

# Volume-Weighted Average Price (VWAP): Definition and Calculation

By [JASON FERNANDO](#) Updated September 03, 2025

Reviewed by [SOMER ANDERSON](#)

Fact checked by [VIKKI VELASQUEZ](#)

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## DEFINITION:

The volume-weighted average price (VWAP) is a technical indicator that calculates a security's average price for the day, weighted by trading volume, to analyze price trends and liquidity.

## What Is the Volume-Weighted Average Price (VWAP)?

The volume-weighted average price (VWAP) is a technical analysis indicator used on intraday charts that resets at the start of every new trading session. It's the average price a security has traded at throughout the day, based on both volume and price.<sup>[1]</sup>

VWAP is important because it provides traders with insight into both the price trend and value of a security.

### KEY TAKEAWAYS

- The volume-weighted average price (VWAP) appears as a single line on intraday charts.
- It looks similar to a moving average line, but is smoother.
- VWAP represents a view of price action throughout a single day's trading session.
- Retail and professional traders may use the VWAP to help them determine intraday price trends.



Credit: Investopedia / Jiaqi Zhou

## Understanding the Volume-Weighted Average Price (VWAP)

VWAP is calculated by totaling the dollars traded for every transaction (price multiplied by the [volume](#)) and then dividing by the total shares traded. This can be described in a formula such as the following:

$$\text{VWAP} = (\text{Sum of (Tick Price} \times \text{Tick Volume)}) / \text{Trading Volume}$$

However, not all traders have a data source that gives them this level of information. Traders and chart vendors often use a substitute formula designed to get close to VWAP.

### Formula

Popular charting packages typically use a formula for closely approximating VWAP, such as:

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Typical Price = High price + low price + closing price / 3

Cumulative = Total trades since the trading session open

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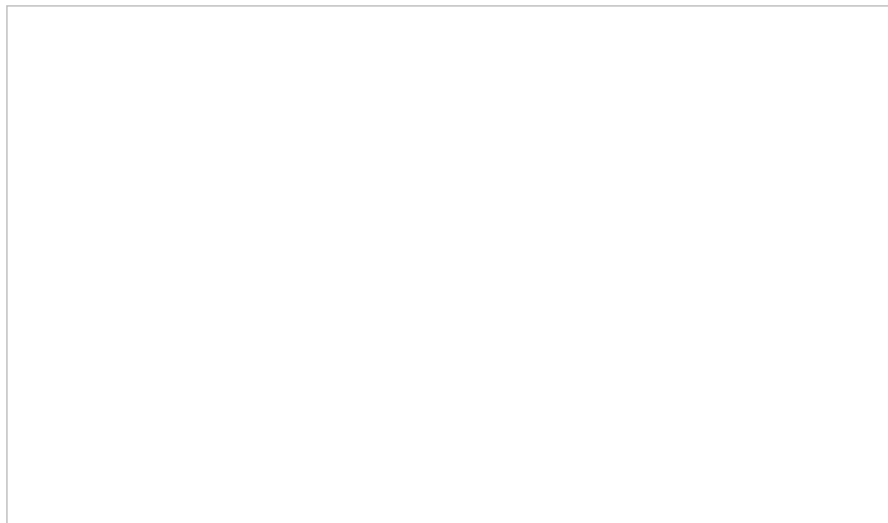
## How to Calculate VWAP

By adding the VWAP indicator to a streaming chart, the calculation will be made automatically. However, to calculate the VWAP yourself, follow the steps below.

Assume a five-minute chart. The calculation is the same regardless of what intraday time frame is used.

1. Find the average price the stock traded at over the first five-minute period of the day. To do this, add the [high, low, and close, then divide by three](#). Multiply this by the volume for that period. Record the result in a spreadsheet, under column PV (price, volume).
2. Divide PV by the volume for that period. This will produce the VWAP.
3. To maintain the VWAP throughout the day, continue to add the PV value from each period to the prior values. Divide this total by the total volume up to that point.

To make Step 3 easier in a spreadsheet, create columns for cumulative PV and cumulative volume and apply the formula to these figures.



TradingView.

## How Is VWAP Used?

VWAP is used in different ways by traders. Traders may use it as [a trend confirmation tool](#) and build trading rules around it. <sup>[2]</sup> For instance, they may consider stocks with prices below VWAP as undervalued and those with prices above it as overvalued. If prices below VWAP move above it, traders may [go long](#) on the stock. If prices above VWAP move below it, they may sell their positions or initiate [short positions](#).

[Top Stories](#) Inflation Just Ticked Up Again—Protect Your Savings Fast    Are You Ready for the Fed actions push the price back toward the average, instead of away from it.

## Note

*VWAP's incorporation of volume is valuable to traders for what it can indicate about the degree of trading activity during short periods of time—whether the competition is taking or exiting positions.*

## VWAP vs. Simple Moving Average

On a chart, VWAP and a [simple moving average \(SMA\)](#) may look similar. However, these two indicators are calculated differently and represent different results.

VWAP is calculated by multiplying the typical price by volume and then dividing by total volume. <sup>[2]</sup>

A simple moving average incorporates price but not volume. The SMA is calculated by totaling [closing prices](#) over a certain period (say, 10 days) and then dividing the total by the number of periods (e.g., 10). <sup>[3]</sup>

## Limitations of VWAP

1. VWAP is a single-day indicator and restarts at the opening of each new trading day. Attempting to create an average VWAP over many days could distort it and result in an incorrect indicator.

2. While some institutions may prefer to buy when the price of a security is below the VWAP or sell when it is above, VWAP is not the only factor to consider.

In strong uptrends, the price may continue to move higher for many days without dropping below the VWAP at all or only occasionally. Therefore, waiting for the price to fall below VWAP could mean a missed opportunity if prices are rising quickly.

3. VWAP is based on historical values and does not inherently have predictive qualities or calculations. VWAP is anchored to the opening price range of the day. Therefore, the indicator increases its lag as the day goes on.

This can be seen in the way a one-minute period VWAP calculation after 330 minutes (the length of a typical trading session) will often resemble a 390-minute moving average at the end of the trading day.

## What Does the VWAP Tell You?

The VWAP can inform traders about a stock's liquidity and indicate at what price buyers and sellers agree. Traders can use it to monitor a stock's price

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volume, over time. In addition, it is used by institutional traders to ensure that their trades do not move the price of the security they are trying to buy or sell too extremely.

For example, a hedge fund might refrain from submitting a buy order for a price above the security's VWAP, in order to avoid artificially inflating the price of that security. Likewise, it might avoid submitting orders too far below the VWAP, so that the price is not dragged down by its sale.

### Is VWAP a Leading Indicator?

No, VWAP is not a leading indicator. It is a lagging indicator because it uses historical data. No real-time data is used to calculate VWAP. Therefore, it only has specific uses and does not help traders who need up-to-the-minute data.

### The Bottom Line

VWAP is a technical analysis indicator used by traders during single trading sessions to determine the average price of a security, which is based on price and volume. It can provide traders with insight about liquidity and price movement during the day.

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