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Sofien Kaabar, CFA [Follow](#)Jun 30, 2021 · 19 min read · + · [Listen](#)[Save](#)

Developing a Full Discretionary Trading System from Scratch.

An Example of a Full Manual Technical Trading System.



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that will inevitably confuse us and will lead us to trouble. The solution to this is to develop a clear system of trading with rules based on layers that need to be respected. In this article, a technical framework is presented for a trading system.

It is worth-mentioning that by technical, the focus is therefore on technical analysis. A complete trading framework must imperatively take into account fundamentals, however, as that would be too long to discuss, we can leave it to another article. At the moment, the focus is on the technical and sentiment part. The technical trading framework proposed below is composed of the following:

- **Price Action Analysis:** This is where charting techniques are applied in order to project the market's direction and levels. The price action technique we will be using is pivot points analysis.
- **Trend Analysis:** This is where we include moving averages to confirm the levels found in the first step. It is also the step where we determine whether the market is trending or ranging so that the next level can be used well.
- **Indicator Analysis:** Contrarian indicators work better in ranging markets, therefore, if the last step determines that the market is ranging, more weight can be given to this step. The indicator discussed here is the Relative Strength Index.
- **Pattern Recognition:** Timing patterns can add to the conviction of the trade. The Fibonacci Timing Pattern will be discussed in this section.
- **Sentiment Analysis:** An extremely important step in any type of analysis is to understand the positioning of other big players so that we make sure we are on the right side. If major hedge funds are preparing to buy the asset, we have to be careful if we have a bearish bias.
- **Risk Management:** After doing the proper research, we need to calculate and measure our risk accordingly so that we survive over the long-term.

I have just published a new book after the success of *New Technical Indicators in Python*.



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The Book of Trading Strategies

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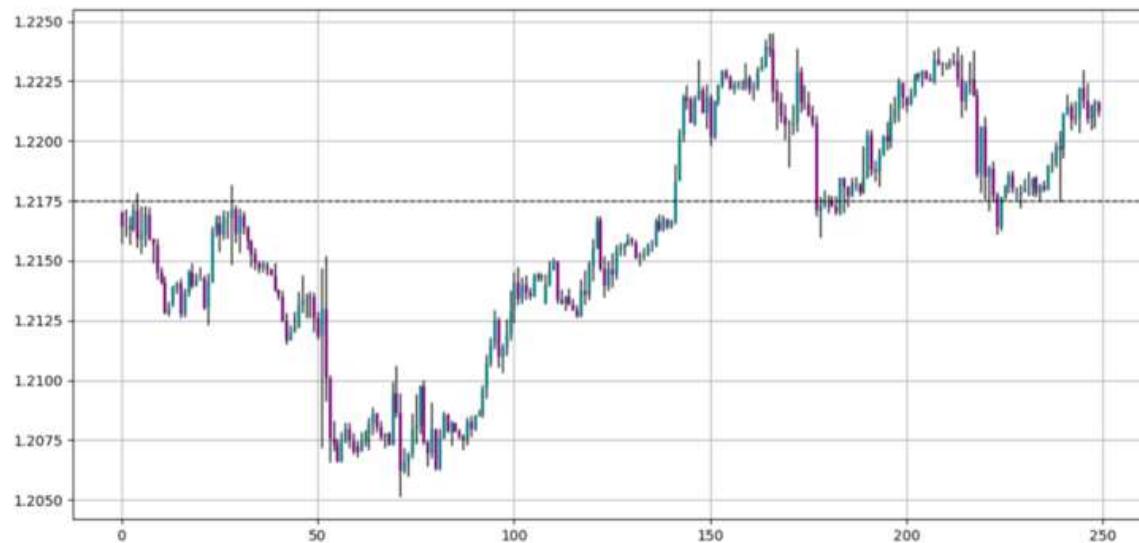
Price Action Analysis

Price action analysis is the pillar of technical analysis and is the basis of any quality research. It can be composed of graphical charting such as drawing support and resistance levels, it can also be composed of Fibonacci levels, and pivot points which will be discussed in this section as an example of a component in the trading framework.

Price action trading is based purely on price rather than its derivatives such as technical indicators. It enjoys a huge advantage in that it is not lagging. Price is what is happening right now and is either leading or coinciding but never lagging. Price action is all about detecting patterns and finding support and resistance levels. One way to do this is through simple mathematical calculations referred to as Pivot Points.

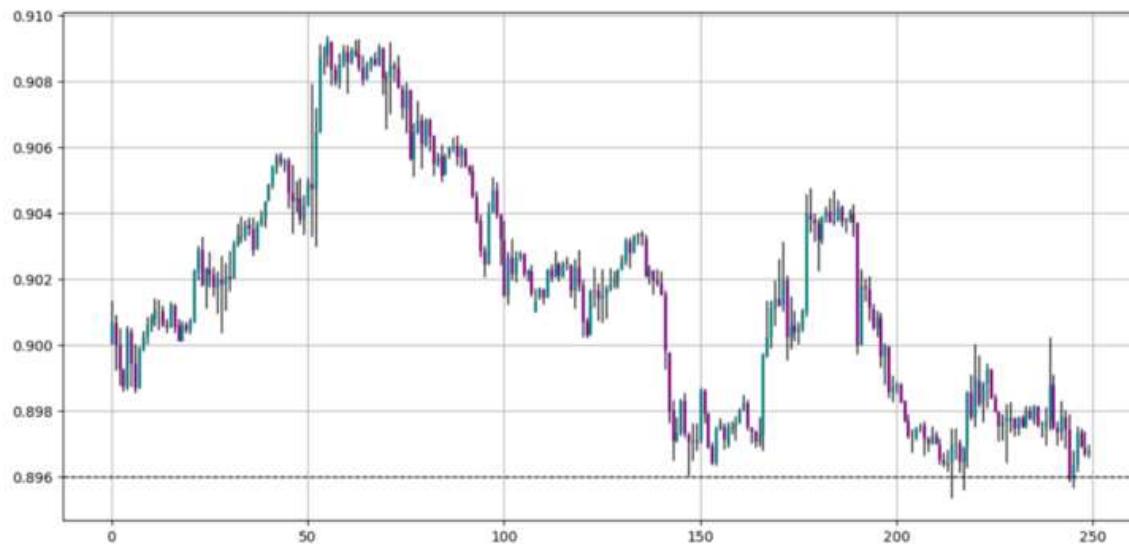
At its purest form, a support level is an area supposed to keep prices from going down further. Naturally, when the market price approaches a support area, the right decision is to have a bullish bias.



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EURUSD hourly values showing 1.2175 acting as resistance before it turned support.

A resistance level is an area supposed to keep prices from going up further. Naturally, when the market price approaches a resistance area, the right decision is to have a bearish bias.



USDCHF hourly values showing 0.8960 acting as a support level.



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levels on a monthly and on a yearly basis. For example, on the first day of January, a trader might calculate the projected support and resistance levels using last year's values. The formulas and types of Pivot Points will be discussed below.

Normal or Classical Pivot Points are the most widely used type. They can be calculated following these formulas. Note that the most important levels are the Pivot Point and the first support/resistance levels. We know how to use the latter but what about the former? What is a Pivot Point and how is it used? Basically, it can be used as a magnet where the market should revert back to it in case it deviates away. Another method is to use it as the profit level where after initiating a reversal position, we can target the Pivot Point as an exit.

$$\text{Pivot Point} = \frac{\text{High} + \text{Low} + \text{Close}}{3}$$

$$\text{First Support} = (\text{Pivot Point} \times 2) - \text{High}$$

$$\text{Second Support} = \text{Pivot Point} - (\text{High} - \text{Low})$$

$$\text{Third Support} = \text{Low} - 2(\text{High} - \text{Point Pivot})$$

$$\text{First Resistance} = (\text{Pivot Point} \times 2) - \text{Low}$$

$$\text{Second Resistance} = \text{Pivot Point} + (\text{High} - \text{Low})$$

$$\text{Third Resistance} = \text{High} + 2(\text{Pivot Point} - \text{Low})$$



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Calculating Pivot Points on the USDCAD hourly values.

The plot above shows the USDCAD hourly values where the calculation period is the previous day. We take the high, low, and close of the previous day, apply the above formulas and get the support and resistance levels. The zone in light grey above shows the trading zone where we already have the defined support at 1.2030 and the defined resistance at 1.2100.

Basically, when the market closed the previous day, we had the following HLC data:

- **High = 1.20950**
- **Low = 1.20275**
- **Close = 1.20650**

Following the above formulas, our Pivot Point should be 1.2062 and the first support should be 1.2030. The first resistance is 1.2100.

If we take an example for this article such as the USDJPY and calculate yearly pivot points so that we project long-term points, we will use the High, Low, and Close prices of the year 2020 which are:



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- Close = 103.250

Giving us a support level at 99.00 and a resistance level at 110.00 which according to the chart below is getting tested.



USDJPY Weekly chart.

This can mean that we are around resistance level and can go lower, but we must be careful as a first reaction around it has already been seen. Price action analysis can be done in many ways and must be combined by other timing and technical tools so that it provides better reactionary signals. Pivot points is a must in the trading arsenal.

Trend Analysis

Moving averages help us confirm and ride the trend. They are the most known technical indicator and this is because of their simplicity and their proven track record of adding value to the analyses. We can use them to find support and resistance levels, stops and targets, and to understand the underlying trend. This versatility makes them an indispensable tool in our trading arsenal.



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EURCAD with its 200-period Moving Average.

As the name suggests, this is your plain simple mean that is used everywhere in statistics and basically any other part in our lives. It is simply the total values of the observations divided by the number of observations. Mathematically speaking, it can be written down as:

$$SMA = \frac{A_1 + A_2 + \dots + A_n}{n}$$

- **Main strengths:** Followed heavily by traders across the world thus benefitting from the fact that reactions are more likely to occur than on other moving averages.
- **Main weaknesses:** Lagging and slow to react to quick moves.



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USDJPY Weekly chart with its long-term moving average.

The chart above is the same as the chart seen in the Price Action section where it shows that the pair might be under resistance from its long-term moving average thus adding some downside pressure. Note however, that this is not a prediction nor investment advice. I have absolutely no opinion nor directional bias on the direction of the USDJPY in the short-term and the long-term. The example is purely for educational purposes only.

Visually, the market seems to be ranging and therefore, the next step may be relevant for the analysis.

If you are interested in seeing more technical indicators and back-test, feel free to check out the below article:

Moving Average Zone Trading Strategy.

A Reactionary Technical Trading Strategy in Python.

[kaabar-sofien.medium.com](https://kaabar-sofien.medium.com/moving-average-zone-trading-strategy-a-reactionary-technical-trading-strategy-in-python-33e0a2a2ca5a)



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We will discuss the Relative Strength Index, the most famous indicator out there where it gives out contrarian signals and is best used during ranging markets.

The RSI is without a doubt the most famous momentum indicator out there, and this is to be expected as it has many strengths especially in ranging markets. It is also bounded between 0 and 100 which makes it easier to interpret. Also, the fact that it is famous, contributes to its potential. This is because the more traders and portfolio managers look at the RSI, the more people will react based on its signals and this in turn can push market prices. Of course, we cannot prove this idea, but it is intuitive as one of the basis of Technical Analysis is that it is self-fulfilling.

The RSI is calculated using a rather simple way. It is based on the idea of normalizing the smoothed momentum. The steps are therefore:

- We must calculate the difference between the current closing price and the previous closing price.
- Create two columns where the first column has the positive differences and the second column has the absolute values of the negative differences.
- Calculate an n-period Smoothed Moving Average on the columns.
- Divide the smoothed positive differences by the smoothed absolute negative differences. This is called the Relative Strength — RS.
- Apply the below normalization formula to get the Relative Strength Index.

$$RSI = 100 - \frac{100}{1 + RS}$$



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USDJPY Weekly chart with its 14-period RSI.

Clearly, there is not much value added here since the RSI is not on its resistance level. It is however close to it, but still not a good conviction enhancer. The step did not provide much value to the analysis. To sum up so far, we have:

- A USDJPY at resistance according to the Pivot Points Price Action analysis.
- A USDJPY at its moving average resistance according to the Trend analysis.
- A USDJPY in the middle of nowhere when it comes to the RSI.

Pattern Recognition

The Fibonacci Timing Pattern combines time, price, and the Fibonacci sequence in order to show whether they provide reversal points or not. Here is the basic intuition:

- For a **bullish Fibonacci Timing Pattern**, we need 8 closes where each close is lower than the close 5 periods ago, lower than the close 3 periods ago, and lower than the close 1 period ago. Upon the completion of this pattern, we will have a **bullish signal**. Any interruption in the sequence will invalidate the pattern.



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have a bearish signal. Any interruption in the sequence will invalidate the pattern.



GBPUSD signal chart following the identification of the Fibonacci Timing Pattern.



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AUDUSD signal chart following the identification of the Fibonacci Timing Pattern.

The plot above shows the signals generated on the AUDUSD hourly data. Sometimes, when markets are very choppy, the signals can be less common but during these times, the quality goes up and it tends to be around tops and bottoms. Surely, this is a subjective statement built on personal experience but the visual component of the pattern when applied on the chart is satisfactory. We will see later a simple back-test using some special risk management conditions.

At the moment, there is no weekly nor monthly pattern on the USDJPY. Therefore, the pattern recognition step is neutral (somewhat the same as the Indicator section).



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Market sentiment is an extremely important part of trading. It allows us to understand the positioning of the players who potentially could move the markets. Knowing that the majority of hedge funds are bullish on an asset gives us more confidence to invest in it. Similarly, knowing that almost all of the hedge funds are bullish on an asset could give us a signal that the market may be overly bullish and that it is wiser to wait before investing or even be brave enough to initiate a contrarian position in case the fundamentals start to justify it.

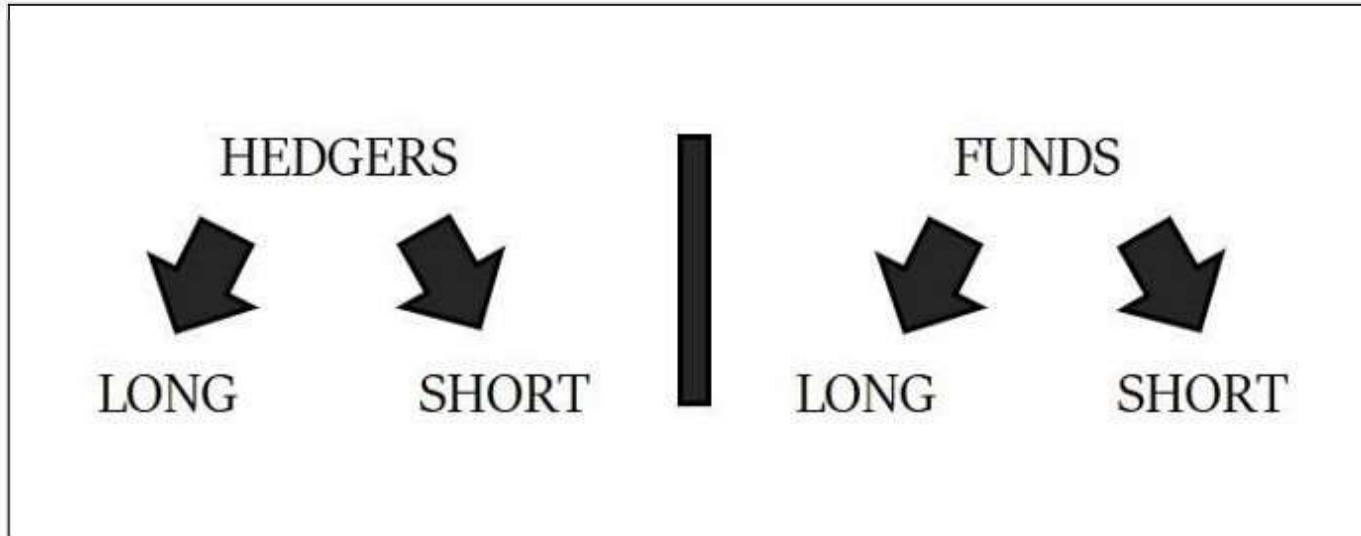
The U.S Commodity Futures Trading Commission (CFTC) publishes statistics of the futures market on a weekly basis called the Commitment of Traders — COT. The report has many valuable information inside, namely the number of futures contracts held by market participants (hedge funds, banks, producers of commodities, speculators, etc.).

Two main categories have to be distinguished before going further:

- **Big speculators (Funds or non-commercial players):** They deal in the futures market for speculative reasons, i.e. to profit from their positions. Examples of speculators are *hedge funds*.
- **Big hedgers (Dealers or commercial players):** They deal in the futures markets for hedging purposes, i.e. to cover their operations or other trading positions. Examples of hedgers include investment banks and big industrial and agricultural giants.

The reason we have used the word big here is because we are interested in those who can make a sizeable impact on prices if they choose to initiate buying and selling activities. Big can also mean that they invest significantly in research and in understanding the product and therefore they tend to be on the *correct* side of the market (or opposite when dealing with hedgers). Every COT report contains information on many assets, and this information comes in the form of long/short for both participants (speculators and hedgers), therefore, we have 4 sets of data for each asset and to simplify this, we can net the longs with the shorts and get a net value, that is, *net speculative positions vs net hedging positions*.

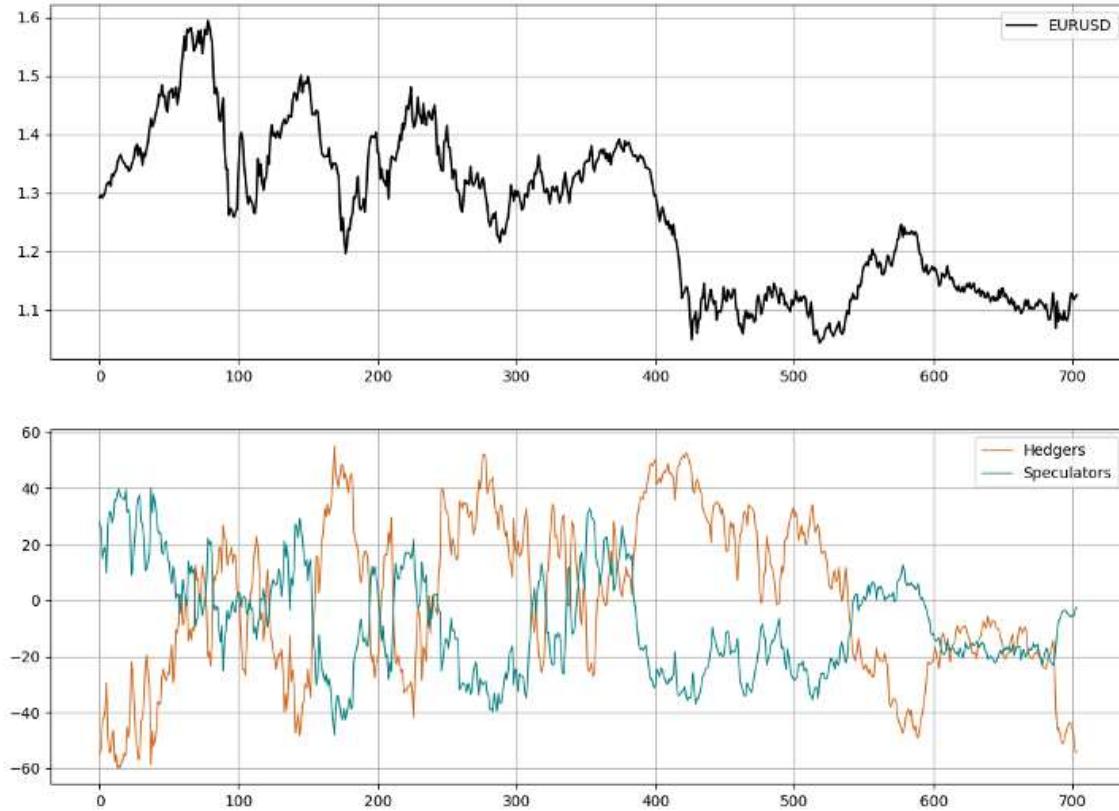


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Obviously, the net speculative positions will have a positive correlation with the underlying asset while the net hedgers' positions will have a negative correlation with the underlying asset:

- **Example 1:** Speculative *net* positions on the EURUSD will have a positive correlation with the currency pair.
- **Example 2:** Hedgers' *net* positions on Gold will have a negative correlation with the asset.

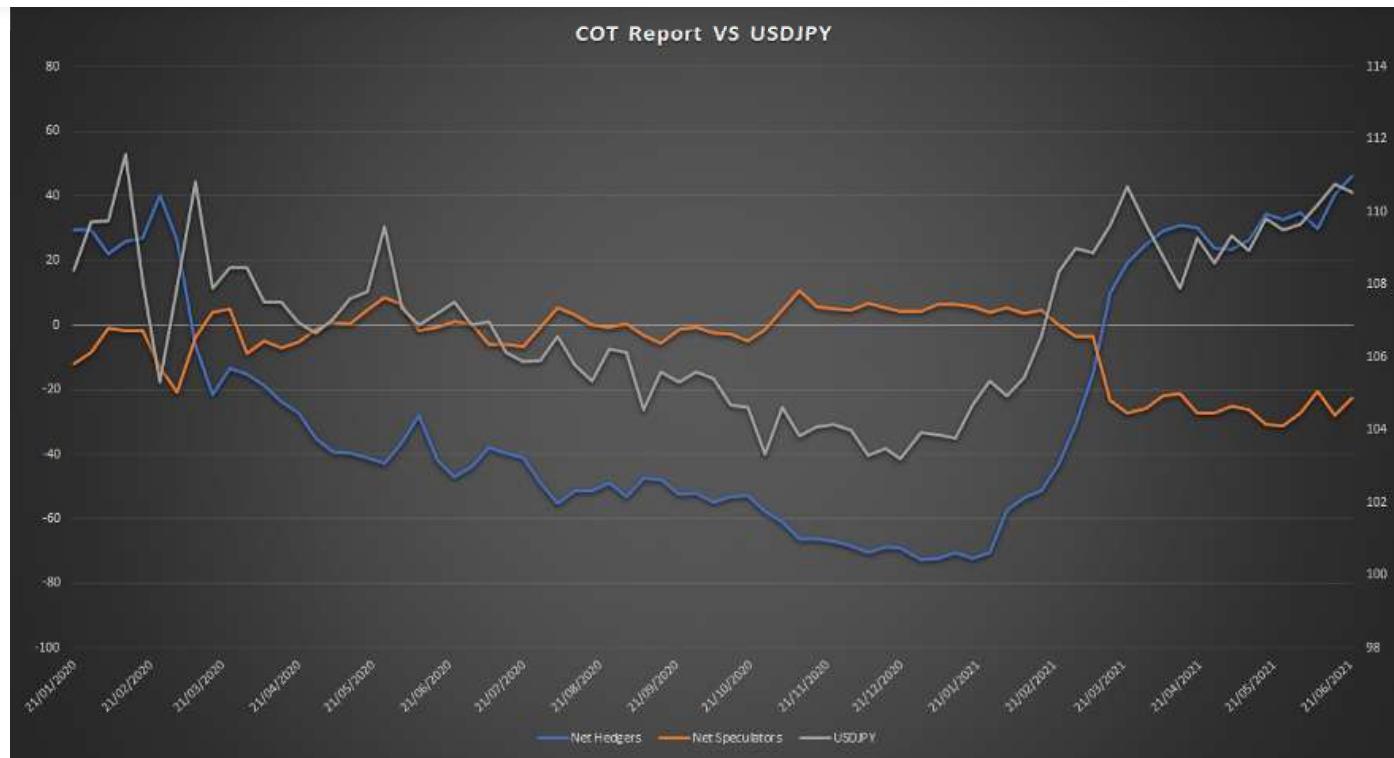


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EURUSD in black with COT positioning in the second panel.

Notice in the graph above how the EURUSD is positively correlated with the Speculators' positioning and negatively correlated with the Hedgers' positioning. We can form many statistical and technical strategies on the COT report to help us with the long-term forecasts on the assets. This forms a huge part in the market sentiment and timing framework. The COT report can be considered to be a leading indicator even though it is mostly a coincidental indicator but it is definitely not a lagging report.



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Excerpt of the USDJPY with its COT values.

The above chart shows the weekly USDJPY closing prices versus the net hedgers and the net speculators. The idea of the Sentiment Analysis is to apply statistical techniques on the COT values so that they give out a useful information on the current state of the USDJPY.

Note that the Net Hedgers are positively correlated to the USDJPY. This is because we are analyzing USDJPY and not JPYUSD. We have to be careful not to misunderstand the COT.

For more strategies on the Commitment of Traders Report:

Applied Sentiment Analysis - Trading & Forecasting

My name is Sofien KAABAR and I'm assuming you are wondering why should you take my course(s). After all, who am I...

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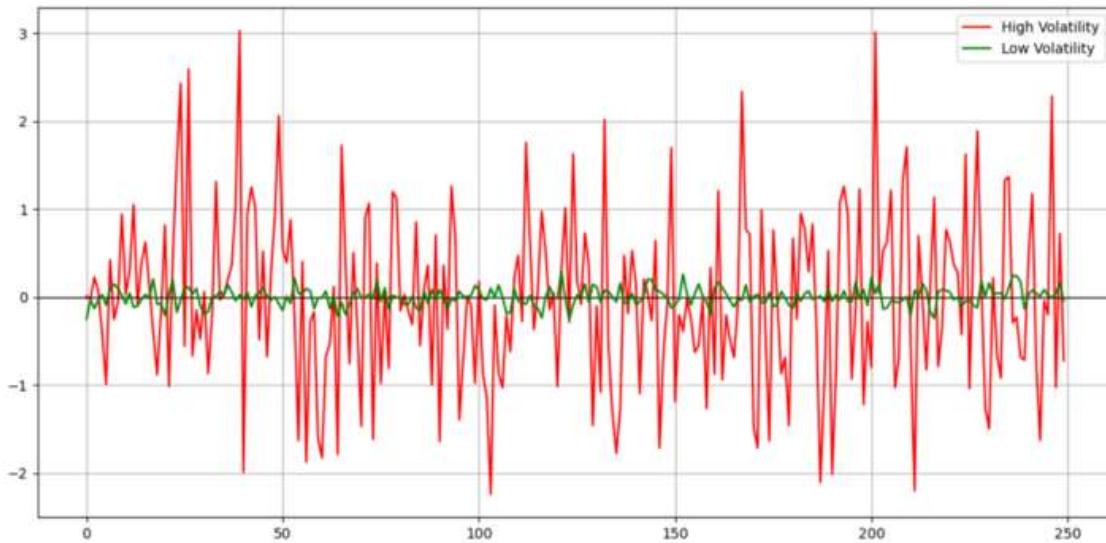
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Risk management is another crucial element in trading. It is what ensures you survive even when you are not making great calls at the moment. One important metric is the risk-reward ratio. It measures the ratio of what you expect to gain (your target) to what you expect to lose (your stop-loss). When we are targeting optimal risk-reward ratio, we should have somewhere between 2.00–4.00. This means that every time we enter into a trade, for every \$1 we risk losing, we expect to gain \$2.00 — \$4.00. Here are some guidelines to respect when entering into a trade:

- **Choose the quantity of the amount to be traded as a percentage of your capital.** The quantity can be chosen subjectively or objectively through formulas like the Kelly Criterion. Try not to have big positions such as 20% of your total balance. And try to limit leverage as much as possible.
- **Choose the maximum total loss tolerated as a percentage of your portfolio.** If we have two trades running and a 6% limit of loss on the capital, then we can say that each trade can lose 3% of the total capital.
- **Choose the proper risk-reward ratio using volatility metrics such as the Average True Range.** Note that some strategies may use suboptimal risk-reward ratios like 0.5 but discretionary trading benefits more if the ratio is equal to or greater than 2.00 thus ensuring that even with 33.33% hit ratio, you will breakeven if you are using equal size quantities.

To understand the Average True Range, we must first understand the concept of Volatility. It is a key concept in finance, whoever masters it holds a tremendous edge in the markets. Unfortunately, we cannot always measure and predict it with accuracy. Even though the concept is more important in options trading, we need it pretty much everywhere else. Traders cannot trade without volatility nor manage their positions and risk. Quantitative analysts and risk managers require volatility to be able to do their work. Before we discuss the different types of volatility, why not look at a graph that sums up the concept? Check out the below image to get you started.



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Comparison of a high volatility simulated time series and a low volatility simulated time series.

The different types of volatility around us can be summed up in the following:

- **Historical volatility:** It is the realized volatility over a certain period of time. Even though it is backward looking, historical volatility is used more often than not as an expectation of future volatility. One example of a historical measure is the standard deviation, which we will see later.
- **Implied volatility:** In its simplest definition, implied volatility is the measure that when inputted into the Black-Scholes equation, gives out the option's market price. It is considered as the expected future actual volatility by market participants. It has one time scale, the option's expiration.
- **Forward volatility:** It is the volatility over a specific period in the future.
- **Actual volatility:** It is the amount of volatility at any given time. Also known as local volatility, this measure is hard to calculate and has no time scale.

The most basic type of volatility is our old friend “the Standard Deviation”. It is one of the pillars of descriptive statistics and an important element in some technical indicators



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Variance is the squared deviations from the mean (a dispersion measure), **we take the square deviations so as to force the distance from the mean to be non-negative**, finally we take the square root to make the measure have the same units as the mean, in a way we are comparing apples to apples (mean to standard deviation standard deviation). Variance is calculated through this formula:

$$\sigma^2 = \frac{\sum(x - \bar{x})^2}{n - 1}$$

Following our logic, standard deviation is therefore:

$$\sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

Therefore, if we want to understand the concept in layman's terms, we can say that Standard Deviation is *the average distance away from the mean that we expect to find when we analyze the different components of the time series.*

Let us now keep the concept of being away from the mean in our heads and move away to the concept of the Average True Range.

In technical analysis, an indicator called the **Average True Range -ATR-** can be used as a gauge for historical volatility. Although it is considered as a lagging indicator, it gives some insights as to where volatility is now and where has it been last period (day, week, month, etc.).

But first, we should understand how the **True Range** is calculated (the ATR is just the average of that calculation). Consider an OHLC data composed of an timely arrange Open, High, Low, and Close prices. For each time period (bar), the true range is simply the greatest of the three price differences:



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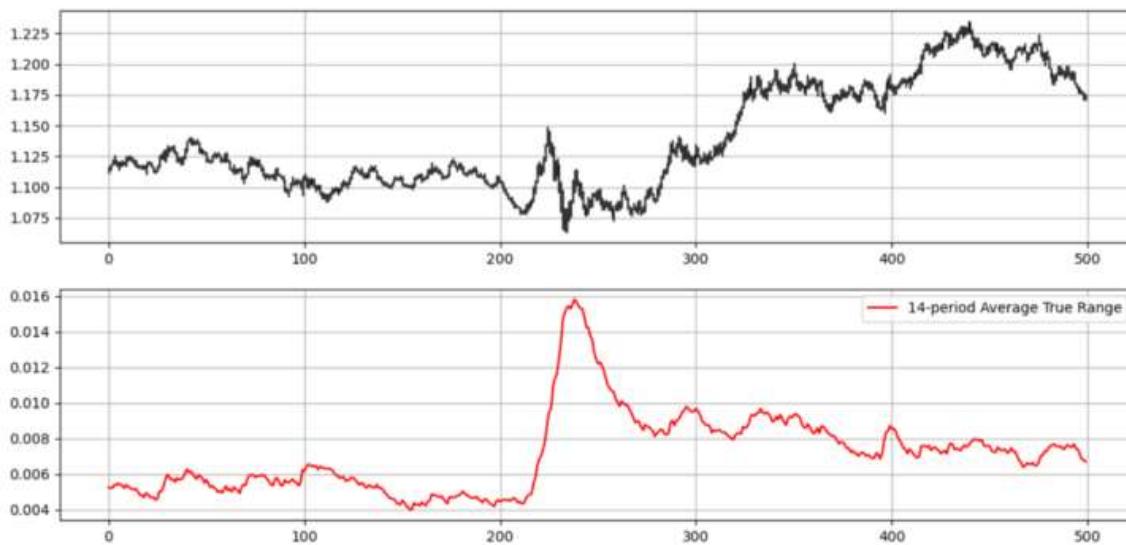
- Previous close — Low

Once we have got the maximum out of the above three, we simply take a smoothed average of n periods of the true ranges to get the Average True Range. Generally, since in periods of panic and price depreciation we see volatility go up, the ATR will most likely trend higher during these periods, similarly in times of steady uptrends or downtrends, the ATR will tend to go lower. One should always remember that this indicator is very lagging and therefore has to be used with extreme caution.

Since it has been created by Welles Wilder, also the creator of the Relative Strength Index, it uses Wilder's own type of moving average, the smoothed kind. To simplify things, the smoothed moving average can be found through a simple transformation of the exponential moving average.

$$\text{Smoothed Moving Average} = (\text{Exponential Moving Average} \times 2) - 1$$

The above formula means that a 100 smoothed moving average is the same thing as $(100 \times 2) - 1 = 199$ exponential moving average.



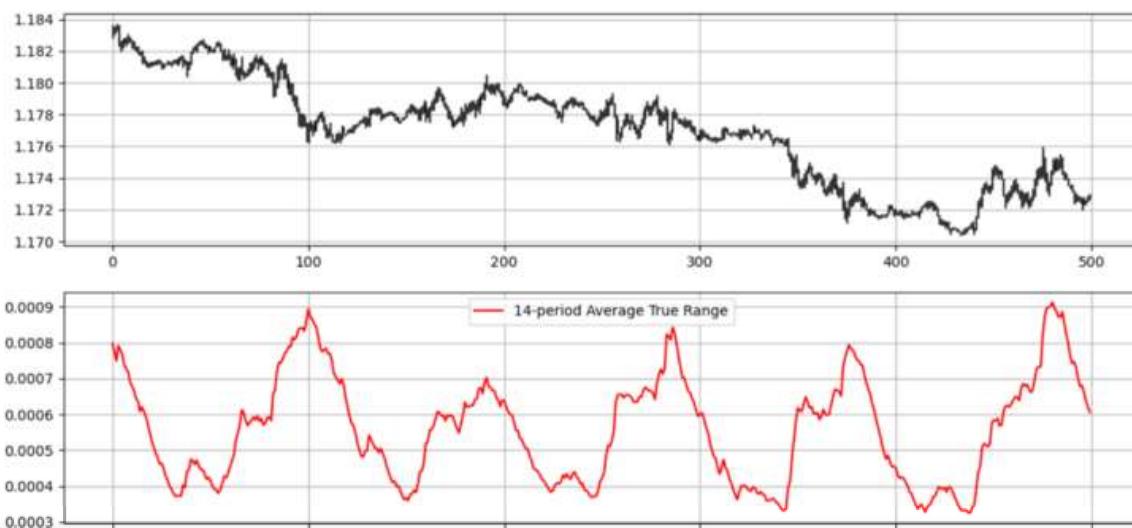
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A long (Buy) position:

- The algorithm initiates a buy order after a signal has been generated following a certain strategy.
- Then, the algorithm will monitor the ticks and whenever the high equals a certain constant multiplied by ATR value at the time of the trade inception, an exit (at profit) order is initiated. Simultaneously, if a low equals a certain constant multiplied by ATR value at the time of the trade inception is seen, an exit (at loss) is initiated. The exit encountered first is naturally the taken event.

A short (Sell) position:

- The algorithm initiates a short sell order after a signal has been generated following a certain strategy.
- Then, the algorithm will monitor the ticks and whenever the low equals a certain constant multiplied by ATR value at the time of the trade inception, an exit (at profit) order is initiated. Simultaneously, if a high equals a certain constant multiplied by ATR value at the time of the trade inception is seen, an exit (at loss) is initiated. The exit encountered first is naturally the taken event.



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The plot above shows the Average True Range. Take a look at the latest value on the ATR. It is around 0.0006 (6 pips). If we initiate a buy order following a simple 2.00 risk-reward ratio (risking half of what we expect to gain), we can place an order this way:

- **Buy at current market price.**
- **Take profit at current market price + (2 x 6 pips).**
- **Stop the position at current market price — (1 x 6 pips).**

Conclusion

Wrapping up what has been seen above, is that some techniques showed that the USDJPY is around resistance but other techniques were neutral, therefore, we cannot really say that we have a valid reason to be technically short the pair, especially that we did not even look at fundamentals. The framework above is but a simple example of a trading system.

Remember to always do your back-tests. You should always believe that other people are **wrong**. My indicators and style of trading may work for me but maybe not for you.

I am a firm believer of not spoon-feeding. I have learnt by doing and not by copying. You should get the idea, the function, the intuition, the conditions of the strategy, and then elaborate (an even better) one yourself so that you back-test and improve it before deciding to take it live or to eliminate it. My choice of not providing Back-testing results should lead the reader to explore more herself the strategy and work on it more. That way you can share with me your better strategy and we will get rich together.

To sum up, are the strategies I provide realistic? Yes, but only by optimizing the environment (robust algorithm, low costs, honest broker, proper risk management, and order management). Are the strategies provided only for the sole use of trading? **No, it is to stimulate brainstorming and getting more trading ideas as we are all sick of hearing about an oversold RSI as a reason to go short or a resistance being surpassed as a**



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One Last Word

I have recently started an NFT collection that aims to support different humanitarian and medical causes. **The Society of Light** is a set of limited collectibles which will help make the world slightly better as each sale will see a percentage of it sent directly to the charity attributed to the avatar. As I always say, nothing better than a bullet list to outline the benefits of buying these NFT's:

- **High-potential gain:** By concentrating the remaining sales proceedings on marketing and promoting **The Society of Light**, I am aiming to maximize their value as much as possible in the secondary market. Remember that trading in the secondary market also means that a portion of royalties will be donated to the same charity.
- **Art collection and portfolio diversification:** Having a collection of avatars that symbolize good deeds is truly satisfying. Investing does not need to only have selfish needs even though there is nothing wrong with investing to make money. But what about investing to *make money, help others, and collect art?*
- **Donating to your preferred cause(s):** This is a flexible way of allocating different funds to your charities.
- **A free copy of my book in PDF:** Any buyer of any NFT will receive a free copy of my latest book shown in the link of the article.



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