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# Technical Analysis Essentials

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# FUNDAMENTAL ANALYSIS


**“The roots of education are  
bitter, but the fruit is sweet.”**

*Aristotle*





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# What is Fundamental Analysis?



Fundamental analysis is a method of evaluating the **intrinsic value** of a security. It is done by studying macro factors like the overall industry and economy state, as well as micro factors like revenues, profits, and expected growth. The goal is to produce a number that can be compared with the current price of the security to understand whether it is overvalued or undervalued.

As opposed to the technical analysis used for observing short-term trends, fundamental analysis is usually applied by traders who are looking for **long-term investment**.

Investors employing fundamental analysis tend to draw information from economic news, government reports, and company financial statements.

# Economic Calendar

Investors use an economic calendar to monitor events that have a high probability of impacting the financial markets, like interest rate decisions, payroll numbers, changes in the gross domestic product, and the consumer price index.

Each day in the calendar lists multiple **influential events** in chronological order so that traders would be able to research and prepare. Every event has a **volatility level** that indicates the likelihood of that event impacting the markets. Usually, there are three levels, the highest of which means the event is expected to have a significant impact, while the effect of the other two will depend on other factors.



# TECHNICAL ANALYSIS



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# What is Technical Analysis?

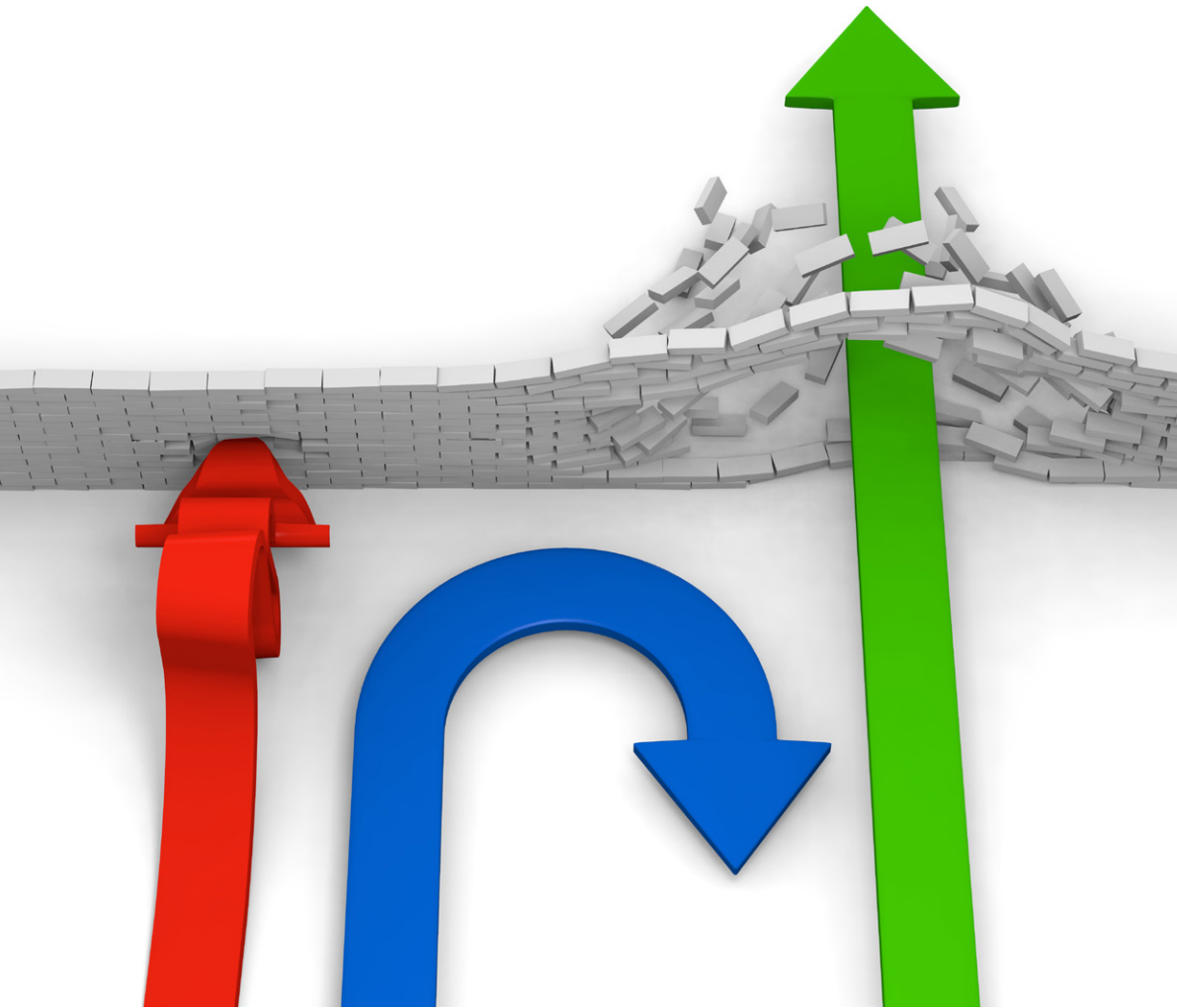
Technical analysis is a method of attempting to **forecast** future price movements based on a security's historical data. The assumption is that the price is subject to crowd psychology, which makes it move in identifiable patterns. The key factors to be analyzed are price movements and volume.

Multiple **technical indicators** have been developed by analysts over time. Some are focused on recognizing the current trend, while others help determine the strength of the trend. The most common indicators of trend trading are:

- Moving Averages
- RSI
- MACD
- Bollinger Bands



# Support and Resistance



A **support** level is where a price has the propensity to stop and bounce back when it **falls**. On the other hand, a **resistance** level is where a price is likely to bounce off when it **rises**. The more a price touches a level and bounces back, the stronger that level becomes.

Once a price breaches a support level, that level often becomes the new resistance level. The same concept applies to breaking out of a resistance level.

People tend to consider round numbers as psychological barriers, so trading history shows that support and resistance levels can often occur at **round numbers**, like \$50, \$60 or \$100.

# Trend

An excellent way to start with technical analysis is to understand trend patterns. Trend trading is a strategy of buying a security when its price trend goes up or selling when it goes down, assuming that price movements will continue. Investors close their positions only when they expect a reversal.

There are two kinds of trends. An **uptrend** occurs when a price is gradually **rising** and is expected to continue growing. Downtrends are the opposite of uptrends and are associated with the **bearish** market.

Before a **reversal** breaks a trend, there is often a sideways pattern in-between. It is when the price goes relatively flat for a period, indicating the absence of a trend. However, an investor should be careful not to mistake small ups and downs for a reversal, as they are common for any trading price.



# Trend



Each trend consists of four stages. The first stage is **consolidation**, which occurs when the price bounces up and down in a sideways pattern, not knowing which way to go next. Then there is the **breakout** when the price goes beyond the support or resistance line. That is the earliest entry opportunity for a trader. The third stage is the **continuation**. It occurs when price continues to go in the same direction. The last stage is always **exhaustion**. The price begins to move in a sideways pattern or completely reverses direction.



# Chart Time Frame

Using a suitable time frame is an essential part of trading, yet there is no single answer for everyone. That is because usually, an investor uses **several** time frames, depending on their trading style. First, they try to find a trend by observing the main time frame they are interested in, then choose a time frame above and below it to verify it.

A **swing trader**, who focuses on the daily charts, would look for the primary trend in a weekly chart, then choose a 60-minute time frame to recognize the short-term trend.

A **day trader** could use a 60-minute chart to find the main trend and a 5-minute chart to seek a current trend.

A **long-term investor** could use a 1-week time frame to find a trend, a monthly chart to confirm it and a daily chart to choose an entry point.

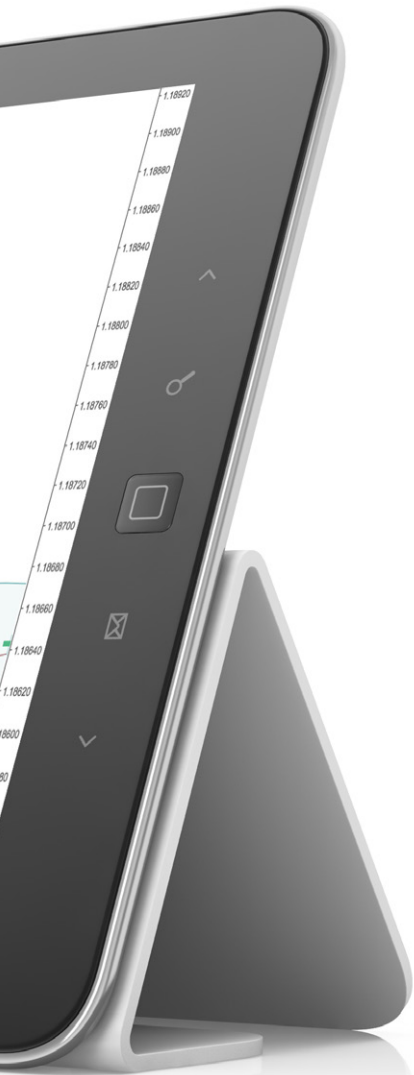
Investors should keep in mind two things. First, the **smaller** the time frame, the more the chart is polluted with **noise** in the form of insignificant ups and downs. Second, it is common for a security to be in an **uptrend in one time frame** and in a **downtrend in another**.



# INDICATORS



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# What's a Technical Indicator?

$$\bar{p}_{SM} = \frac{p_M + p_{M-1} + \cdots + p_{M-(n-1)}}{n} = \frac{1}{n} \sum_{i=0}^{n-1} p_{M-i}$$

$$CMA_{n+1} = \frac{x_{n+1} + n \cdot CMA_n}{n + 1}$$

$$\begin{aligned} CMA_{n+1} &= \frac{x_{n+1} + n \cdot CMA_n}{n + 1} \\ &= \frac{x_{n+1} + (n + 1 - 1) \cdot CMA_n}{n + 1} \\ &= \frac{(n + 1) \cdot CMA_n + x_{n+1} - CMA_n}{n + 1} \\ &= CMA_n + \frac{x_{n+1} - CMA_n}{n + 1} \end{aligned}$$

A technical indicator is a **mathematical calculation** employed by traders to predict future price movements based on historical price and volume data. Indicators either **overlay** on price chart data, like Moving Averages and Bollinger Bands, or they are shown **below or above** the chart, like MACD and RSI. Those that are added outside the chart are called oscillators.

An important thing to remember is that experienced investors tend not to make decisions based on a signal from one indicator. They usually **confirm with at least one other** technical indicator to make sure it is not a false positive.



# Moving Average

A moving average is a widely used indicator that removes random price fluctuations in order to recognize the **trend direction** and identify **support and resistance** levels.

The basic type of a moving average is called a **Simple Moving Average**. It represents the arithmetic mean of the closing prices from a specified number of days. For example, the 10-day moving average is calculated by adding the closing prices from the past 10 days and dividing that sum by 10.



# Moving Average



Traders often use Simple Moving Averages for **20 days, 50 days and 200 days**.

When a security price is **above its 20-day** moving average, it is a sign of a **short-term uptrend**. If it is below the moving average, then the price is in a short-term downtrend.

When the price is **above its 50-day** moving average, it is considered to be a **relatively strong uptrend**. On the other hand, the price being below the moving average is a sign of a downtrend.

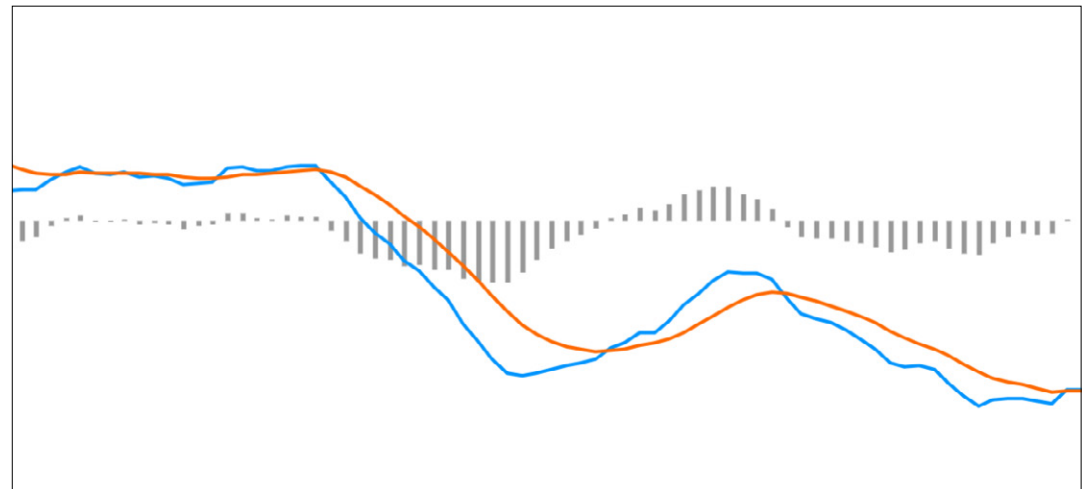
The **200-day** moving average is **rather insignificant** as it takes too long to turn.

Overall, the strongest signal of an uptrend is having the **20-day above the 50-day, which is above the 200-day**. If the order is flipped the opposite way, that would indicate a strong downtrend.

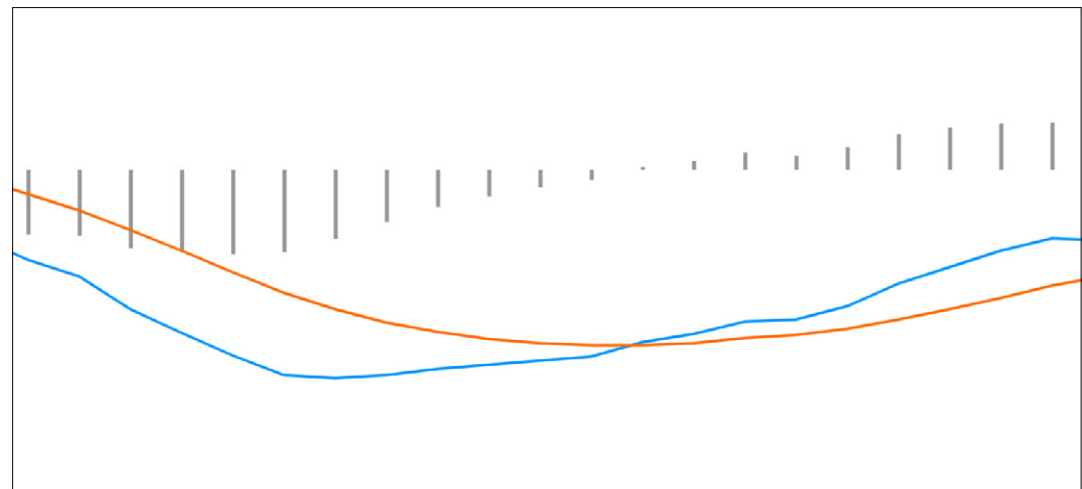
Besides a simple moving average, another popular type of this indicator is an **Exponential Moving Average**. It has a rather complicated formula and gives more weight to recent prices.

# MACD

MACD is an acronym for “Moving Average Convergence Divergence.” It is a trend-following indicator that shows a **histogram** based on the difference between two lines: the MACD line and the signal line. The MACD line is calculated by subtracting a 26-day exponential moving average from a 12-day exponential moving average. The signal line is a 9-day exponential moving average of the MACD itself. The histogram gets **bigger as the two lines diverge** and it **disappears when they cross** each other.



When the **MACD crosses the signal line**, it is perceived as the start of a **new trend**. Falling below the signal line indicates a signal to sell, while rising above it suggests it is time to buy.

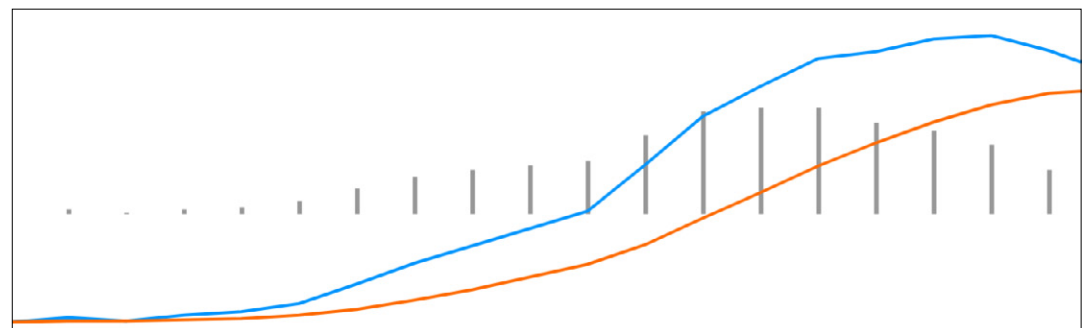


# MACD

If the security price starts to move in a **direction different from the MACD**, a **reversal** of the current trend is likely to occur.

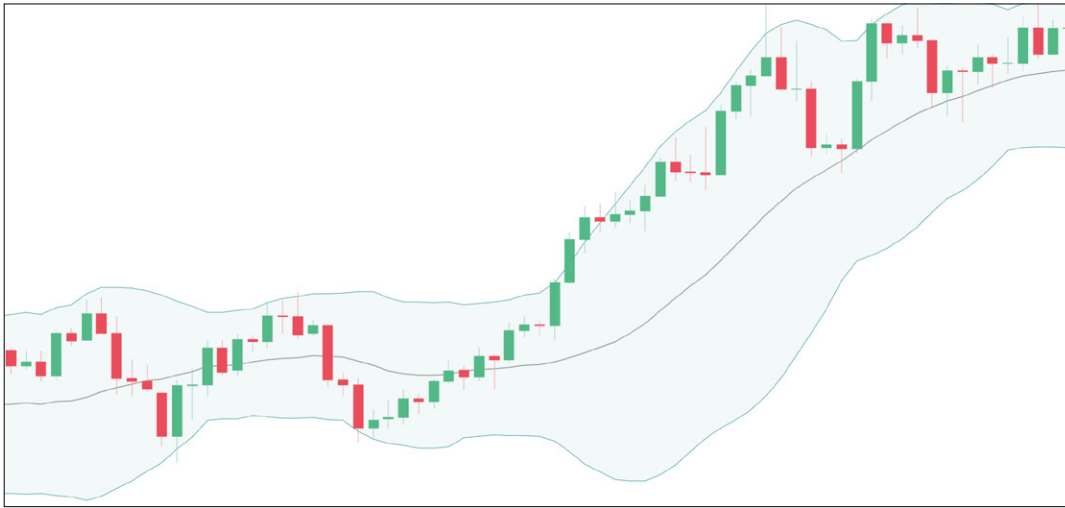


Sometimes, an investor might see a **rapid rise** of the MACD, which indicates that the asset is currently **overbought**, but will soon return to the average volume.

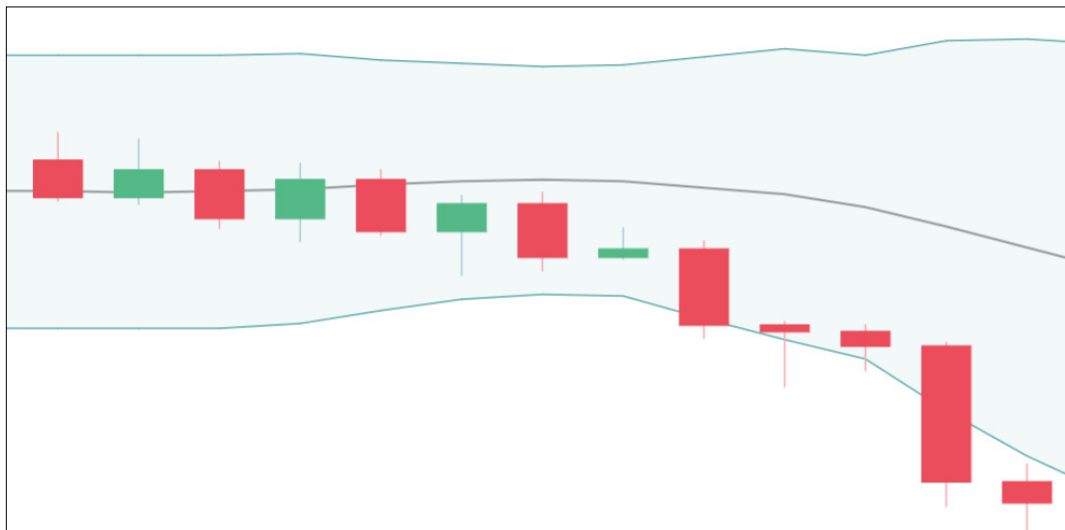




# Bollinger Bands



Bollinger Bands® are an indicator of **volatility** that was developed by technical analyst John Bollinger. It places two bands above and below a moving average. When they **narrow**, it means the market is quiet and a sharp price move in either direction becomes more likely. If the bands **widen** significantly, the increased volatility might indicate the end of an existing trend.



Almost all price movements occur between the two bands, so when a breakout happens, some traders consider it a trading signal. Others think that is a misconception and do not believe that breakouts imply the price is going to continue in that direction.

# Bollinger Bands

Bollinger Bands® are **not meant to be used as a standalone indicator**, as they only provide information on volatility. It is advised to complement them with two or three momentum and volume indicators, like MACD and RSI.



# RSI

RSI stands for “Relative Strength Index.” It is a momentum oscillator that measures the **velocity** and **magnitude** of price movements on a scale from 0 to 100. When the index is at 70 and above, it is traditionally considered overbought, while 30 and below is looked upon as oversold.

RSI can be used to **confirm trends**. If a downward trend is occurring, the index should be found fluctuating between 10 and 50. When the RSI breaks out of that level, it often corresponds with the breakout of the price as well. The same goes for an uptrend, except that the index moves between 50 and 90.



# RSI

If the RSI line and the price line both experience trends, but in the opposing directions, that **divergence** can signal a price **reversal**. Although, it must be noted, that when a trend is strong, divergences are likely to appear without breaking the trend.



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