TECHNICAL INDICATORS FOR TRADERS

A Step By Step Guide

Includes Calculations and Chart Examples

ChartPatternTrading.com

Technical Analysis Indicators

1. The Average Directional Index – ADX

Created in 1978 by J. Welles Wilder, the Average Directional Index (or ADX for short) is an oscillating lagging technical indicator that is used to gauge how strong the trend is.

Interpretation

Since ADX is a non-directional indicator, it measures the extent of trend strength without consideration to trend direction. The indicator fluctuates from 0 to 100, with readings below 20 signaling a weak trend and readings above 40 signaling a strong trend. If the trend is exceedingly strong, the indicator shows readings above 50.

Calculation

The indicator is normally plotted on charts together with two lines referred to as the positive directional indicator (commonly referred to as +DI) and negative directional indicator (commonly referred to as -DI). Basically, ADX is computed from the relationship of the DMI lines.

Here is the formula for its calculation.

(Calculations sourced from [Tradingview](https://www.tradingview.com))

Calculating the DMI can actually be broken down into two parts.
First, calculating the +DI and -DI, and second, calculating the ADX.

To calculate the +DI and -DI you need to find the +DM and -DM (Directional Movement).

+DM and -DM are calculated using the High, Low and Close for each period. You can then calculate the following:

Current High - Previous High = UpMove
Current Low - Previous Low = DownMove

If UpMove > DownMove and UpMove > 0, then +DM = UpMove, else +DM = 0
If DownMove > Upmove and Downmove > 0, then -DM = DownMove, else -DM = 0

Once you have the current +DM and -DM calculated, the +DM and -DM lines can be
calculated and plotted based on the number of user defined periods.

+DI = 100 times Exponential Moving Average of (+DM / Average True Range)

-DI = 100 times Exponential Moving Average of (-DM / Average True Range)

Now that -+DX and -DX have been calculated, the last step is calculating the ADX.

ADX = 100 times the Exponential Moving Average of the Absolute Value of (+DI- -DI) / (+DI + -DI)

Generally Accepted Use

1. ADX can be used to make trade decisions. The best way to achieve this is to wait for breakouts first before making a decision to place a buy or a sell order. You can use this indicator to confirm if a currency pair will continue with its present trend or not.
2. ADX can be combined with other indicators to filter and affirm trade decisions.
3. ADX can be used to determine if you can exit a running position.

Chart Example

All charts created using www.tradingview.com

In this example, the ADX indicator lingered below 20 from December to early May. During this period, EUR/USD was confined in a range. From June, the indicator started to rise until it reached above 50 in October signaling that the pair was trading in a strong downtrend. So, you could place a sell order when

the pair broke out of the range and the ADX started to rise. You could aim to get out of the trade once the indicator starts dropping below 50 again.

2. The Aroon Oscillator

Created by Tushar Chande in 1995, the Aroon oscillator is used to gauge the beginning of a new trend and to know how strong the trend is. This indicator system comprises of two components: Aroon up and Aroon down.

Interpretation

The Aroon oscillator fluctuates between -100 and +100. Zero is the middle line between the extreme points. Aroon up (when indicator is positive) gauges the strength of an uptrend while Aroon down (when indicator is negative) gauges the strength of a downtrend. The greater the absolute value of the indicator, the stronger is the signal of a trend.

If Aroon up and Aroon down are moving lower in close proximity, it signals consolidation with no clear trend in the market. If Aroon up drops below 50, it signals that the present trend no longer has enough energy to move further upwards. Likewise, if Aroon down drops below 50, it signals that the present downtrend no longer has enough energy to move further downwards. When either Aroon up or Aroon down give readings of more than 70, it typifies a strong trend.

Calculation

Technically, the Aroon oscillator can be calculated using the following formula:

Aroon up= [[number of specified periods) - (number of periods since highest high during that time)] / (number of specified periods)] x 100

Aroon down= [[(number of specified periods) - (number of periods since lowest low during that time)] / (number of specified periods)] x 100

Generally Accepted Use

- Aroon up values of more than 70 signifies a strong up-trend
- Aroon down values of more than 70 signifies a strong down-trend
- Aroon up values of less than 50 indicates a weakening up-trend
- Aroon down values of less than 50 indicates a weakening down-trend

Chart Example
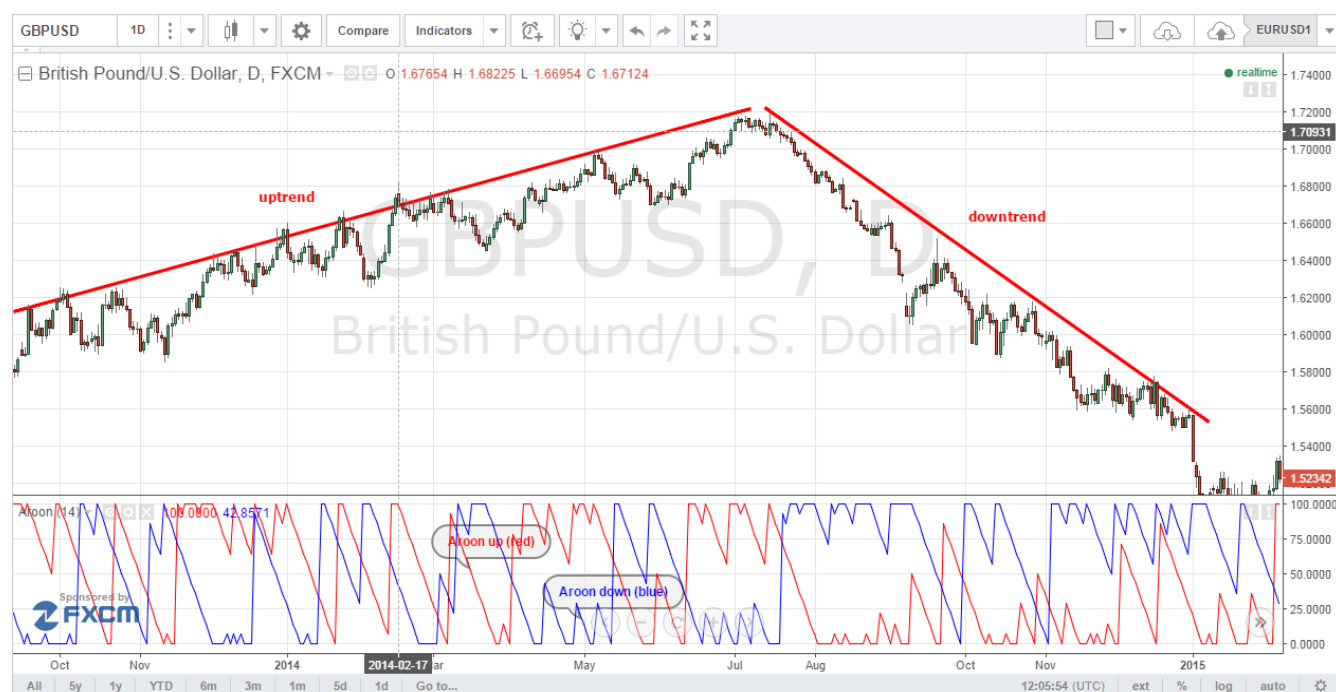
In this example, Aroon up (red line) gives values of above 70 whenever GBP/USD is trading upwards. On the other hand, Aroon down (blue line) gives values of above 70 whenever the pair is trading downwards. So, you can use the behavior of the indicator to make trade decisions.

3. The Average True Range (ATR)

J. Welles Wilder introduced the Average True Range (ATR) indicator to the world in 1978. The indicator is normally used to measure market volatility.

Interpretation

The range of a financial instrument is the difference between the high and low price during any trading session. It shows how volatile the financial instrument is; that is, large ranges suggest high volatility while small ranges suggest low volatility. Therefore, the ATR indicator can be effectively used for keeping an eye on the market volatility.

Calculation

When calculating the ATR, the true range should first be determined. True range considers the most current period high/low range and the previous period close, if required.

(Calculations sourced from Tradingview)

Three calculations should be done and compared against one another.

The true range is the greatest of the following:

- o The Current Period High minus (-) Current Period Low
- o The Absolute Value (abs) of the Current Period High minus (-) The Previous Period Close
- o The Absolute Value (abs) of the Current Period Low minus (-) The Previous Period Close

true range=max[(high - low), abs(high - previous close), abs (low - previous close)

*Absolute Value is used since the ATR does not gauge price direction, only volatility.

Thus, there should be no negative numbers.

*Once you have the True Range, the Average True Range can be plotted.

The ATR is an Exponential Moving Average (generally 14-days) of the True Range.

Generally Accepted Use

- High values indicate market tops and bottoms
- Low values signal ranging markets

Chart Example

On the chart above, the ATR indicator peaks before price bottoms and gives low readings when the market is ranging. So, it could be used for making trade decisions. For example, you can enter a sell order immediately the ATR indicator starts to rise.

4. Bollinger Bands

John Bollinger founded Bollinger Bands in the 1980's. This indicator comprises of a band of three lines with the middle one being a simple 20 period moving average by default. The bands are plotted in relation to the price of the financial instrument.

Interpretation

The Bollinger Bands indicator is usually used as a volatility indicator. When there is high volatility in the market, the bands become wider, and vice versa. Also, traders use the indicator to determine overbought and oversold conditions in the market. If price hugs the upper band or even breaks through it, it could indicate overbought conditions. On the other hand, if price hugs the lower band or breaks through it, it could indicate oversold conditions.

Calculation

Bollinger Bands consist of three bands, which are calculated as below.

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)

Generally Accepted Use

1. Go long if price is rejected from the lower band and as a confluence if it creates a bullish divergence with RSI or other preferred oscillators.
2. Go short if the price is rejected from the upper band and creates a bearish divergence with RSI or other oscillators.

Chart Examples

Upper and lower bands getting closer to each other means a trendy price action is ahead. If price is rejected from the upper bands, it means price is overbought and likely to reverse downwards.

When price repeatedly hugs one particular band, it indicates that the current trend is likely to continue. When price keeps touching both the upper and lower bands while consecutively maintaining a definite support/resistance level, it means a ranging market.
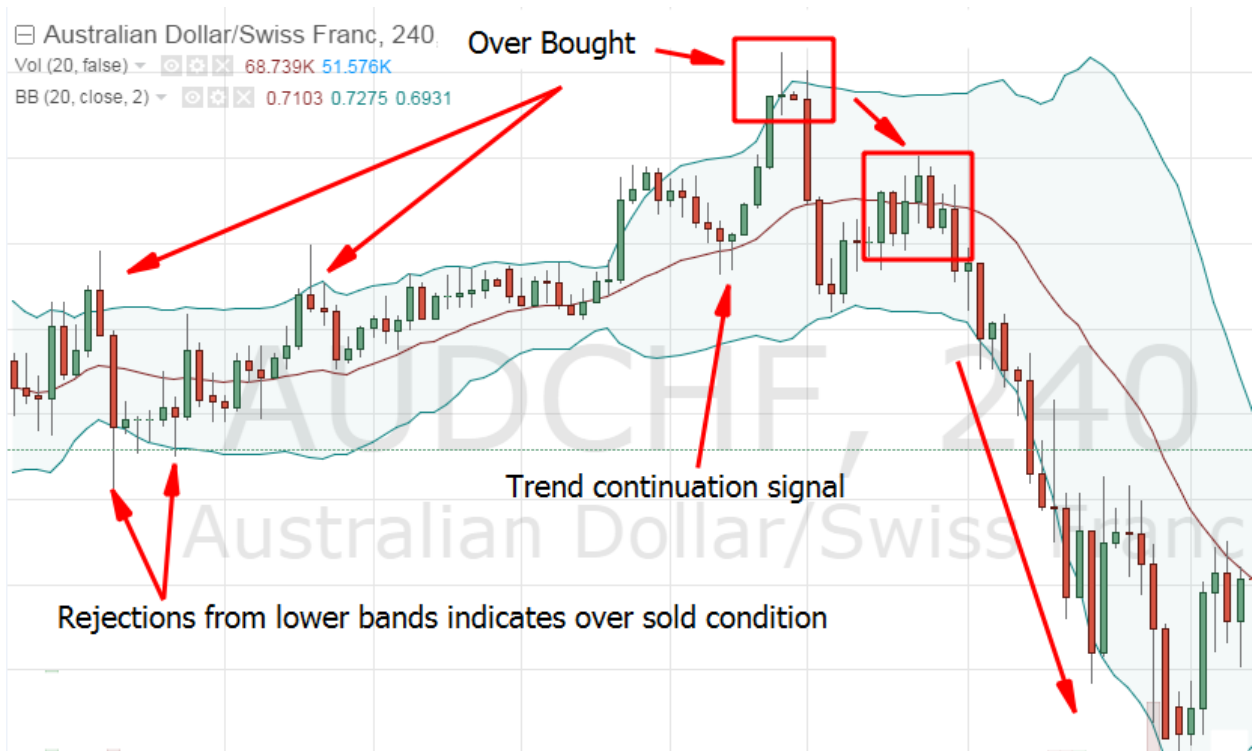
Conversely, if price is rejected from lower band, it indicates the financial instrument is oversold and likely to go upwards. Traders can go long from the rejected areas and hold the trade until next divergence appears. If a candle closes outside of the band and the next candle follows through the same direction, it means a strong strength of the trend.
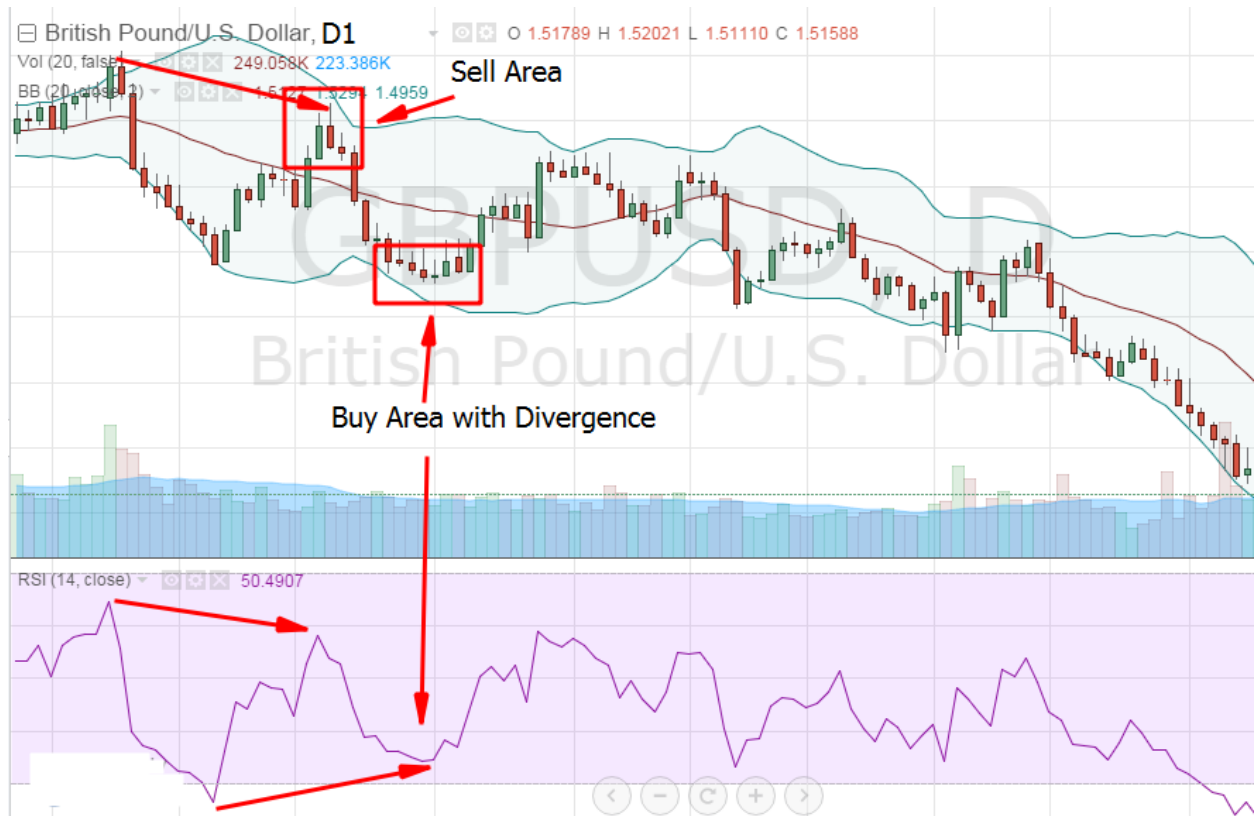
When the Relative Strength Index (RSI) creates a lower high with a rejection of price from the upper band, it means a bearish divergence and a time to go short from the rejected area. Conversely, when price is rejected and fails to go through the lower band and RSI creates lower high, it means a bullish divergence. Traders can go for long orders from a rejected area of lower bands.
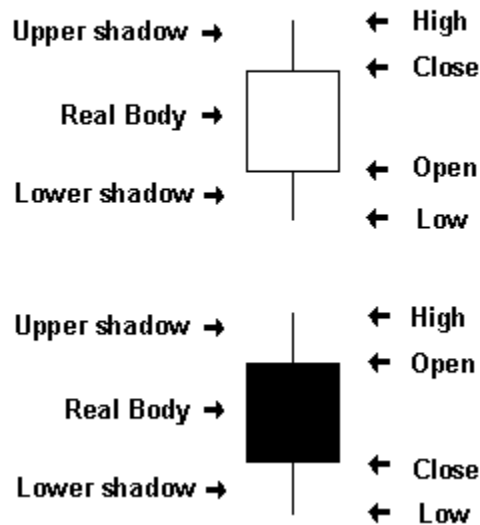
5. Candlestick charts

It is believed that Munehisa Homma, a Japanese rice trader, first developed the candlestick patterns in the 18th century. A candlestick pattern expresses a detail level of information about what is happening in the market. Each candlestick shows the high, low, open and close prices of a financial instrument during a particular trading session.

Formation

Usually, a candlestick forms with a body and thin protruding lines. And, for it to be formed, a set of data that contains open, high, low and close prices of a financial instrument during each time period is required. Long thin lines (upper shadows) above the candlesticks represent the high range of prices traded during a period while long thin lines below (lower shadows) represent low range of prices traded during that period.

The hollow/filled portion of the candlestick represents the difference between open and close price of the particular trading period. It is referred to as the "the body" of the candlestick.

Candlestick Formation

Upper shadow →   ← High
    ← Close
Real Body →
    ← Open
Lower shadow →   ← Low

Upper shadow →   ← High
    ← Open
Real Body →
    ← Close
Lower shadow →   ← Low

Setup:

On the MetaTrader trading terminal from chart option, select the candlestick option to see the candlestick charts. Different kinds of color combinations can be set for the thin lines and the body from the chart properties option.

Candlesticks Chart
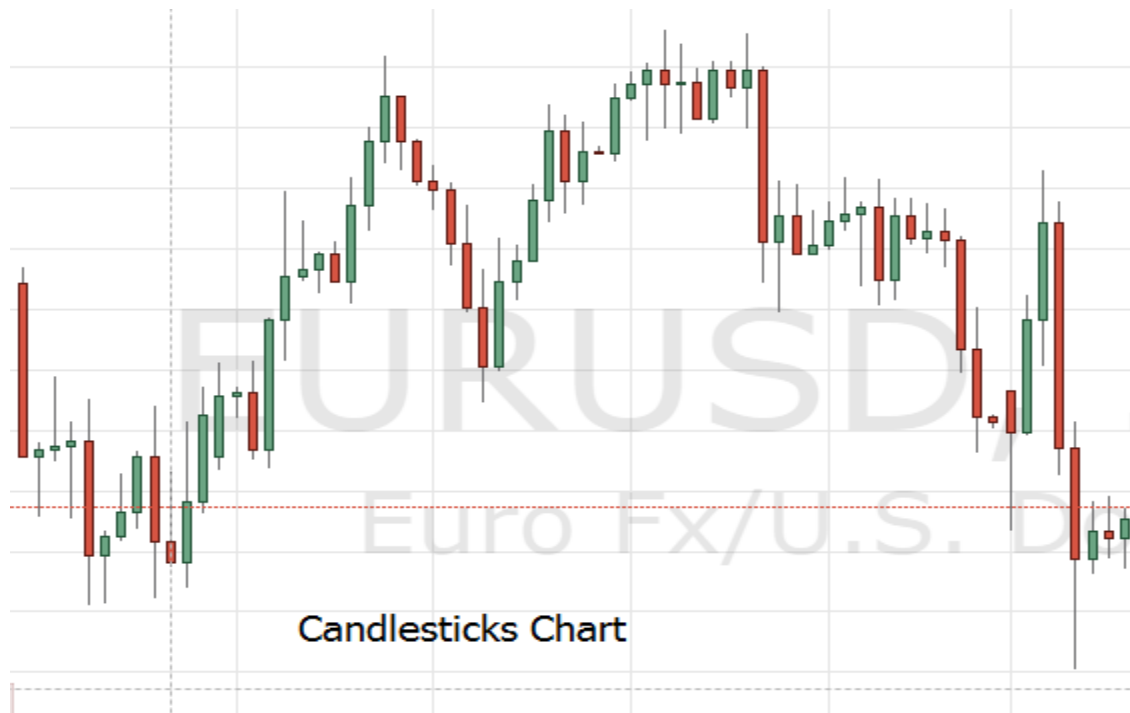
Different Candlestick Patterns with Examples

Marubozu is a basic candlestick pattern that indicates whether the price movement is strongly bullish (white candle) or strongly bearish (black candle).

Marubozu

White Marubozu   Black Marubozu
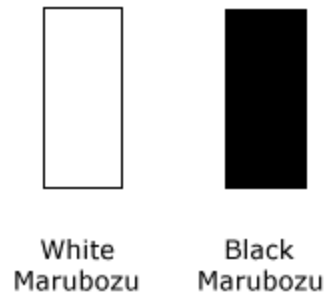
Long Shadows indicates price rejection occurring due to increased buying or selling pressure. A candle with a long upper shadow indicates that sellers have dominated the buyers and price is likely to reverse downwards. Conversely, a candle with long lower shadow indicates buyers have dominated the sellers and price is likely to reverse upwards.

Long Shadows

Long Upper Shadow →
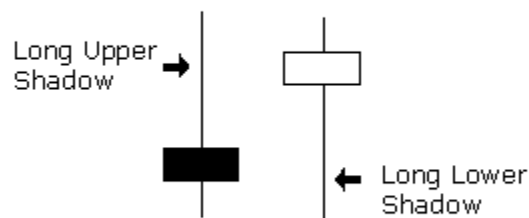
← Long Lower Shadow

Spinning Tops candlestick patterns indicate a situation where there is indecision in the market. A candlestick pattern with a long upper shadow, a long lower shadow, and a small body is called a spinning top.

Spinning Tops
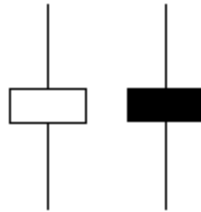
Doji is formed by a small short upper shadow and a short lower shadow. The open and close price of a Doji should be same or the difference should be very small. Doji is a neutral pattern. Usually it forms before a trend reversal or trend continuation.

Doji

Both the **Hammer** and the **Hanging Man** have a small body with long lower shadows. If it forms after a price decline, then it is called a Hammer, which is considered as a bullish reversal pattern. If it forms at the top or resistance level after a price hike, then it is called a Hanging Man, which is considered as a bearish reversal pattern.

Hammer
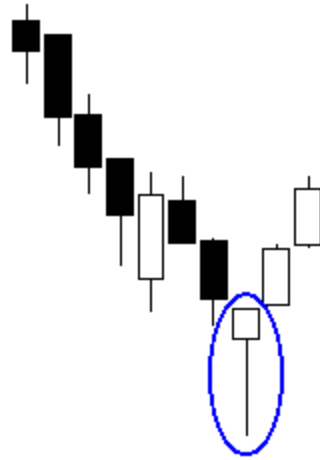
Hanging Man

Both **the Inverted Hammer and the Shooting Star** have a small body with long upper shadows. If it forms after a price decline, then it is called an Inverted Hammer, which is considered as a bullish reversal pattern. If it forms at the top or resistance level after a price hike, then it is called a Shooting Star, which is considered as a bearish reversal pattern.
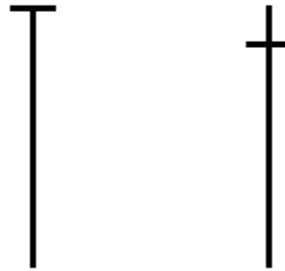
**Inverted Hammer**
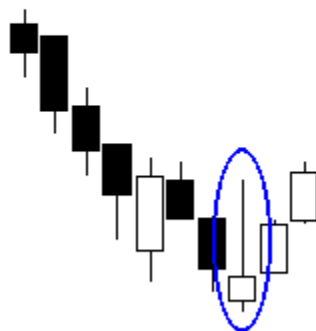
Shooting Star

Dragonfly has a long lower shadow. Sometimes it forms with a short upper shadow where the open and close price is the same. Dragonfly is a trend reversal pattern.

Dragonfly

Gravestone is formed with a long upper shadow where the open and close price will be the same or will have a very small body. Gravestone also indicates a trend reversal from the top or bottom of a trading period. It is a converse of the Hammer.
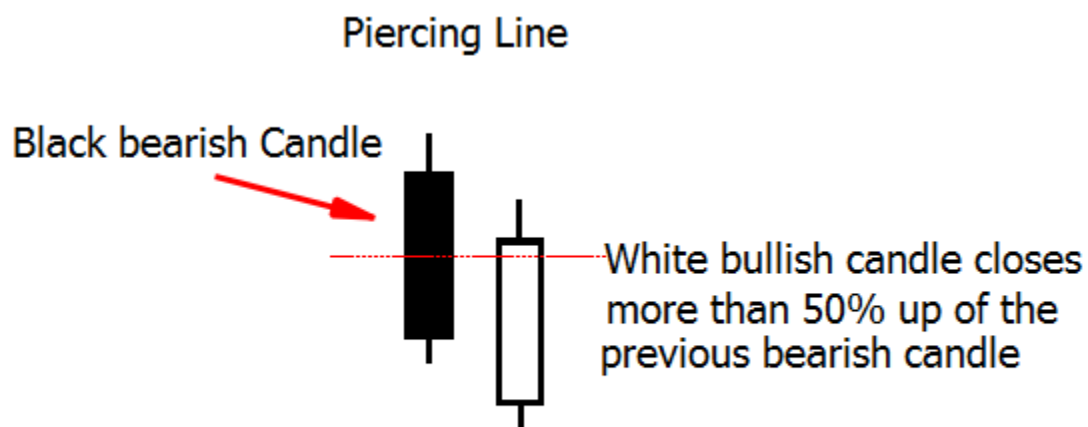
Gravestone
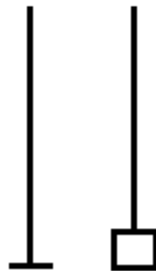
Dark Cloud Cover occurs when a bullish white candle is immediately encountered with a black Marubozu, which indicates the end of bullish trend. It suggests that a trend is likely to turn bearish.

Dark Cloud Cover

Bullish white candle

Black bearish candle covering more than
50% of the previous white candle
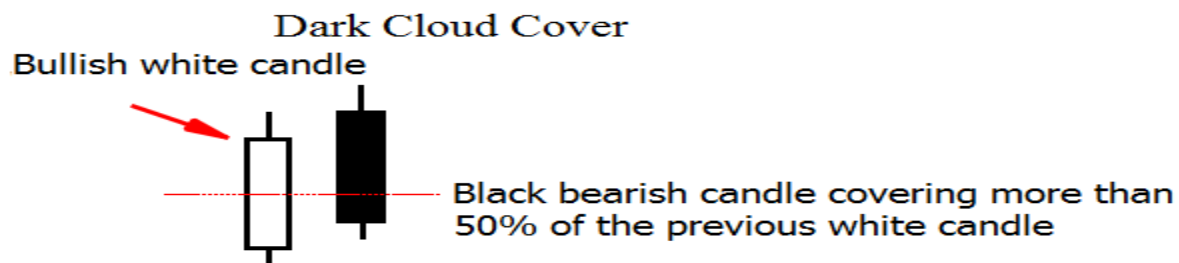
Piercing Line is just the opposite of the Dark Cloud Cover pattern, indicating the end of a down trend and enthuses to bullish trend.

Piercing Line

Black bearish Candle

White bullish candle closes
more than 50% up of the
previous bearish candle

Engulfing Candlesticks pattern occurs when the body of the second candle completely covers or engulfs the previous candle. Usually, engulfing patterns are followed by other reversal patterns like doji, hammer, gravestone, and indicates trend reversal.

Engulfing Patterns

Bullish sign in a down trend
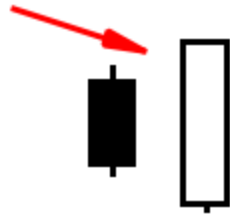
Bearish sign in a up trend

Harami candlestick patterns indicate the weakness of the price momentum, which normally indicates a trend reversal. The second candlestick must be an inside bar of the first candlestick (mother bar). The inside bar may form with short upper and lower shadows.

Harami

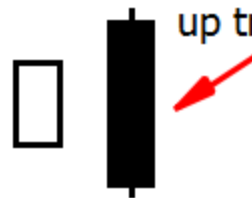Harami   Harami Cross
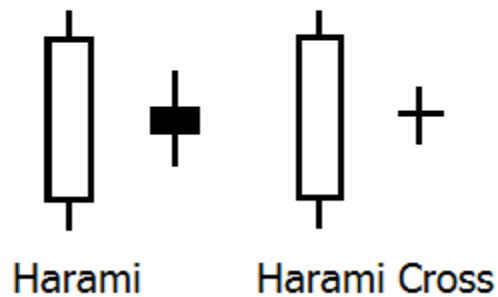
Morning Star is a strong bullish reversal pattern that usually occurs at the end of a down trend. The first candlestick is a long black bearish candle. The second candle both opens and closes lower than the close of the first candle (with a gap) and with a small white body. The next candle moves straight up with a long bullish white candle that closes upper than the 50% of the first bearish candle.

Morning Star

Third candle closes more
Than 50% of the first
Candle

Price Gap
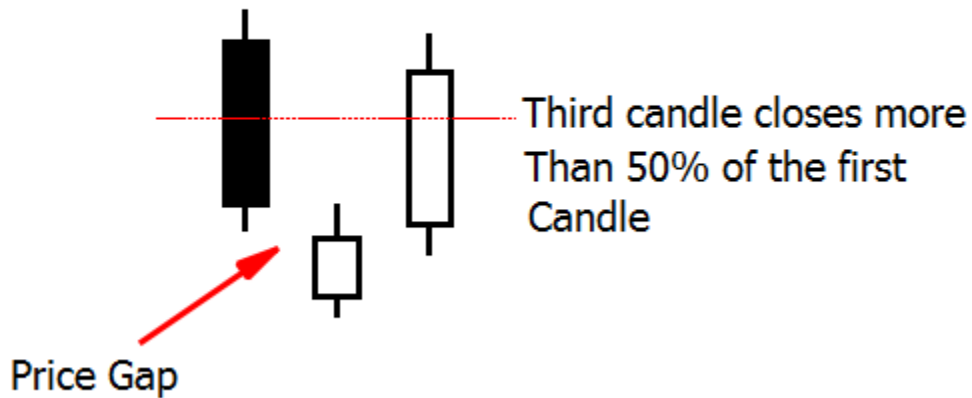
Evening Star is just the opposite of the Morning Star pattern. It occurs at the end of the uptrend and enthuses bearish trend. The third candle makes the pattern more bearish if it closes much lower than the 50% of the first candle.

Evening Star

Price Gap

The Third candle closes
More than 50% of the
First candle
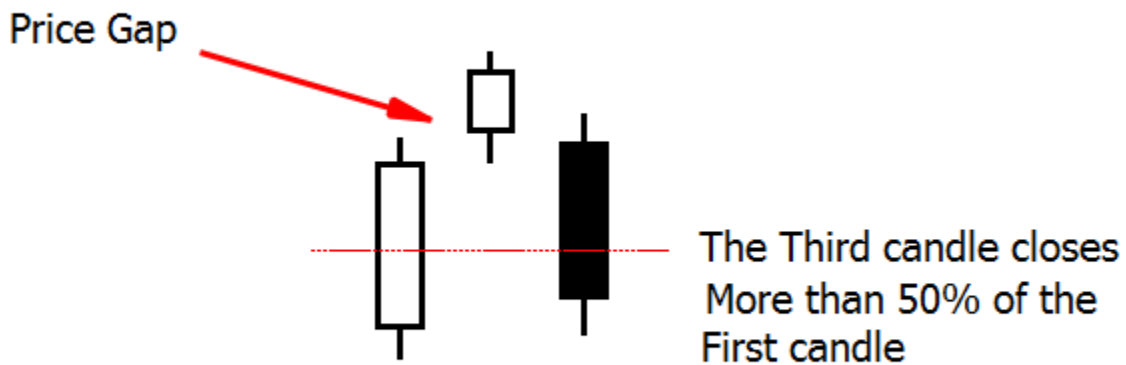
The Rising Three Method forms with two large bullish candles containing 3 or 4 tiny bearish candles at the middle. This is a bullish continuation pattern and

usually occurs at the middle of an uptrending market. The last bullish candle must close above the high of the first bullish candle (mother bar).

Rising Three Method

Mother bar

Last candle closes above the mother bar
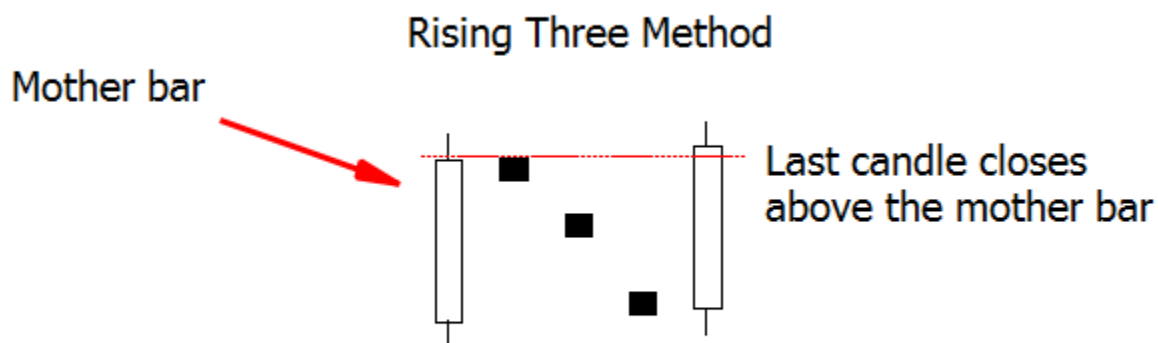
The second bullish candle must be closed above the mother bar

The Falling Three Method is just the opposite of the Rising Three Method. It indicates that the bearish momentum will be continuing forming new lows. The last candle should close below the first bearish candle (mother bar).

Falling Three Method

Mother bar

Last candle closes below The mother bar
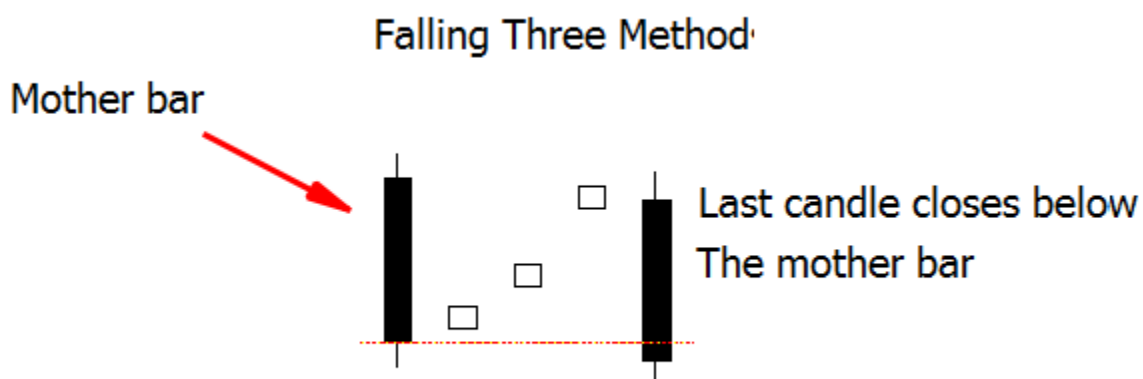
The second bearish candle must be closed below the mother bar

Candlesticks are considered as a powerful visual aid for traders for decision making and they are the most popular method of reading and interpreting charts.

6. Chaikin Money Flow

Marc Chaikin introduced the Chaikin Money Flow (CMF) to the world of traders. The indicator is based on the belief that price usually follows volume. CMF is mostly used to isolate strong trends. It can be combined with moving averages or support/resistance for better trade signals.

Interpretation

When the Chaikin Money Flow is above the zero line, it indicates accumulation (high buying pressure) and if it stays below zero, it indicates distribution (high selling pressure). CMF fluctuates between -1 and + 1. The more it moves away from zero (above or below), the stronger the signal becomes. CMF also creates bullish and bearish divergence to indicate the next possible price movement direction.

Calculation

Chaikin Money Flow is a combination of Accumulation Distribution indicator and calculated through 3 simple steps:

1. Money Flow Multiplier = {(Close - Low) - (High – Close)}/(High – Low)
2. Money Flow Volume = Money Flow Multiplier x Volume for the period

Now if we want to calculate 20 days period Chaikin Money Flow, we'll be doing it as follows:

3. 20 period CMF = 20 period sum of Money Flow Volume / 20 period sum of volume

Each period of the Money Flow Volume depends on the Money Flow Multiplier. This multiplier is positive only when the close is in the upper half and negative when the close is in the lower half of the period's high-low range. The multiplier equals to 1 when the close equals the high and -1 when the close equals to the low. In this way, the multiplier adjusts the amount of volume that ends up in Money Flow Volume.

Generally Accepted Use

1. Go for long when price breaks out above the resistance and Chaikin Money Flow is above the zero level
2. Go for short if price breaks out below the support and Chaikin Money Flow is below the zero level

Chaikin Money Flow also creates divergences with price actions. Traders go for long orders if it is a bullish divergence and short orders in case of a bearish divergence.

Chart Example
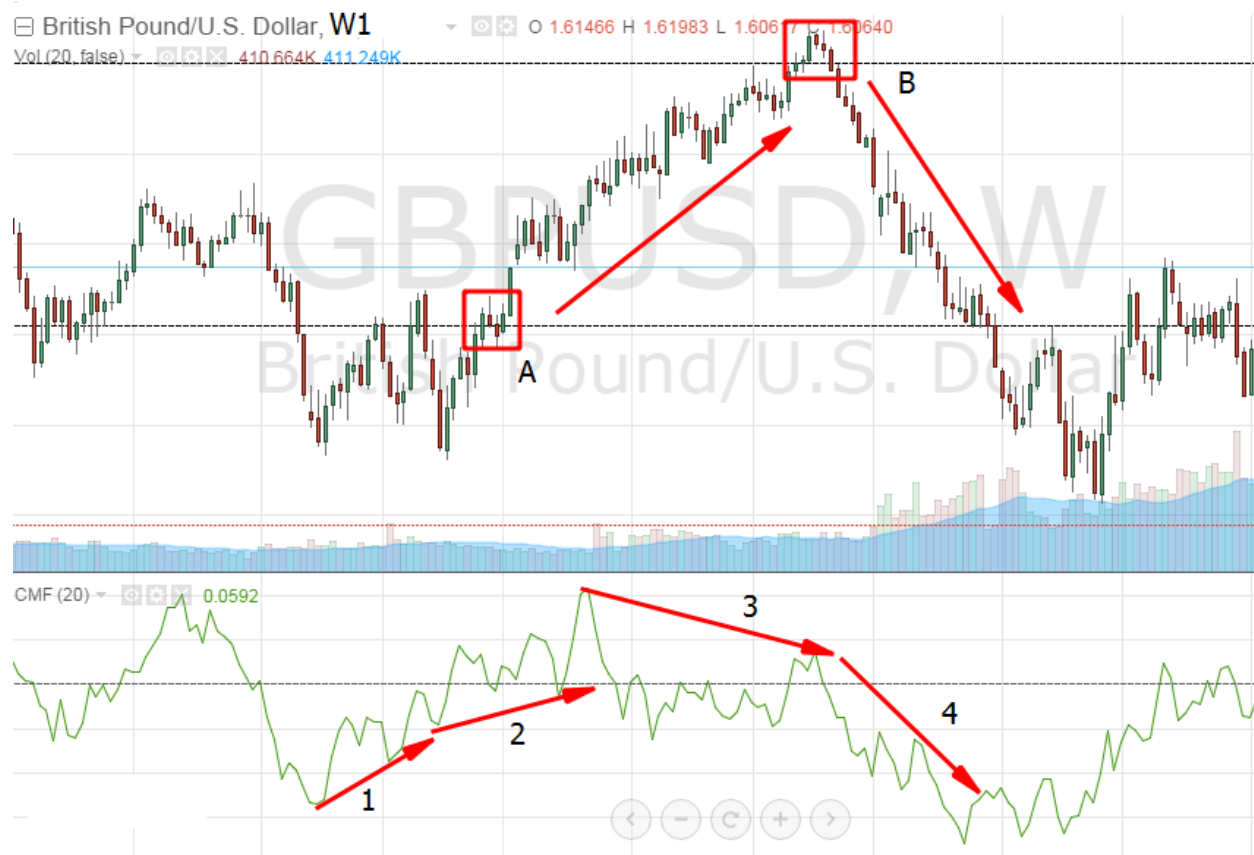
On the chart above, the Chaikin Money Flow started moving towards the zero level (1) and continued (2) to stay above the zero level until price broke out above the resistance (A). This is a long opportunity. Price hiked straight to the next resistance level.

Secondly, price started to fall and broke out below the support level (B) and the Chaikin Money Flow indicated bearish divergence (3) moving below the zero level. This is a short opportunity as price continued to go down straight to the next support level. The ongoing selling pressure on the indicator (4) supported this bearish momentum.

7. Chaikin Oscillator

The level of money flow is very important in trading markets. It expresses market sentiment and helps to find out the high and low of a trading range. Chaikin Oscillator is used to monitor the level of money flow in and out of the market.

Interpretation

This indicator is developed to measure the Accumulation Distribution Line (ADL) or the momentum behind buying and selling pressure. The indicator determines the value that oscillates between positive and negative values. If the indicator gives a reading of below zero, the ADL' momentum and consequently the bullish pressure is higher. On the other hand, when the indicator gives a reading of above zero, the ADL's momentum and consequently the bearish pressure is higher.

Calculations

The 4 step calculation process of Chaikin Oscillator is given below,

1. Money Flow Multiplier = {(Close – Low) – (High – Close)} / (High – Low)
2. Money Flow Volume = Money Flow Multiplier x Volume for the period
3. Accumulated Distribution Line = Previous ADL + Current Period's Money Flow Volume
4. Chaikin Oscillator = (3day EMA of ADL) – (10day of ADL)

Generally Accepted Use

To generate trade signals, the Chaikin Oscillator creates divergence in collaboration with price actions.

1. Go long if the divergence is bullish
2. Go short if the divergence is bearish

Chart Example
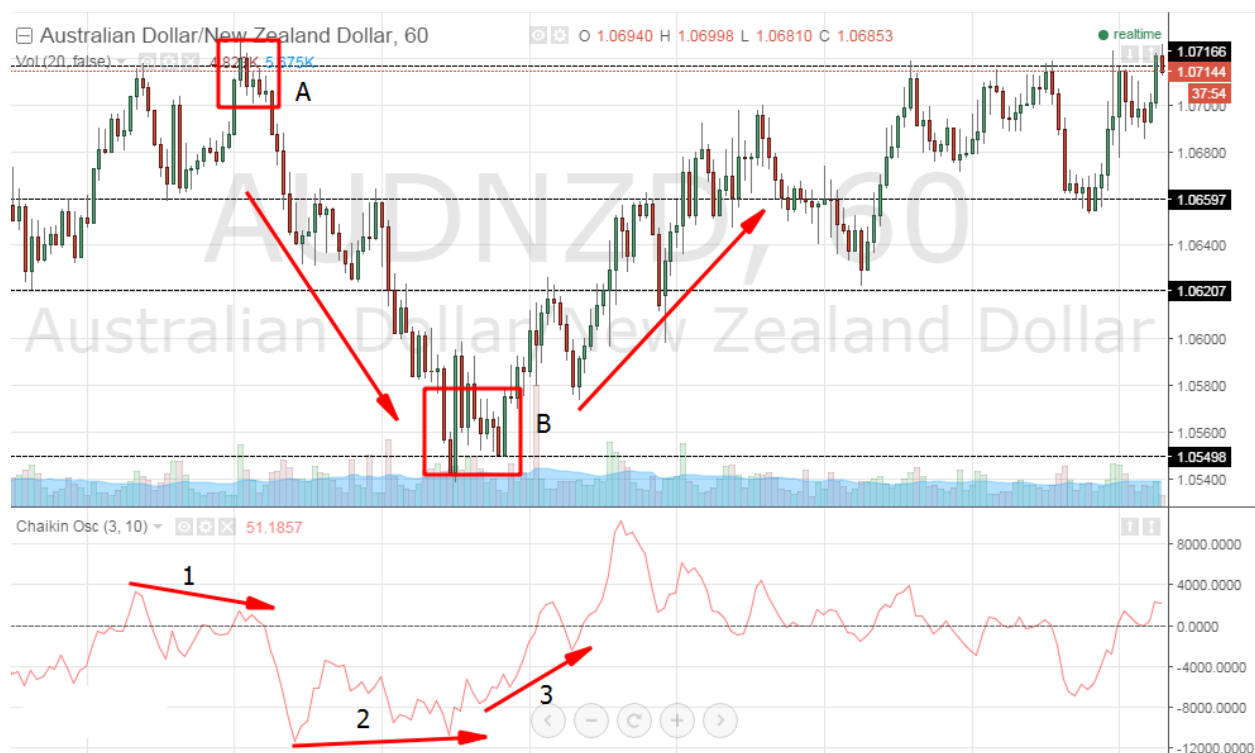
On the chart above, a bearish divergence (1) formed on the Chaikin Oscillator while price made a false break at the resistance level (A). This indicates a short opportunity.

At the support level, price made another false break (B) and started to move up while Chaikin Oscillator showed bullish divergence (2, 3). This signals a long opportunity, as price hiked with a strong momentum after the divergence occurred.

Traders have to remember that Chaikin Oscillator alone cannot create a profitable trade signal. For better results, price action with support and resistance, moving averages, or other preferred oscillators can be used to find the divergence and trading opportunities.

8. Chaikin Volatility

Chaikin Volatility, developed by Marc Chaikin, is used to gauge the volatility of the market. The indicator compares the spread between the high and low prices of a financial instrument in the market. This way, it computes volatility as a broadening of the range between the high and low prices. It is important to combine this indicator with moving average penetrations or trading band systems to confirm its trade signals.

Interpretation

1. Market tops are generally accompanied by the raise of volatility and market bottoms are generally accompanied by the decrease of volatility.
2. An increase of the volatility indicator over a relatively short time period indicates price is going to find a new bottom or low. If the volatility decreases over a longer time period, it indicates price is going to rock to a new top or high.

Calculations

The first step involves the calculation of the exponential moving average of the difference between the daily high and low prices. Chaikin recommends a 10-day moving average for use.

H–L average = Exponential moving average of (High – Low)

On the second step, the percentage change in the moving average over a specified period is calculated. For example, if the specified period is 10, the formula becomes:

[{(H–L Average) – (H–L Average 10-periods ago)} / (H–L Average 10-periods ago)}] X 100

Generally Accepted Use

1. Go long if the Chaikin Volatility starts to increase and price breaks resistance or recent high after a longer time period of low volatility.
2. Go short if the Chaikin volatility starts to decrease after a high volatility and price breaks support or recent low.

Chart Example

On the chart above, price made a new high (A) after ranging for a long time. And, the Chaikin Volatility started to increase (1), indicating a long opportunity. After making another new high (B), price started to fall and created a lower low (C). Consequently, the volatility started to decrease from the top, signaling a short opportunity.

9. Commodity Channel Index

Donald Lambert originally introduced Commodity Channel Index (CCI) in 1980. It is used to identify cyclical trends that help traders adapt and trade with repeatedly changing trends. At the beginning, this indicator was used mainly in the commodity markets but now it is a very common tool for traders both in the equity and currency markets.

Interpretation

CCI is interpreted and used in much the same way as oscillators. If price hikes and drives CCI over 100, it means overbought market conditions. On the other hand, if there is a significant fall of price and CCI gets down to -100, it means oversold market conditions. CCI also forms bullish or bearish divergences with price actions.

Calculations

To calculate Commodity Channel Index, first we'll have to calculate Typical Price.

Typical Price = (High + Low + Close) / 3

CCI = (typical Price – Simple Moving Average) / (0.015 x Mean Deviation)

A 20-day simple moving average is recommended for use in CCI calculation

Generally Accepted Use

During ranging markets, traders consider CCI parameters and it's movements to make trade decisions.

1. Go long if CCI moves up from below -100 and price bounces back from trade range support.
2. Go short if CCI moves down from above 100 and price bounces back from trade range resistance.

During trending markets, traders use CCI divergences to determine trend continuations and reversals.

1. Take long orders if it is a bullish divergence.
2. Take short orders if it is a bearish divergence.

Chart Example
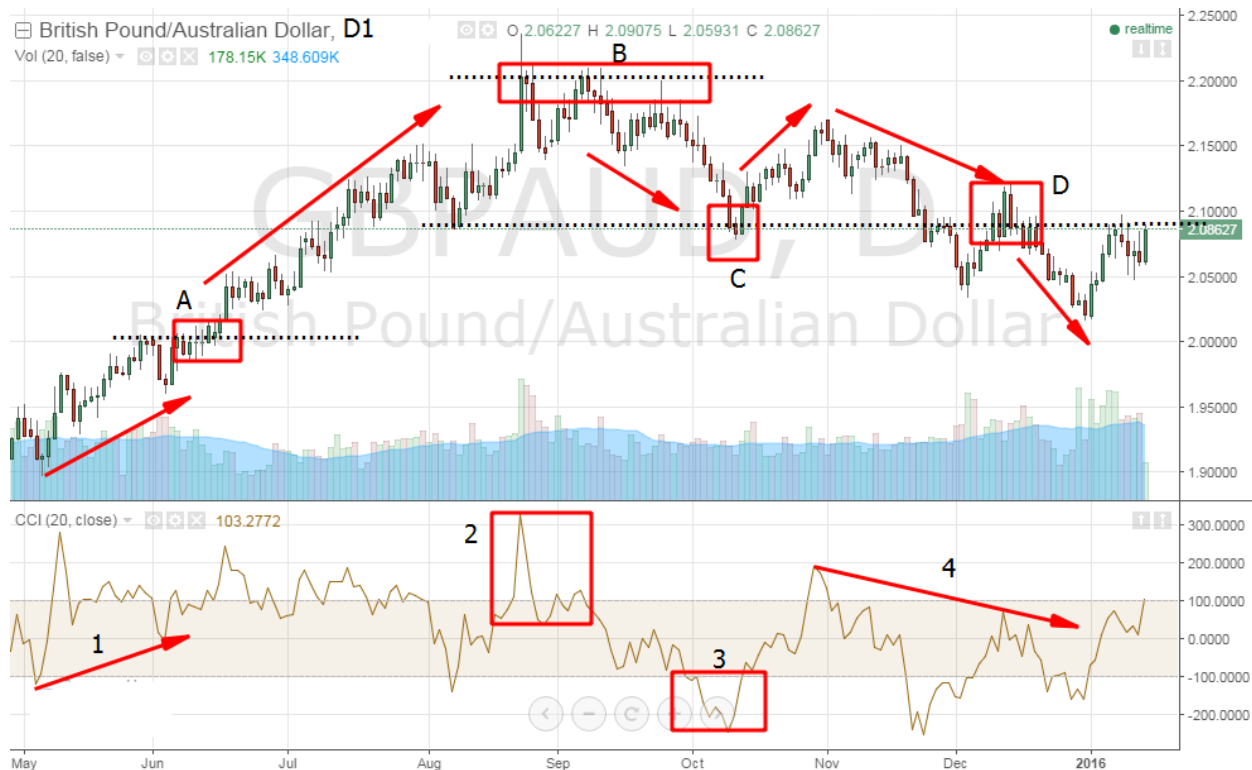
- At the beginning, price was trending up and broke a minor resistance while CCI was showing a bullish momentum (1). It's a long opportunity.
- Price bounced back from resistance (B) and CCI dropped down below 100, indicating a short opportunity.
- Price found support (C) and market started to range while CCI turned up above -100 from the bottom (3), indicating a long opportunity.
- Price treated the previous support as a resistance (D) and CCI showed a bearish divergence (4), giving a signal to go short.

10. Detrended Price Oscillator

The Detrended Price Oscillator (DPO), as its name suggests, is a technical indicator that eliminates price trends in an attempt to make it easier to identify the length of price cycles from one peak to the other, or from one trough to the other. This way, it also shows overbought or oversold levels.

Interpretation

The indicator relates past prices of a financial instrument to a displaced (moved to the past) Simple Moving Average (SMA). The SMA becomes the zero line and price fluctuation between positive (above the line) and negative (below the line) becomes the DPO indicator.

If the DPO indicator is above the zero line, it implies that the price of a financial instrument is above the SMA. And, this is interpreted as a bullish signal. On the other hand, if the DPO indictor is below the zero line, it implies that price is below the SMA, giving a bearish signal.

Calculation

(sourced from [Tradingview.com](https://www.Tradingview.com))

(Price of (N/2 + 1) periods ago) - (N Period SMA) = DPO

  N = The user defined look-back period

Generally Accepted Use

- Buy if the DPO indicator crosses above the zero line
- Buy if the DPO indicator is in an oversold zone, as evidenced by previous lows of the oscillator, and both the indicator and price break the downward resistance trendline
- Sell if the DPO crosses below the zero line
- Sell if the DPO indicator is in an overbought zone, as evidenced by the previous highs of the oscillator, and both the indicator and price break the upward supporting trendline

Chart Example

11. Directional Movement Index

Created by J. Welles Wilder, the Directional Movement (DMI) Index is used to determine whether the market is trending or not. It is a group of three different indicators joined into one: the Average Directional Index (ADX), Plus Directional Indicator (+DI), and the Minus Directional Indicator (-DI).

Interpretation

The DMI is a complete and accurate system for identifying profitable trading opportunities in the market. The +DI illustrates upward trend movement, -DI illustrates downward trend movement, and the ADX illustrates if the market is trending or not. If the ADX is declining, it indicates that the market's direction is becoming unclear. If the ADX drops below both the +DI and the -DI, it points at market inactivity.

Calculation

(sourced from Tradingview.com)

Calculating the DMI can actually be broken down into two parts.
First, calculating the +DI and -DI, and second, calculating the ADX.

To calculate the +DI and -DI you need to find the +DM and -DM (Directional Movement).
+DM and -DM are calculated using the High, Low and Close for each period.
You can then calculate the following:

Current High - Previous High = UpMove
Current Low - Previous Low = DownMove

If UpMove > DownMove and UpMove > 0, then +DM = UpMove, else +DM = 0
If DownMove > Upmove and Downmove > 0, then -DM = DownMove, else -DM = 0

Once you have the current +DM and -DM calculated, the +DM and -DM lines can be
calculated and plotted based on the number of user defined periods.

+DI = 100 times Exponential Moving Average of (+DM / Average **True** Range)
-DI = 100 times Exponential Moving Average of (-DM / Average **True** Range)

Now that -+DX and -DX have been calculated, the last step is calculating the ADX.

ADX = 100 times the Exponential Moving Average of the Absolute Value of (+DI-
-DI) / (+DI + -DI)

Generally Accepted Use

- Enter long order if +DI goes above -Di. This signal becomes more valid if
  either the ADX upswings while the +DI and ADX are above -DI or ADX
  turns up from below +Di and -DI.
- Enter short order when -DI goes above +DI. This signal becomes more
  valid if either the ADX upswings while -DI and ADX are above +DI or
  ADX turns up from below +DI and -DI.

Chart Example
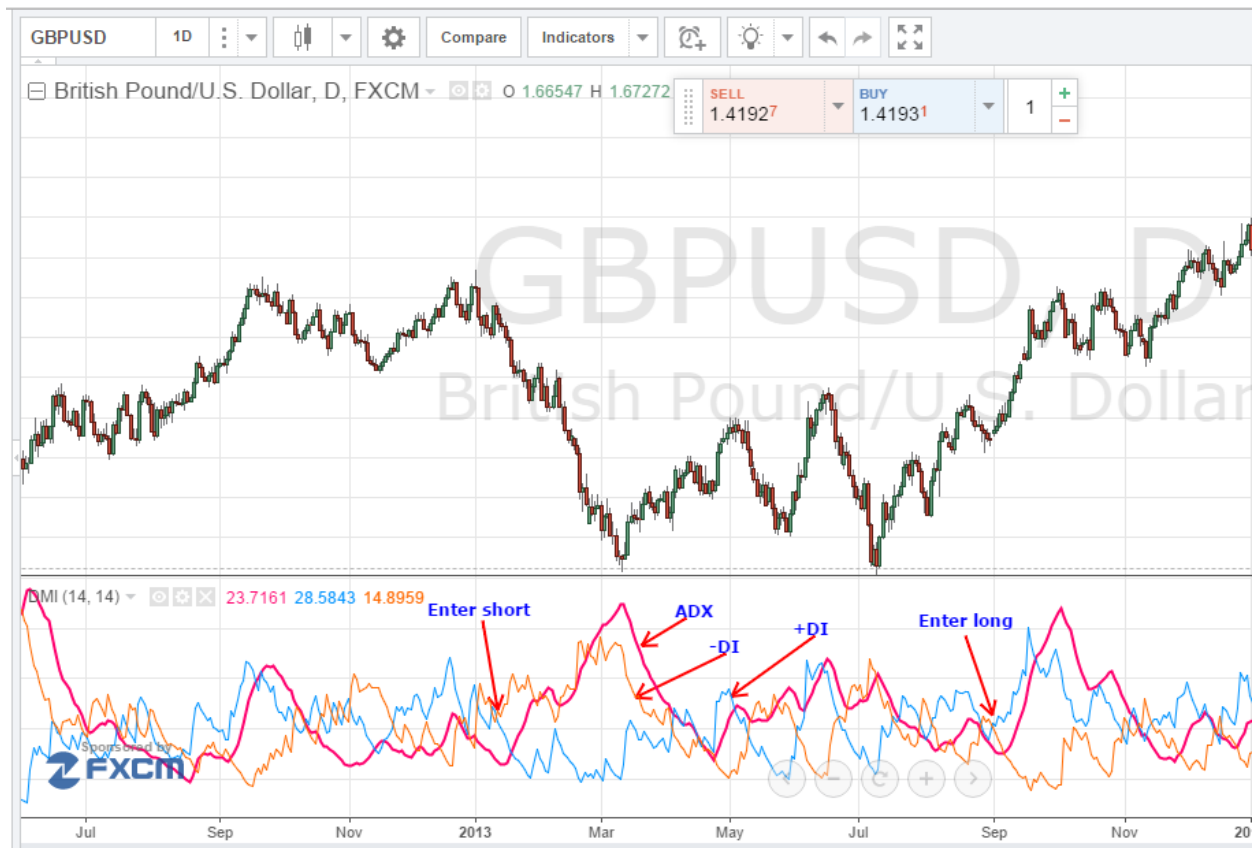
12. Donchian Channels

Designed by Richard Donchian, the Donchian Channels is a technical indicator used to gauge the market's volatility. They are also used for seeing possible breakouts or overbought/oversold conditions when the price of a financial instrument hugs either the Upper or Lower Band.

Interpretation

The Donchian Channels takes a user's defined number of periods (for instance, 20 days) and computes the Upper Band (the high price for the period), Lower Band (the low price for the period), and the Middle Line (the average of the Upper Band and the Lower Band).

During high volatile markets, the Upper and Lower Bands will expand. On the other hand, when volatility is low, the bands come closer to one another. If price touches or breaks through one of the bands, it could suggest overbought or oversold conditions in the market. And, this could imply that the present trend has been confirmed and the breakthrough would result in further price action in a similar trend direction.

Calculation

(sourced from Tradingview.com)

On this example, a 20 day period is used (it's the regularly used timeframe).

Upper Channel = 20 Day High
Lower Channel = 20 Day Low
Middle Channel = (20 Day High + 20 Day Low)/2

Generally Accepted Use

It's important to remember that this indicator works best in trending markets.

- Enter long when price crosses into the Upper Band territory
- Enter short when price crosses into the Lower Band territory

Chart Example

On the above British Pound/U.S. Dollar chart, the Donchian Channels are used for confirming the trend. When the pair was moving upwards, price was going into the overbought territory, suggesting a strengthening uptrend. On the other hand, when the pair was moving downwards, price was going into the oversold territory, suggesting a strengthening downtrend.

13. Ease of Movement

Developed by Richard W. Arms, the Ease of Movement is a volume based indicator that gauges the relationship between volume and price changes of a financial instrument. The indicator shows that relationship as an oscillator that fluctuates above and below a zero line, and it's particularly important in determining the strength of a trend.

Interpretation

As the indicator oscillates between positive and negative values, it quantifies the "ease" of price movements of a particular financial instrument. When the indicator is in positive territory, prices are moving upward with a lot of ease. A high positive reading would suggest advancing prices on light volume. On the other hand, when the indicator is giving negative readings, prices are moving downward with a lot of ease. A high negative reading would suggest declining prices on light volume.

Calculation

(sourced from Tradingview.com)

There are four essential steps when calculating Ease of Movement. For this example, we will calculate a 14 Period EOM which is very common:

1. Calculate the distance moved.
   ((CurrentHigh + CurrentLow)/2 - (PreviousHigh + PreviousLow)/2) = Distance Moved

2. Calculate the Box Ratio which take volume and high/low range to produce the denominator in EOM calculations.
   ((CurrentVolume/100,000,000) / (CurrentHigh - CurrentLow))

3. Calculate a 1 Period EOM.
   Distance Moved / Box Ratio = 1 Period EOM

4. Calculate a 14 Period EOM.
   14 Period Simple Moving Average of the 1 Period EOM = 14 Period EOM

Generally Accepted Use

To increase the accuracy of the signals generated by the Ease of Movement, it's recommended you use it as a complimentary indicator or in combination with other trading strategies.

- Enter long orders when the indicator crosses to above zero

- Enter short orders when the indicator crosses to below zero

Chart Example
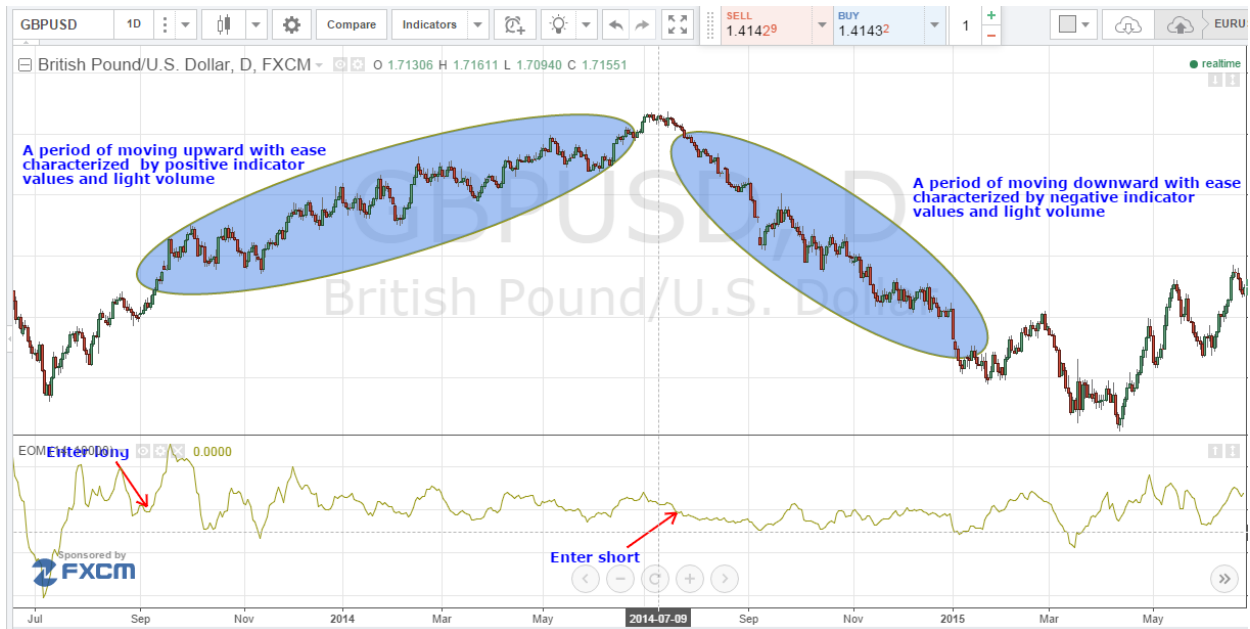
14. Equivolume

Developed by Richard W. Arms, Equivolume displays prices of financial instruments in a way that adds weight to the relationship between price and volume. On a normal bar chart, volume is usually given on the lower margin of the chart. However, Equivolume displays price and volume activity as two-dimensional bars (boxes), so making it easier to confirm price movements.

Interpretation

An Equivolume box has three main components: upper boundary, lower boundary, and width.
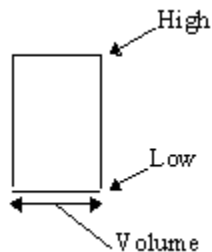
The upper boundary represents the high for the trading period and the lower boundary represents the low for the period. The width of the bar is the unique feature of the tool, as it identifies the extent of the volume traded during the period. The height of the bar is used to understand the trading range for the period.

Generally Accepted Use

The shape of the Equivolume boxes gives detailed information about what is happening in the market. Usually, when a short and wide bar appears, it indicates large volume, which would precede major market reversals. On the other hand, tall and narrow bars, indicating light volume, are normally present in established trends.

Chart Example

Here are the common types of Equivolume boxes:
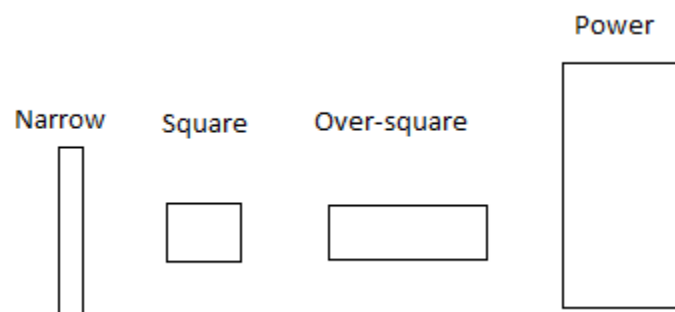
A narrow box, occurring because of light volume, makes the reliability of a breakout to be doubted. An over-square Equivolume box displays strong commitment from both bulls and bears to rule the day. As such, it normally gives an excellent indication of a possible trend reversal when it appears on the charts. A "power box" (illustrating strong commitment by bulls during an uptrend or bears during a downtrend) usually gives a powerful confirmation of a price breakout above resistance zones or below support zones.

15. Exponential Moving Averages (EMAs)

The exponential moving averages (EMAs) are also known as "exponentially weighted moving averages (EWMAs)". An EMA carries weighting factors that progressively applies less weight at older data but more at newest data. The EMAs are considered the most reliable moving averages among other basic moving average types.

Interpretation

Interpreting an exponential moving average is very simple. The slope of an EMA is always down when price closes below the moving average and always up when price closes above the moving average. Thus, it is also considered as a trend following indicator.

Calculation

The calculation process of exponential moving average is given below:

1. First calculate the EMA% (k) = 2/(N+1) [N= number of days or EMA period]
2. Multiply EMA% (k) with today's price (t) and add it with EMA of yesterday (y) multiplied by (1-k)

Therefore, the formula becomes:

EMA = Price (t) x k + EMA (y) x (1-k)

An Excel or some other spreadsheet software can be applied to calculate the EMA in a semi-automatic way.

Generally Accepted Use

EMA with Price Action:

1. If the trend is up and price continues to stay above the EMA slope, look for long opportunities.
2. If the trend is bearish and price continues to stay below the EMA slope, look for short opportunities.

EMA Crossover:

1. An EMA crossing over the longer period EMA from below to above indicates bullish trend and long trading opportunities.
2. An EMA crossing over the shorter period EMA from above to below indicates bearish trend and short trading opportunities.

Chart Example

EMA with price action:
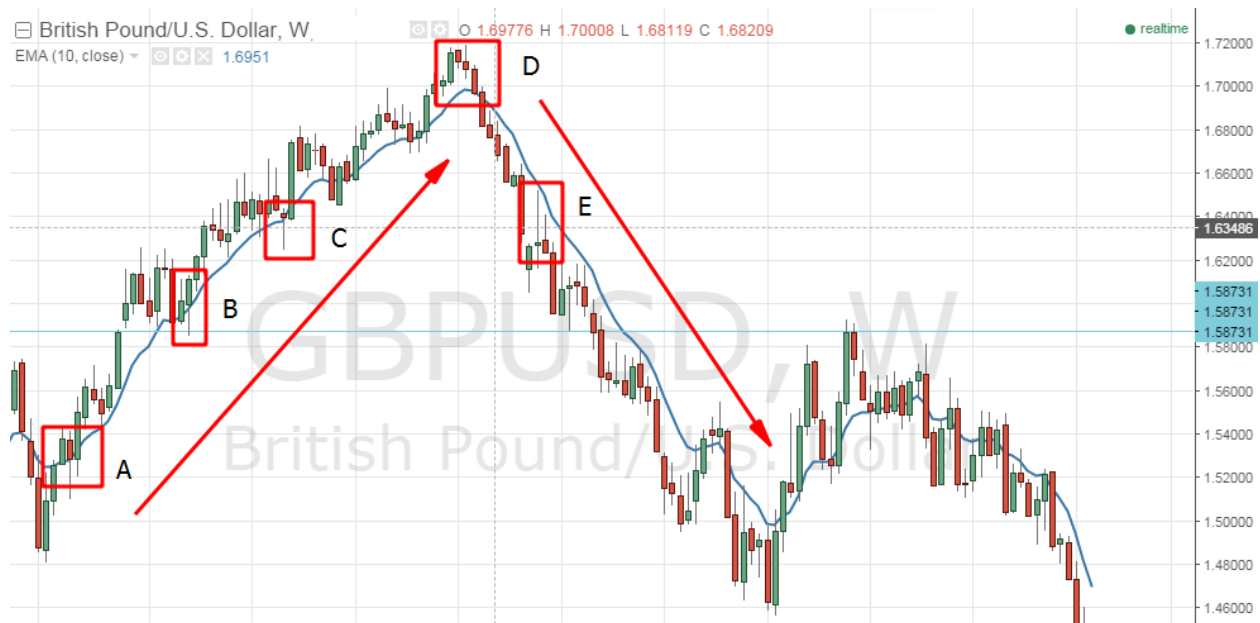
This is a British Pound / U.S. Dollar weekly chart where a 10-day period EMA has been applied. At point "A", price crossed EMA 10 up and continued to stay above it, signaling bullish momentum. Price was rejected from EMA slope when it acted as dynamic support with the trend (B, C), signaling buy opportunity. At point, "D" price went below the EMA and continued to stay below it, signaling bearish trend. Price was rejected from EMA (E) when it acted as a dynamic resistance with the trend, signaling sell opportunity.

EMA crossover:
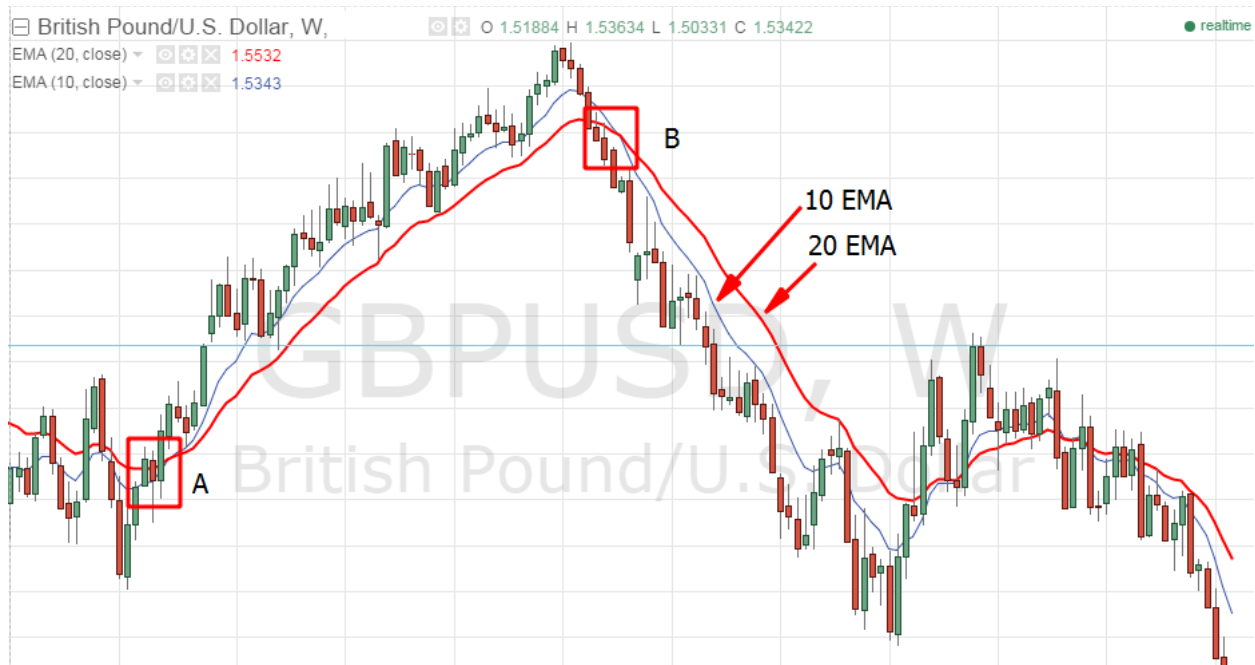
On the same chart, we have added a 20-day period EMA (RED) to see the crossover impact with EMA 10 (Blue). Initially, EMA 10 crossed EMA 20 from below to above (A) and confirmed bullish trend. On the other hand, at point "B", EMA 20 crossed over EMA 10 from above to below, signaling trend reversal and the emergence of a bearish trend. Thereafter, a significant fall of price occurred after the crossover.

16. Fibonacci Extensions

Fibonacci Extensions are the levels of prices plotted by measuring the price's primary move and its likely targets. The extension levels also indicate areas of possible support and resistance on charts in the form of horizontal lines. Fibonacci Extensions are well known for determining profit-taking areas when making trade decisions based on the prevailing market trends.

Interpretation

There are some popular Fibonacci Extension levels such as 0.618, 1.000, and 1.6180. Traders may also add customized extension levels like 2.618 and 4.236. All these levels are considered as either support or resistance levels.

Those who already have running positions in the market usually use such levels to determine their profit taking areas. If price successfully breaks out of any of those levels, it could indicate that the market is going to reach the next extended levels.

Correctly identifying swing high and low levels as well as the trend direction is important in determining accurate Fibonacci Extensions levels.

Drawing Fibonacci Extensions

A four-step process for drawing Fibonacci Extension levels is given below:

1. Open Draw menu or the toolbar option on the trading platform and select Fibonacci Extensions
2. Select the range by dragging over the mouse
3. Select Highs and Lows (for short-term charts) or Closing price (for long-term charts)
4. Complete the drawing by clicking the selected button

Generally Accepted Use

After plotting the Fibonacci Extension levels (to either direction), if price reaches to 61.8% extension level and fails to break the support or resistance level, you can choose to close the trade and take your full profits. Or, you can also choose to close the trade partially with some profits and allow the remaining portion to run until 100%, 161.8% or 261.8%. At every level, do the same as done at 61.8%.

Chart Example

On the above chart, A and B were the previous high and low of the range respectively. Point C was the nearest swinging lower high, which is also considered as the retracement level. Price broke out at the 61.8% Extension level and used the same level as resistance (R1). Price eventually reached and broke out of the 100% and 161.80% levels and continued to fall further. In such cases, closing a short trade partially at each Extension level and allowing the balance to run further could lead to increased profits.

17. Fibonacci Retracements

When the market is trending, it does not mean that it will continue in the same direction non-stop. Normally, price retraces before its next big move to a higher high or lower low.

Fibonacci Retracement is the tool used by traders to determine possible retracement areas. Determining retracement levels is important because it unlocks great trading possibilities. First, traders can adjust their stop-loss levels based on the retracement low or high. Secondly, they can add more positions on their running trades when the trend is moving according to their predictions.

Interpretation

Before price starts to make its next move towards the current direction, it usually retraces back to Fibonacci retracement levels and uses them as possible areas of reversal in favor the current trend. Traders may add candlestick reversal chart patterns on those levels to determine retracement limits with better accuracy.

Drawing Fibonacci Retracements

Drawing Fibonacci Retracements just needs some simple mouse clicks.

1. Open Draw menu or toolbar on the trading platform and select Fibonacci Retracements
2. Drag the mouse over the range that is selected at any trend
3. For short-term charts select Highs and Lows and for long-term charts, select the Closing prices
4. Complete the drawing by clicking on the select button.

Generally Accepted Use

There are some important retracement levels such as 23.6%, 38.2%, 50%, 61.8% etc. Once, the area is determined, traders may bring their stop-loss below the retracement low (for long trade with bullish trend) or above the retracement high (for short trade with bearish trend). They also add positions with their current trades to re-join the trend.

Chart Example
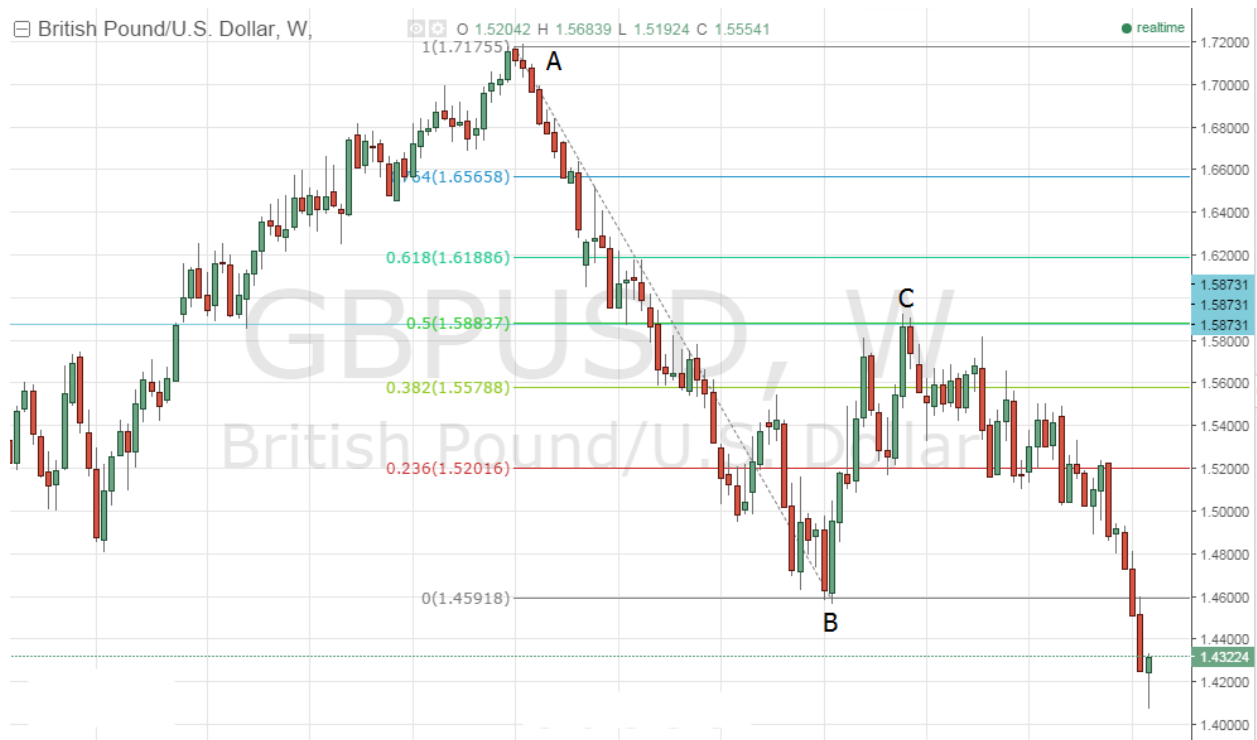
On the above chart, Point A and B are marked as High and Low of the range that was plotted with a strong bearish move. From range low B, price started to retrace and pulled back up to the 50% level (C). Price used that level as a key resistance area and turned down again to re-join the current bearish trend creating a new low. Here, the 50% area was a potential zone to enter the market with a sell opportunity and ride the trend downwards.

18. The Force Index

Dr. Alexander Elder developed the Force Index indicator. The Force Index measures the strength of bulls and bears in the market by combining price movements and volume. It can accurately measure significant changes in the power of bulls and bears when it is combined with a moving average. In this way, Dr. Elder made it an extremely useful indicator.

Interpretation

The Force Index works in conjunction with a 2-day exponential moving average for short-term charts or a 13-day exponential moving average for long-term charts. If the Force Index stays above zero, it indicates that bulls are in control of the market. The Force Index getting higher readings means that bulls are stronger. On the other hand, if the indicator stays below zero, it signals that bears are in control. The Force Index getting lower readings indicates that bears are stronger. If the index keeps moving flat at the zero level, it shows that both sides have equal power or no trend is present in the market.

Calculation

To calculate Force Index, subtract yesterday's close from today's close and then multiply the result with volume.

Here is the formula:

Force index = (today's close – yesterday's close) x Volume

Generally Accepted Use

1. Go long if price is trending up and Force Index is above zero level
2. Go short if price is trending down and Force Index is below zero level
3. Go long if there is a bullish divergence between Force Index and price movement
4. Go short if there is bearish divergence between Force Index and price movement

Chart Example

Let's start with a bearish divergence when price was rising (A) but the Force Index was falling (1). Thereafter, a massive downward movement of price after the divergence was noticed occurred.

Next, price made a lower low (B) but the Force Index made a higher low (2), which is a bullish divergence. Thereafter, price made a significant hike.

At one point price broke out the support level (S1) while the Force Index was going lower from the zero level (3), signaling a strong bearish move. At point C, we can see another bullish divergence with the Force Index (4).

On another situation, price broke out the resistance level (R1) while the Force Index was going higher from the zero level (5), indicating that bulls are stronger. Consequently, it resulted in a higher movement of price. On the other hand, price broke out of the support (S2) and the Force Index got lower from the zero level (6), signaling that bears are stronger. Consequently, price dropped downwards.

19. Keltner Channels or Keltner Bands

Keltner Channels is an indicator that shows a central moving average line with channel lines at a distance above and below it; in other words, it plots volatility based envelops set both above and below an exponential moving average.

Keltner Channels was named after its developer Chester W. Keltner who described it as "Ten-day Moving Average Trading Rule" in his 1960 book named "How to Make Money in Commodities". In Keltner's description, a 10-day simple moving average is plotted as the centre line. This is a simple moving average based on typical price where each day's typical price is the average of high, low, and closing prices of the financial instrument. Later, it has been developed with the use of Average True Range (ATR) for the bands, which are above and below a 20-day exponential moving average.

Interpretation

Traders usually use Keltner Channels to determine whether the market is trending or not. Also, the indicator is used to verify market reversals with channel direction and channel breakouts. If price breaks and closes above the upper channel, it indicates an extreme strength of the current momentum, and a move below the lower channel signals its weakness. It may also indicate the end of the current trend and the start of a new trend.

When the channel is moving down, it indicates a downtrend. On the other hand, when it's moving up, it indicates an uptrend. If the channel moves flat or sideways, it signals "no-trend" or indecision in the market. During such a situation, price oscillates between the channel lines indicating a ranging market where the upper and lower bands are considered as overbought and oversold areas respectively.

Calculation

The calculation of Keltner Channels is a three-step process:

1. Select the periods for the exponential moving average
2. Select the periods for Average True Range (ATR)
3. Select the multiplier for the ATR

Middle Line = 20-day exponential moving average

Upper Band = 20-day EMA + (2 x 10-day period ATR)

Lower Band = 20-day EMA + (2 x 10-day period ATR)

Generally Accepted Use

In a trending market:

1. Go long if the trend is up and price successfully breaks out of the upper band
2. Go short if the trend is down and price successfully breaks out of the lower band

In a ranging market:

1. Consider the lower band as an oversold area and look for buy opportunities
2. Treat the upper band as an overbought area and look for sell opportunities

Chart Example
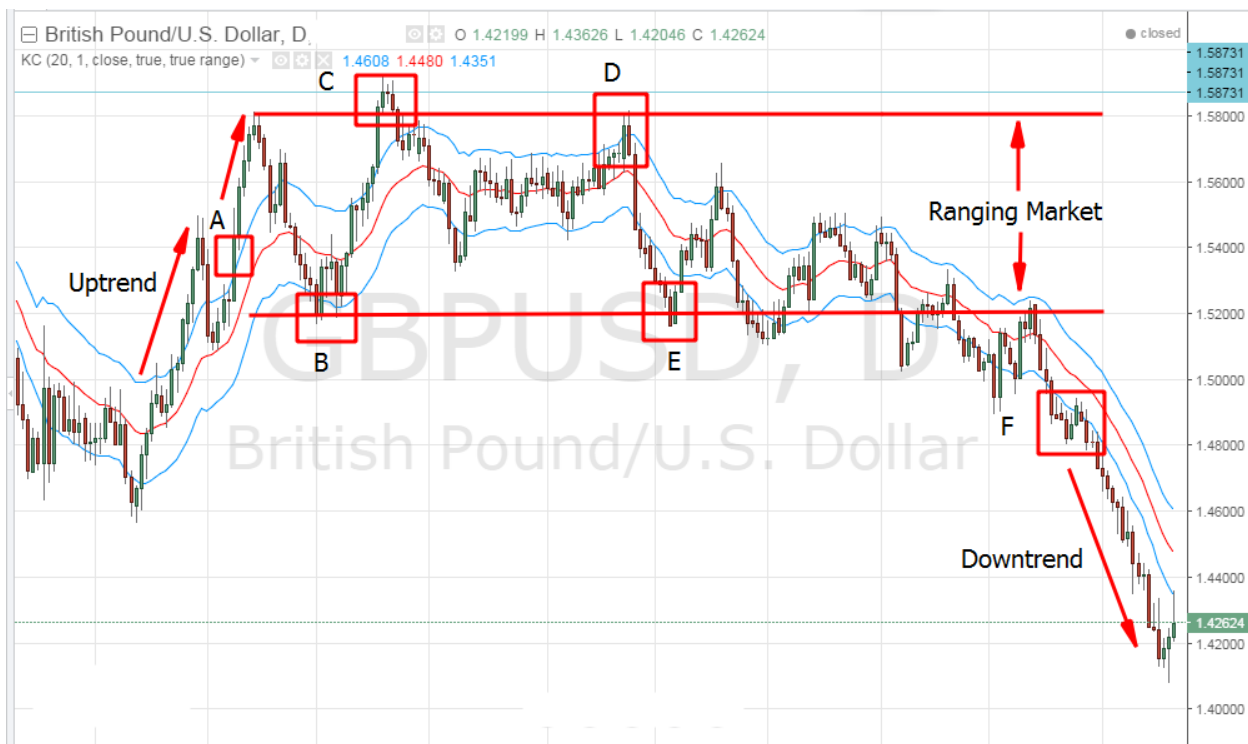
On the above chart, price was initially on an uptrend with an upward movement of Keltner Channels. Price retraced a bit but broke out of the upper band again (A) in favor of the uptrend. This indicated a good opportunity to go long and ride the trend upwards.

After the price hike, the market entered into a ranging zone and treated the upper band as an overbought area (C, D), creating potential sell opportunities. On the other hand, the lower band was treated as an oversold area (B, E), creating potential buy opportunities.

Thereafter, price slowly broke the lower line of the range and finally plunged lower with a successful break of the lower band (F). Consequently, the downtrend was started, as the channels also moved downwards.

20. Linear Regression

Linear regression is an approach used to model the relationship between a scalar dependent variable and one or more explanatory variables. A single explanatory variable is known as simple linear regression while a process with more than one explanatory variable is called multiple linear regressions.

Interpretation
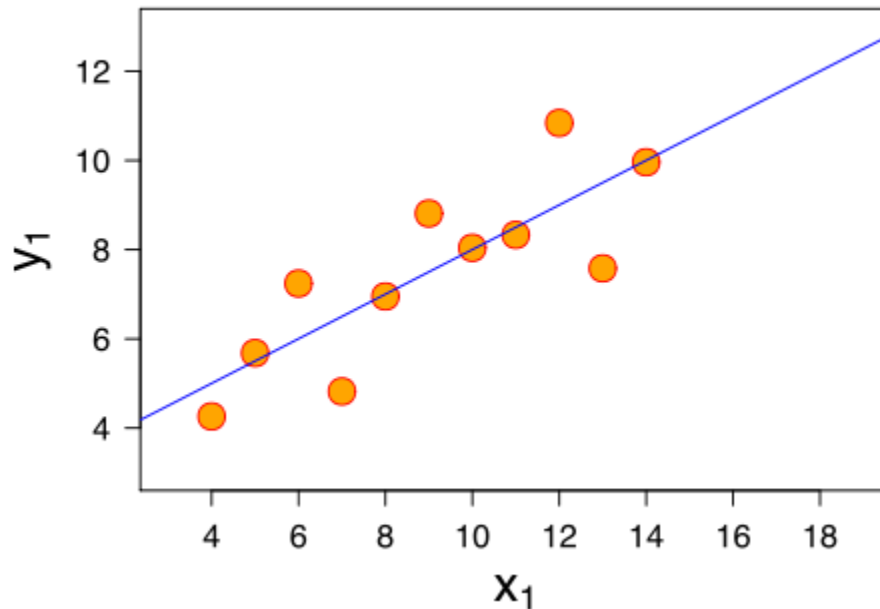
To identify the relationship between a single predictor variable X1 and the response variable Y1 when all other predictor variables in the model are held fixed, we need a best-fitted linear regression line.

Essentially, the expected change in Y1 for one unit change in X1 when the other variables are held fixed should be determined. This is referred to as the unique effect of X1 on Y1. We need to be careful while interpreting the regression results as some regressors may not be variable like dummy variables and some may not be possible to be held fixed like "time".

Calculation

Using the Sum of Least Squares method:

1. Multiply the number of dates with 0.11
2. Add the result with the closing price of the day
3. Subtract the result from the closing price

4. Square the result and continue to do the same for each day
5. Sum up all the squared results

Date	Number of Days, n	Closing price	Price = Closing price + 0.11 x n	Distance	Squared figure
15-Jul	1	30.65	30.76	-0.11	0.0121
16-Jul	2	30.72	30.94	-0.22	0.0484
17-Jul	3	30.50	30.83	-0.33	0.1089
18-Jul	4	30.80	31.24	-0.44	0.1936
19-Jul	5	30.95	31.5	-0.55	0.3025
Sum					**0.6655**

Using the Mathematical Formula method:

The mathematical formula for the straight line is quite a shortcut way rather than The Sum of Least Squares method.

Here is the formula:

$y = a + bx$

here,

y = the price

x = date

a = the constant value when x = 0

b = slope of the line

Here, are the formulas to find the value of a and b,

$b = \{n*\Sigma xy - \Sigma x*\Sigma y\} / \{n*\Sigma x^2 - (\Sigma x)^2\}$

$a = \{\Sigma y - b*\Sigma x\} / n$

Note: n = the number of selected data points

21. The Linear Regression Indicator

The Linear Regression Indicator is used to tell traders whether the market is trending or not, just the same way as most moving averages. It's important to note that the Linear Regression Lines and the Linear Regression Indicators are not same. The former refers to straight lines plotted on connecting data points.

The Linear Regression Indicator represents the ending values of a total series of linear regression lines plotted within a specified period. The indicator responds quicker to the change in trend direction than a moving average does. Importantly, the Linear Regression Indicator should only be used to trade during strong market trends. Using this indicator, a trader can determine both entry and exit points in a market.

Interpretation

Basically, the Linear Regression Indicator is interpreted in a similar way as the moving averages. It is all about the direction of its slope. An upward slope indicates that the trend is strongly bullish while a downward slope indicates that a trend is strongly bearish.

Crossover Method:

Multiple Linear Regression Lines can be used to define crossover points as well as trend reversals. For example, if a 100-day Linear Regression line crosses a 300-day Linear Regression line from underneath to above, it indicates a bullish crossover. On the other hand, if a 100-day Linear Regression line crosses a 300-day Linear Regression line from above to underneath, it indicates a bearish crossover.

Calculation

The Linear Regression Indicator uses the formula of "the Sum of Least Squares" to define the line that best fits the data for the selected time period. The method has been discussed briefly on the earlier Linear Regression section.

Generally Accepted Use

1. Go long or exit short trades if the Linear Regression Indicator moves up or makes a bullish crossover with multiple Regression Lines.

2. Go short or exit long trades if the Linear Regression Indicator moves down or makes a bearish crossover in between multiple regression lines.

Chart Example
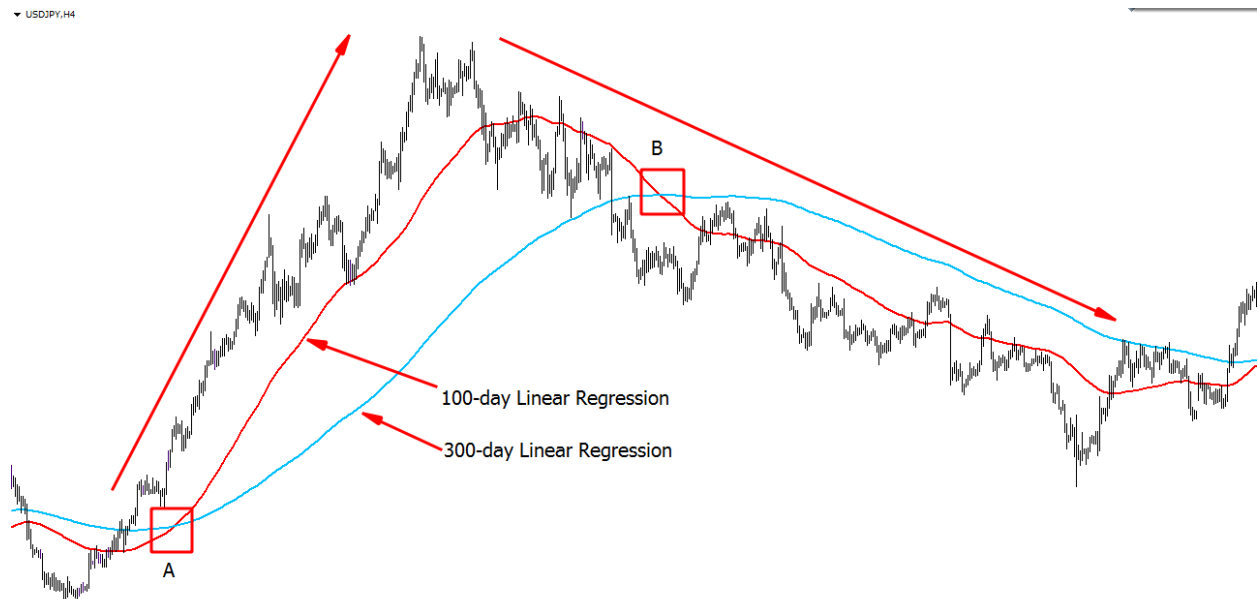
On the above chart, the 100-day Linear Regression line crossed over the 300-day Linear Regression line from below to above (A), signaling a long opportunity (the direction of both slopes was upwards). Consequently, the result was truly amazing as can be seen on the chart.

Also, the 100-day Linear Regression Line crossed over the 300-day Linear Regression Line from above to below (B), signaling a wonderful short opportunity (the direction of both slopes was downwards).

22. MACD Indicator

MACD (pronounced "MAC – dee" or "M-A-C-D"), which stands for **M**oving **A**verage **C**onvergence **D**ivergence, was developed by Gerald Appel. It was published in his book called "The Moving Average Convergence Divergence Trading Method" in 1970.

MACD is a popular momentum indicator that measures the distance between two moving average lines or the crossovers to determine the strength/weakness of market trend reversals.

Interpretation

MACD can be interpreted in several ways.

1. Zero Crossover: If MACD line crosses the zero level upwards or MACD value turns positive from negative, then it signals bullish trading conditions. Conversely, a negative MACD value or if MACD line crosses below the zero level signals bearish market conditions.

2. Signal-line crossover: If MACD line crosses up through the average line, it is called a bullish crossover, and it signals the emergence of a bullish trend. On the other hand, if it crosses downwards through the average line, then it is called a bearish crossover, and it indicates the emergence of a bearish trend.

3. Divergence:
   a. Bullish divergence: If price makes a new low but MACD makes a higher low
   b. Bearish divergence: If price makes a new high but MACD makes a lower high

Calculation

A 9, 12 and 26-day exponential moving averages (EMA) are used as default settings during the calculation process of MACD.

Here is the formula.

Signal line = 9-day EMA of MACD

MACD Line = 12-day EMA – 26-day EMA

Remember to use closing prices for these moving averages.

Generally Accepted Use

1. Go long if:
   a. MACD crosses above the zero line and turns positive from a negative value
   b. MACD line crosses up through the average line
   c. MACD creates a bullish divergence with price action

2. Go short if:
   a) MACD crosses above the zero line and turns positive from a negative value
   b) MACD line crosses up through the average line
   c) MACD creates a bullish divergence with price action

Chart Example

Zero crossover:
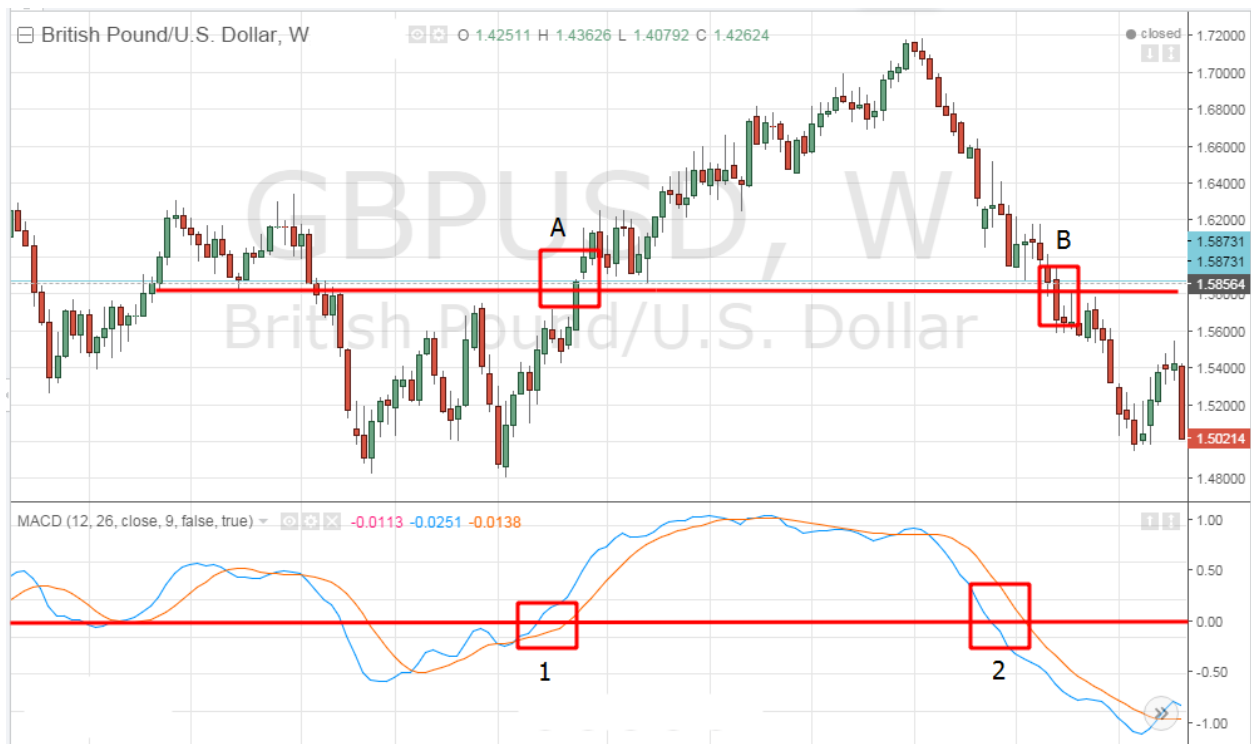
MACD line crossed above the zero level (1) and price broke out of the nearest resistance (A), signaling a long opportunity even as the bullish trend advanced.

Thereafter, price broke down to the support level while MACD crossed below the zero line, indicating a short signal even as the bearish trend progressed.

Signal-line crossover:
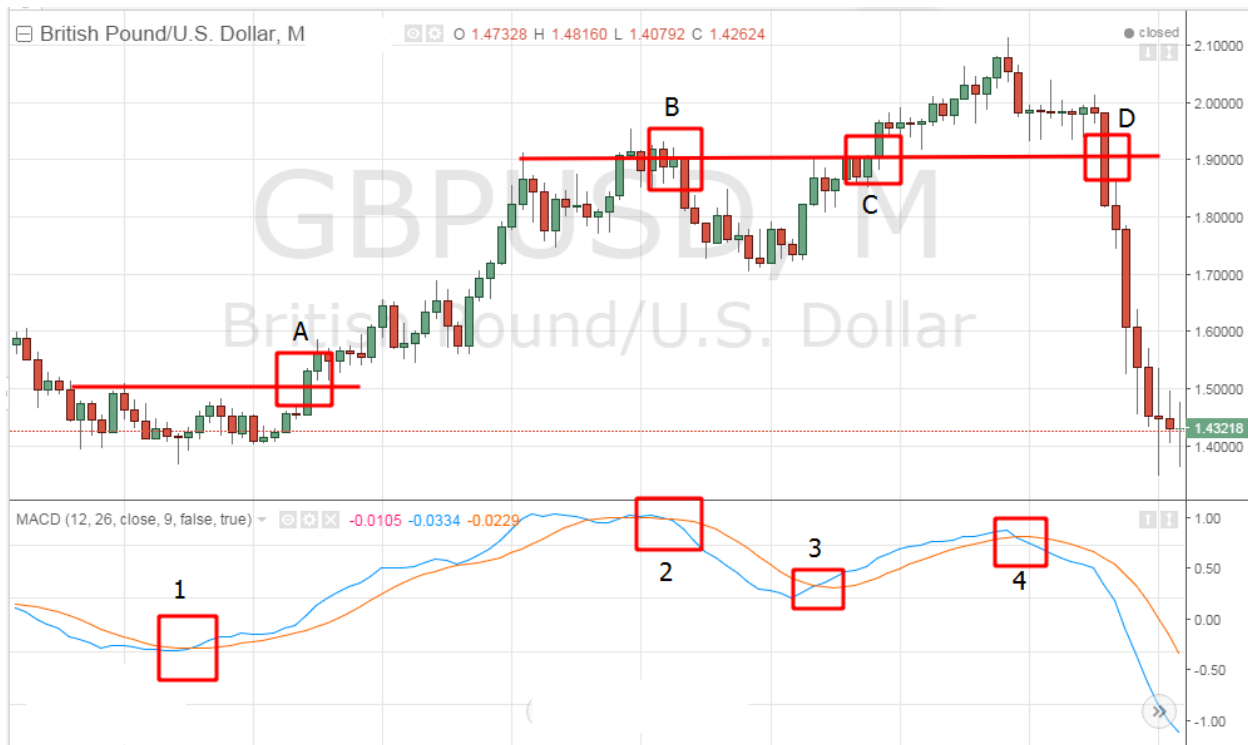
On the above chart, MACD line crossed above the average line twice (1, 3) and each time price broke out of the support level and surged upwards (A, C). On the other hand, MACD line crossed below the average line twice (2, 4) and price broke out of the resistance level and plummeted downwards (B, D).

Divergence:
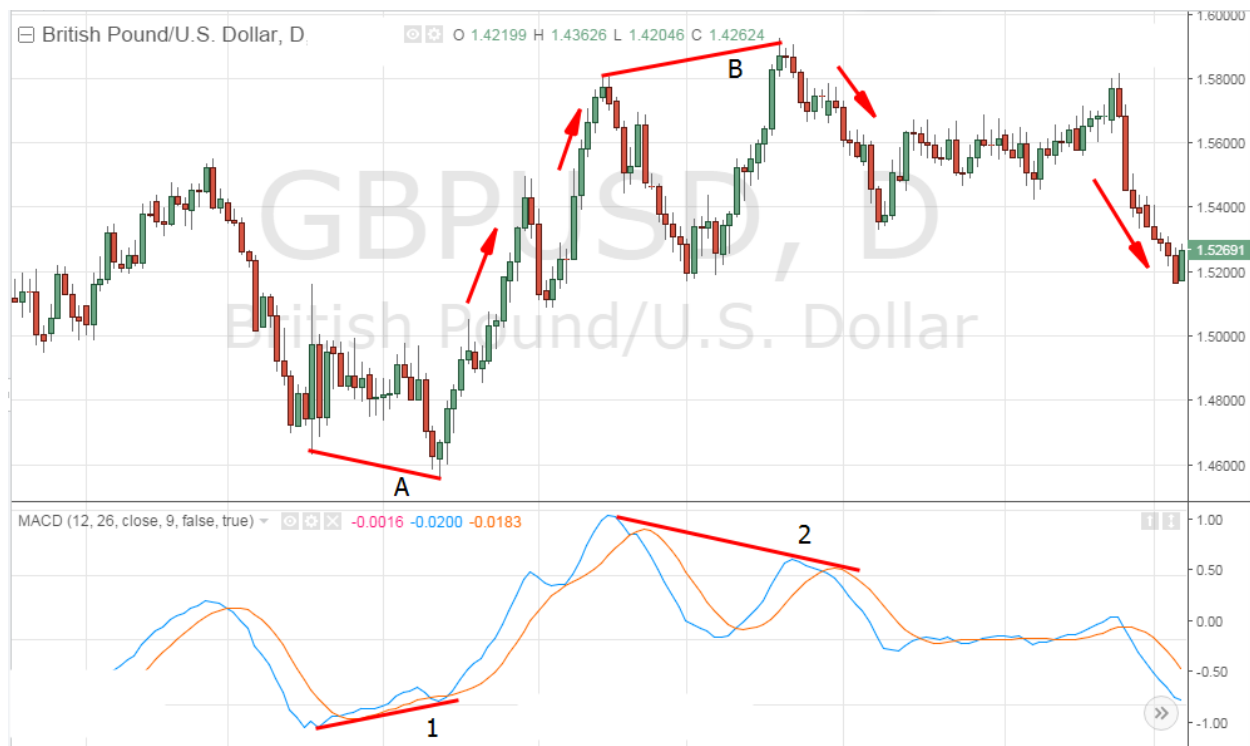
On the chart above, price made a lower low (A) but MACD made a higher low (1), indicating a bullish divergence. Consequently, price made its way up immediately. Secondly, price made a higher high (B) but MACD made a lower high, indicating a bearish divergence. As a result, price started dropping.

23. The MACD Histogram

Thomas Aspray created the MACD Histogram in 1986 to assist traders determine the distance between MACD and its signal line and thus make better trade decisions. The signal line is the 9-day exponential moving average of MACD.

The MACD Histogram is a quite similar indicator to MACD in terms of oscillating above and underneath the zero line. However, the MACD Histogram solves the lagging problem of MACD by detecting trend changes as early as possible. Therefore, it can be used to filter signal-line crossovers that results in fewer and better trade signals.

Interpretation

Like MACD, the MACD Histogram also identifies convergence, divergence, or crossovers in the market. The value of the Histogram is positive when MACD is above the signal line. The positive value will increase if MACD diverges more from its signal line to the upside.

If the MACD Histogram crosses below the zero line, it gives a negative value just like when MACD crosses below its signal line. The negative value increases when MACD diverges more from its signal line to the downside.

A positive value implies that bulls are in control of the market while a negative value implies that bears are in control of the market. If the Histogram makes a higher low but price makes a lower low, then it is a bullish divergence. On the other hand, if price makes a higher high but the Histogram is making a lower high, then it signifies a bearish divergence.

Calculation

Calculating the MACD Histogram first requires a definition of MACD. Afterwards, the value of the signal line is subtracted from MACD.

Here is the formula.

MACD Line = 12-day EMA – 26-day EMA

Signal line = 9-day EMA of MACD

MACD Histogram = MACD – Signal line

A 9-day exponential moving average of MACD acts as a signal line that drives the turns of the indicator.

Generally Accepted Use

1. Go long if the trend is up and the MACD Histogram turns positive from a negative value
2. Go short if the trend is down and the MACD Histogram turns negative from a positive value

Divergence:

1. Go long if the divergence is bullish
2. Go short if the divergence is bearish

Chart Example
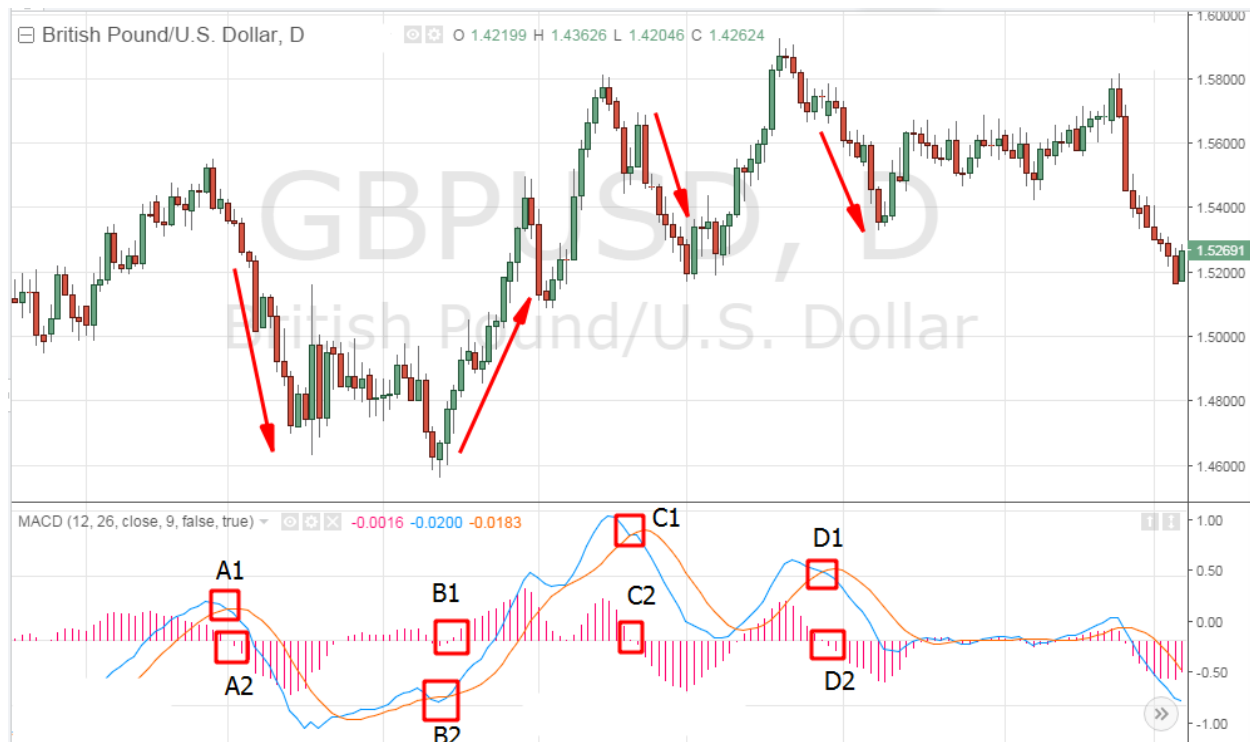
As per the above chart, MACD line crossed below the signal line (A1, C1, D1) while the MACD Histogram moved down to the zero level with negative value (A2, C2, D2), each time causing a fall of price. On the other hand, once MACD crossed up through the signal line and the MACD Histogram turned positive and stayed above the zero line, it caused a huge bullish move.

Divergence:
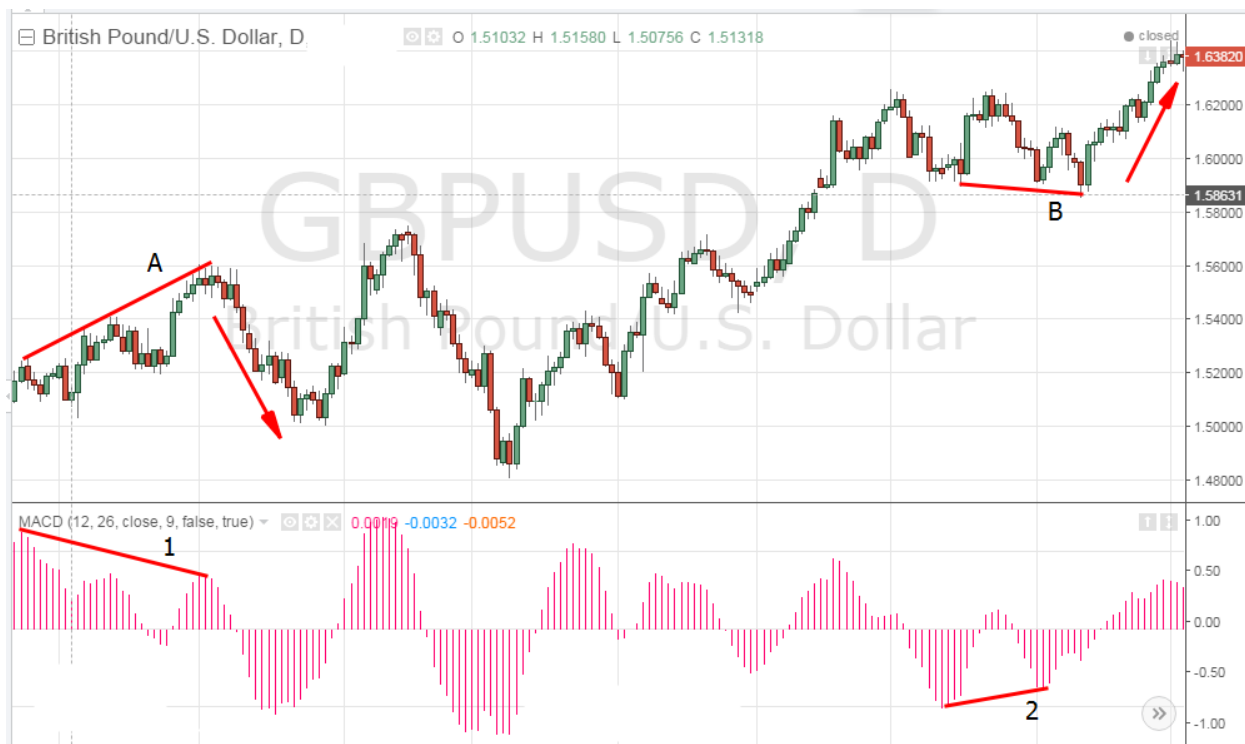
On the above chart, price made a higher high (A) but the MACD Histogram made a lower high (1), causing a bearish divergence.

Next, price made a lower low but the MACD Histogram made a higher low. This is a bullish divergence and as can be seen on the chart, price hike occurred after the divergence.

24. Median Price

The Median Price indicator, as its name suggests, is simply the middle point of the trading range for every trading period of a particular financial instrument.

Interpretation

The median price gives a quick glimpse of the trading prices of financial instruments. When plotted on charts, the indicator is normally used as a filter for trend indicators; that is, smoothing out the inconsistencies of price data.

Calculation

It is computed by adding the high and low price and dividing the result by two.

$$(High + Low) / 2$$

25. Momentum

The momentum indicator is a simple technical indicator used to gauge the rate of change in the closing prices of a financial instrument over a given time period.

Interpretation

Generally, "momentum" denotes that prices are maintaining a steady trend. When the market is strongly trending, the momentum indicator will give high readings (positive or negative). On the other hand, when the market is starting to trend or the trend is losing strength, the indicator will give lower readings.

For overbought and oversold territories, they are normally defined according to the behavior of every financial instrument, according to the performance of the indicator during previous cycles. It's important for the overbought and oversold territories to be set that they cut across about two-thirds of the peaks and bottoms.

Calculation

It is computed as a ratio of today's price to the price numerous (N) periods ago.

Momentum = Close(p)÷Close(p-N)×100

Where:

Close(p): Stands for the closing price of the present bar

Close(p-N): Stands for the closing bar price N periods ago

Generally Accepted Use

- On ranging markets, enter buy orders when the indicator crosses to below the oversold territory and then upswings back above it. You can also enter buy orders on formation of bullish divergences.
- On ranging markets, enter sell orders when the indicator crosses to above the overbought territory and then drops back below it. You can also enter sell orders on formation of bearish divergences.
- On uptrending markets (when the indicator is usually above zero), enter buy orders when the indicator turns upwards when below zero
- On downtrending markets (when the indicator is usually below zero), enter sell orders when the indicator turns downwards when above zero

Chart Example

26. Money Flow Index

The Money Flow Index (MFI), developed by Gene Quong and Avrum Soudack, is an indicator that analyzes both price and volume to gauge the bullish and bearish pressure in the market. The MFI is also referred to as volume-weighted Relative Strength Index (RSI).

Interpretation

The MFI fluctuates from 0 to 100. If the indicator rises, it shows an increment in the bullish pressure and if it drops, it shows an increment in the bearish pressure. This way, the MFI can produce numerous trading signals, such as overbought and oversold conditions, and bullish and bearish divergences. Usually, overbought areas begin above 80 while oversold areas begin below 20. These are important in deciphering unsustainable price extremes in the market.

Calculation

(sourced from Tradingview.com)

There are four separate steps to compute the MFI.
The following example is for a 14 Period MFI:

1. Calculate the Typical Price.
   (High + Low + Close) / 3 = Typical Price

2. Calculate the Raw Money Flow.
   Typical Price x Volume = Raw Money Flow

3. Calculate the Money Flow Ratio
   (14 Period Positive Money Flow) / (14 Period Negative Money Flow)

   -Positive Money Flow is calculated by summing the Money Flow of all of the days in the period where Typical Price is higher than the previous period Typical Price.
   -Negative Money Flow is calculated by summing the Money Flow of all of the days in the period where Typical Price is higher than the previous period Typical Price.

4. Calculate the Money Flow Index.
   100 - 100/(1 + Money Flow Ratio) = Money Flow Index)

Generally Accepted Use

- Enter buy orders on bullish divergence
- Enter sell orders on bearish divergence

Chart Example

On the above chart of U.S. Dollar/Swiss Franc, the price of the pair is making new highs but the MFI indicator is making lower highs. This indicates a bearish divergence and is soon followed by a price drop to the downside.

27. Moving Average Indicator

The moving average indicators are used to give an objective indication of trend direction through eliminating false market movements. Usually, they are calculated using the closing prices of financial instruments. The moving averages usually give strong trade signals when used in combination with other indicators.

Moving Average Time Frames

Short-term moving averages normally respond faster to changes in the market and therefore detect new trends earlier. However, they are more prone to giving false trade signals. Long-term moving averages are considered to be more dependable but less responsive. The long-term moving averages work best in identifying the big market movements.

It's advisable you use a moving average that is half the amount of time you are monitoring the market for tradable movements. For example, if the peak-to-peak cycle length is about 60 days, then a 30-day moving average is suitable, and if 30 days, then a 15-day moving average is suitable. Nonetheless, some traders will use 14 or 9 day moving averages or Fibonacci numbers of 5, 8, 13, and 21 even on higher cycles with the intention of identifying trading opportunities as early as possible.

- 100 to 200 day (twenty to forty weeks) moving averages are commonly used for longer cycles
- 20 to 65 day (four to thirteen weeks) moving averages are commonly used for intermediate cycles
- 5 to 20 day moving averages are commonly used for short cycles

Generally Accepted Use

The simple moving average indicators usually identify possible trading opportunities if price crosses the moving average.

- Enter buy orders if price crosses to above the indicator from below
- Enter sell orders if price crosses to below the indicator from above

Moving averages are normally susceptible to whipsaws when the market is ranging. During such times, price usually crosses back and forth across the indicators, giving a high number of false trading opportunities. Therefore, to make their signals more accurate and profitable, the indicators usually use filters to lower whipsaws and signals from poorly trending market movements.

Some robust and refined moving average trading systems employ more than one moving average for generating trading signals.

Here are some examples:

- Trading systems based on two moving averages employ a quicker moving average as a replacement for closing price
- Trading systems based on three moving averages use a third moving average to tell if the market is ranging or not
- Trading systems based on multiple moving averages employ four to six quick moving averages and four to six slow moving averages to validate one another
- Keltner Channels employ bands placed at a multiple of average true range to refine the signals generated by the crossovers of moving averages
- The commonly used MACD (pronounced "MAC – dee" or "M-A-C-D"), which stands for **M**oving **A**verage **C**onvergence **D**ivergence, is a trend-following momentum indicator that is a variation of the two moving average system. It subtracts the slow moving average (usually 26-period) from the quick moving average (usually 12-period).

Common Types of Moving Averages

There are various types of moving averages with their own unique characteristics.

- Simple moving averages, as their name suggests, are easy to use but more susceptible to false trade signals
- Weighted moving averages are complicated to use but generate more valid trade signals
- Exponential moving averages realize the advantages of weighting in conjunction with simplicity in use
- The indicators designed by J. Welles Wilder employ a type of moving averages called Wilder moving averages. Basically, they utilize similar computation plans as exponential moving averages. Also, they employ various weightings that require traders to make allowances for.

28. Negative Volume Index (NVI)

Negative Volume Index (NVI) was invented by Paul L. Dysart in 1936 and developed by Norman Fosback in1976. NVI is a cumulative indicator and it uses the change in volume to determine the period of smart money activity. NVI assumes that smart money is more active on days when volume decreases and less active on days when volume increases.

Interpretation

NVI was built in a concept that smart money gets in and starts working in a quiet market or in low volume trading days not in a crowd-following market where the volume is very high. So, it is important to trace those quiet moments to get in the market in favor of the odds which can be done by the assistance of NVI. A 1-year (255-trading day) moving average is used at Negative Volume Index. NVI rises above its one-year moving average means bull's power at the market. If NVI goes below one-year moving average signals bulls got lost the strength and it is time for reversal or consolidation.

Calculation

The value of NVI starts with 1000. The percentage of change in price has to be added tp cumulative NVI when volume decreases. Cumulative NVI is no changeable when volume increases. A-255-day exponential moving average is recommended to use for signals.

1. If today's volume is less than yesterday's volume,

   NVI = yesterday's NVI + [{(today's close – yesterday's close)/yesterday's close} x yesterday's NVI]

2. If today's volume is bigger than yesterday's volume,
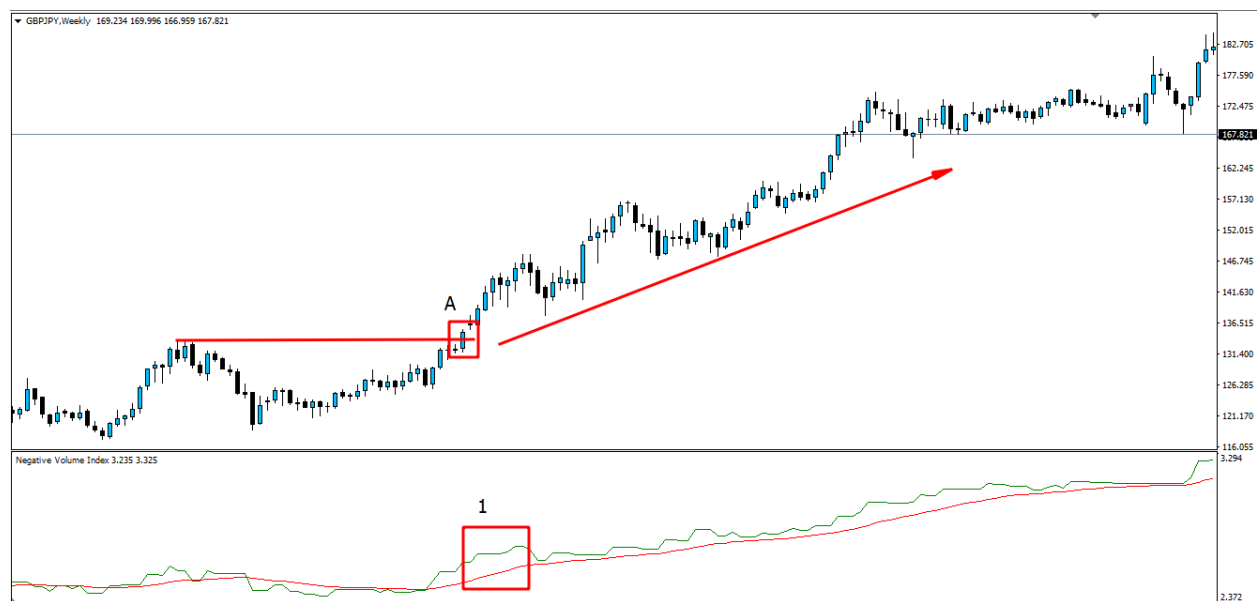
   NVI = yesterday's NVI

   This is because falling prices are often associated with falling volume while NVI trends down usually.

Generally Accepted Use

NVI usually works in the bullish market with the favor to bulls. Go long when,

1. Market is trending high
2. NVI crossing above its one year moving average

Chart Example

In this chart, price broke out above the resistance (A) creating a new higher high confirming uptrend and Negative Volume Index was well above the 255-day exponential moving average (1). This confirms a buy signal according to NVI rule. As we can see price had made a massive hike after the signal was created.

29. On Balance Volume (OBV)

On Balance Volume (OBV) is used to measure buying and selling pressure as a cumulative indicator. OBV was first developed by Joe Granville which was introduced in his book "Granville's New Strategy of Daily Stock Market Timing for Maximum Profit". OVB was one among the indicators used to measure positive and negative volume flow for the very first time. It works adding volume on market up days and subtracts volume on market down days. Traders use OBV for trend confirmation or its divergence with price for trade signals

Interpretation

On volume balance can be interpreted as a running total of volume that shows the inflow and outflow of volume of a security. OBV rises when the volume of market up days is larger than the volume of market down days and falls if the volume of market up days is less than the volume of market down days. A rising OVB predicts a price hike whereas; a falling OVB indicates price is going to move down.

OBV also plots divergences with price movements. If OBV makes a higher low but price makes a lower low, is signals bullish divergence that means it is time for a reversal and the start of a bullish move. On the other hand if OBV makes a higher high but price makes a lower high then it is a bearish divergence that signals the current up trend is going to be ended with the start of bearish trend.

If OBV and price both moves in a smaller range indicates ranging market, indecision or no-trend.

Calculation

The calculation process of OBV is directly depended on the day's closing price weather it is higher, lower or equal to the prior close price. Here are the formulas,

1. If the closing price is higher than the previous close price;
   Current OBV = Previous OBV + Current Volume
2. If the closing price is lower than the previous close price;
   Current OBV = Previous OBV – Current Volume
3. If the closing price is equal to the previous close price;
   Current OBV = Previous OBV
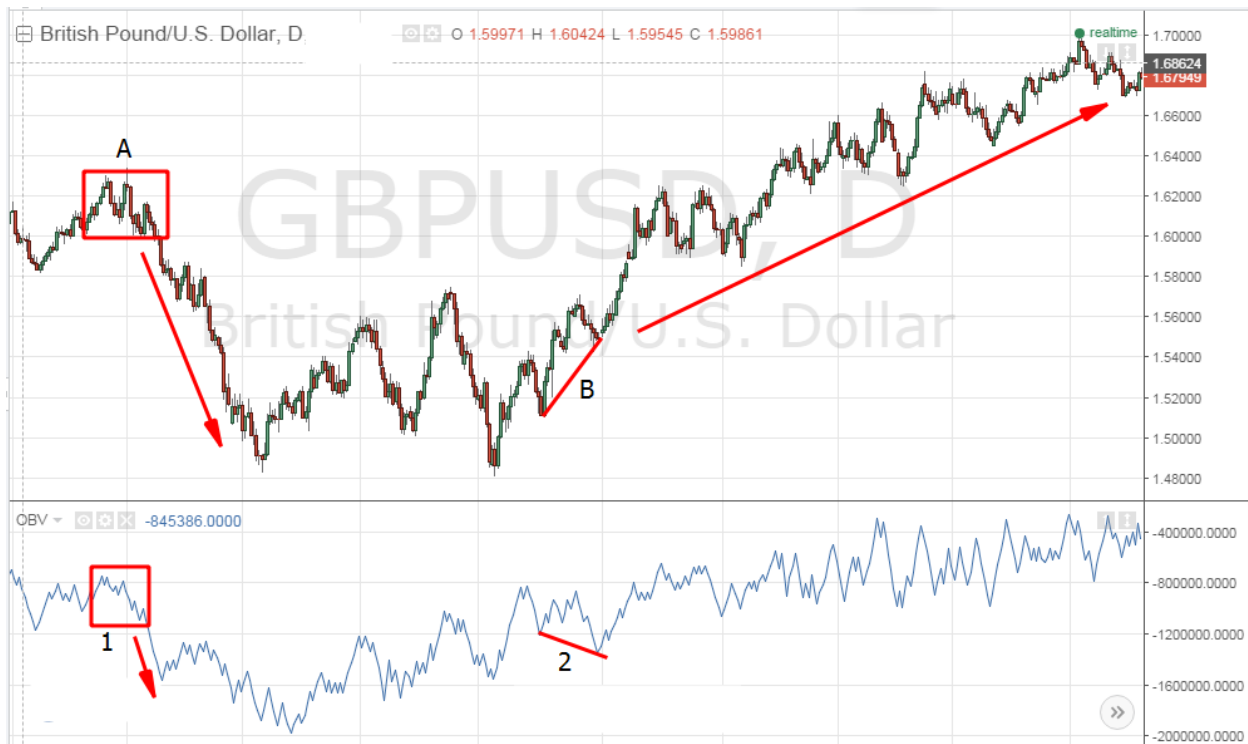
Generally Accepted Use

In a trendy market:

1. Go long if OBV plots a bullish divergence with price movement
2. Go short if OBV creates a bearish divergence with price movement

In a ranging market:

1. Go long if price breaks above the high of the market range with a rising OBV
2. Go short if price breaks down the low of the market range with a falling OBV

Chart Example

At this chart area "A" is marked as a ranging market where price broke the low of range with a falling OBV (1) creating a short signal with the start of a down trend. At the second scenario, trend was up, price made a higher low (B) while OBV made a lower low (2) that clearly signaled a bullish divergence with long opportunity and later price made a significant price hike towards the trend.

30. Parabolic SAR

Parabolic SAR means Parabolic Stop and Reverse which was developed by J. Welles Wilder, Jr. It is used to define signals of potential reversals of price direction. It is also used to set the trailing stop in order to determine the entry or exit points based on prices are staying in or out of the parabolic curve. Parabolic SAR should only be used in trending markets to stay within the trend or exit before the trend changes.

Interpretation

Parabolic SAR represents itself by parabolic curves made by "dots" up or below the price candle. When a trend is high, parabolic SAR starts to move up with an upward acceleration of dotted curves. When market is trending down, the curve starts to fall and accelerates more to downwards with the fall of prices. Every dot of Parabolic SAR represents the stop level also. Stop level below the price means a long trade and if above the price then it is a short trade. In both cases, this stop level gets updated at the end of each day (at daily chart) until price reaches to the stop level.

Calculation

Rising Parabolic SAR:

Prior SAR = The SAR value for the previous period

Extreme Point (EP) = The highest high of the current uptrend

Acceleration Factor (AF): Starting at 0.02, AFF increases by 0.02 each time the EP makes a new high. AF can reach a maximum of 0.20 (Does not matter how long the uptrend extends)

Current SAR = Prior SAR + Prior AF x (Prior EP – Prior SAR)

Falling SAR

Prior SAR = The SAR value for the previous period

Extreme Point (EP) = The lowest period of the current downtrend

Acceleration Factor (AF) starting at 0.02, AF increases by 0.02 each time the extreme point makes a new low. AF can reach up to 0.20 (Does not matter how long the downtrend extends)

Current SAR = Prior SAR – Prior AF x (Prior SAR – Prior EP)

Generally Accepted Use

Signals should be taken supported by trends

1. Go long if price reaches to the Parabolic SAR stop level situated above the price level
2. Go short if price reaches to the Parabolic SAR stop level situated below the price level

It is recommended not to take parabolic SAR signals in a ranging or indecisive market.

Chart Example
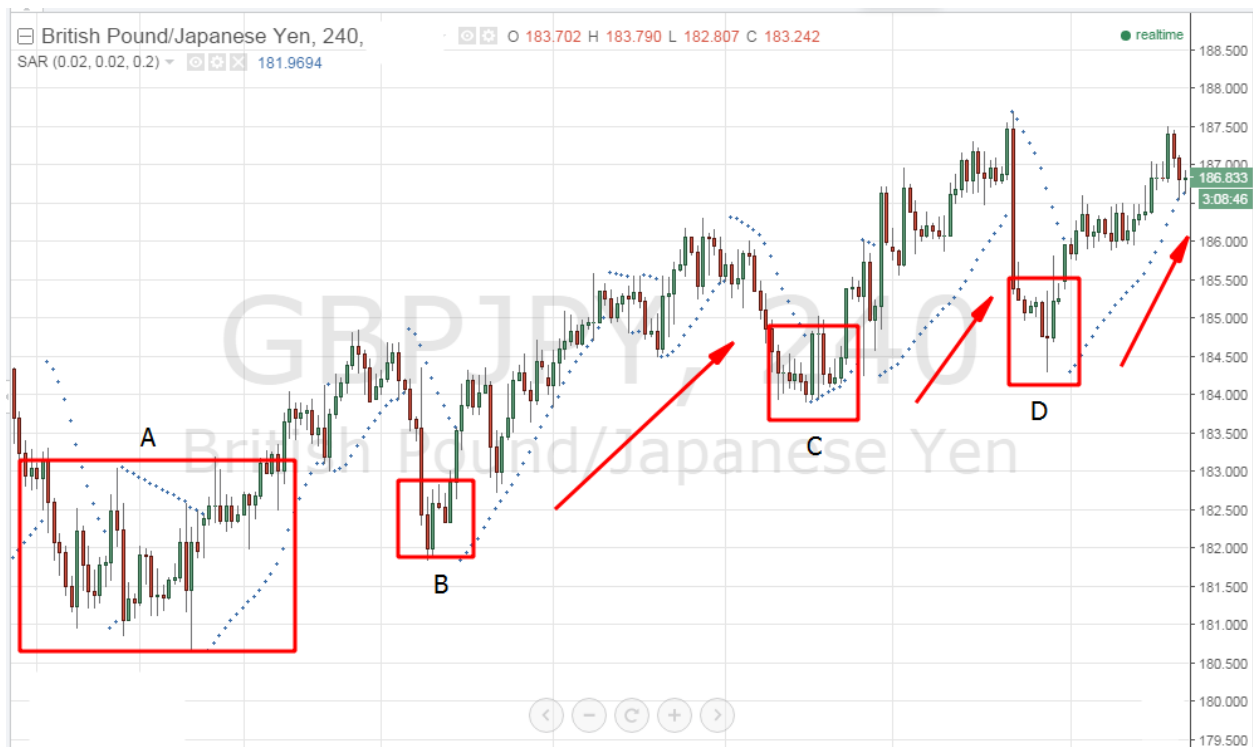
At the early stage of this chart market ranged for a while (A) then started to trending up creating Higher Low each time (B, C, D) price reached the Parabolic SAR dots above the price candles creating excellent long signals. Even though there were some sell signals as well as price often reached the stop level below the price candles but those short signals were not supported by the trends and should not be counted as trading signals. Trend is friend after all!

31. Percentage Trailing Stops

Percentage Trailing Stops is classified as a trend-following system that updates or trails the stop loss according to the trend direction. This system uses stop and reverse rules which is similar to Parabolic SAR or ATR trailing stops to define the updated area of stops after each time-period.

Interpretation

Percentage Trailing Stops appears as a line or dotted line above or below the price level which moves according to the trend direction. If the trend is down it appears above and if up then it appears below the price level and updates its position according to the change of prices. Traders use this level as a stop level or an exit point of the current long trade. Swing traders uses this level for trend reversal entry but it is recommended that Percentage Trailing Stops should not be used alone to define the swinging area of a trend.

Calculation

Percentage Trailing Stops are calculated by applying a percentage on the closing prices. Here is the process:

1. If the trend is up, subtract 10 percent from the closing price and use the resulted level as the stop for the next day
2. If the trend is down, add 10 percent to the closing price to define the level of stops for the following day
3. Continue process 1 or 2 (depends on the trend) until price reaches the stop levels

Generally Accepted Use

The signals are usually used to define the exit of a trend following trade:

1. Exit long positions when price crosses below the Percentage Trailing Stop level
2. Exit short positions when price crosses above the percentage Trailing Stop level

Chart Example

Here, at this chart you can see the Percentage Trailing Stop line appeared below when the price was trending up and moved along with the trend until got intercepted by the price and signaled the exit of a long position that travelled with the trend. You can see, once the stop level is hit, a red line started to appear above the price indicating a new stop level for the new trend.

32. Relative Strength Index (RSI)

Relative Strength Index (RSI) was developed by J. Welles Wilder which was published in a 1978 book. RSI is a momentum indicator and classified as momentum oscillator. It measures the velocity and magnitude of directional price movements to determine the overbought and oversold conditions of the market.

Interpretation

RSI is measured on a scale from 0 to 100. High and low levels are marked at 70 and 30 respectively. RSI reaches over 70 means overbought market on the other hand below 30 means market is oversold. RSI level between 70 and 30 is considered neutral and at 50 considers no trend. RSI is also famous for divergence signals.

1. Bullish divergence: If price makes a lower low but RSI makes a higher low
2. Bearish divergence: If price makes a higher high but RSI makes a lower high

Calculation

First we'll have to determine Relative Strength (RS). It measures two different and separate entities by means of ratio line.

RS = Average of n-days up closes / Average of n-days down closes

RSI = 100 – {100 / (1+RS)}

RSI is mostly used to a 14-day time period.

Generally Accepted Use

1. Look for sell opportunity if RSI is over 70 level
2. Look for buy opportunity if RSI is below 30 level
3. If price makes a lower low but RSI makes a higher high then take the buy opportunity
4. If price makes a higher high but RSI makes a lower low then take the sell opportunity

Chart Example

At the chart we can see the first divergence where price made a lower low (A) but RSI made a higher low (1). It is a perfect bullish divergence to go for buy opportunity. Next, price made a higher high (B) but RSI made a lower high (2). It is a bearish divergence plus RSI turned down from overbought level 70. It is a sell opportunity. RSI got below oversold area (3) 30 and turned up with a price hike (C) means buy opportunity. Finally price made a lower high (D) and RSI made a higher high (4), this is also a bearish divergence signaling short signal.

33. Accumulation Distribution

Developed by Marc Chaikin, the Accumulation Distribution is a momentum indicator that is usually used to gauge the underlying supply and demand of a particular financial instrument. It achieves this by attempting to establish if traders are really accumulating (buying) or distributing (selling)a financial instrument.

Interpretation

The Accumulation Distribution can be used for trend confirmation. When the market is experiencing a strong upward or downward trend, the indicator will move in the same direction as the market, affirming the strength of the present trend.

In addition, the Accumulation Distribution indicator normally plays a pivotal role in determining divergences in the market. Normally, volume precedes price in the market. So, when volume and price are moving in opposite direction can signal a major market activity. And, the Accumulation Distribution indicator can assist traders determine these instances.

A bullish divergence takes place when the indicator is moving upwards while price is moving downwards. On the other hand, a bearish divergence takes place when the indicator is moving downwards while price is moving upwards.

Importantly, before making trade decisions, the Accumulation Distribution indicator should always be used together with other indicators and not as a stand-alone indicator.

Calculation

(Calculations sourced from Tradingview)

Accumulation/Distribution = ((Close – Low) – (High – Close)) / (High – Low) * Period Volume

In order to fully understand how the indicator actually works, it is necessary to break this formula down into individual parts.

1.Find the Money Flow Multiplier.

  ((Close - Low) - (High - Close))/(High - Low) = Money Flow Multiplier

2.Once you have calculated the Money Flow Multiplier, you can calculate Money Flow Volume.

Money Flow Multiplier x Period's Volume = Money Flow Volume

3. As previously mentioned The ADL is a running total of each period's Money Flow Volume. Therefore once you have the
Current Money Flow Volume you can plot the ADL.

ADL = Previous ADL + Current Money Flow Volume.

Generally Accepted Use

- Look for buy opportunities when there is a bullish divergence
- Look for sell opportunities when there is a bearish divergence

Chart Example

The above chart shows an example of a bearish divergence on the AUD/CAD 4-hour graph. While the indicator was trending downwards, the price of the currency pair was trending upwards. Ultimately, a significant drop in price occurred.

34. Trend Lines:

A trend line, commonly called "trendline", is simply a momentum indicator, which shows the trend and its direction. It also indicates the acceleration and deceleration of the trend momentum by measuring the rate of increase and decrease of the price over a particular period.

A significant difference exists between trendlines and other momentum indicators based on how they are plotted on charts. A trendline is not computed by a PC based on any formula but uses the human brain for a visible identification of the trend.

Interpretation

A trendline plotted by connecting at least three lower highs of a downtrend signals the continuation of the bearish momentum. On the other hand, a trendline plotted by connecting at least three higher lows of an uptrend indicates that the bullish momentum is intact.

A trend line also works as dynamic support and resistance in confluence with price actions or horizontal support and resistance levels. Traders normally expect price to bounce back from the trend line again and again in the direction of the trend.

If price makes a false break at the trendline and continues to move in the direction of the trend, it usually suggests strong trade signals. On the other hand, if price breaks a trend line successfully and continues to move in the opposite direction of the trend direction, it means the current trend got weaker and a reversal could be imminent.

Drawing a Trend Line:

Drawing a trendline can be bit confusing for newbie traders but an extended practice can make it simpler. Here are some rules of drawing a trendline.

1. If the trend is up and price is continuing to make higher lows, then try to connect at least three lows with one straight line.
2. If the trend is down and price continues to make lower highs, then try to connect at least three highs with one straight line.
3. Draw the trend line through the closing prices of highs or lows of the momentum if plotted on a long term chart.
4. If price intersects a trendline after extension, look for a false break or the trendline will be considered as expired.
5. Trendlines can be drawn on both long and normal scale mode. For a better demonstrations and future references, traders are advised to

draw trendlines on a long scale mode. Normal scale mode trendlines are used by shorter timeframe traders.

Important: Do not **force** the trendline to be matched with the highs or lows of the price / momentum. Only draw the line if it is naturally respected by the above-mentioned rules.

Generally Accepted Use

1. If an ascending trendline confirms a bullish trend, traders should look for opportunities to go long. A false break at the support level also adds confluence to the long entry.
2. A downtrending market with a bearish trendline indicates opportunities to go for short orders. In this case, a false break at the resistance level also strengthens the short entry decision.
3. If there is a **successful** breakout from an ascending trendline and price continues to fall, then it is assumed that a trend reversal could be imminent. And, this creates short trade opportunities for swing traders.
4. Go for long orders if there is a successful breakout of a descending trendline and price continues to go up, which also signals trend reversal.

Please see the chart examples below for better understandings.

Chart Example

**Going long with an ascending trendline in a bullish market:**
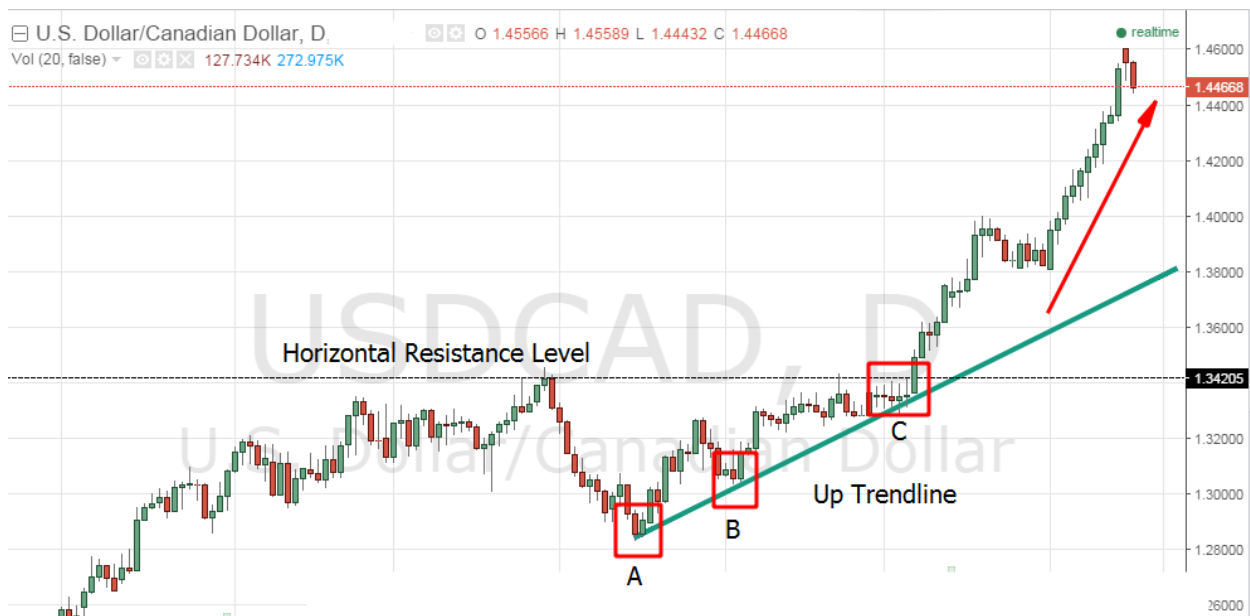
On the above daily chart of U.S. Dollar/Canadian Dollar, price bounced back thrice (A, B, C) from the up trendline and successfully broke out of the horizontal resistance level in the direction of the trend. Placing a long entry (C) could be profitable until 1.48000.

**Going short with down trendline in a bearish market:**

Euro / Japanese Yen bounced back thrice from a down trendline (A, B, C) and the market was extremely bearish. At point C, price was rejected for the third time and broke the horizontal support successfully at 132.97 in the direction of the trend, creating a strong sell opportunity as price dropped rapidly to 128.21.

A false break at the trend line with the trend direction:
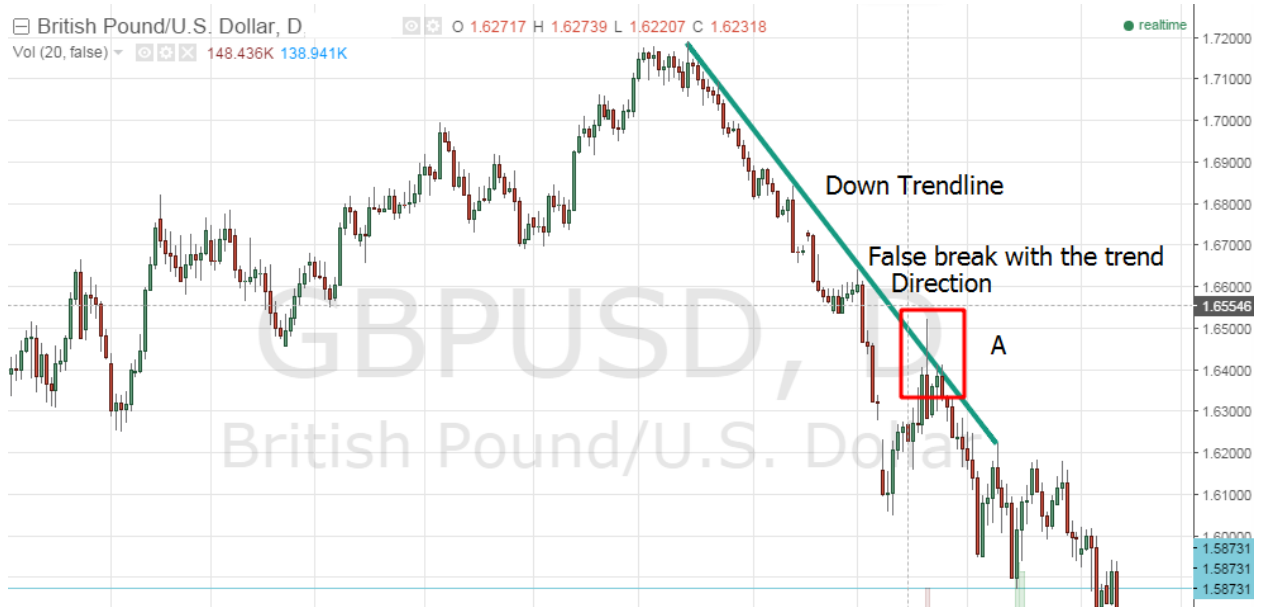
A false break at the trendline in the direction of the trend indicates that the trend is likely to continue. As can be seen on the above chart, the market was bearish and price made a false break at A and continued to fall further.

Trendline expires with successful breakouts:
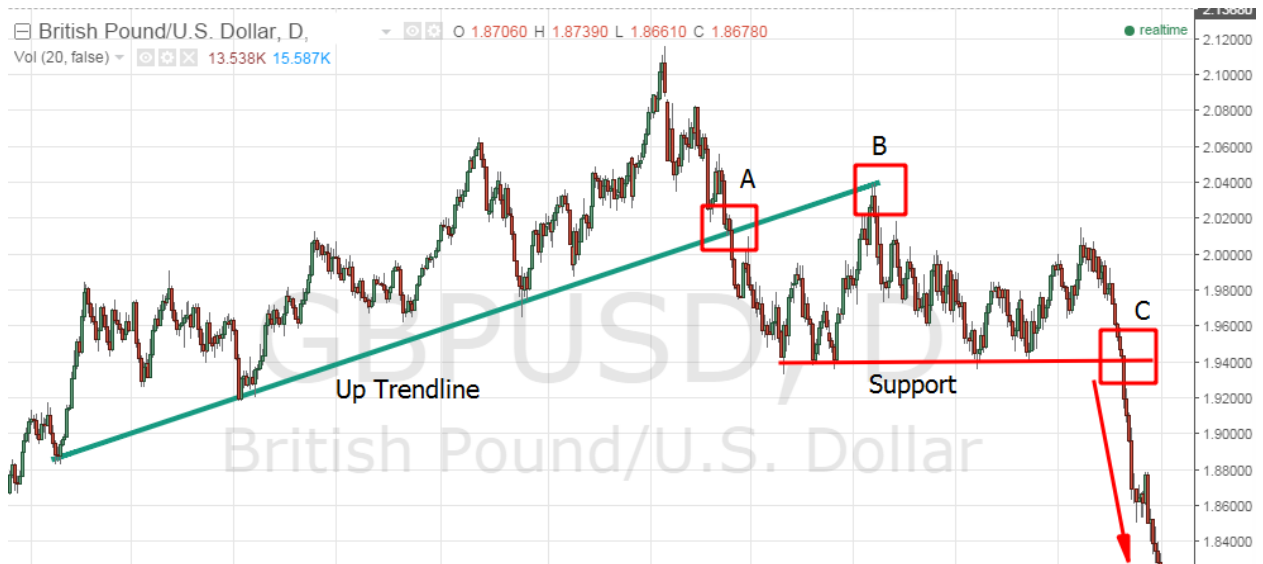
On the above chart, earlier price was strongly bullish and nicely maintained an ascending trendline. However, at point A, price broke the trendline out successfully and used the same ascending trendline as a dynamic resistance at

B. That clearly signaled the end of the trend. Price was indecisive for a while and broke the support, indicating a trend reversal at C.

Trend acceleration with trendlines:

Sometimes, in the direction of the same trend, a new trend line can be plotted when a trend starts to accelerate it's movement. On the above chart example, price was slowly trending up initially and then started to accelerate the current bullish move with a new uptrend line.

Long term trending pattern:

A long term trend is indicated by several trendlines plotted on the same direction but from the same origin. The above Australian dollar / U.S. dollar daily chart shows that price started to fall and continued to form a long term bearish trend with several descending trendlines but from the same origin (A).

Conclusion

Trendlines can provide great trading opportunities with significant profits in the long term only when plotted properly. An improper trendline can produce false signals and cause massive losses. Traders need to practice drawing trendlines correctly, as the art of their perfection depends exceptionally on the ability of the "human-brain". The other technical indicators can be automatically plotted on charts by computer programs. Experts advise traders to add horizontal support/resistance levels with trendlines to make confluence entries resulting in better probabilities of success.

35. TRIX indicator

Introduced to traders by Jack Huton in the 1980's, TRIX ("**tri**ple e**x**ponential")
is a momentum indicator used for trading trends. It oscillates around a zero
line.

Interpretation

To use the indicator effectively, you will need to choose a TRIX indicator period
suitable to the time frame that you want to use for trading. And, it will ensure
you remain in trends equal to or smaller than the number of periods you
intend to trade in. Its triple exponential smoothing capability gets rid of
unimportant cycles; that is, those that are smaller than the chosen indicator
period. This way, it is able to reduce volatility and lessen the possibility of
incorrect signals driving you out of the market too early.

You should open positions on the market only when the TRIX indicator
changes direction; that is, place long orders when it is moving up and short
orders when it is moving down. If a signal line is plotted (such as 9-period
moving average), you can place long orders when the TRIX indicator rises above
the signal and place short orders when it drops below the signal.

Divergences are another important feature of the TRIX indicator. Bullish
divergence occurs when price is falling but the indicator is rising while a
bearish divergence occurs when price is rising while the indicator is falling.

Calculation

(Calculations sourced from Tradingview)

There are four constituents to the TRIX calculation:

1. Single Smoothed EMA = 18 Period EMA of Closing Price.
2. Double Smoothed EMA = 18 Period EMA of the Single Smoothed EMA.
3. Triple Smoothed EMA = 18 Period EMA of the Double Smoothed EMA.
4. TRIX = 1 Period Percent Change of Triple Smoothed EMA.

There is also essentially a signal line, which is an EMA of the TRIX line.

Generally Accepted Use

- Go long when TRIX crosses above zero
- Go short when TRIX crosses below zero
- Go long when TRIX rises above signal line
- Go short when TRIX drops below signal line
- Look for buy opportunities when there is a bullish divergence
- Look for sell opportunities when there is a bearish divergence

Chart Example

As can be seen on the above chart example, the indicator was mostly below the zero line during the downtrend. And, during the uptrend, the indicator was mostly above the zero line, indicating an uptrend. So, you could place a buy order once the indicator crosses above the zero line and ride the uptrend until signs of trend exhaustion start to appear.

Credits and Acknowledgements

Charts and calculations were provided from Trading View
(www.tradingview.com)