

Advanced Technical Analysis

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Technical Analysis is a method of evaluating securities by analyzing statistics generated by market activity, such as past prices and volume.

Technical analysts do not attempt to measure a security's intrinsic value, but instead use charts and other tools to identify patterns that can suggest future activity.

Technical analysts believe that the historical performance of stocks and markets are indications of future performance.

Introduction to Technical Analysis provides a thorough grounding in technical analysis to traders and investment managers of all asset classes who are new to the subject.

This course covers the technical analysis, whether from a purely short-term timing perspective or for longer-term analysis, and is designed to get students quickly up to speed and to a level where they can apply TA correctly and confidently in the markets they cover.

Lesson1: Moving Average

The definition of 'Moving Average' refers the average value of a security's price over a given period of time. It is a widely used indicator in technical analysis that helps smooth out price action by filtering out the "noise" from random price fluctuations. A moving average (MA) is a trend-following or lagging indicator because it is based on past prices.

There are several uses for moving average (MAs) for people in the trading industry. They are useful to:

- 1- measure the momentum of price
- 2- ascertain the direction of the current and future price of security
- 3- define sections of possible supports and resistances
- 4- give importance on the direction of a trend
- 5- reduce the 'noise' of price and volume which otherwise may create confusion while analyzing.

DIFFERENT TYPES OF 'MOVING AVERAGE'

SIMPLE MOVING AVERAGE (SMA)

It is simply the average price of a security at a given period of time. Usually, these are calculated using closing prices. The sum of closing prices for the last ten days divided by ten is the Moving Average of that security. Naturally, as its name implies, the moving average moves or changes with the price movement.

Description

SMA is the easiest moving average to construct. It is simply the average price over the specified period. The average is called "moving" because it is plotted on the chart bar by bar, showing a line that moves along the chart as the average value changes.

Moving Average



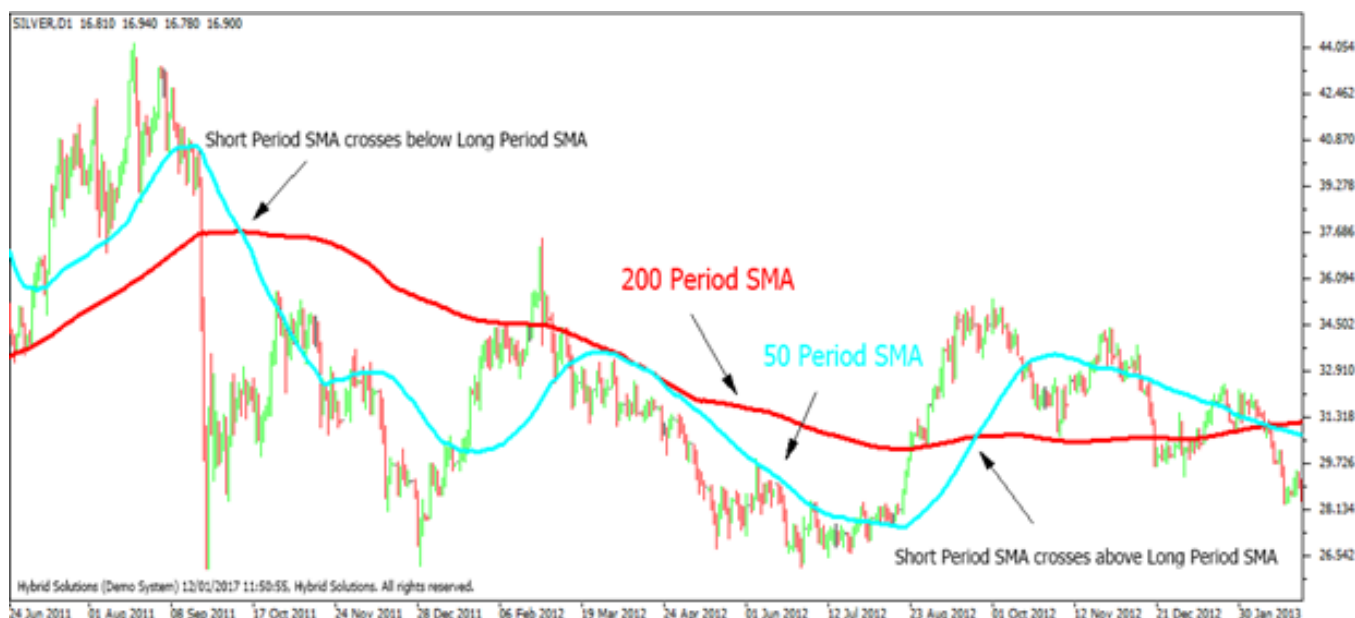
How this indicator works

- SMAs are often used to determine trend direction. If the SMA is moving up, the trend is up. If the SMA is moving down, the trend is down. A 200-bar SMA is typically used for the long term trend. 50-bar SMAs are typically used to measure the intermediate trend. Shorter period SMAs can be used to determine shorter term trends.
- SMAs are commonly used to smooth price data and technical indicators. The longer the period of the SMA, the smoother the result, but the more lag that is introduced between the SMA and the source.
- Price crossing SMA is often used to trigger trading signals. When prices cross above the SMA, traders might want to go long or exit short; when they cross below the SMA, traders might want to go short or exit long.



Moving Average

- SMA Crossing SMA is another common trading signal. When a short period SMA crosses above a long period SMA, traders may want to go long. Traders may want to go short when the short-term SMA crosses back below the long-term SMA.



Calculation

SMA is simply the mean, or average, of the stock price values over the specified period.

Assume the Closing prices of a security as: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15. Now, 1st value of 10 day SMA (Simple Moving Average) will be:

$$1+2+3+4+5+6+7+8+9+10=55/10=5.5$$

2nd value of 10 day SMA (Simple Moving Average) will be:

$$2+3+4+5+6+7+8+9+10+11=65/10=6.5$$

3rd value of 10 day SMA (Simple Moving Average) will be:

$$3+4+5+6+7+8+9+10+11+12=75/10=7.5$$

4th value of 10 day SMA (Simple Moving Average) will be:

$$4+5+6+7+8+9+10+11+12+13=85/10=8.5$$

5th value of 10 day SMA (Simple Moving Average) will be:

$$5+6+7+8+9+10+11+12+13+14=95/10=9.5$$

EXPONENTIAL MOVING AVERAGE (EMA)

Description

This moving average focuses more on the recent price movement and hence it is considered as more responsive towards than a simple moving average. The calculation for this is not as simple as the calculation for simple moving average [SMA]. It is complicated. VertexFX Trader provides the calculation of EMA and hence traders can easily concentrate on other implications rather than on the calculations. EMA turns faster and has less lag than SMA.



How this indicator works

- Use the same rules that apply to SMA when calculating EMA. Keep in mind that EMA is generally more sensitive to price movement. This can be a double-edged sword. On one side, it can help you identify trends earlier than an SMA would. On the other hand, EMA will experience more short-term changes than SMA.
- Use the EMA to determine trend direction, and trade in that direction. When the EMA rises, traders may want to buy when prices come near or just below the EMA. When the EMA falls, traders may consider selling when prices come near or just above the EMA.
- Moving averages can also indicate support and resistance areas. A rising EMA tends to support prices, while a falling EMA tends to provide resistance to prices. This reinforces the strategy of buying when the price is near the rising EMA and selling when the price is near the falling EMA.
- All moving averages, including EMA, are not designed to identify a trade at the exact bottom and top. Moving averages may help you trade in the general direction of a trend, but with a delay at the entry and exit points. The EMA has a shorter delay than the SMA with the same period.

Calculation

You should notice how the EMA uses the previous value of the EMA in its calculation. This means the EMA includes all the price data within its current value. The newest price data has the most impact on the Moving Average and the oldest prices data has only a minimal impact.

$$\text{EMA} = (K \times (C - P)) + P$$

Where:

C = Current Price

P = Previous periods EMA (A SMA is used for the first periods calculations)

K = Exponential smoothing constant

The smoothing constant K, applies appropriate weight to the most recent price. It uses the number of periods specified in the moving average.



WEIGHTED MOVING AVERAGE (WMA)

A Weighted Moving Average puts more weight on recent data and less on past data. This is done by multiplying each bar's price by a weighting factor. Because of its unique calculation, WMA will follow prices more closely than a corresponding Simple Moving Average.

Moving Average



How this indicator works

- WMA is used to help determining trend direction. It could be an indication to buy when prices comes near or just below the WMA. It could be an indication to sell when prices come near or just above the WMA.
- Moving averages can also indicate support and resistance areas. A rising WMA tends to support prices, while a falling WMA tends to provide resistance to prices. This strategy reinforces the idea of buying when price is near rising WMA or selling when price is near falling WMA.
- All moving averages, including the WMA, are not designed to identify trade at the exact bottom or top. Moving averages tend to validate that the trade is in the general direction of trend, but with a delay at entry and exit. WMA has shorter delay than SMA.
- Use same rules that apply to SMA when calculating WMA. Keep in mind, WMA is more sensitive to price movement. This can be a double-edged sword. On one side, WMA can identify trends faster than SMA. On the other hand, WMA experience more whipsaws than corresponding SMA.

Calculation

The most recent data is more heavily weighted, and contributes more to the final WMA value. The weighting factor used to calculate the WMA is determined by the period selected for the indicator. For example, a 5 period WMA would be calculated as follows:

$$\text{WMA} = (P1 * 5) + (P2 * 4) + (P3 * 3) + (P4 * 2) + (P5 * 1) / (5 + 4 + 3 + 2 + 1)$$

Where:

P1 = current price

P2 = price one bar ago, etc...

How are moving averages used?

Moving averages with different time frames can provide a variety of information. A longer moving average (such as a 200-day EMA) can serve as a valuable smoothing device when you are trying to assess long-term trends.

A shorter moving average, such as a 50-day moving average, will more closely follow the price action, and therefore is frequently used to assess short-term patterns. Each moving average can serve as a support and resistance indicator, and is frequently used as a short-term price target or key level.

How exactly do moving averages generate trading signals? Moving averages are widely recognized by many traders as potentially significant support and resistance price levels. If the price is above a moving average, it can serve as a strong support level—meaning if the stock does decline, the price might have a more difficult time falling below the moving average price level. Alternatively, if the price is below a moving average, it can serve as a strong resistance level—meaning if the stock were to increase, the price might struggle to rise above the moving average.

Lesson 2 Bollinger Bands

Lesson2: BOLLINGER BANDS

Description

Bollinger Bands are types of price envelope that was developed by John Bollinger. (Price envelopes define upper and lower price range levels.) Bollinger Bands are envelopes plotted at a standard deviation level above and below a simple moving average of the price. Because the distance of the bands is based on standard deviation, they adjust to volatility swings in the underlying price.

Bollinger Bands use 2 parameters, Period and Standard Deviations, StdDev. The default values are 20 for period, and 2 for standard deviations.

Bollinger bands helps determining if prices are high or low on a relative basis. They are used in pairs, both upper and lower bands in addition to a moving average. Further, the pair of bands is not intended to be used alone. Use the pair to confirm signals given with other indicators.

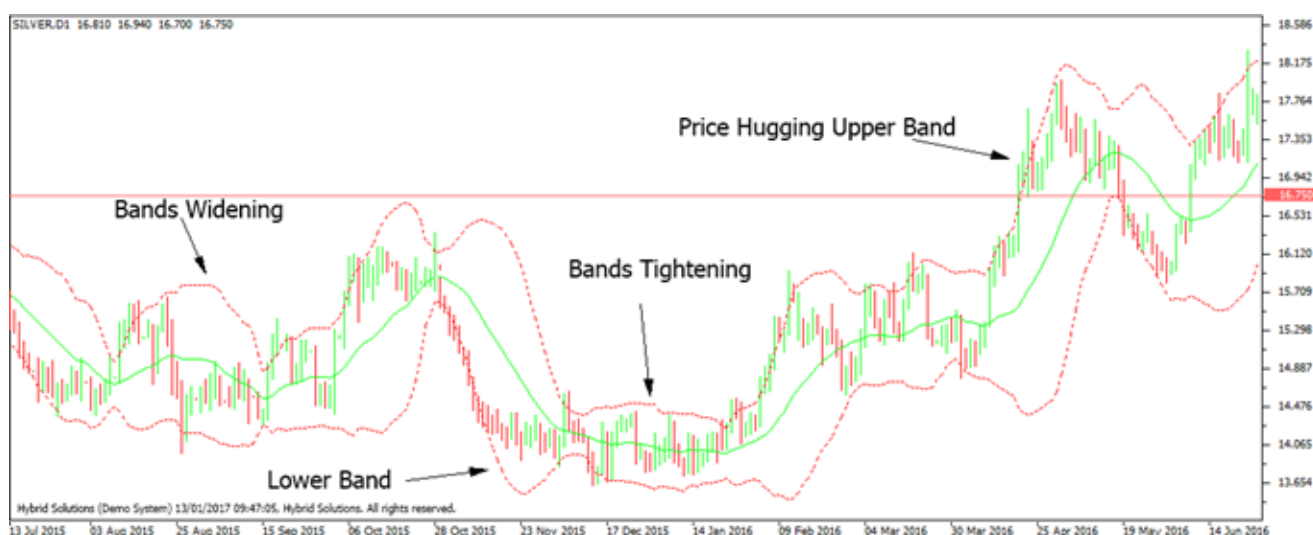


How this indicator works

- When the bands narrow during a period of low volatility, it boosts the probability of an intense price movement in either direction. This may start new trend move. We should be careful for false move in opposite direction which reverses before the proper trend begins.

Bollinger Bands

- When the bands separate by an unusual large amount, volatility increases and any existing trend may be ending.
- Prices have a tendency to bounce between the bands' envelope. You can use these swings to help identify potential profit targets. For example, if a price bounces off the lower band and then crosses above the moving average, the upper band then becomes the profit target.
- Price can exceed or hug the band envelope for long periods through strong trends. Traders may want to do additional researches to determine if taking additional profits is applicable.
- A strong trend continuation can be expected when the price moves out of bands. However, if prices move instantly back inside the bands, then the suggested strength is revoked.



Calculation

At first, calculate a simple moving average. Next, calculate the standard deviation over the same number of periods as the simple moving average. For the upper band, add the standard deviation to the moving average. For the lower band, subtract the standard deviation from the moving average.

Typical values used:

20 day moving average, bands at 2 standard deviations. (2 times the standard deviation. +/- the SMA).

Middle Band = 20 Day Simple Moving Average

Upper Band = 20 Day Simple Moving Average + (20 day Simple Moving Average + Standard Deviation x 2)

Lower Band = 20 Day Simple Moving Average - (20 day Simple Moving Average + Standard Deviation x 2)

VertexFX is used for the calculation of the Bollinger Bands and for applying it on the chart by many technical analysis and traders.

Lesson3:

MACD Moving Average Convergence Divergence

Description

MACD, short for moving average convergence divergence, is a trading indicator used in technical analysis of stock prices, created by Gerald Appel in the late 1970s. It reveals changes in the strength, direction, momentum, and duration of a trend in a security price.

MACD indicator is a momentum oscillator used to trade trends. Although it is an oscillator, it is not typically used to identify over bought or oversold conditions. On the chart it appears as two lines that oscillates without boundaries. The intersection of the two lines provides trading signals.

The concept behind the MACD is very easy; it calculates the difference between a security 26-day and 12-day exponential moving averages (EMA). One of the two moving averages that is constructing the MACD, the 12-day EMA is the faster one, while the 26-day is the slower. In the calculation of their values, both moving averages use the closing. When attaching the MACD on chart using VertexFX, a nine-day EMA of the MACD itself is plotted as well, and it acts as a signal provider for buy and sell decisions. The MACD generates a buy signal when it moves above its own nine-day EMA, and it generates a sell sign when it moves below its nine-day EMA.

The Three Major Components

1 The MACD Line

MACD Line is a result of taking a longer term EMA and subtracting it from a shorter term EMA.

The most commonly used values are 26 days for the longer term EMA and 12 days for the shorter term EMA, but it is the trader's choice.

2 The Signal Line

The Signal Line is an EMA of the MACD Line described in Component 1.

The trader can choose what period length EMA to use for the Signal Line however 9 is the most common.

3 The MACD Histogram

As time advances, the difference between the MACD Line and Signal Line will continually differ. The MACD histogram takes that difference and plots it into an easily readable histogram. The difference between the two lines oscillates around a Zero Line.

When the MACD histogram is above the Zero Line, the MACD is considered positive and when it is below the Zero Line, the MACD is considered negative.

MACD Moving Average Convergence Divergence



How MACD indicator works

- When the MACD crosses above the zero line, then it is considered bullish signal (signal to buy), while when the MACD crosses below the zero line, then it is considered bearish signal (signal to sell).
- When the MACD elevates from below the zero then it is considered a bullish signal. On the contrary, when it demotes from above the zero then it is considered a bearish signal.
- When the MACD line crosses from below to above the signal line, the indicator is considered bullish.
- When the MACD line crosses from above to below the signal line, the indicator is considered bearish.
- During trading ranges the MACD might whipsaw, with the MACD line crossing across the signal line. Trader who uses the MACD generally avoids trading in this case or closes positions to reduce loss within their accounts.
- Divergence between MACD and price action is a stronger signal when it confirms the crossover signals.

DIVERGENCE

- Divergence is another signal created by the MACD. Simply put, divergence is when the MACD and actual price are not in agreement.
- For example, Bullish Divergence occurs when price records a lower low, but the MACD records a higher low. The movement of price can provide evidence of the current trend, however changes in momentum as evidenced by the MACD can sometimes precede a significant reversal.

What makes the MACD such a valuable tool for technical analysis is that it is two indicators in one. It can help to identify trends, and it can measure momentum as well. It takes two separate lagging indicators and adds the aspect of momentum which is much more active or predictive. That kind of versatility is why it has been and is used by traders and analysts.

Despite MACD's obvious attributes, just like with any indicator, the trader or analyst needs to exercise caution. There are just some things that MACD doesn't do well which may tempt a trader regardless. Most notably, traders may be tempted into using MACD as a way to find overbought or oversold conditions. This is not a good idea. Remember, MACD is not bound to a range, so what is considered to be highly positive or negative for one instrument may not be good to a different instrument.

Calculation

An approximated MACD can be calculated by subtracting the value of a 26 period Exponential Moving Average (EMA) from a 12 period EMA. The shorter EMA is constantly converging toward, and diverging away from, the longer EMA. This causes MACD to oscillate around the zero level. A signal line is created with a 9 period EMA of the MACD line.

Note: The sample calculation above is the default. You can adjust the parameters based upon your own criteria.

MACD: (12 day EMA – 26 day EMA)

Signal Line: 9 day EMA of MACD

MACD Histogram: MACD - Signal Line

Lesson4: RSI Relative Strength Index

Description

The Relative Strength Index (RSI), developed by J. Welles Wilder, is a momentum oscillator that measures the speed and change of price movements. RSI oscillates between zero and 100. According to Wilder, RSI is considered overbought when above 70 and oversold when below 30. Signals can also be generated by looking for divergences, failure swings and centerline crossovers. RSI can also be used to identify general trend.



How RSI indicator works

- RSI is considered overbought when above 70 and oversold when below 30.
- RSI also often forms chart patterns that may not show on the price chart, such as double tops and bottoms and trend lines. Also, look for support or resistance on the RSI.
- In an uptrend RSI tends to remain between 40 to 90 range with the 40-50 zone acting as support. During downtrend RSI tends to stay between the 10 to 60 range with the 50-60 zone acting as resistance.
- If security prices made new high or low that isn't confirmed by the RSI, this divergence can signal a price reversal. If the RSI makes a lower high and then follows with a downside move below a previous low, a Top Swing Failure has occurred. If the RSI makes a higher low and then follows with an upside move above a previous high, a Bottom Swing Failure has occurred.

Calculation

The RSI is a fairly simple formula, but is difficult to explain without pages of examples. Use the Vertex-FX trader to help you see a visual and use RSI. The basic formula is:

$$RSI = 100 - [100 / (1 + (\text{Average of Upward Price Change} / \text{Average of Downward Price Change}))]$$

Lesson5: Fibonacci

In mathematics, the Fibonacci numbers are the numbers in the following sequence, called the Fibonacci sequence, and characterized by the fact that every number after the first two is the sum of the two preceding ones:

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ...

In short, Fibonacci numbers or ratios are mathematically significant numbers that occur all life aspects. Fibonacci numbers were discovered by Leonardo de Pisa. The most important number or ratio is the 61.8% or .618 levels. There is also a 1.618 Extension along with 2.618. In trading, Fibonacci retracements can identify potential support / resistance levels.

Fibonacci retracement

Description

Fibonacci retracement plots percentage retracement lines based on the mathematical relationship in the Fibonacci sequence. Retracement levels provide support and resistance levels.

Fibonacci Retracements are displayed by drawing a trend line between two extreme points. A series of horizontal lines are drawn intersecting the trend line at Fibonacci levels between 0.0%, and 100%.



How Fibonacci retracement works

- Retracements show possible support or resistance areas, 23.6%, 38.2%, 50%, 61.8%, and 100%.
- According to market direction, prices will retrace a big portion of the previous trend prior resuming in the move in the original direction.

Calculation

Fibonacci numbers are a sequence of numbers in which each successive number is the sum of the two previous numbers:

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, and so on.

The key Fibonacci ratio is 61.8% - also known as "the golden ratio" - is found by dividing one number in the series by the number that follows it. For example: $8/13 = 0.6153$, and $55/89 = 0.6179$.

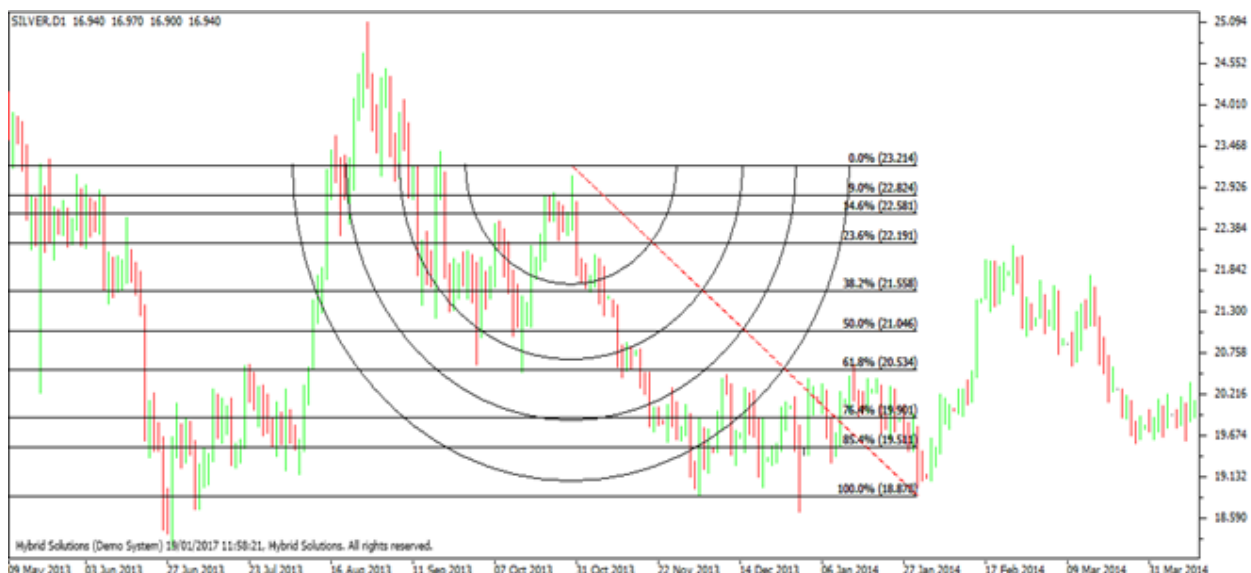
The 38.2% ratio is found by dividing one number in the series by the number that is found two places to the right. For example: $55/144 = 0.3819$.

The 23.6% ratio is found by dividing one number in the series by the number that is three places to the right. For example: $8/34 = 0.2352$.

Fibonacci Arc

Description

Fibonacci Arcs are half circles that extend out from a trend line drawn between two points. Half arcs are drawn, measured from the second extreme point, so they intersect the trend line at the Fibonacci levels. These arcs mark support and resistance areas as prices retrace a portion of their move after a decline or an advance.



How Fibonacci Arcs works

Anticipate support / resistance as price approaches Fibonacci Arcs.

After the significant bear market, the rally was stopped by the 50% arc; the 50% arc retracement acted as resistance, 38.2% arc then gave support, bouncing between the 50% arc and the 38.2% arc for many months. After price broke through the resistance arc at 50%, price moved up to the next significant Fibonacci ratio, 61.8%, where it found a new resistance level. The prior resistance level at 50%, after being broken, became a new support level. The next Fibonacci arc was at 100%, where price met resistance.

Calculation

- Base Line: A line from point A to point B
- First Arc: Radius = 23.6% of base line
- Second Arc: Radius = 38.2% of base line
- Third Arc: = 61.8% of base line.

Fibonacci Fan

Description

Fibonacci Fan Lines are displayed by drawing a trend line between two points. Then an "invisible" vertical line, equal to the vertical distance between the extreme points, is drawn from the second extreme point to the level of the first extreme point. Four trend lines are then drawn from the first extreme point so they pass through the invisible vertical line at the Fibonacci levels of 23.6%, 38.2%, 50.0%, and 61.8%.



How this indicator works

Anticipate support / resistance as price approaches Fibonacci Fan Lines.

So we have the following at the end of the trace:

- Rising fan lines which pass from a trough along the various retracement levels to the peak. These fan lines serve primarily as support levels for rising prices, or resistance when a particular line has been broken downwards.
- Falling fan lines which head down from a peak along the retracement levels and get down to a trough. These fan lines can serve as resistance levels.

Fibonacci fans are trend lines which extend in the shape of a fan either upwards or downwards. These trend lines correspond to the Fibonacci retracement levels. The only difference between the Fibonacci fans and Fibonacci retracement levels is the direction of the lines. Two Fibonacci fans are recognized:

- Rising Fibonacci Fan

The fan lines are seen as follows:

- Fan Line 1: Price trough to 38.2% retracement level
- Fan Line 2: Price trough to 50% retracement level
- Fan Line 3: Price trough to 61.8% retracement level

- Falling Fibonacci Fan

The fan lines are seen as follows:

- Fan Line 1: Price peak to 38.2% retracement level
- Fan Line 2: Price peak to 50% retracement level
- Fan Line 3: Price peak to 50% retracement level

Calculation

Rising Fibonacci Fan






- Fan line 1: Drawn from extreme low through 23.6% retracement level
- Fan line 2: Drawn from extreme low through 38.2% retracement level
- Fan line 3: Drawn from extreme low through 50% retracement level
- Fan line 4: Drawn from extreme low through 61.8% retracement level
-

Falling Fibonacci Fan

- Fan line 1: Drawn from extreme high through 23.6% retracement
- Fan line 2: Drawn from extreme high through 38.2% retracement
- Fan line 3: Drawn from extreme high through 50% low retracement
- Fan line 4: Drawn from extreme high through 61.8% retracement



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