



1) Guide to Technical Analysis in Foreign Exchange

Introduction

When attempting to predict the future value or more importantly the direction of a future currency movement there are several methods, which one can use to arrive at a conclusion:

- a. Econometrics
- b. Judgmental forecasting
- c. Technical Analysis

Econometrics, using computer models of economies to arrive at projections of economic indicators including the exchange rate moves in and out of fashion, and although its proponents had a fairly good track record during part of the 1970's, it lost favour in recent years with huge global capital flows being the prime determinant.

Judgmental forecasting is that used by many participants in the foreign exchange market including most dealers, and consists of deciding which factors will influence the market over time and how much influence they will have. The factors that are important will vary between the short and long term:

Short Term	Long Term
1. Market liquidity (long/short, depth of market)	1. Economic growth performance
2. Interest rate movements/differentials	2. Current account performance
3. Central bank intervention	3. Rate of inflation
4. Implications of economic data	4. Real rate of return – fiscal and monetary Policies
5. Seasonal factors	5. Political climate
6. 'Gut feeling'	6. Market confidence

There are two major problems with these first two types of analysis:

1. The bulk of statistics which fundamentalists study are past history, out of date and already taken into account by the market in determining its price behaviour.
2. These techniques involve the analyst placing himself outside the market in determining what factors will affect it, then arbitrarily deciding what weighting to give them.

Technical analysis takes the view that the price is the only commodity that counts. It considers that the market price is the summation of all the hopes, fears, desires and greed of its participants and that all future expectations are discounted back into the current price. Therefore technical analysis is really the study of the psychology of the market. This means that although the external factors affecting the market may change, the human response i.e., the desire to buy or sell does not change, and therefore what has happened before can easily happen again, even if for different reasons.

With this in mind, let us look at the three types of Technical Analysis which can be utilised: -

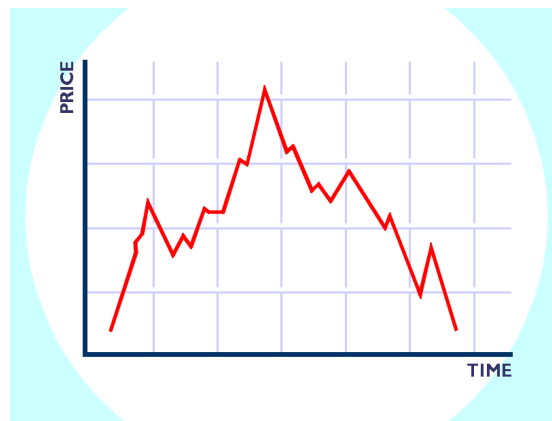
1. Charts
2. Mathematical Model
3. Wave Theory

1. Charts

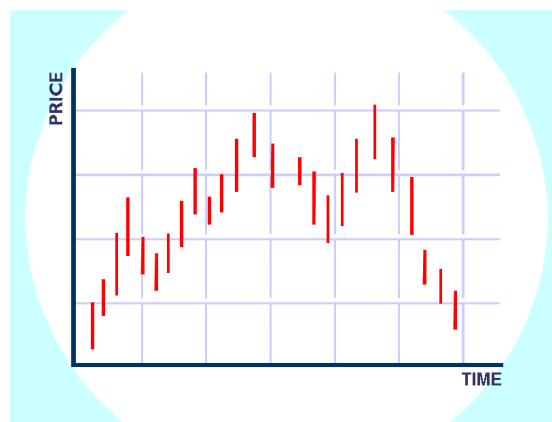
This is the pictorial base from which all technical analysts begin by recording the value of the currency over time. There are three main types of basic price chart:

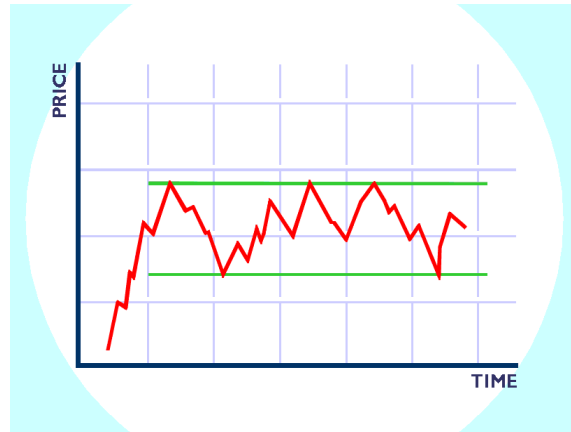
- a. Line
- b. Bar
- c. Point and figure

A Line chart is simply a graph of the value of the currency taken at regular time intervals.



The time horizon of any expectations can be changed by altering the time interval between plotting the value of the exchange rate i.e., for short term expectations the value may be plotted every 10 minutes, for longer term expectations it is more usual to take the closing price of the day.





The more often prices reverse from a particular points the stronger the support or resistance level becomes.

In psychological terms these levels work because buyers or sellers remember that there was a sharp reaction from the same level last time it was seen. Therefore, at a support level sellers are tempted to take profits, new sellers are reluctant to take positions and buyers are keen to enter the market.

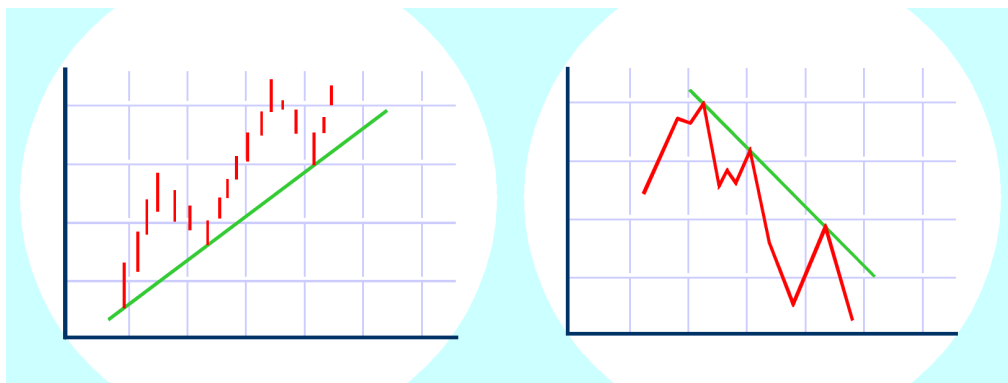
It is always noticeable however, that once a major level has been broken buying (breaking a resistance) or selling (breaking a support) will accelerate.

If a support level is broken, this will then become a resistance level for any rally, whilst a broken resistance will become a support level for any pullback.

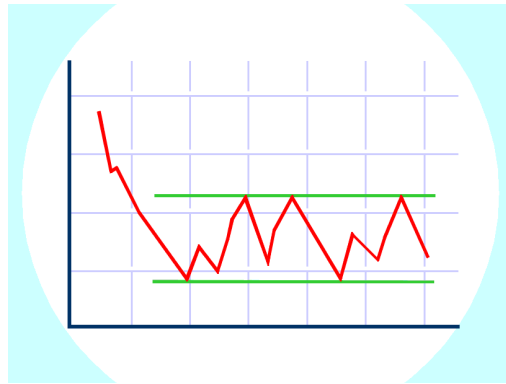
Support and resistance levels take on an added significance when used in conjunction with momentum or relative strength, the latter two factors giving a good indication whether a particular level may be broken.

b) Trendlines

'The trend is your friend'



A trendline is drawn by finding a straight (or sometimes curved) line that can be drawn through a number of highs or lows of a currency movement.



An uptrend is characterised by a series of higher highs and lows, (or closes if using a line chart), the trendline being drawn through the lowest prices. Similarly a downtrend is exemplified by a series of lower highs and lows (or closes) the trendline being drawn through the highest prices. A sideways trend represents an area where prices move in a flat and narrow range for several days or weeks. This price action is often termed a congestion area and rapid movement usually follows a breakout.

A trendline gains significance from its length (duration) and the number of times it has been touched (tested). A trendline is assumed to remain in existence until it is penetrated. On a bar chart an intra-day penetration needs to be followed by a close that also breaks the trendline, otherwise it is a false break. To be absolutely certain that the trend has been broken two successive closes should be outside the existing trend.

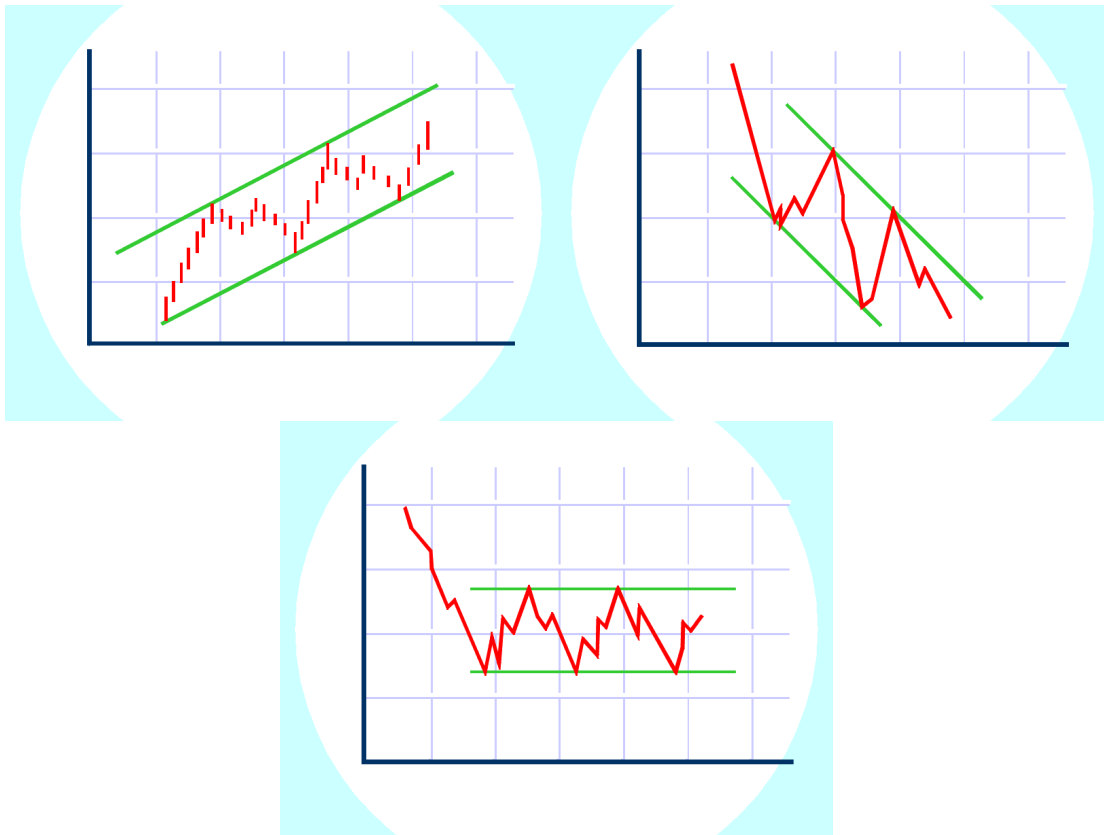
Volume – When charting commodity and futures markets much is made of the volume of transactions in the market and the level of open interest. In the foreign exchange cash market this is a very difficult variable to measure, and experience suggests that unless the market is extremely thin it has little impact on the reliability of the charts.

One rule of thumb for commodities/equities is that volume should rise in a bull market and decline in a bear market. Further, the end of a bull market is often shown by prices continuing to rise during a period of declining volume.

c) Patterns

Although charts are not predictors of the extent of future exchange rate movements some measurement principles can be adopted relating to the recognition of certain chart patterns. There are a number of patterns, which occur reasonably regularly when using foreign exchange charts, and we will look at each of these in turn. In doing so though, it should be remembered that the chances of a chart pattern producing the desired objective are reduced if there is a solid area of support or resistance between breakout and objective.

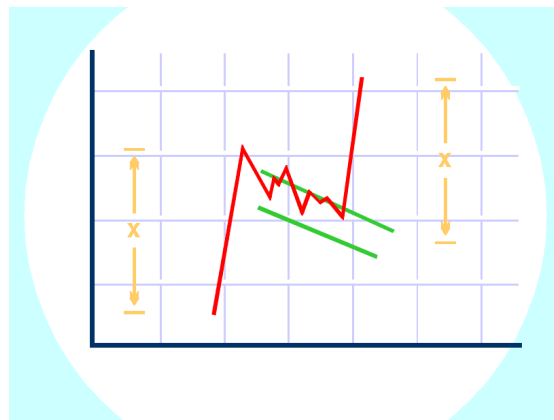
- i. **Channels** – A channel is effectively two Trendlines, which can be drawn in parallel to each other, the higher line acting as the resistance line, the lower line as the support. As with trends channels can be upward, downward or sideways. In an upchannel the support line is the most important trendline, in a downchannel the resistance line is the most important.



Usually in a channel, the resistance and support lines will be tested alternately, although this is not obligatory for a channel to exist.

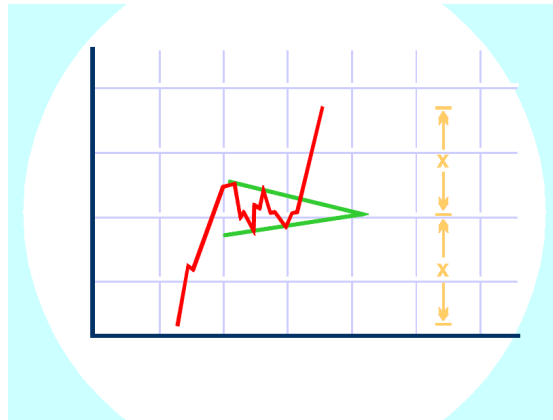
If the price breaks out of the channel it is usual that the price will test the support/resistance level if the mirror image of the channel, usually within 2/3 days if a bar chart is used, almost immediately if using a short term line chart.

- ii. **Flags and pennants** – These are two short-term patterns that usually form during a brief pause in a strongly trending market. The pattern is characterised by a moderate movement in the opposite direction to the main trend. Again using bar charts this period can last for anything from three to seven days (or periods if a line chart is used), before a sharp breakout in the direction of the original trend is seen.



If volume can be measured, it should be seen to decrease during the formation of the flag and increase sharply immediately after the breakout.

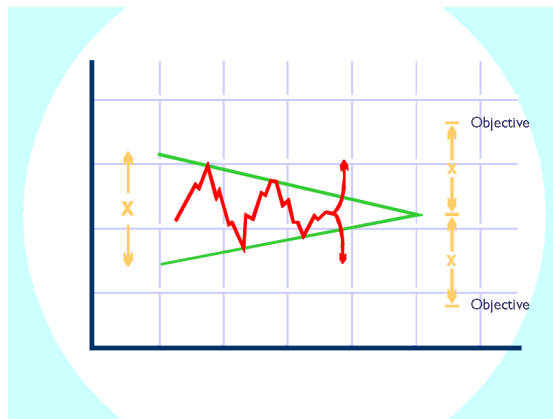
A pennant is very similar to a flag, but instead of the sluggish pullback a symmetrical triangle is formed which is then followed by the sharp breakout in the direction of the original move.



Two points to note are 1) the pennant phase may last longer than the flag, 2) there are two potential objectives, one from the triangle or channel and one from the flag or pennant.

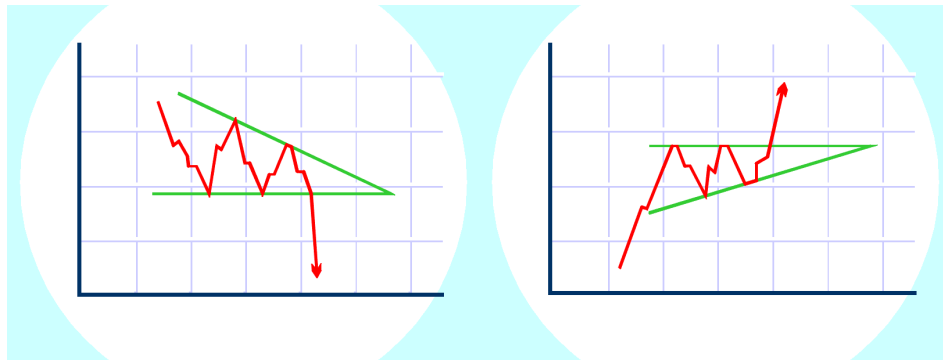
- i. **Triangles** – Triangles take longer to form than pennants or flags and come in four main types: symmetrical, ascending, descending and expanding. They generally form over a period of three weeks to three months and quite often form after a major price move. They may be continuation or reversal patterns.

Symmetrical



This type of pattern characterised by a series of progressively lower peaks and higher troughs and is a sign of market indecision. The price usually breaks out of this pattern 2/3 – 3/4 of the way to the apex and will usually move by an amount equal to the base of the triangle.

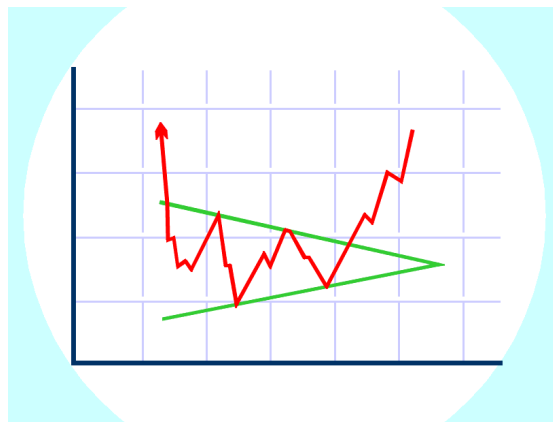
Ascending/Descending



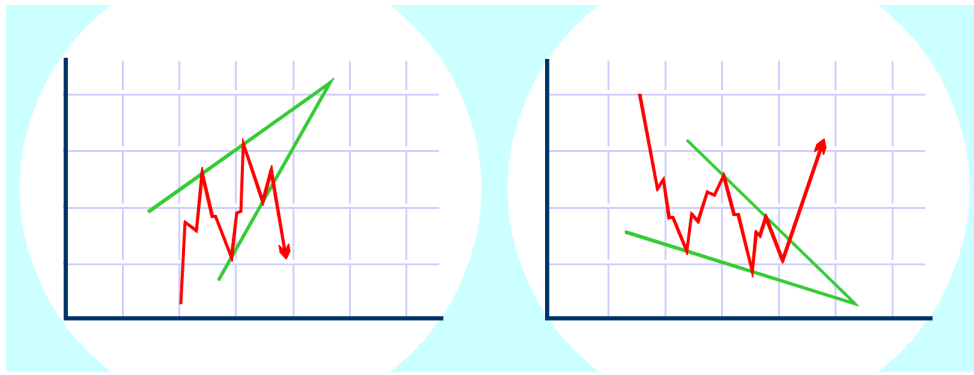
There should be at least four points of contact to the two trendlines before a breakout occurs. In these patterns, where one of the trendlines is horizontal the direction of breakout can be predicted. For example with an ascending triangle the buyers are clearly more aggressive than the sellers, each attempt at a pullback stopping at an earlier stage. As with symmetrical triangles one would expect the move from the apex to equal the base of the triangle.

Expanding

This formation does not occur frequently and is likely to be detected at major tops and bottoms after lengthy price moves. Again a minimum of two tracking points for each trendline is needed before breakout.

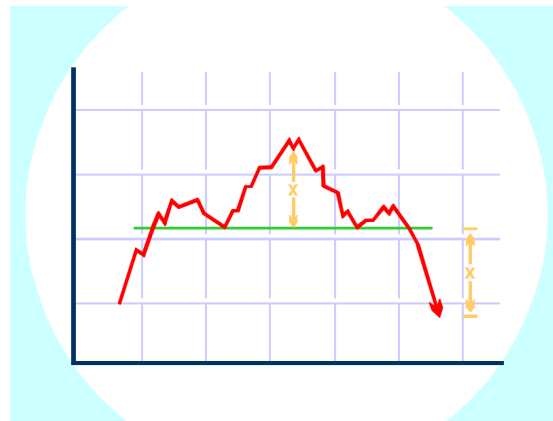


- ii. **Wedges** – The wedge is basically a sloping triangle, however instead of one of the trendlines being horizontal it is sloping. In the case of an ascending wedge this suggests there are more participants selling and tends to suggest a loss of upward momentum. The breakout from a wedge is always in the opposite direction to the original move and tends to occur about $\frac{3}{4}$ of the way to the apex.



It should be noted that many major trends have come to an end with a rising or falling wedge.

- iii. **Head and Shoulders** – This is probably the most famous of all chart patterns, but not always the most reliable. When it works it will always be seen as a reversal pattern and consists of four phases.



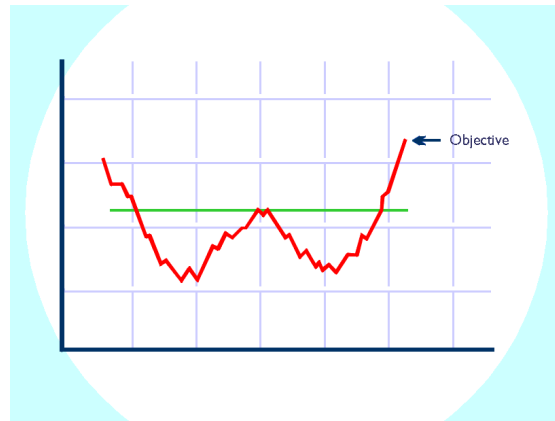
The first phase consists of the formation of a small peak, which is the left shoulder, this is followed by more aggressive buying to create the head, which eventually fizzles out and results in a test of the neckline (trendline). The third phase is another attempt at a rally, which does not produce a peak as high as the last rally. This is followed by another test of the neckline (trendline) which results in a break. The objective of the move then becomes the equivalent of the distance from the neckline to the top of the head.

The unreliability of this move result from the fact that the final test of the neckline does not always result in a break and the move continues in the same direction as before. This means a definite break of the neckline (say 1%) should be seen before action is taken.

In volume terms, the volume should be higher during the formation of the left shoulder than the right shoulder to confirm that this pattern is taking place.

- iv. **Tops/Bottoms** – There can be single, double or triple tops and bottoms, the principle involved being roughly the same in each case. For example let us take the case of a double bottom. This would be formed when consecutive bouts of selling stop at roughly the same level of support and the second rally exceeds the level achieved on the first rally.

The objective is measured by calculating the distance between the troughs and the neckline and measuring the mirror image.



- iv. **Other reversal signals** – There are three other types of pattern which convincingly suggest that a trend reversal is taking place:

Rounding top or bottom

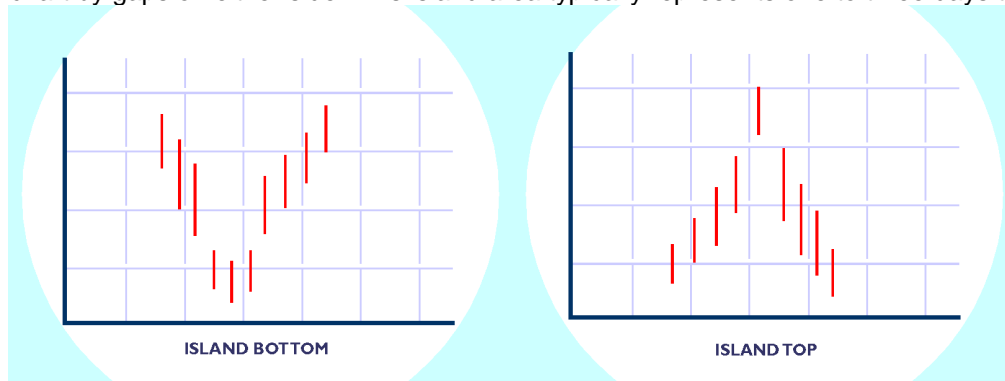
These are seen as saucer shape patterns and reflect a slow and elongated reversal signal. It is more usual to see a rounded bottom than top.

Key Day Reversal

These are usually a reliable indicator of an impending trend reversal if preceded by a sharp move, and occur when the price moves initially up or down to make a new high or low for the move but is rapidly followed by selling/buying that takes the close below/above the previous two days closes. A trend reversal confirmation by the breaking of a trendline, usually soon follows.

Island Reversal

This is a bar chart pattern and is characterised by a trading area, which is set apart from the rest of the chart by gaps on either side. This island area typically represents one to three days trading.



If the initial gap is seen in the context of heavy volume, this will help to confirm the rest of the pattern.

Gaps

Gaps relate solely to bar charts and relate to the time when one day's high low range is completely above or below the previous days range. There are four main types of gap:

- i. **Common Gap** – It occurs in fairly active markets but usually during periods of relatively trendless movement and is usually filled within a few days.

- ii. **Breakaway Gap** – This occurs at the inception of a trend and usually does not get filled for a long time, if at all. If the price subsequently returns towards a breakaway gap the gap acts as a barrier that repels the correction and does not permit complete closure. If a closure does occur this serves as a warning that a false or premature trend signal may have been given.



- iii. **Midway Gap** – This appears halfway through a move and typically appears after an extensive gapless trend. Some attempt to fill the gap may occur for up to three days after its opening. Failure to do so gives an objective for the move. The time taken to reach this objective usually equals the time to reach the midway gap from the start of the move.
- iv. **Exhaustion Gap** – Occurs after a long steady move and is destined to be filled, or gapped over by a breakaway gap in the opposite direction.

As a general rule, a gap that is able to stop a pullback to fill it usually points to the move continuing in the same direction as the trend. A gap that is completely filled can be viewed as a barrier that has been demolished leaving the market vulnerable to further reversal action.

Timing Trades – When a market closes at or near the highs (lows) of the day and on the following morning gaps up (down) at the opening, the subsequent action usually follows a set pattern. As bullish (bearish) the initial action may be the opening strength (weakness) is overdone and soon after the opening, the price should attempt to settle halfway into the gap. This should signal an opportunity to buy (sell), as new highs (lows) should then be seen.

Trading – Charting is very subjective, three people can look at the same chart and arrive at three separate conclusions as to what will happen next. Perhaps the best way to use charts is to: -

- Look for the Trendline
- Mark the Support and Resistance Levels
- Search for the Relevant Chart Patterns and Mind the Gaps

Remember that it is very dangerous to try and predict chart movements (this is akin to trying to draw your own charts, which really needs large amounts of cash to work consistently). If a fully flexible trading strategy is being followed, profits may accrue from reacting to chart movements.

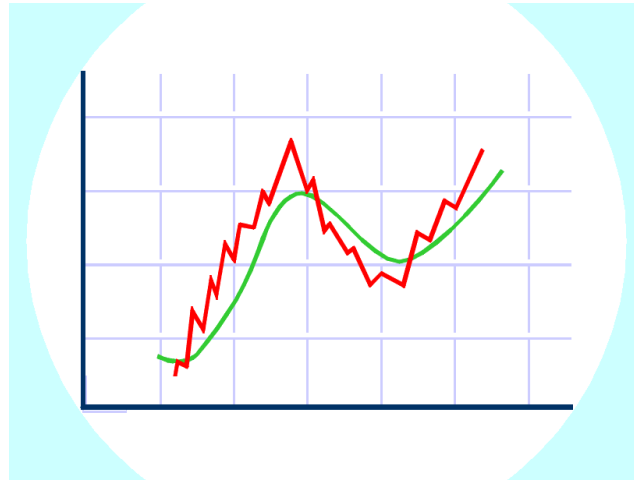
2. Mathematical Models

If charting is the art of technical analysis then mathematical modelling is the science. The basis of these models is usually moving averages although other factors such as momentum and relative strength will be taken into account in setting up the model. Once all the factors have been

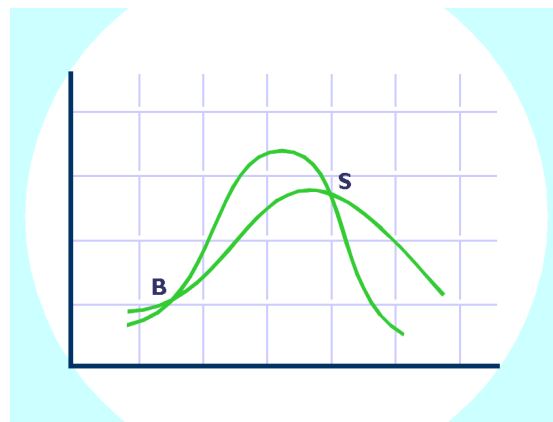
incorporated the theory is that the model will then automatically churn out signals as to when to buy and sell, no further action being needed by the analyst.

a) **Moving Averages**

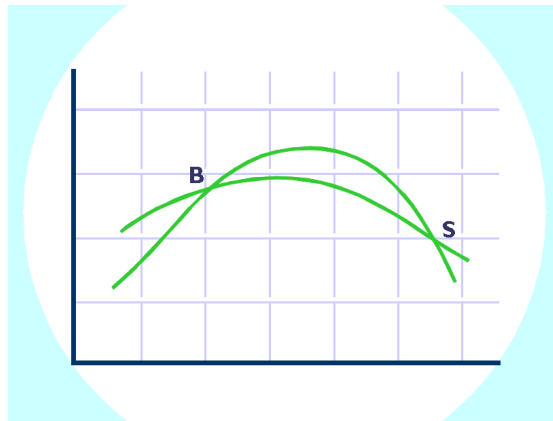
The first move from charts towards models usually involves placing a moving average over the chart of the spot price as shown in the example below: -



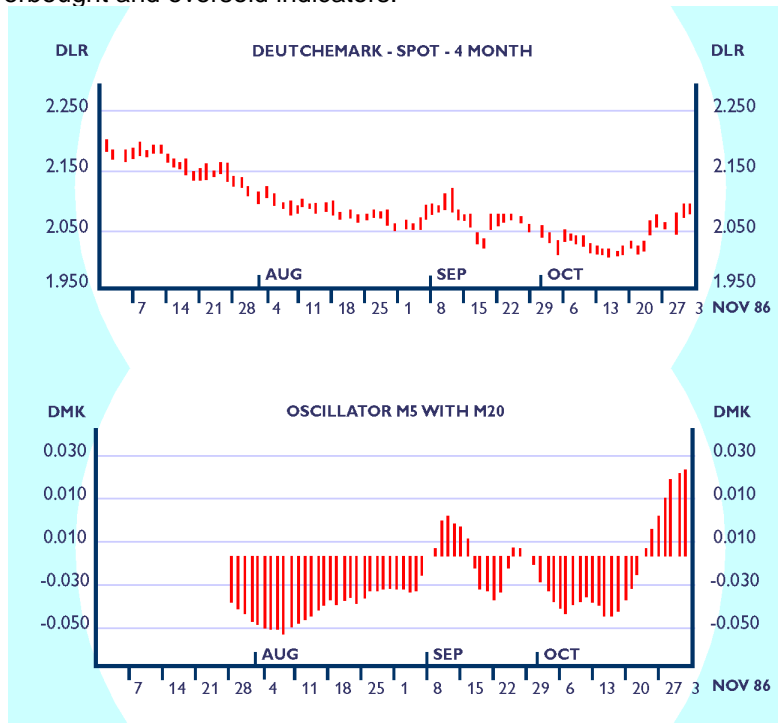
This moving average can be either a simple arithmetical average or an exponential (weighted) average. In the former case equal weighting is given to all values used in the average, whilst in the latter much greater weighting is given to the latest data. This of course means that a weighted moving average will follow the spot price more closely than the arithmetical average. Moving averages tend to smooth out irregular price fluctuations. The assumption of moving averages is that the foreign exchange markets are volatile but that a trend will remain in place long enough to benefit from it. The basic principle is that a short run moving average crossing a longer terms moving average on the way up indicates a change in sentiment and suggests a 'buy'. A downward crossing of averages conversely represents a sell.



Most moving average models tend to work best in a strongly trending market, a relatively trendless market leading to the possibility of 'whipsaw' patterns.



Moving average analysis is frequently represented by an oscillator which monitors the variance between two moving averages and can be used to give signals as to when to buy and sell as well as providing overbought and oversold indicators.



If the oscillator is above zero – buy, if it is below zero – sell. Points to note:

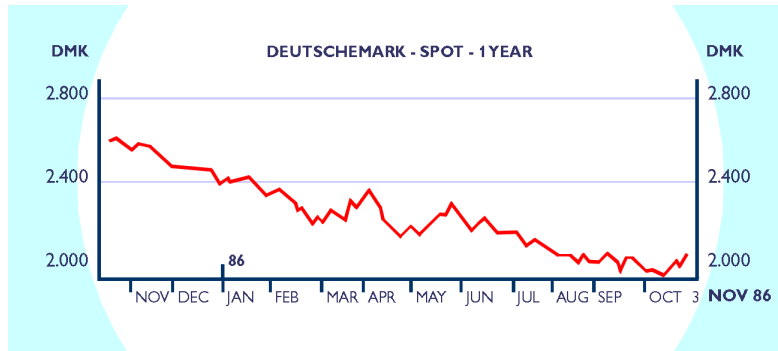
1. Most moving average models use at least three moving averages
2. The time of day which is used to take the value is extremely important
3. Most models will incorporate a filter rule to ensure all profits are not given up
4. The model will be set up and the principle – cut the losses short and let the profits run. This means the percentage of winning trades might be quite low.

b) **Momentum**

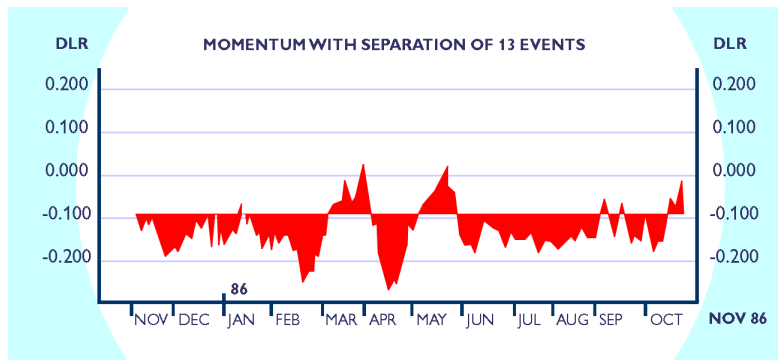
Momentum is the expression of the rate at which a price changes and can be calculated in one of two ways: -

- i. Simple difference between price levels e.g., $C - (C-N)$ where C = today's rate, N = number of days.

As an index $\frac{C}{C-N} \times 100$



Momentum is usually used to look for overbought or oversold levels. If the speed of the price movement causes the resultant momentum figure to penetrate the overbought or oversold line, it is reasonable to suppose that the speed of the move has reached excessive proportions and that a pullback or period of consolidation might be expected.



Similarly, although an exchange rate may still be rising, its rate of advance may be declining, perhaps giving an early warning of a change in trend. Momentum will not be used on its own, a rising or falling momentum index indicates very little. It would be used on conjunction with a price chart or moving averages.

c) **Relative Strength Index**

This is also used to gauge the strength of market trends. In the case of Reuters graphics the RSI is calculated as follows: -

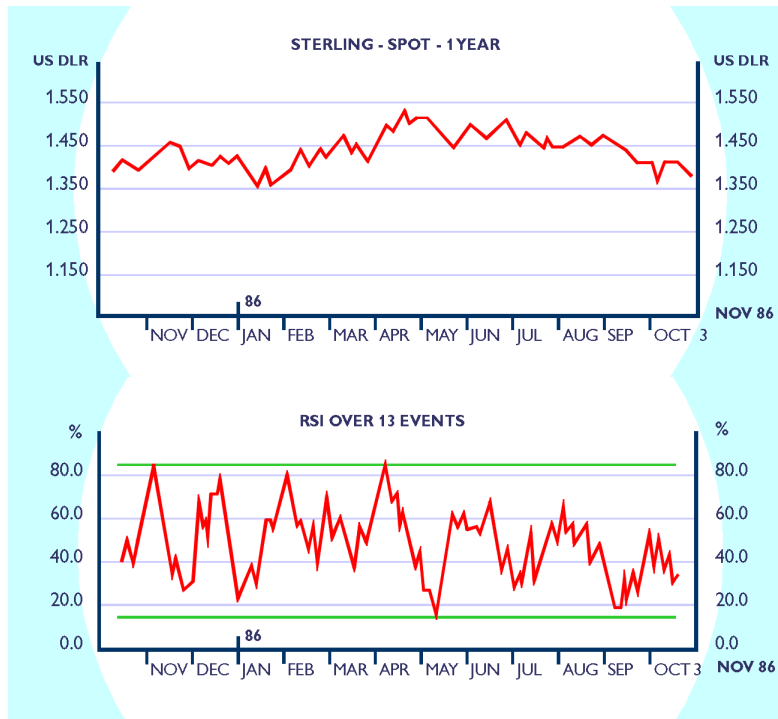
$$RSI = \frac{100}{1+RS}$$

Where RS = $\frac{\text{Average of X periods 'closes up'}}{\text{Average of X periods close down}}$

Average Up = $\frac{\text{Sum of X periods closes up}}{X}$

Average Down = $\frac{\text{Sum of X periods closes down}}{X}$

Where X is any defined number



RSI is usually used to detect overbought and oversold conditions in the same way as momentum, But also used as a confirmation of the price trend from chart formations i.e., if the trends are in the same direction – fine, if they are in opposite directions – beware! A trend change may be imminent.

d) Pitfalls

Having looked at charts and mathematical models, perhaps we should note some of the pitfalls of technical analysis before moving on to wave theory.

1. Identifying patterns that do not exist
2. 'Second guessing' the chart
3. Failed genuine patterns
4. Ambiguous patterns
5. 'Whipsaws' in moving average systems
6. Inability to specify time periods in which targets will be hit

At all times the 'Law of Multiple Techniques' should be used. That is that the more factors that point in the same direction the more confident the analyst can become that his expectations will prove to be correct.

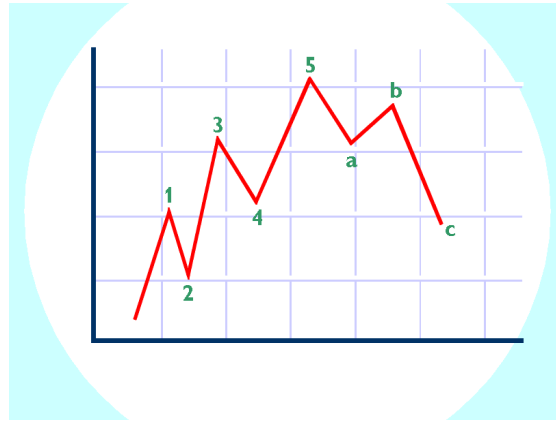
3. Wave Theory - Cycles

The originator of technical analysis was Charles H Dow who spent a great deal of his time analysing the Dow Jones index. He propounded a theory, which stated that there were three distinct trends: primary, secondary and minor. He suggested that the primary trend lasted for a year or more, during which time prices would move by at least 20 pct. The secondary trend lasted for three weeks to three months, moved in the opposite direction to the primary trend and retraced between 1/3 and 2/3rds of the original market action, although this reaction frequently stopped at 50 pct. A move of less than 1/3 seldom occurred. Finally the minor trend was made of relatively unimportant day to day movements which lasted less than six days.

The most popular wave theory in use today is the Elliot Wave Theory, which uses as its basis the Fibonacci series of numbers:

1 2 3 5 8 13 21 34 55 88 143 etc

Elliot defines five major up moves, corrected by three down moves.



Each move can be divided into five or three sub-waves. The major difficulty is that a lot of this fitting of the waves is done in hindsight. Within the context of the wave theory the Fibonacci series can be used to decide for how long a trend will run i.e., if the move lasts beyond 21 days it should meet resistance on day 34.

Elliot's use of maths also says that Fibonacci can be used for ratios to determine the likely extent of price retracement in percentage terms. Such ratios are 1/2, 2/3, 3/5, 8/13 etc. Combining this with resistance/support levels can lead to predictions of the zone where moves will stop.

Given the complexity of the theory some basic guidelines should be followed: -

- a. Define the trend.
- b. Examine past history for five and three wave trends and corrections.
- c. Identify the current status in relation to the major highs and lows of the current trend using closing prices.
- d. Measure the duration of the waves, and find their correlation to the Fibonacci series.
- e. Check the validity of the percentage retracements suggested by the ratios derived from the Fibonacci series.

Conclusion

Over the last few years Technical Analysis has become a very important part of the foreign exchange market. With many market participants actively watching the chart points. Whether it will ever become self-fulfilling is debatable, but what is evident is that when used in conjunction with fundamental forecasting it can become a potent weapon in correctly positioning oneself within the markets.