the first day. When the slope of the AVWAP is higher, it indicates buyers are in control. Also, notice how the AVWAP initially offered resistance (red arrows) and then became support (green arrows).

Time is a constant, it cannot be changed or manipulated. Time is how we organize market data. Time is defined as "a limited period or interval, as between two successive events."

Each day the US equities markets are open (excluding pre- and post-market trading) for a period of 6.5 hours. The trading day starts at 9:30AM and business concludes at 4PM Eastern. The trading week is Monday through Friday, the trading year is the first business day in January, and it ends on the last business day in December. These time segments are fixed units that allow us to organize data in a consistent way.

The anchored VWAP allows us to study the combination of price and volume from any point, it is not constrained by a clock or calendar. We can fix our anchor from meaningful market events, not just fixed time periods. This gives us the opportunity to measure supply and demand accurately and objectively from important market events.

At its root, the VWAP is a sentiment indicator. Sentiment attempts to quantify a nebulous concept of the collective psychology of the market participants. The problem with most sentiment indicators is how difficult to accurately measure what people say they are doing in the markets versus what they are actually doing with their money. The AVWAP allows us to measure true crowd behavior in terms of actual supply and demand, rather than opinion, from any point, on any timeframe.





When the Federal Reserve Open Market Committee (FOMC) announces any change in monetary policy, it typically results in immediate and large market volatility. The charts above show 5-minute candles for trading in the SPY and QQQ. The AVWAPs on these charts are anchored from 2:00 PM Eastern (1) when the Fed announcement is made. Notice how these VWAPs from “the event” found sellers over the coming two days.



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