



Technical Analysis Module



NATIONAL STOCK EXCHANGE OF INDIA LIMITED

Test Details:

Sr. No.	Name of Module	Fees (Rs.)	Test Duration (in minutes)	No. of Questions	Maximum Marks	Pass Marks (%)	Certificate Validity
1	Financial Markets: A Beginners' Module *	1686	120	60	100	50	5
2	Mutual Funds : A Beginners' Module	1686	120	60	100	50	5
3	Currency Derivatives: A Beginner's Module	1686	120	60	100	50	5
4	Equity Derivatives: A Beginner's Module	1686	120	60	100	50	5
5	Interest Rate Derivatives: A Beginner's Module	1686	120	60	100	50	5
6	Commercial Banking in India: A Beginner's Module	1686	120	60	100	50	5
7	Securities Market (Basic) Module	1686	120	60	100	60	5
8	Capital Market (Dealers) Module *	1686	105	60	100	50	5
9	Derivatives Market (Dealers) Module * [Please refer to footnote no. (i)]	1686	120	60	100	60	3
10	FIMMDA-NSE Debt Market (Basic) Module	1686	120	60	100	60	5
11	Investment Analysis and Portfolio Management Module	1686	120	60	100	60	5
12	Fundamental Analysis Module	1686	120	60	100	60	5
13	Financial Markets (Advanced) Module	1686	120	60	100	60	5
14	Securities Markets (Advanced) Module	1686	120	60	100	60	5
15	Mutual Funds (Advanced) Module	1686	120	60	100	60	5
16	Banking Sector Module	1686	120	60	100	60	5
17	Insurance Module	1686	120	60	100	60	5
18	Macroeconomics for Financial Markets Module	1686	120	60	100	60	5
19	Mergers and Acquisitions Module	1686	120	60	100	60	5
20	Back Office Operations Module	1686	120	60	100	60	5
21	Wealth Management Module	1686	120	60	100	60	5
22	NISM-Series-I: Currency Derivatives Certification Examination	1000	120	100	100	60	3
23	NISM-Series-II-A: Registrars to an Issue and Share Transfer Agents – Corporate Certification Examination	1000	120	100	100	50	3
24	NISM-Series-II-B: Registrars to an Issue and Share Transfer Agents – Mutual Fund Certification Examination	1000	120	100	100	50	3
25	NISM-Series-IV: Interest Rate Derivatives Certification Examination	1000	120	100	100	60	3
26	NISM-Series-V-A: Mutual Fund Distributors Certification Examination *	1000	120	100	100	50	3
27	NISM-Series-VI: Depository Operations Certification Examination	1000	120	100	100	60	3
28	NISM Series VII: Securities Operations and Risk Management Certification Examination	1000	120	100	100	50	3
29	NISM-Series-VIII: Equity Derivatives Certification Examination	1000	120	100	100	60	3
30	Certified Personal Financial Advisor (CPFA) Examination	4495	120	80	100	60	3
31	NSDL–Depository Operations Module	1686	75	60	100	60 #	5
32	Commodities Market Module	2022	120	60	100	50	3
33	Surveillance in Stock Exchanges Module	1686	120	50	100	60	5
34	Corporate Governance Module	1686	90	100	100	60	5
35	Compliance Officers (Brokers) Module	1686	120	60	100	60	5
36	Compliance Officers (Corporates) Module	1686	120	60	100	60	5
37	Information Security Auditors Module (Part-1)	2528	120	90	100	60	2
	Information Security Auditors Module (Part-2)	2528	120	90	100	60	
38	Options Trading Strategies Module	1686	120	60	100	60	5
39	Options Trading (Advanced) Module	1686	120	35	100	60	5
40	FPSB India Exam 1 to 4**	2247 per exam	120	75	140	60	NA
41	Examination 5/Advanced Financial Planning **	5618	240	30	100	50	NA
42	Equity Research Module ##	1686	120	65	100	55	2
43	Issue Management Module ##	1686	120	80	100	55	2
44	Market Risk Module ##	1686	120	50	100	55	2
45	Financial Modeling Module ###	1123	120	30	100	50	NA
46	Financial Services Foundation Module ###	1123	120	45	100	50	NA

* Candidates have the option to take the tests in English, Gujarati or Hindi languages.

Candidates securing 80% or more marks in NSDL-Depository Operations Module ONLY will be certified as 'Trainers'.

** Following are the modules of Financial Planning Standards Board India (Certified Financial Planner Certification)

- FPSB India Exam 1 to 4 i.e. (i) Risk Analysis & Insurance Planning (ii) Retirement Planning & Employee Benefits (iii) Investment Planning and (iv) Tax Planning & Estate Planning
- Examination 5/Advanced Financial Planning

Modules of Finitiatives Learning India Pvt. Ltd. (FLIP)

Module of IMS Proschool

The curriculum for each of the modules (except Modules of Financial Planning Standards Board India, Finitiatives Learning India Pvt. Ltd. and IMS Proschool) is available on our website: www.nseindia.com > Education > Certifications.

Note: (i) NISM has specified the NISM-Series-VIII-Equity Derivatives Certification Examination as the requisite standard for associated persons functioning as approved users and sales personnel of the trading member of an equity derivatives exchange or equity derivative segment of a recognized stock exchange.

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Distribution of weights in the Technical Analysis Module Curriculum

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	Total	100

Note: Candidates are advised to refer to NSE's website: www.nseindia.com, click on 'Education' link and then go to 'Updates & Announcements' link, regarding revisions/updations in NCFM modules or launch of new modules, if any.

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CHAPTER 1 INTRODUCTION TO TECHNICAL ANALYSIS

Learning objectives

After studying this chapter the student should be able to understand:

- The basis of technical analysis
- The strengths and weaknesses of technical analysis

1.1 What is Technical Analysis?

Technical Analysis can be defined as an art and science of forecasting future prices based on an examination of the past price movements. Technical analysis is not astrology for predicting prices. Technical analysis is based on analyzing current demand-supply of commodities, stocks, indices, futures or any tradable instrument.

Technical analysis involve putting stock information like prices, volumes and open interest on a chart and applying various patterns and indicators to it in order to assess the future price movements. The time frame in which technical analysis is applied may range from intraday (1-minute, 5-minutes, 10-minutes, 15-minutes, 30-minutes or hourly), daily, weekly or monthly price data to many years.

There are essentially two methods of analyzing investment opportunities in the security market viz fundamental analysis and technical analysis. You can use fundamental information like financial and non-financial aspects of the company or technical information which ignores fundamentals and focuses on actual price movements.

The basis of Technical Analysis

What makes Technical Analysis an effective tool to analyze price behavior is explained by following theories given by Charles Dow:

- Price discounts everything
- Price movements are not totally random
- What is more important than why

1.1.1 *Price discounts everything*

"Each price represents a momentary consensus of value of all market participants – large commercial interests and small speculators, fundamental researchers, technicians and gamblers- at the moment of transaction" – Dr Alexander Elder

Technical analysts believe that the current price fully reflects all the possible material information which could affect the price. The market price reflects the sum knowledge of all participants, including traders, investors, portfolio managers, buy-side analysts, sell-side analysts, market strategists, technical analysts, fundamental analysts and many others. It would be folly to disagree with the price set by such an impressive array of people with impeccable credentials. Technical analysis looks at the price and what it has done in the past and assumes it will perform similarly in future under similar circumstances. Technical analysis looks at the price and assumes that it will perform in the same way as done in the past under similar circumstances in future.

1.1.2 *Price movements are not totally random*

Technical analysis is a trend following system. Most technicians acknowledge that hundreds of years of price charts have shown us one basic truth – prices move in trends. If prices were always random, it would be extremely difficult to make money using technical analysis. A technician believes that it is possible to identify a trend, invest or trade based on the trend and make money as the trend unfolds. Because technical analysis can be applied to many different time frames, it is possible to spot both short-term and long-term trends.

"What" is more important than "Why"

It is said that "A technical analyst knows the price of everything, but the value of nothing". Technical analysts are mainly concerned with two things:

- 1.** The current price
- 2.** The history of the price movement

All of you will agree that the value of any asset is only what someone is willing to pay for it. Who needs to know why? By focusing just on price and nothing else, technical analysis represents a direct approach. The price is the final result of the fight between the forces of supply and demand for any tradable instrument. The objective of analysis is to forecast the direction of the future price. Fundamentalists are concerned with why the price is what it is. For technicians, the why portion of the equation is too broad and many times the fundamental reasons given are highly suspect. Technicians believe it is best to concentrate on what and never mind why. Why did the price go up? It is simple, more buyers (demand) than sellers (supply).

The principles of technical analysis are universally applicable. The principles of support, resistance, trend, trading range and other aspects can be applied to any chart. Technical analysis can be used for any time horizon; for any marketable instrument like stocks, futures and commodities, fixed-income securities, forex, etc

Top-down Technical Analysis

Technical analysis uses top-down approach for investing. For each stock, an investor would analyze long-term and short-term charts. First of all you will consider the overall market, most probably the index. If the broader market were considered to be in bullish mode, analysis would proceed to a selection of sector charts. Those sectors that show the most promise would be selected for individual stock analysis. Once the sector list is narrowed to 3-5 industry groups, individual stock selection can begin. With a selection of 10-20 stock charts from each industry, a selection of 3-5 most promising stocks in each group can be made. How many stocks or industry groups make the final cut will depend on the strictness of the criteria set forth. Under this scenario, we would be left with 9-12 stocks from which to choose. These stocks could even be broken down further to find 3-4 best amongst the rest in the lot.

1.1.3 *Technical Analysis: The basic assumptions*

The field of technical analysis is based on three assumptions:

1. The market discounts everything.
2. Price moves in trends.
3. History tends to repeat itself.

1. The market discounts everything

Technical analysis is criticized for considering only prices and ignoring the fundamental analysis of the company, economy etc. Technical analysis assumes that, at any given time, a stock's price reflects everything that has or could affect the company - including fundamental factors. The market is driven by mass psychology and pulses with the flow of human emotions. Emotions may respond rapidly to extreme events, but normally change gradually over time. It is believed that the company's fundamentals, along with broader economic factors and market psychology, are all priced into the stock, removing the need to actually consider these factors separately. This only leaves the analysis of price movement, which technical theory views as a product of the supply and demand for a particular stock in the market.

2. Price moves in trends

"Trade with the trend" is the basic logic behind technical analysis. Once a trend has been established, the future price movement is more likely to be in the same direction as the trend than to be against it. Technical analysts frame strategies based on this assumption only.

3. History tends to repeat itself

People have been using charts and patterns for several decades to demonstrate patterns in price movements that often repeat themselves. The repetitive nature of price movements

is attributed to market psychology; in other words, market participants tend to provide a consistent reaction to similar market stimuli over time. Technical analysis uses chart patterns to analyze market movements and understand trends.

1.1.4 *Strengths and weakness of Technical Analysis*

1.1.4.1 *Importance of Technical Analysis*

Not Just for stocks

Technical analysis has universal applicability. It can be applied to any financial instrument - stocks, futures and commodities, fixed-income securities, forex, etc

Focus on price

Fundamental developments are followed by price movements. By focusing only on price action, technicians focus on the future. The price pattern is considered as a leading indicator and generally leads the economy by 6 to 9 months. To track the market, it makes sense to look directly at the price movements. More often than not, change is a subtle beast. Even though the market is prone to sudden unexpected reactions, hints usually develop before significant movements. You should refer to periods of accumulation as evidence of an impending advance and periods of distribution as evidence of an impending decline.

Supply, demand, and price action

Technicians make use of high, low and closing prices to analyze the price action of a stock. A good analysis can be made only when all the above information is present

Separately, these will not be able to tell much. However, taken together, the open, high, low and close reflect forces of supply and demand.

Support and resistance

Charting is a technique used in analysis of support and resistance level. These are trading range in which the prices move for an extended period of time, saying that forces of demand and supply are deadlocked. When prices move out of the trading range, it signals that either supply or demand has started to get the upper hand. If prices move above the upper band of the trading range, then demand is winning. If prices move below the lower band, then supply is winning.

Pictorial price history

A price chart offers most valuable information that facilitates reading historical account of a security's price movement over a period of time. Charts are much easier to read than a table of numbers. On most stock charts, volume bars are displayed at the bottom. With this historical picture, it is easy to identify the following:

- Market reactions before and after important events
- Past and present volatility
- Historical volume or trading levels
- Relative strength of the stock versus the index.

Assist with entry point

Technical analysis helps in tracking a proper entry point. Fundamental analysis is used to decide what to buy and technical analysis is used to decide when to buy. Timings in this context play a very important role in performance. Technical analysis can help spot demand (support) and supply (resistance) levels as well as breakouts. Checking out for a breakout above resistance or buying near support levels can improve returns.

First of all you should analyze stock's price history. If a stock selected by you was great for the last three years has traded flat for those three years, it would appear that market has a different opinion. If a stock has already advanced significantly, it may be prudent to wait for a pullback. Or, if the stock is trending lower, it might pay to wait for buying interest and a trend reversal.

1.1.4.2 Weaknesses of Technical Analysis

Analyst bias

Technical analysis is not hard core science. It is subjective in nature and your personal biases can be reflected in the analysis. It is important to be aware of these biases when analyzing a chart. If the analyst is a perpetual bull, then a bullish bias will overshadow the analysis. On the other hand, if the analyst is a disgruntled eternal bear, then the analysis will probably have a bearish tilt.

Open to interpretation

Technical analysis is a combination of science and art and is always open to interpretation. Even though there are standards, many times two technicians will look at the same chart and paint two different scenarios or see different patterns. Both will be able to come up with logical support and resistance levels as well as key breaks to justify their position. Is the cup half-empty or half-full? It is in the eye of the beholder.

Too late

You can criticize the technical analysis for being too late. By the time the trend is identified, a substantial move has already taken place. After such a large move, the reward to risk ratio is not great. Lateness is a particular criticism of Dow Theory.

Always another level

Technical analysts always wait for another new level. Even after a new trend has been identified, there is always another “important” level close at hand. Technicians have been accused of sitting on the fence and never taking an unqualified stance. Even if they are bullish, there is always some indicator or some level that will qualify their opinion.

Trader's remorse

An array of pattern and indicators arises while studying technical analysis. Not all the signals work. For instance: A sell signal is given when the neckline of a head and shoulders pattern is broken. Even though this is a rule, it is not steadfast and can be subject to other factors such as volume and momentum. In that same vein, what works for one particular stock may not work for another. A 50-day moving average may work great to identify support and resistance for Infosys, but a 70-day moving average may work better for Reliance. Even though many principles of technical analysis are universal, each security will have its own idiosyncrasies.

TA is also useful in controlling risk

It is Technical Analysis only that can provide you the discipline to get out when you're on the wrong side of a trade. The easiest thing in the world to do is to get on the wrong side of a trade and to get stubborn. That is also potentially the worst thing you can do. You think that if you ride it out you'll be okay. However, there will also be occasions when you won't be okay. The stock will move against you in ways and to an extent that you previously found virtually unimaginable.

It is more important to control risk than to maximize profits!

There is asymmetry between zero and infinity. What does that mean? Most of us have very finite capital but infinite opportunities because of thousands of stocks. If we lose an opportunity, we will have thousands more tomorrow. If we lose our capital, will we get thousands more tomorrow? It is likely that we will not. We will also lose our opportunities. Our capital holds more worth to us than our opportunities because we must have capital in order to take advantage of tomorrow's opportunities.

It is more important to control risk than to maximize profits! Technical Analysis, if practiced with discipline, gives you specific parameters for managing risk. It's simply supply and demand. Waste what's plentiful, preserve what's scarce. Preserve your capital because *your capital is your opportunity*. You can be right a thousand times, become very wealthy and then get wiped out completely if you manage your risk poorly just once. One last time: That is why it is more important to control risk than to maximize profits!

How to know what to look for? How to organize your thinking in a market of thousands of stock trading millions of shares per day? How to learn your way around? Technical Analysis answers all these questions.

Conclusions

Technical analysis works on Pareto principle. It considers the market to be 80% psychological and 20% logical. Fundamental analysts consider the market to be 20% psychological and 80% logical. Psychological or logical may be open for debate, but there is no questioning the current price of a security. After all, it is available for all to see and nobody doubts its legitimacy. The price set by the market reflects the sum knowledge of all participants, and we are not dealing with lightweights here. These participants have considered (discounted) everything under the sun and settled on a price to buy or sell. These are the forces of supply and demand at work. By examining price action to determine which force is prevailing, technical analysis focuses directly on the bottom line: What is the price? Where has it been? Where is it going?

Even though some principles and rules of technical analysis are universally applicable, it must be remembered that technical analysis is more an art form than a science. As an art form, it is subject to interpretation. However, it is also flexible in its approach and each investor should use only that which suits his or her style. Developing a style takes time, effort and dedication, but the rewards can be significant.

CHAPTER 2 CANDLE CHARTS

Learning objectives

After studying this chapter the student should be able to understand:

- Types of charts
- The candlestick analysis
- Pattern Psychology – investors' psychology behind formation of candlestick pattern

2.1 The charts

What is a chart?

Charts are the working tools of technical analysts. They use charts to plot the price movements of a stock over specific time frames. It's a graphical method of showing where stock prices have been in the past.

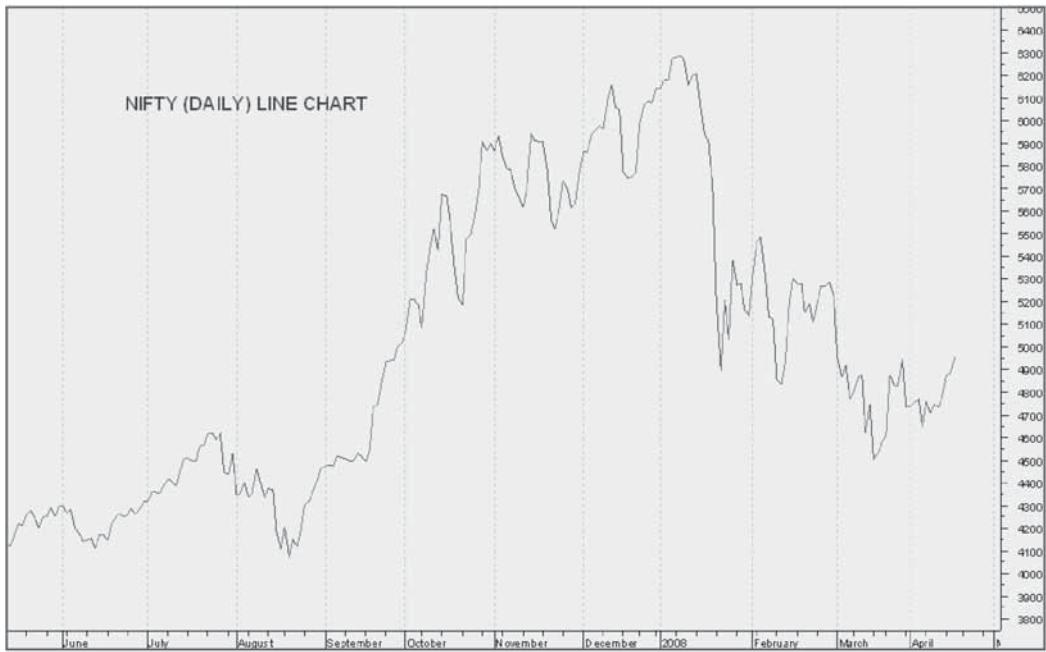
A chart gives us a complete picture of a stock's price history over a period of an hour, day, week, month or many years. It has an x-axis (horizontal) and a y-axis (vertical). Typically, the x-axis represents time; the y-axis represents price. By plotting a stock's price over a period of time, we end up with a pictorial representation of any stock's trading history.

A chart can also depict the history of the volume of trading in a stock. That is, a chart can illustrate the number of shares that change hands over a certain time period.

Types of price charts:

1. Line charts

"Line charts" are formed by connecting the closing prices of a specific stock or market over a given period of time. Line chart is particularly useful for providing a clear visual illustration of the trend of a stock's price or a market's movement. It is an extremely valuable analytical tool which has been used by traders for past many years.

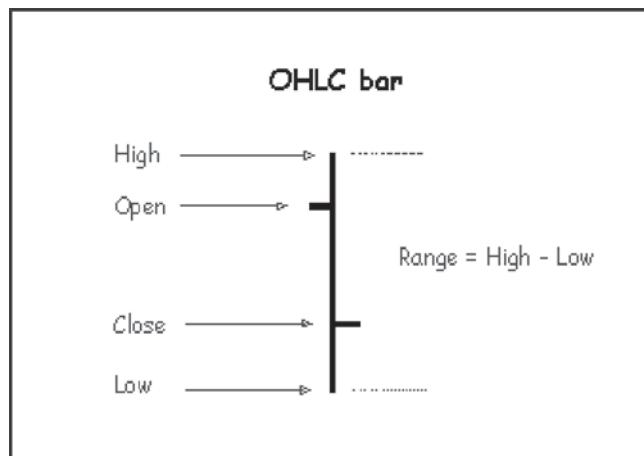


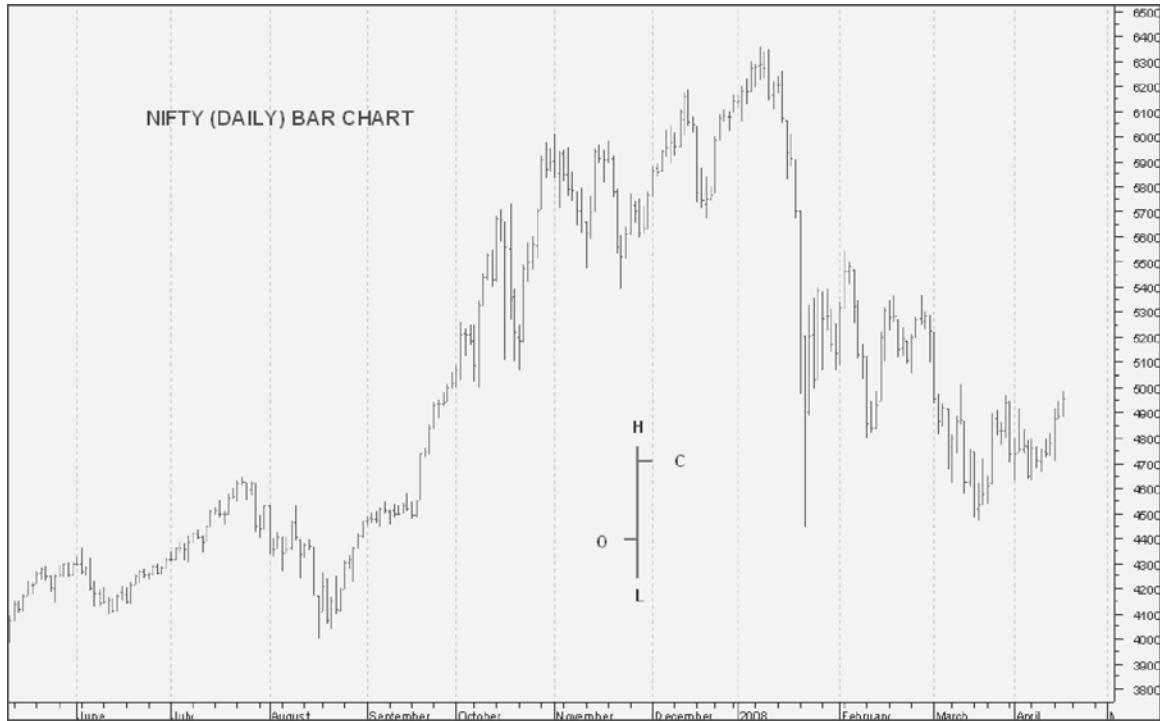
NIFTY (Daily) Line Chart

2. Bar chart

Bar chart is the most popular method traders use to see price action in a stock over a given period of time. Such visual representation of price activity helps in spotting trends and patterns.

Although daily bar charts are best known, bar charts can be created for any time period - weekly and monthly, for example. A bar shows the high price for the period at the top and the lowest price at the bottom of the bar. Small lines on either side of the vertical bar serve to mark the opening and closing prices. The opening price is marked by a small tick to the left of the bar; the closing price is shown by a similar tick to the right of the bar. Many investors work with bar charts created over a matter of minutes during a day's trading.



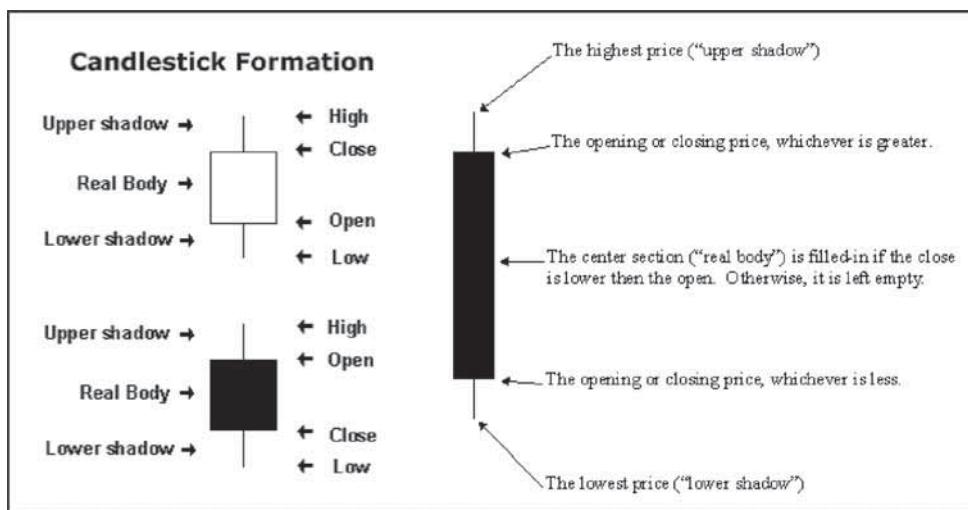


NIFTY (Daily) Bar Chart

3. Candlesticks

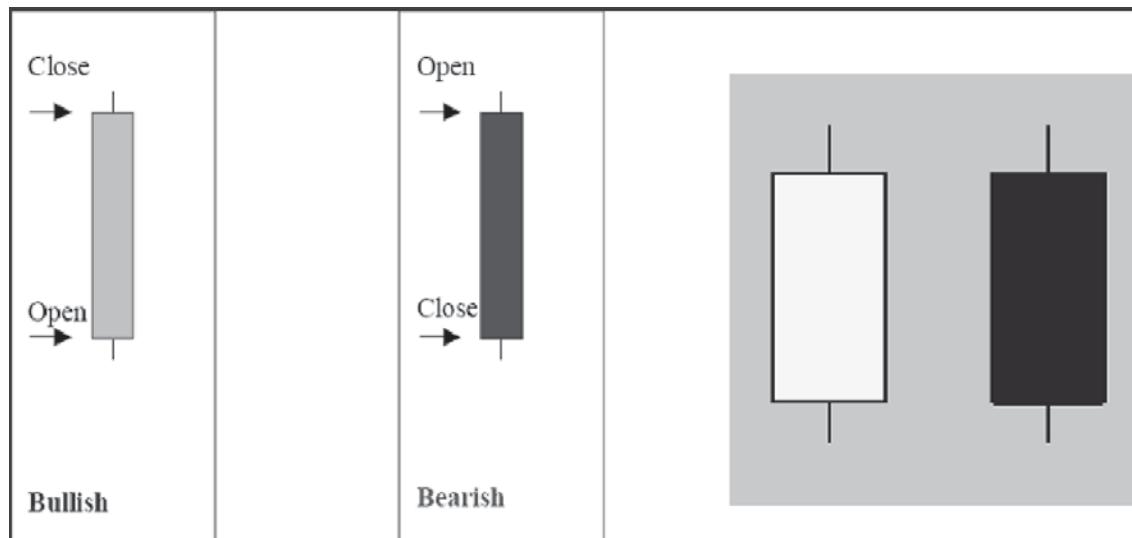
Formation

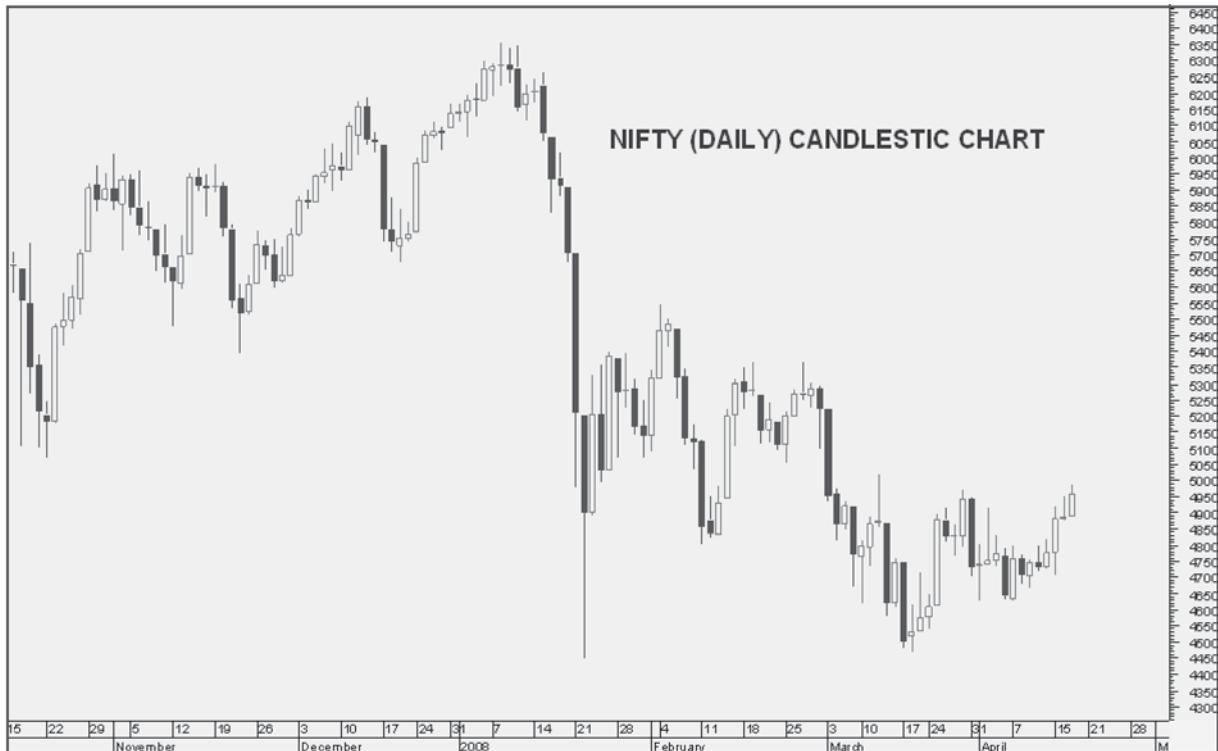
Candlestick charts provide visual insight to current market psychology. A candlestick displays the open, high, low, and closing prices in a format similar to a modern-day bar-chart, but in a manner that extenuates the relationship between the opening and closing prices. Candlesticks don't involve any calculations. Each candlestick represents one period (e.g., day) of data. The figure given below displays the elements of a candle.



A candlestick chart can be created using the data of high, low, open and closing prices for each time period that you want to display. The hollow or filled portion of the candlestick is called "the body" (also referred to as "the real body"). The long thin lines above and below the body represent the high/low range and are called "shadows" (also referred to as "wicks" and "tails"). The high is marked by the top of the upper shadow and the low by the bottom of the lower shadow. **If the stock closes higher than its opening price**, a hollow candlestick is drawn with the bottom of the body representing the opening price and the top of the body representing the closing price. **If the stock closes lower than its opening price**, a filled candlestick is drawn with the top of the body representing the opening price and the bottom of the body representing the closing price.

Each candlestick provides an easy-to-decipher picture of price action. Immediately a trader can see and compare the relationship between the open and close as well as the high and low. The relationship between the open and close is considered vital information and forms the essence of candlesticks. Hollow candlesticks, where the close is greater than the open, indicate buying pressure. Filled candlesticks, where the close is less than the open, indicate selling pressure. Thus, compared to traditional bar charts, many traders consider candlestick charts more visually appealing and easier to interpret.





NIFTY (Daily) Candlestick Chart

Why candlestick charts?

What does candlestick charting offer that typical Western high-low bar charts do not? Instead of vertical line having horizontal ticks to identify open and close, candlesticks represent two dimensional bodies to depict open to close range and shadows to mark day's high and low.

For several years, the Japanese traders have been using candlestick charts to track market activity. Eastern analysts have identified a number of patterns to determine the continuation and reversal of trend.

These patterns are the basis for Japanese candlestick chart analysis. This places candlesticks rightly as a part of technical analysis. Japanese candlesticks offer a quick picture into the psychology of short term trading, studying the effect, not the cause. Applying candlesticks means that for short-term, an investor can make confident decisions about buying, selling, or holding an investment.

2.2 Candlestick analysis

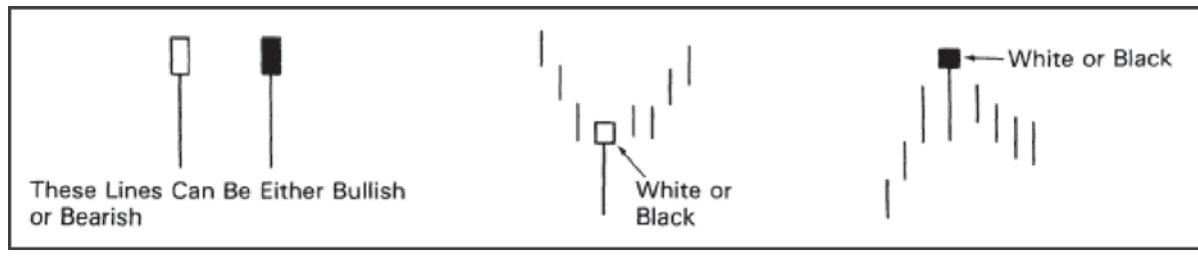
One cannot ignore that investor's psychologically driven forces of fear; greed and hope greatly influence the stock prices. The overall market psychology can be tracked through candlestick analysis. More than just a method of pattern recognition, candlestick analysis shows the interaction between buyers and sellers. A white candlestick indicates opening price of the

session being below the closing price; and a black candlestick shows opening price of the session being above the closing price. The shadow at top and bottom indicates the high and low for the session.

Japanese candlesticks offer a quick picture into the psychology of short term trading, studying the effect, not the cause. Therefore if you combine candlestick analysis with other technical analysis tools, candlestick pattern analysis can be a very useful way to select entry and exit points.

2.2.1 One candle patterns

In the terminology of Japanese candlesticks, one candle patterns are known as "Umbrella lines". There are two types of umbrella lines - the hanging man and the hammer. They have long lower shadows and small real bodies that are at top of the trading range for the session. They are the simplest lines because they do not necessarily have to be spotted in combination with other candles to have some validity.



Hammer and Hanging Man

Hammer

Hanging Man Candlesticks

2.2.1.1 Hammer

Hammer is a one candle pattern that occurs in a downtrend when bulls make a start to step into the rally. It is so named because it hammers out the bottom. The lower shadow of hammer is minimum of twice the length of body. Although, the color of the body is not of much significance but a white candle shows slightly more bullish implications than the black body. A positive day i.e. a white candle is required the next day to confirm this signal.

Criteria

1. The lower shadow should be at least two times the length of the body.
2. There should be no upper shadow or a very small upper shadow.
3. The real body is at the upper end of the trading range. The color of the body is not important although a white body should have slightly more bullish implications.
4. The following day needs to confirm the Hammer signal with a strong bullish day.

Signal enhancements

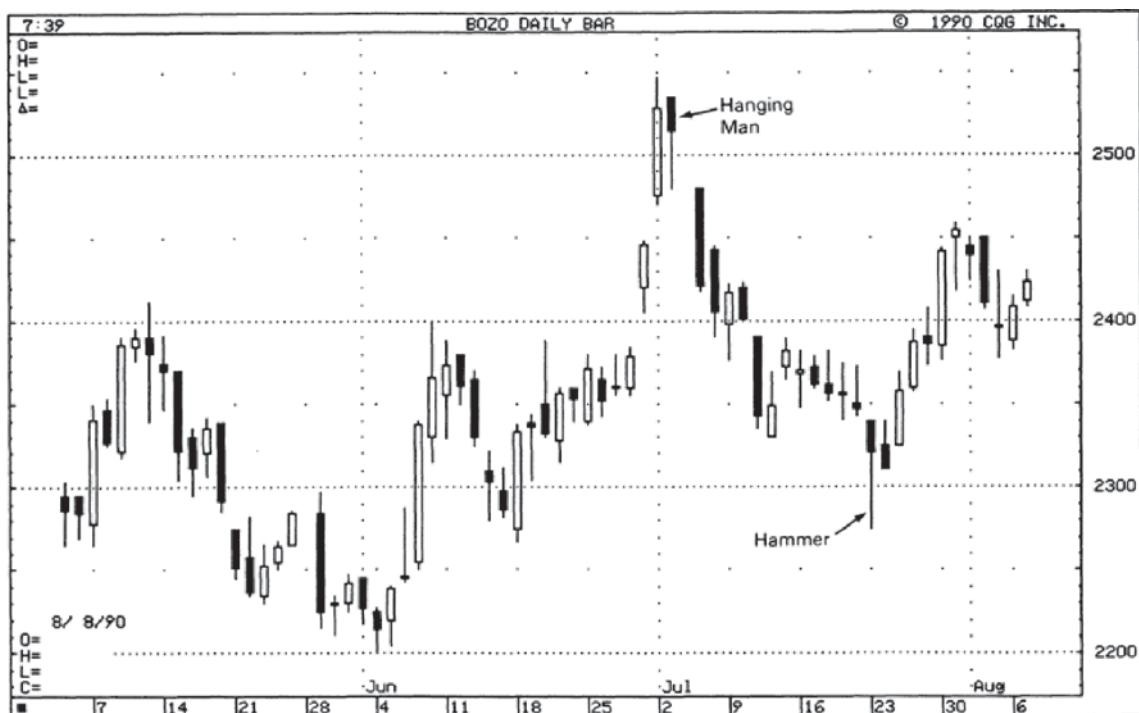
1. The longer the lower shadow, the higher the potential of a reversal occurring.
2. Large volume on the Hammer day increases the chances that a blow off day has occurred.
3. A gap down from the previous day's close sets up for a stronger reversal move provided the day after the Hammer signal opens higher.

Pattern psychology

The market has been in a downtrend, so there is an air of bearishness. The price opens and starts to trade lower. However the sell-off is abated and market returns to high for the day as the bulls have stepped in. They start bringing the price back up towards the top of the trading range. This creates a small body with a large lower shadow. This represents that the bears could not maintain control. The long lower shadow now has the bears questioning whether the decline is still intact. Confirmation would be a higher open with yet a still higher close on the next trading day.

2.2.1.2 Hanging man

The hanging man appears during an uptrend, and its real body can be either black or white. While it signifies a potential top reversal, it requires confirmation during the next trading session. The hanging man usually has little or no upper shadow.



Soybean Oil-December, 1990, Daily (Hanging Man and Hammer)

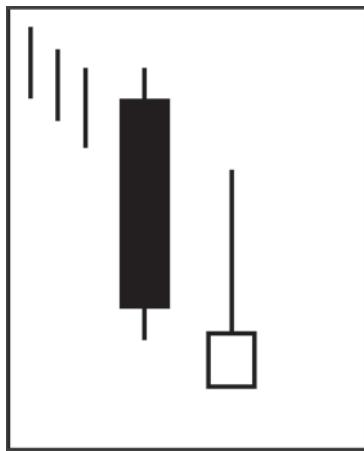


Dow Jones Industrials-1990, Daily (Hanging Man and Hammer)

2.2.1.3 *Shooting star and inverted hammer*

Other candles similar to the hanging man and hammer are the “shooting star,” and the “inverted hammer.” Both have small real bodies and can be either black or white but they both have long *upper* shadows, and have very little or no lower shadows.

Inverted Hammer



Description

Inverted hammer is one candle pattern with a shadow at least two times greater than the body. This pattern is identified by the small body. They are found at the bottom of the decline

which is evidence that bulls are stepping in but still selling is going on. The color of the small body is not important but the white body has more bullish indications than a black body. A positive day is required the following day to confirm this signal.

Signal enhancements

1. The longer the upper shadow, the higher the potential of a reversal occurring.
2. A gap down from the previous day's close sets up for a stronger reversal move.
3. Large volume on the day of the inverted hammer signal increases the chances that a blow off day has occurred
4. The day after the inverted hammer signal opens higher.

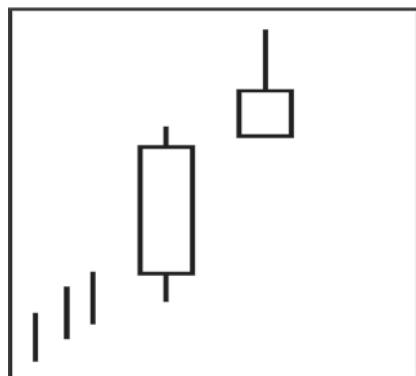
Pattern psychology

After a downtrend has been in effect, the atmosphere is bearish. The price opens and starts to trade higher. The Bulls have stepped in, but they cannot maintain the strength. The existing sellers knock the price back down to the lower end of the trading range. The Bears are still in control. But the next day, the Bulls step in and take the price back up without major resistance from the Bears. If the price maintains strong after the Inverted Hammer day, the signal is confirmed.

Stars

A small real body that gaps away from the large real body preceding it is known as star. It's still a star as long as the small real body does not overlap the preceding real body. The color of the star is not important. Stars can occur at tops or bottoms.

Shooting star



Description

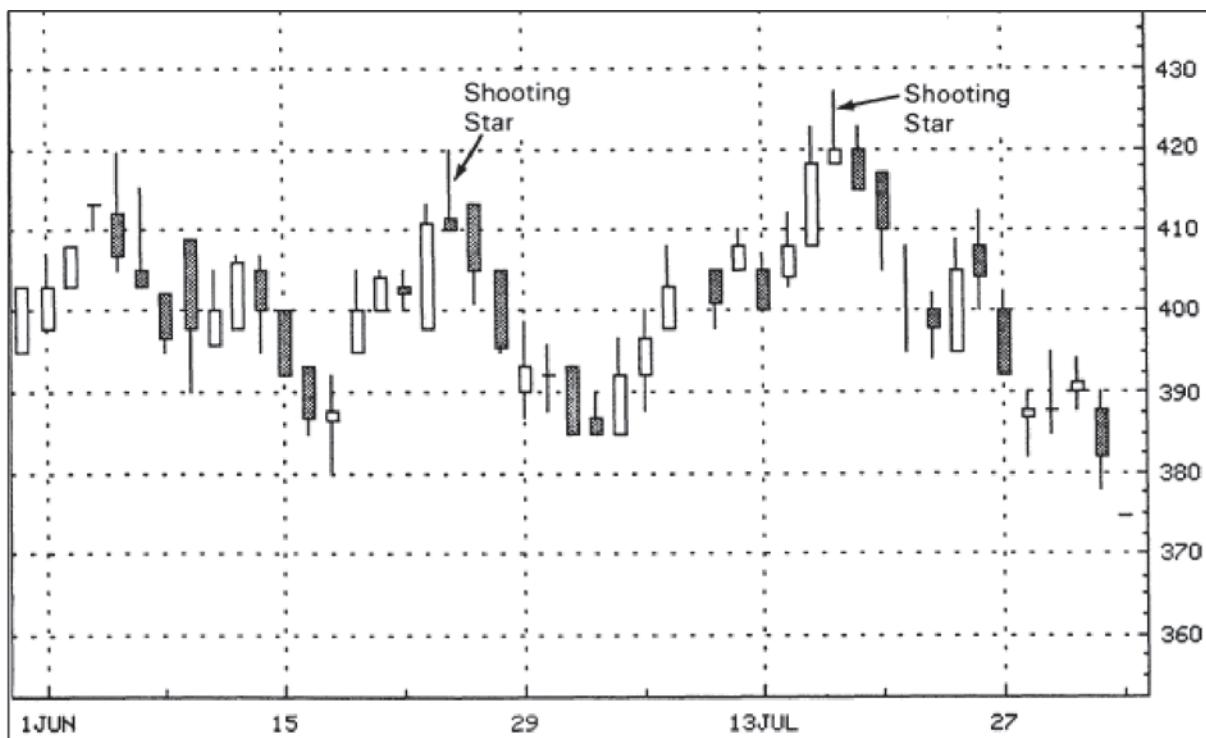
The Shooting Star is a single line pattern that indicates an end to the uptrend. It is easily identified by the presence of a small body with a shadow at least two times greater than the body. It is found at the top of an uptrend. The Japanese named this pattern because it looks like a shooting star falling from the sky with the tail trailing it.

Criteria

1. The upper shadow should be at least two times the length of the body.
2. Prices gap open after an uptrend.
3. A small real body is formed near the lower part of the price range. The color of the body is not important although a black body should have slightly more bearish implications.
4. The lower shadow is virtually non-existent.
5. The following day needs to confirm the Shooting Star signal with a black candle or better yet, a gap down with a lower close.

Signal enhancements

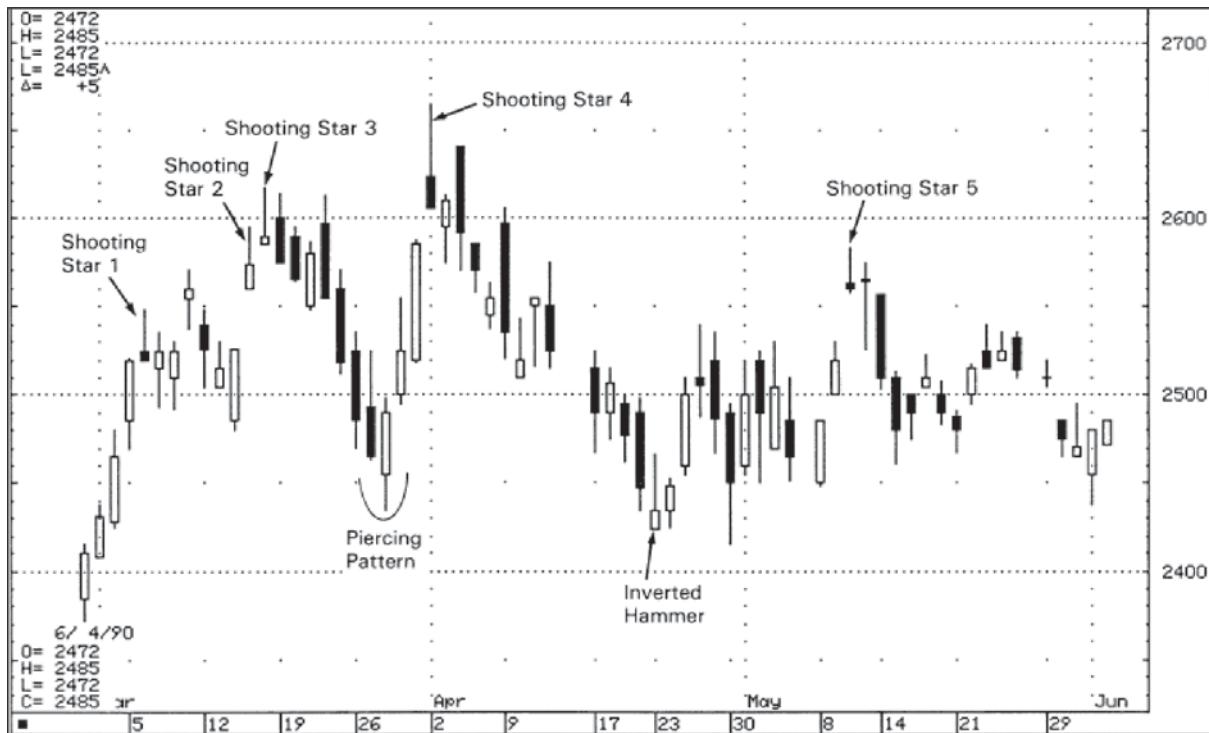
1. The longer the upper shadow, the higher the potential of a reversal occurring.
2. A gap up from the previous day's close sets up for a stronger reversal move provided.
3. The day after the Shooting Star signal opens lower.
4. Large volume on the Shooting Star day increases the chances that a blow-off day has occurred although it is not a necessity.



Pattern psychology

During an uptrend, the market gaps open and rallies to a new high. The price opens and trades higher. The bulls are in control. But before the close of the day, the bears step in and take the price back down to the lower end of the trading range, creating a small body for the day.

This could indicate that the bulls still have control if analyzing a Western bar chart. However, the long upper shadow represents that sellers had started stepping in at these levels. Even though the bulls may have been able to keep the price positive by the end of the day, the evidence of the selling was apparent. A lower open or a black candle the next day reinforces the fact that selling is going on.

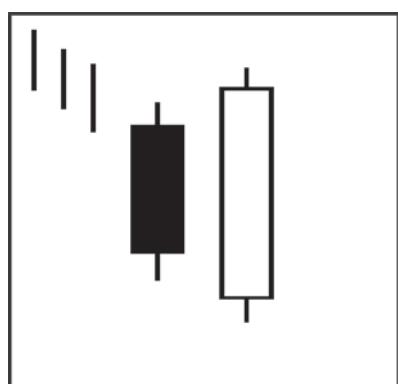


2.2.2 Two candles pattern

2.2.2.1 Bullish engulfing

A “**bullish engulfing pattern**” consists of a large white real body that engulfs a small black real body during a downtrend. It signifies that the buyers are overwhelming the sellers

Engulfing



Bullish engulfing

Description

The Engulfing pattern is a major reversal pattern comprised of two opposite colored bodies. This Bullish Pattern is formed after a downtrend. It is formed when a small black candlestick is followed by a large white candlestick that completely eclipses the previous day candlestick. It opens lower than the previous day's close and closes higher than the previous day's open.

Criteria

- 1.** The candlestick body of the previous day is completely overshadowed by the next day's candlestick.
- 2.** Prices have been declining definitely, even if it has been in short term.
- 3.** The color of the first candle is similar to that of the previous one and the body of the second candle is opposite in color to that first candle. The only exception being an engulfed body which is a doji.

Signal enhancements

- 1.** A small body being covered by the larger one. The previous day shows the trend was running out of steam. The large body shows that the new direction has started with good force.
- 2.** Large volume on the engulfing day increases the chances that a blow off day has occurred.
- 3.** The engulfing body engulfs absorbs the body and the shadows of the previous day; the reversal has a greater probability of working.
- 4.** The probability of a strong reversal increases as the open gaps between the previous and the current day increases.

Pattern psychology

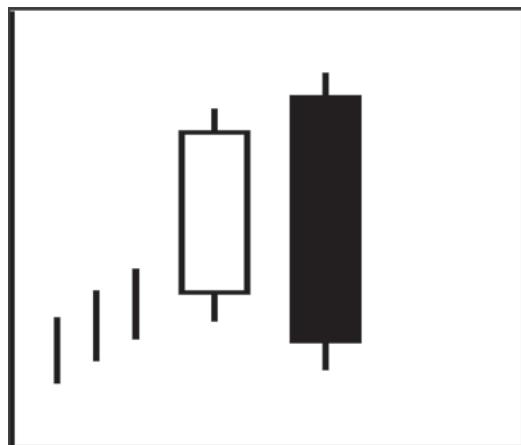
After a decline has taken place, the price opens at a lower level than its previous day closing price. Before the close of the day, the buyers have taken over and have led to an increase in the price above the opening price of the previous day. The emotional psychology of the trend has now been altered.

When investors are learning the stock market they should utilize information that has worked with high probability in the past.

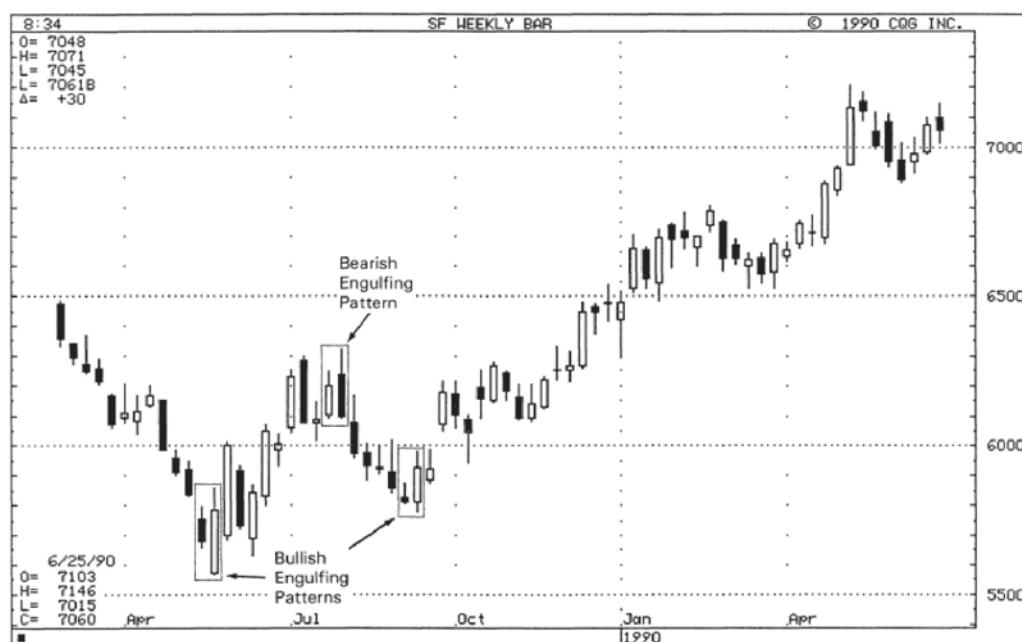
Bullish Engulfing signal if used after proper training and at proper locations, can lead to highly profitable trades and consistent results. This pattern allows an investor to improve their probabilities of being in a correct trade. The common sense elements conveyed in candlestick signals makes for a clear and concise trading technique for beginning investors as well as experienced traders.

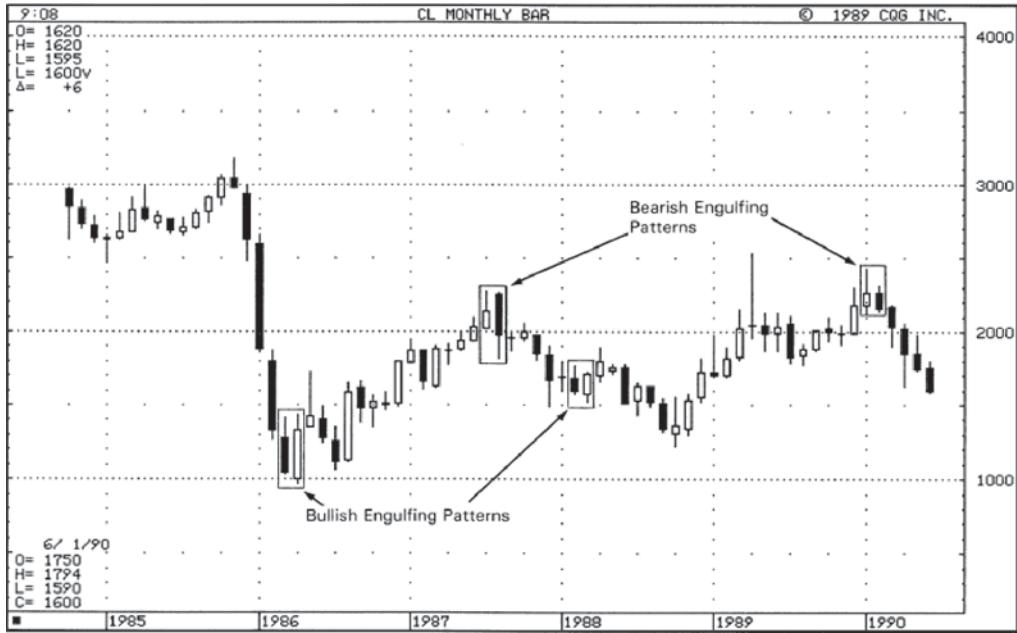
2.2.2.2 Bearish engulfing

A “**bearish engulfing pattern**,” on the other hand, occurs when the sellers are overwhelming the buyers. This pattern consists of a small white candlestick with short shadows or tails followed by a large black candlestick that eclipses or “engulfs” the small white one.



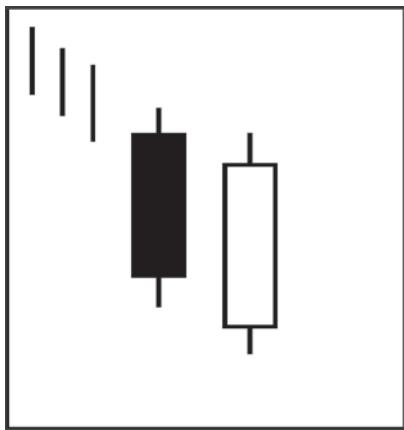
Bearish Engulfing





2.2.2.3 Piercing

The bullish counterpart to the dark cloud cover is the “**piercing pattern**.” The first thing to look for is to spot the piercing pattern in an existing downtrend, which consists of a long black candlestick followed by a gap lower open during the next session, but which closes at least halfway into the prior black candlestick’s real body.



Description

The Piercing Pattern is composed of a two-candle formation in a down trending market. With daily candles, the piercing pattern will often end a **minor** downtrend (a downtrend that lasts between **six and fifteen trading days**). The day before the piercing candle appears, the daily candle should have a fairly large dark real body, signifying a strong down day.

Criteria

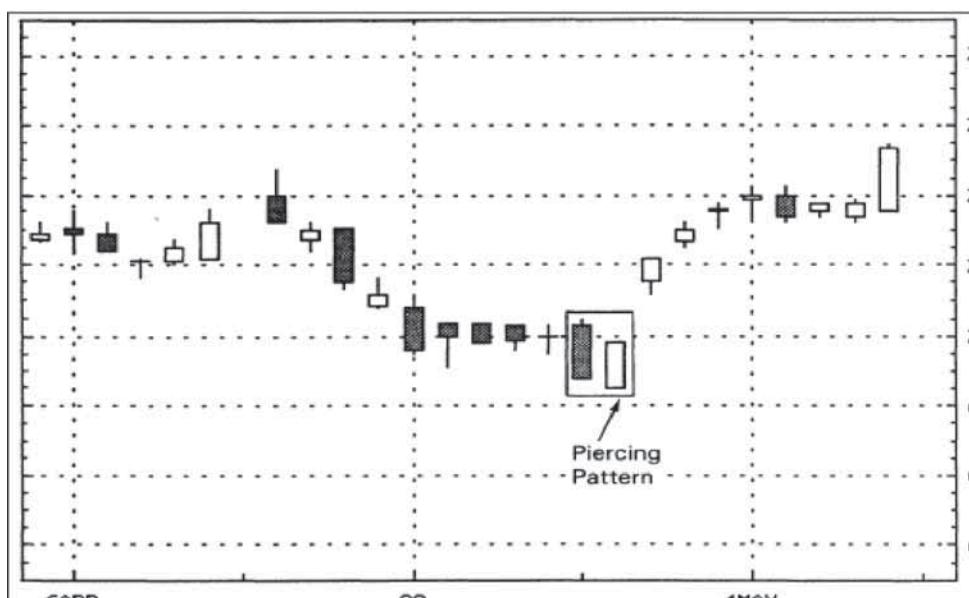
1. The downtrend has been evident for a good period.
2. The body of the first candle is black; the body of the second candle is white.
3. A long black candle occurs at the end of the trend.
4. The white candle closes more than halfway up the black candle.
5. The second day opens lower than the trading of the prior day.

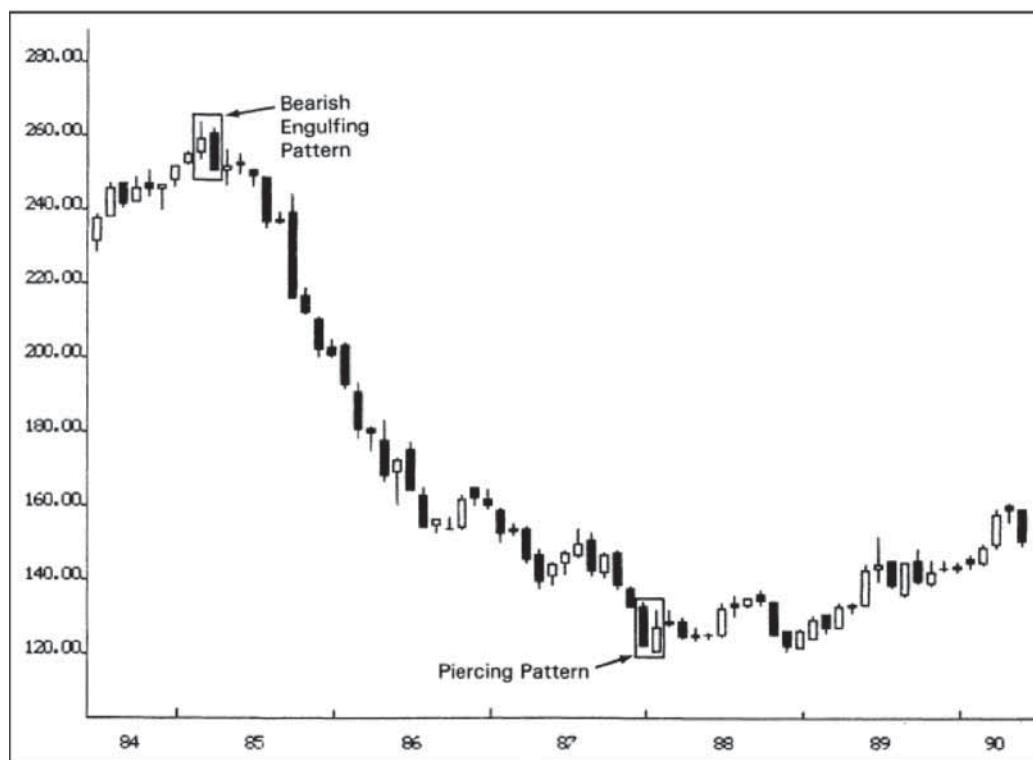
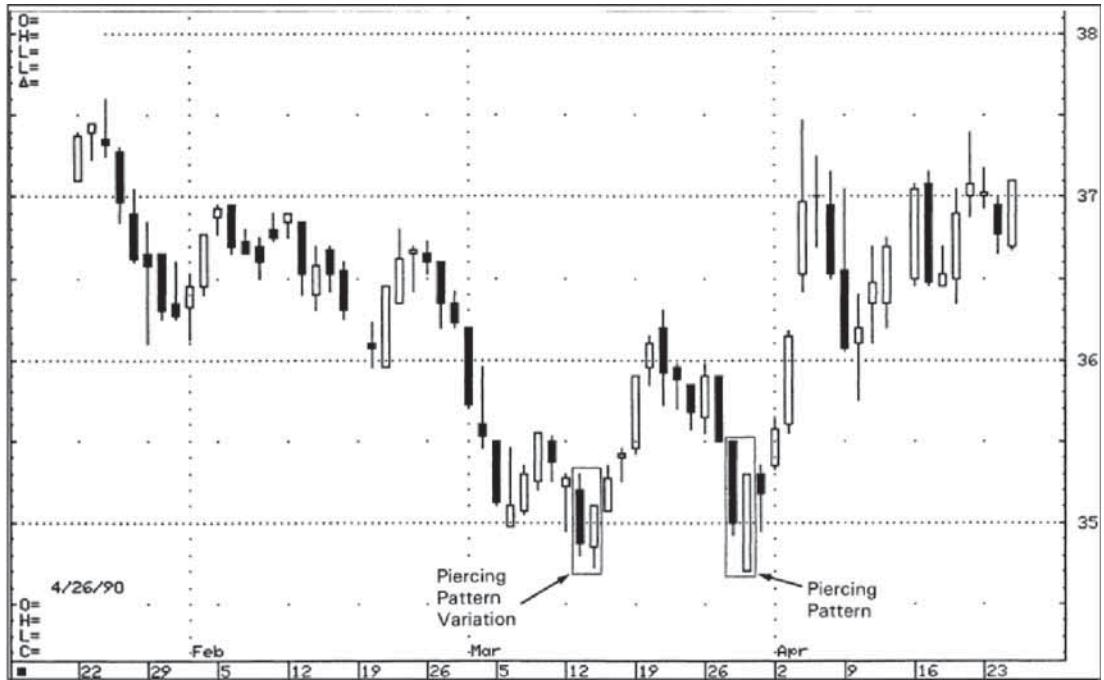
Signal enhancements

1. The reversal will be more pronounced, if the gap down the previous day close is more.
2. The longer the black candle and the white candle, the more forceful the reversal.
3. The higher the white candle closes into the black candle, the stronger the reversal.
4. Large volume during these two trading days is a significant confirmation.

Pattern psychology

The atmosphere becomes bearish once a strong downtrend has been in effect. The price goes down. Bears may move the price even further but before the day ends the bulls enters and bring a dramatic change in price in the opposite direction. They finish near the high of the day. The move has almost negated the price decline of the previous day. This now has the bears concerned. More buying the next day will confirm the move. Being able to utilize information that has been used successfully in the past is a much more viable investment strategy than taking shots in the dark. Keep in mind, when you are given privileged information about stock market tips, where you are in the food chain. Are you one of those privileged few that get top-notch pertinent information on a timely manner, or are you one of the masses that feed into a frenzy and allow the smart money to make the profits?

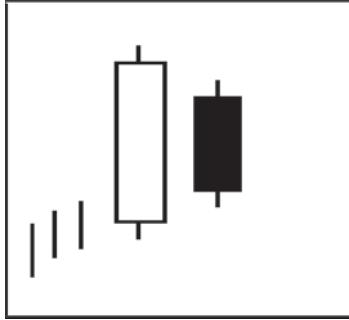




Harami

2.2.2.4 Bearish Harami

In up trends, the harami consists of a large white candle followed by a small white or black candle (usually black) that is within the previous session's large real body.



Bearish Harami

Description

Bearish Harami is a two candlestick pattern composed of small black real body contained within a prior relatively long white real body. The body of the first candle is the same color as that of the current trend. The open and the close occur inside the open and the close of the previous day. Its presence indicates that the trend is over.

Criteria

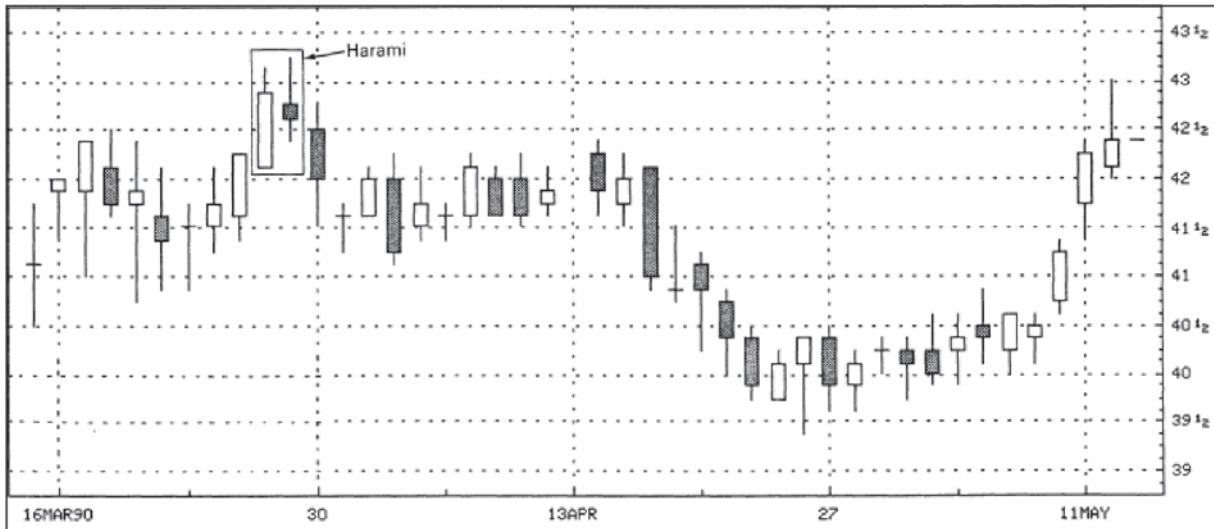
1. The first candle is white in color; the body of the second candle is black.
2. The second day opens lower than the close of the previous day and closes higher than the open of the prior day.
3. For a reversal signal, confirmation is needed. The next day should show weakness.
4. The uptrend has been apparent. A long white candle occurs at the end of the trend.

Signal enhancements

1. The reversal will be more forceful, if the white and the black candle are longer.
2. The lower the black candle closes down on the white candle, the more convincing that a reversal has occurred, despite the size of the black candle.

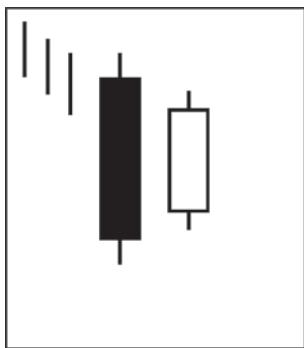
Pattern psychology

The bears open the price lower than the previous close, after a strong uptrend has been in effect and after a long white candle day. The longs get concerned and start profit taking. The price for the day ends at a lower level. The bulls are now concerned as the price closes lower. It is becoming evident that the trend has been violated. A weak day after that would convince everybody that the trend was reversing. Volume increases due to the profit taking and the addition of short sales.



2.2.2.5 Bullish Harami

A candlestick chart pattern in which a large candlestick is followed by a smaller candlestick whose body is located within the vertical range of the larger body. In downtrends, the harami consists of a large black candle followed by a small white or black candle (usually white) that is within the previous session's large real body. This pattern signifies that the immediately preceding trend may be concluding, and that the bulls and bears have called a truce.



Bullish Harami

Description

The Harami is a commonly observed phenomenon. The pattern is composed of a two candle formation in a down-trending market. The color first candle is the same as that of current trend. The first body in the pattern is longer than the second one. The open and the close occur inside the open and the close of the previous day. Its presence indicates that the trend is over.

The Harami (meaning “pregnant” in Japanese) Candlestick Pattern is a reversal pattern. The pattern consists of two Candlesticks. The first candle is black in color and a continuation of

the existing trend. The second candle, the little belly sticking out, is usually white in color but that is not always the case. Magnitude of the reversal is affected by the location and size of the candles.

Criteria

- 1.** The first candle is black in body; the body of the second candle is white.
- 2.** The downtrend has been evident for a good period. A long black candle occurs at the end of the trend.
- 3.** The second day opens higher than the close of the previous day and closes lower than the open of the prior day.
- 4.** Unlike the Western "Inside Day", just the body needs to remain in the previous day's body, whereas the "Inside Day" requires both the body and the shadows to remain inside the previous day's body.
- 5.** For a reversal signal, further confirmation is required to indicate that the trend is now moving up.

Signal enhancements

- 1.** The reversal will be more forceful if the black candle and the white candle are longer.
- 2.** If the white candle closes up on the black candle then the reversal has occurred in a convincing manner despite the size of the white candle.

Pattern psychology

After a strong down-trend has been in effect and after a selling day, the bulls open at a price higher than the previous close. The shorts get concerned and start covering. The price for the day finishes at a higher level. This gives enough notice to the short sellers that trend has been violated. A strong day i.e. the next day would convince everybody that the trend was reversing. Usually the volume is above the recent norm due to the unwinding of short positions.

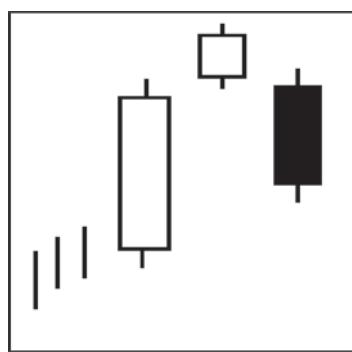
When the second candle is a doji, which is a candle with an almost non-existent real body, these patterns are called "harami crosses." They are however less reliable as reversal patterns as more indecision is indicated.



2.2.3 Three candle pattern

2.2.3.1 Evening star

The Evening Star is a top reversal pattern that occurs at the top of an uptrend. It is formed by a tall white body candle, a second candle with a small real body that gaps above the first real body to form a "star" and a third black candle that closes well into the first session's white real body.



Description

The Evening Star pattern is a bearish reversal signal. Like the planet Venus, the evening star represents that darkness is about to set or prices are going to decline. An uptrend has been in place which is assisted by a long white candlestick. The following day gaps up, yet the trading

range remain small for the day. Again, this is the star of the formation. The third day is a black candle day and represents the fact that the bears have now seized control. That candle should consist of a closing that is at least halfway down the white candle of two days prior. The optimal Evening Star signal would have a gap before and after the star day.

Criteria

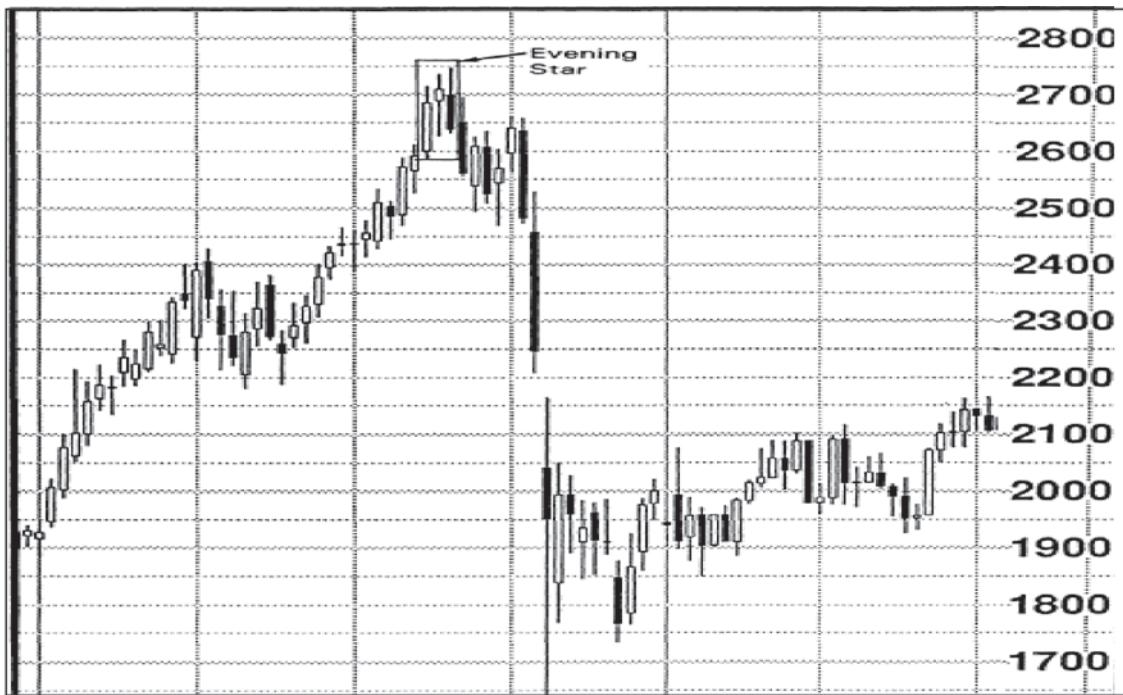
- 1.** The uptrend should be apparent.
- 2.** The body of the first candle is white, continuing the current trend. The second candle has small trading range showing indecision formation.
- 3.** The third day shows evidence that the bears have stepped in. That candle should close at least halfway down the white candle.

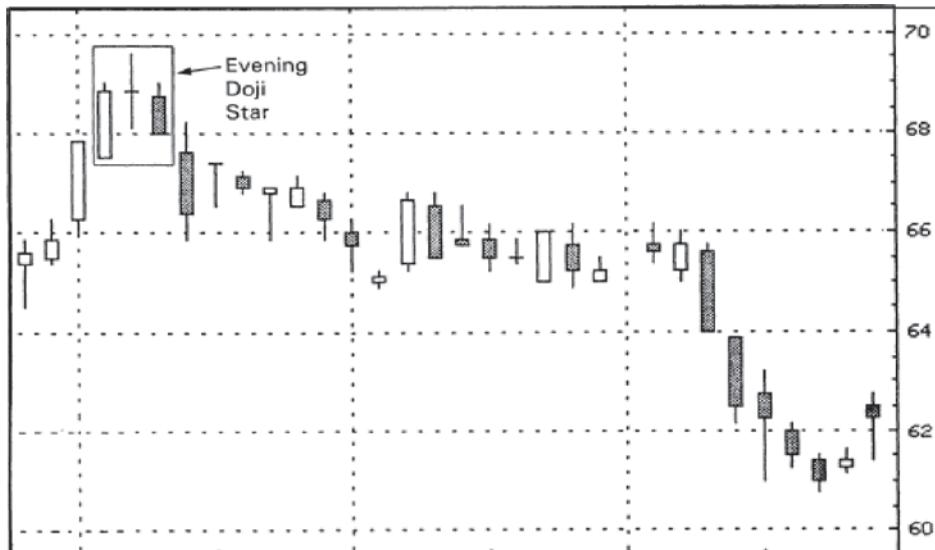
Signal enhancements

- 1.** Long length of the white candle and the black candle indicates more forceful reversal.
- 2.** The more indecision the middle day portrays, the better probabilities that a reversal will occur.
- 3.** A gap between the first day and the second day adds to the probability of occurrence of reversal.
- 4.** A gap before and after the star day is even more desirable. The magnitude, that the third day comes down into the white candle of the first day, indicates the strength of the reversal.

Pattern psychology

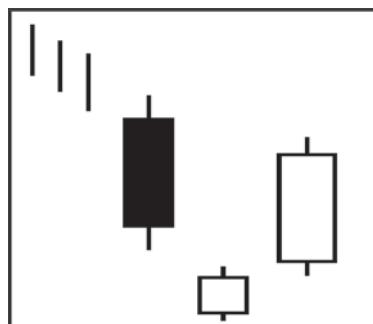
The psychology behind this pattern is that a strong uptrend has been in effect. Buyers have been piling up the stock. However, it is the level where sellers start taking profits or think the price is fairly valued. The next day all the buying is being met with the selling, causing for a small trading range. The bulls get concerned and the bears start taking over. The third day is a large sell off day. If there is big volume during these days, it shows that the ownership has dramatically changed hands. The change of direction is immediately seen in the color of the bodies.





2.2.3.2 Morning star

Morning star is the reverse of evening star. It is a bullish reversal pattern formed by a tall black body candle, a second candle with a small real body that gaps below the first real body to form a star, and a third white candle that closes well into the first session's black real body. Its name indicates that it foresees higher prices.



Description

The Morning Star is a bottom reversal signal. Like the planet Mercury, the morning star, signifies brighter things – that is sunrise is about to occur, or the prices are going to go higher. A downtrend has been in place which is assisted by a long black candlestick. There is little about the downtrend continuing with this type of action. The next day prices gap lower on the open, trade within a small range and close near their open. This small body shows the beginning of indecision. The next day prices gap higher on the open and then close much higher. A significant reversal of trend has occurred.

The make up of the star, an indecision formation, can consist of a number of candle formations. The important factor is to witness the confirmation of the bulls taking over the next day. That

candle should consist of a closing that is at least halfway up the black candle of two days prior.

Criteria

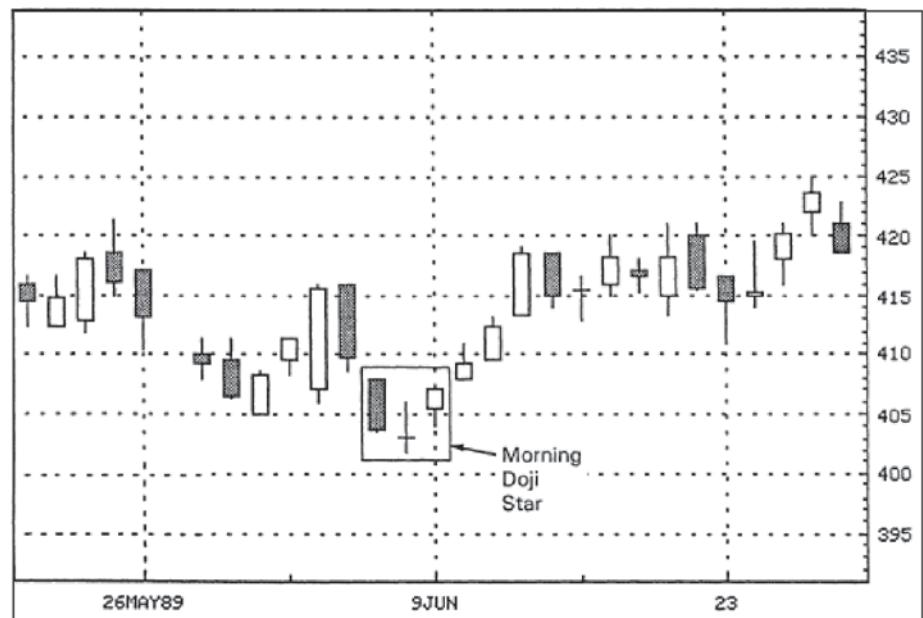
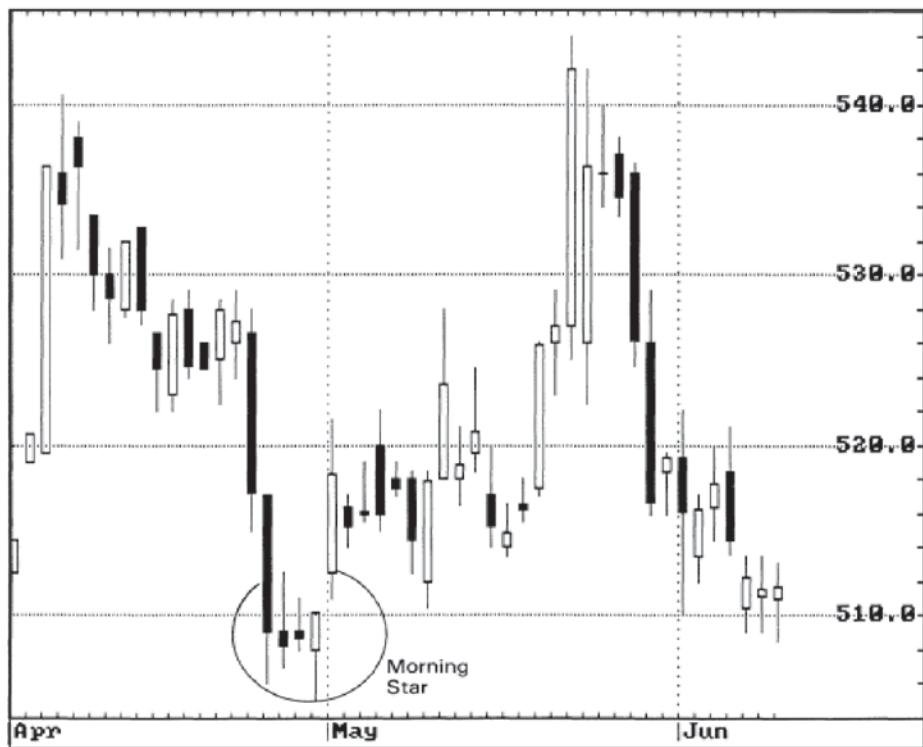
- 1.** Downtrend should be there.
- 2.** The body of the first candle is black, continuing the current trend. The second candle is an indecision formation.
- 3.** The third day is the opposite color of the first day. It shows evidence that the bulls have stepped in. That candle should close at least halfway up the black candle.

Signal enhancements

- 1.** Long length of the black candle and the white candle indicates more forceful reversal.
- 2.** The more indecision that the star day illustrates, the better probabilities that a reversal will occur.
- 3.** A Gap between the first day and the second day adds to the probability of occurrence of reversal.
- 4.** A gap before and after the star day is even more desirable.
- 5.** The magnitude, that the third day comes up into the black candle of the first day, indicates the strength of the reversal.

Pattern psychology

While a strong downtrend has been in effect, there is a large sell-off day. The selling continues and bulls continue to step in at low prices. Big volume on this day shows that the ownership has dramatically changed. The second day does not have a large trading range. The third day, the bears start to lose conviction as the bull increase their buying. When the price starts moving back into the trading range of the first day, the sellers diminish and the buyers seize control.



2.2.3.3 Doji

Doji lines are patterns with the same open and close price. It's a significant reversal indicator.



The Importance of the Doji

The perfect doji session has the same opening and closing price, yet there is some flexibility to this rule. If the opening and closing price are within a few ticks of each other, the line could still be viewed as a doji.

How do you decide whether a near-doji day (that is, where the open and close are very close, but not exact) should be considered a doji? This is subjective and there are no rigid rules but one way is to look at a near-doji day in relation to recent action. If there are a series of very small real bodies, the near-doji day would not be viewed as significant since so many other recent periods had small real bodies. One technique is based on recent market activity. If the market is at an important market junction, or is at the mature part of a bull or bear move, or there are other technical signals sending out an alert, the appearance of a near-doji is treated as a doji. The philosophy is that a doji can be a significant warning and that it is better to attend to a false warning than to ignore a real one. To ignore a doji, with all its inherent implications, could be dangerous.

The doji is a distinct trend change signal. However, the likelihood of a reversal increases if subsequent candlesticks confirm the doji's reversal potential. Doji sessions are important only in markets where there are not many doji. If there are many doji on a particular chart, one should not view the emergence of a new doji in that particular market as a meaningful development. That is why candlestick analysis usually should not use intra-day charts of less than 30 minutes. Less than 30 minutes and many of the candlestick lines become doji or near doji

Doji at tops

A Doji star at the top is a warning that the uptrend is about to change. This is especially true after a long white candlestick in an uptrend. The reason for the doji's negative implications in uptrend is because a doji represents indecision. Indecision among bulls will not maintain the uptrend. It takes the conviction of buyers to sustain a rally. If the market has had an extended rally, or is overbought, then formation of a doji could mean the scaffolding of buyers' support will give way.

Doji are also valued for their ability to show reversal potential in downtrends. The reason may be that a doji reflects a balance between buying and selling forces. With ambivalent market

participants, the market could fall due to its own weight. Thus, an uptrend should reverse but a falling market may continue its descent. Because of this, doji need more confirmation to signal a bottom than they do a top.

New Terms

Bull: An investor who thinks the market, a specific security or an industry will rise.

Bear: An investor who believes that a particular security or market is headed downward is indicative of a bearish trend. Bears attempt to profit from a decline in prices. Bears are generally pessimistic about the state of a given market.

Bull market: A financial market of a group of securities in which prices are rising or are expected to rise. The term "bull market" is most often used to refer to the stock market, but can be applied to anything that is traded, such as bonds, currencies and commodities.

Bull markets are characterized by optimism, investor confidence and expectations that strong results will continue. It's difficult to predict consistently when the trends in the market will change. Part of the difficulty is that psychological effects and speculation may sometimes play a large role in the markets

The use of "bull" and "bear" to describe markets comes from the way the animals attack their opponents. A bull thrusts its horns up into the air while a bear swipes its paws down. These actions are metaphors for the movement of a market. If the trend is up, it's a bull market. If the trend is down, it's a bear market.

Bear Market

A market condition in which the prices of securities are falling, and widespread pessimism causes the negative sentiment to be self-sustaining. As investors anticipate losses in a bear market, selling continues, which then creates further pessimism.

This is not to be confused with a correction which is a short-term trend that has duration shorter than two months. While corrections are often a great place for a value investor to find an entry point, bear markets rarely provide great entry points as timing the bottom is very difficult to do. Fighting back can be extremely dangerous because it is quite difficult for an investor to make stellar gains during a bear market unless he or she is a short seller.

Fundamental Analysis: A method of evaluating securities by analyzing statistics generated by market activity such as past prices and volume is defined as 'Fundamental Analysis'. Technical analysts do not attempt to measure a security's intrinsic value, but instead use charts and other tools to identify patterns that can suggest future activity.

Morning star: A bullish candlestick pattern that consists of three candles that have demonstrated the following characteristics:

- The first bar is a large black candlestick located within a defined downtrend.
- The second bar is a small-bodied candle (either black or white) that closes below the first black bar.
- The last bar is a large white candle that opens above the middle candle and closes near the center of the first bar's body.

This pattern is used by traders as an early indication that the downtrend is about to reverse.

Technical Analysis: This is a method of evaluating securities by analyzing statistics generated by market activity, such as past prices and volume. Technical analysts do not attempt to measure a security's intrinsic value, but instead use charts and other tools to identify patterns that can suggest future activity

Model Questions

- Q1 Technical analysis can help investors anticipate what is "likely" to happen to _____ over time.
- a) prices
 - b) volumes
 - c) economy
 - d) fair value of stock
- Q2 The study of technical analysis is based on which of the following elements:
- a) price
 - b) volume
 - c) open interest (in case of derivatives)
 - d) all of the above
- Q3 A technician will refer to periods of accumulation as evidence of an upcoming
- a) rise in prices
 - b) fall in prices
 - c) range-bound prices
 - d) none of the above
- Q4 Which of the following statements is true about price?
- a) Price movements succeed fundamental developments
 - b) Price movements are totally random
 - c) Price discounts everything
 - d) Price never move in trend
- Q5 _____ movements are typically referred to as bull and bear markets.
- a) Secondary
 - b) Daily
 - c) Major
 - d) Primary
- Q6 Which of the following is not true about chart?
- a) it plots the price movements of a stock over specific time frames
 - b) x-axis represents price and y-axis represents time
 - c) it gives pictorial representation of any stock's trading history
 - d) it can give a complete picture of a stock's price history over a period of an hour, day, week, month or many years.

- Q7 Which of the following best reveal psychology of the market at a certain point in time?
- a) Line Chart
 - b) Candlestick chart
 - c) Bar Chart
 - d) None of the above
- Q8 A higher open on next trading day of hammer indicates that:
- a) bears are intact
 - b) bulls have taken control
 - c) there is no possibility of trend reversal
 - d) none of the above
- Q9 Which of the following candlestick pattern look like star falling from sky with a tail trailing it?
- a) morning star
 - b) shooting star
 - c) dark cloud cover
 - d) none of the above
- Q10 Which of the following is not a feature of bearish kicking pattern?
- a) it is a three candle pattern
 - b) it is a top reversal signal
 - c) the body of first candle is black and second candle is white in colour
 - d) there is a gap between the first day and the second day candle

CHAPTER 3 PATTERN STUDY

Learning Objectives

After studying this chapter the student should be able to understand:

- Formation of support and resistance lines
- Change of support to resistance and vice versa
- How to trade head and shoulders pattern
- Volume study in head and shoulders pattern
- Double top and double bottom
- The gap analysis

3.1 What are support and resistance lines?

Support and resistance represent key junctures where the forces of supply and demand meet. These lines appear as thresholds to price patterns. They are the respective lines which stops the prices from decreasing or increasing.

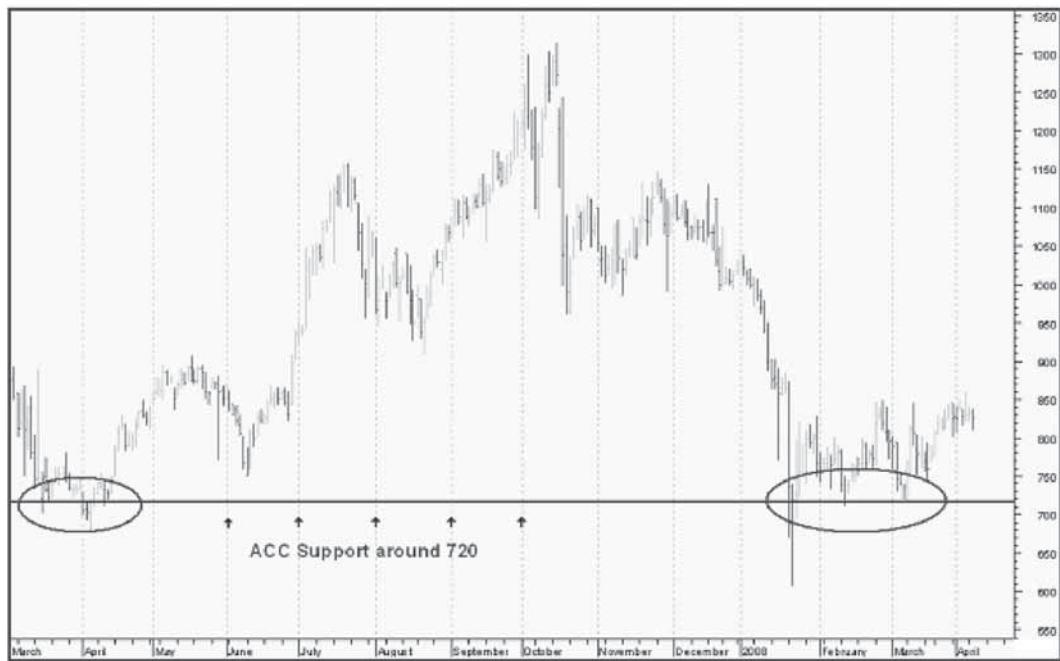
A support line refers to that level beyond which a stock's price will not fall. It denotes that price level at which there is a sufficient amount of demand to stop and possibly, for a time, turn a downtrend higher. Similarly a resistance line refers to that line beyond which a stock's price will not increase. It indicates that price level at which a sufficient supply of stock is available to stop and possibly, for a time, head off an uptrend in prices. Trend lines are often referred to as support and resistance lines on an angle.

3.1.1 Support

A support is a horizontal floor where interest in buying a commodity is strong enough to overcome the pressure to sell. Support level is the price level at which sufficient demand exists to, at least temporarily, halt a downward movement in prices. Logically as the price declines towards support and gets cheaper, buyers become more inclined to buy and sellers become less inclined to sell. By the time the price reaches the support level, it is believed that demand will overcome supply and prevent the price from falling below support.



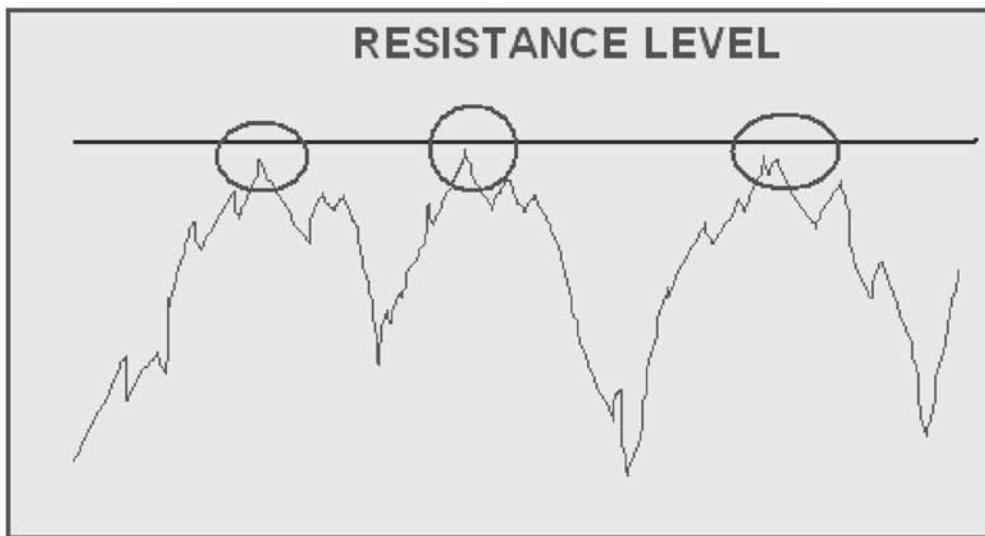
Support does not always hold true and a break below support signals that the bulls have lost over the bears. A fall below support level indicates more willingness to sell and a lack of willingness to buy. A break in the levels of support indicates that the expectations of sellers are reducing and they are ready to sell at even lower prices. In addition, buyers could not be coerced into buying until prices declined below support or below the previous low. Once support is broken, another support level will have to be established at a lower level



ACC chart showing the support level at 720

3.1.2 Resistance

A resistance is a horizontal ceiling where the pressure to sell is greater than the pressure to buy. Thus a Resistance level is a price at which sufficient supply exists to; at least temporarily, halt an upward movement. Logically as the price advances towards resistance, sellers become more inclined to sell and buyers become less inclined to buy. By the time the price reaches the resistance level, it is believed that supply will overcome demand and prevent the price from rising above resistance.



Resistance does not always hold true and a break above resistance signals that the bears have lost over the bulls. A break in the resistance level shows more willingness to buy or lack of incentive to sell. Resistance breaks and new highs indicate that buyer's expectations have increased and are ready to buy at even higher prices. In addition, sellers could not be coerced into selling until prices rose above resistance or above the previous high. Once resistance is broken, another resistance level will have to be established at a higher level.



Euro showing resistance around 1.4930 and then 1.5896

3.1.3 Why do support and resistance lines occur?

A stock's price is determined by supply and demand. Bulls buy when the stock's prices are too low and bears sell when the price reaches its maximum. Bulls increase the prices by increasing the demand and bears decrease it by increasing the supply. The market reaches a balance when bulls and bears agree on a price.

When prices are increasing upward, there exists a point at which the bears become more aggressive the bulls begin to pull back - the market balances along the resistance line.

When prices are going downwards, the market balances along the support line. As prices starts to decline toward the support line, buyers become more inclined to buy and sellers start holding on to their stocks. The support line marks the point where demand takes precedence over supply and prices will not decrease below that support line. The reverse holds true for a resistance line.

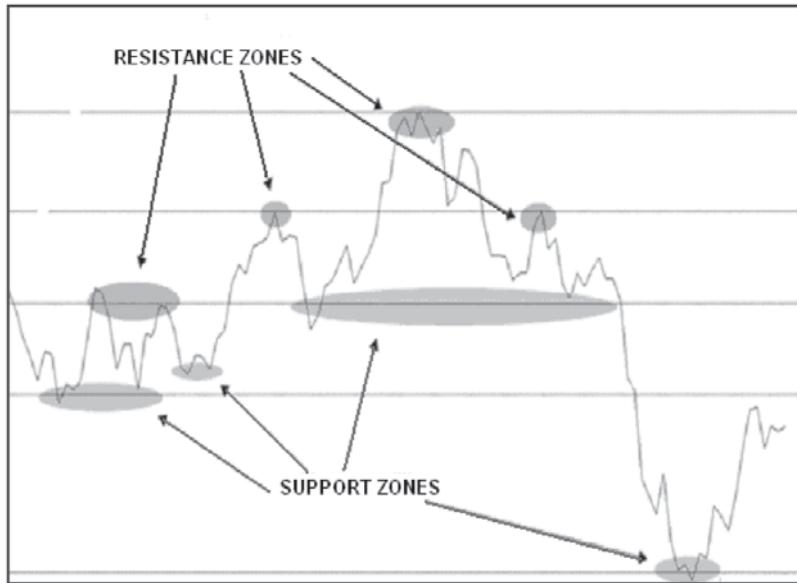
Prices often break through support and resistance lines. A break through a resistance line shows that the buyers have won out over the sellers. The price of the stock is bid higher than the previous levels by the Bulls. Once the resistance line is broken, another will be created at a higher level. The reverse holds true for a support line.

3.1.4 Support and resistance zones

Support and resistance is often thought of as a price level. For example, analysts and traders might discuss support for Nifty futures contract is at 4850. As a trader, if you are looking for

a place to go long would you wait for the market to actually trade at 4850 before taking a position? Should you buy one, two or maybe five ticks above the low and stop yourself out one tick through the low to manage your risk in the long position. If you wait for a test of support, you could miss a trading opportunity. The problem is thinking about support and resistance as a precise price level and this is where most traders err. It is very common for most people to think of support and resistance levels in terms of absolute price levels. For instance, if they are looking at Rs 50 as a resistance levels, they mean exactly Rs 50.

In reality, support and resistance levels are not exact prices, but rather price zones. So, if the resistance level is Rs50, then it is actually the zone around that 50 level that is the resistance. The stock may hit only 49.87 or it may hit 50.25 and still hold the Rs 50 as price resistance. One solution is to use price zones for support and resistance instead of price levels. Support and resistance zones give you a better trading opportunity. A risk taking investor may buy at top of support zone whereas a cautious investor may want to wait till the bottom of support zone.



The main factor in determining exactly how much the exact prices are tested by is how quickly or slowly the prices move into that resistance zone. For instance, if the zone hits very quickly on a large momentum surge, then it is more likely to hit that 50.25 level. This is also the case if the stock is a rather volatile one with a wide price range intraday. If the security spikes higher and does not quite hit the price resistance, such as a spike into 49.70, then it may round off into 50 with slightly higher highs and never exactly touch the Rs 50 price resistance zone before turning over due to the slowdown in momentum into that resistance. The larger the time frame, the greater the price zone is as well. A resistance zone at 50 on a weekly time frame may have a range of 1 Rs on each side of 50. Where traders tend to run into trouble

is in thinking that because the stock has traded over 50 therefore the Rs 50 resistance has been broken, so we often hear of people "buying the highs" or "shorting the lows" in the case of support.

Resistance levels can transform into support levels and vice versa. After prices break through a support level, investors may try to limit their losses by selling the stock, pushing prices back up to the line which now becomes a resistance level.

3.1.5 *Change of support to resistance and vice versa*

Another principle of technical analysis stipulates that support can turn into resistance and visa versa. Once the price penetrates below the support level, the earlier or the broken support level can turn into resistance. The break of support level signals that the forces of supply have overcome the forces of demand. Therefore, if the price returns to this level, there is likely to be an increase in supply, and hence resistance



Wipro chart showing change of support around 440 to resistance

Another aspect of technical analysis is resistance turning into support. As the price increases above resistance, it signals changes in demand and supply. The breakout above resistance proves that the forces of demand have overcome the forces of supply. If the price returns to this level, there is likely to be an increase in demand and support can be established at this point



Crude oil chart showing change of resistance to support around 100\$

3.1.6 Why are support and resistance lines important?

Technical analysts often say that the market has a memory. Support and resistance lines are a key component of that memory.

Investors “tend” to remember previous area levels and thus make them important. When a price of a stock is changing rapidly each day the buying and selling will be done at a divergent level and there will not exist any unanimity or pattern in price changing. But when prices trade within a narrow range for a period of time an area is formed and investors begin to remember that specific price.

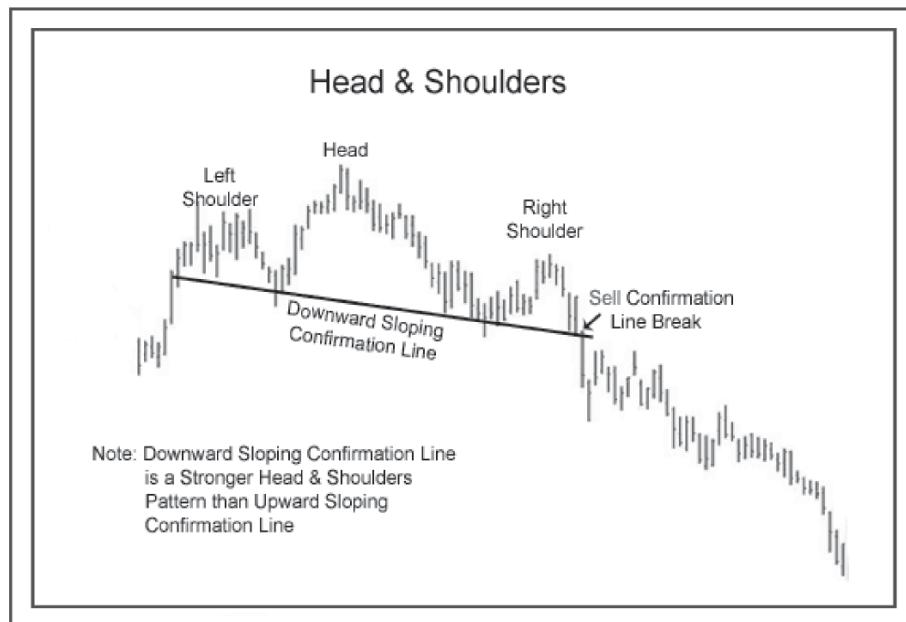
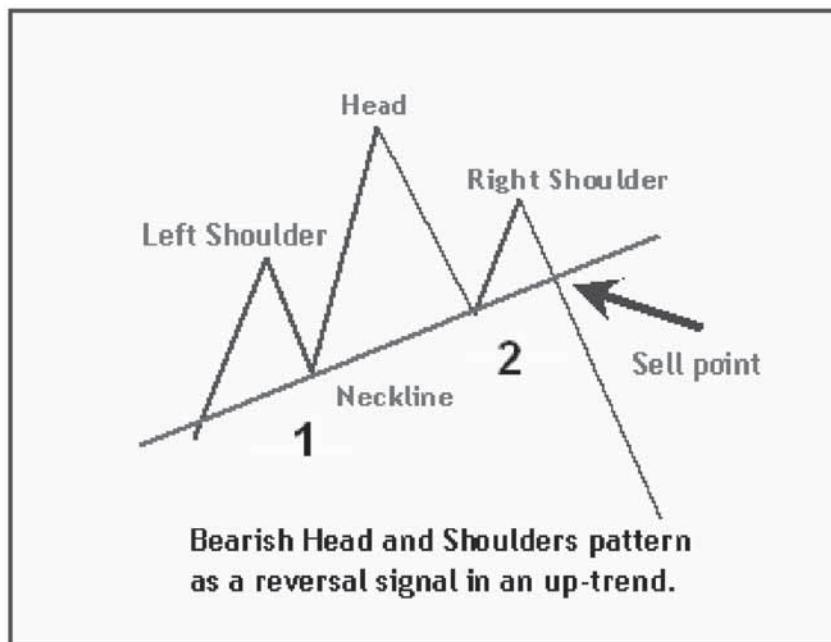
If the prices stay in an area for a longer period than the volume of that spot increases and that level becomes more important because investors remember it exceptionally well. Therefore, that level becomes more significant for the technical analyst. According to experts, previous support and resistance levels can be used as “target” or “limit” prices when the market have traded away from them. Assume that a year ago a rally ended with a top price of 120. That price of 120 then becomes a resistance level for the rally occurring in today’s market.

3.2 Head and Shoulders

The head and shoulders pattern can be either head and shoulders, top or head and shoulders bottom. The Charts are a picture of a head and shoulders movement, which portrays three successive rallies and reactions with the second one making the highest/lowest point.

3.2.1 Head and Shoulders (Top reversal)

A Head and Shoulders (Top) is a reversal pattern which occurs following an extended uptrend forms and its completion marks a trend reversal. The pattern contains three successive peaks with the middle peak (head) being the highest and the two outside peaks (shoulders) being low and roughly equal. The reaction lows of each peak can be connected to form support, or a neckline



As its name implies, the head and shoulders reversal pattern is made up of a left shoulder, head, right shoulder, and neckline. Other parts playing a role in the pattern are volume, the

breakout, price target and support turned resistance. Lets look at each part individually, and then put them together with some example

1. Prior trend: It is important to establish the existence of a prior uptrend for this to be a reversal pattern. Without a prior uptrend to reverse, there cannot be a head and shoulders reversal pattern, or any reversal pattern for that matter.

2. Left shoulder: While in an uptrend, the left shoulder forms a peak that marks the high point of the current trend. It is formed usually at the end of an extensive advance during which volume is quite heavy. At the end of the left shoulder there is usually a dip or recession which typically occurs on low volume.

3. Head: From the low of the left shoulder, an advance begins that exceeds the previous high and marks the top of the head. At this point, in order conform to proper form, prices must come down somewhere near the low of the left shoulder –somewhat lower perhaps or somewhat higher but in any case, below the top of the left shoulder.

4. Right shoulder: The right shoulder is formed when the low of the head advances again. The peak of the right shoulder is almost equal in height to that of the left shoulder but lower than the head. While symmetry is preferred, sometimes the shoulders can be out of whack. The decline from the peak of the right shoulder should break the neckline.

5. Neckline: A neckline can be drawn across the bottoms of the left shoulder, the head and the right shoulder. A breaking of this neckline on a decline from the right shoulder is the final confirmation and completes the head and shoulder formation.

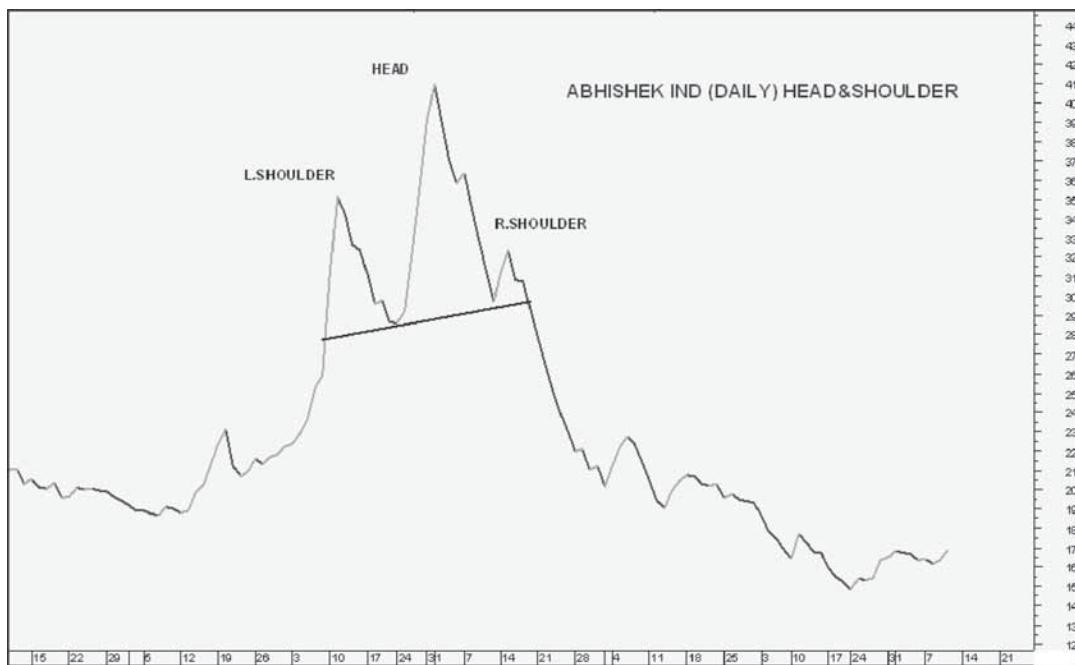
6. Volume: As the head and shoulders pattern unfolds, volume plays an important role in confirmation. Volume can be measured as an indicator (OBV, Chaikin Money Flow) or simply by analyzing volume levels. Ideally, but not always, volume during the advance of the left shoulder should be higher than during the advance of the head. These decreases in volume along with new highs that form the head serve as a warning sign. The next warning sign comes when volume increases on the decline from the peak of the head. Final confirmation comes when volume further increases during the decline of the right shoulder.

7. Neckline break: The head and shoulders pattern is said to be complete only when the neckline support is broken. Ideally, this should also occur in a convincing manner with an expansion in volume.

8. Support turned resistance: Once support is broken, it is common for this same support level to turn into resistance. Sometimes, but certainly not always, the price will return to the support break, and offer a second chance to sell.

9. Price target: After breaking neckline support, the projected price decline is found by measuring the distance from the neckline to the top of the head. Price target is calculated by

subtracting the above distance from the neckline. Any price target should serve as a rough guide, and other factors such as previous support levels should be considered as well.

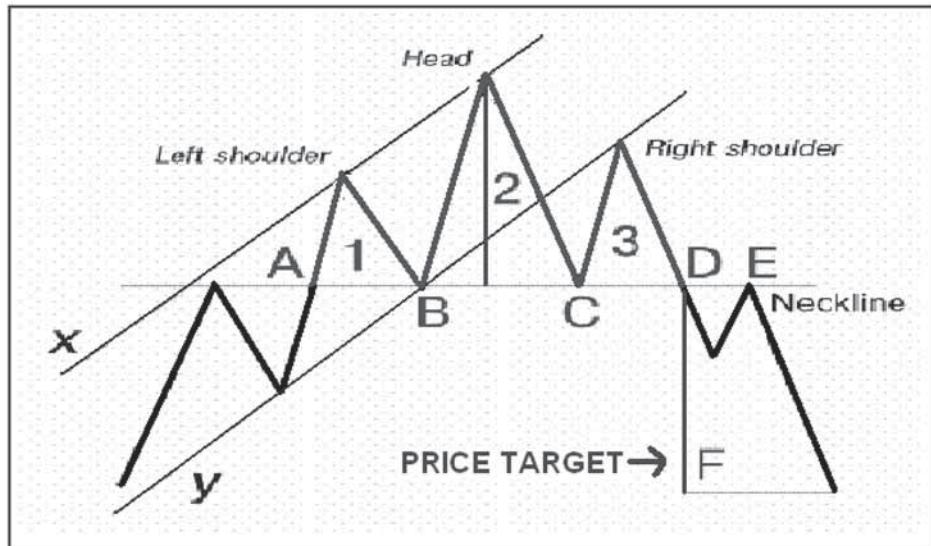


ABHISHEK IND chart showing the Head and Shoulders pattern



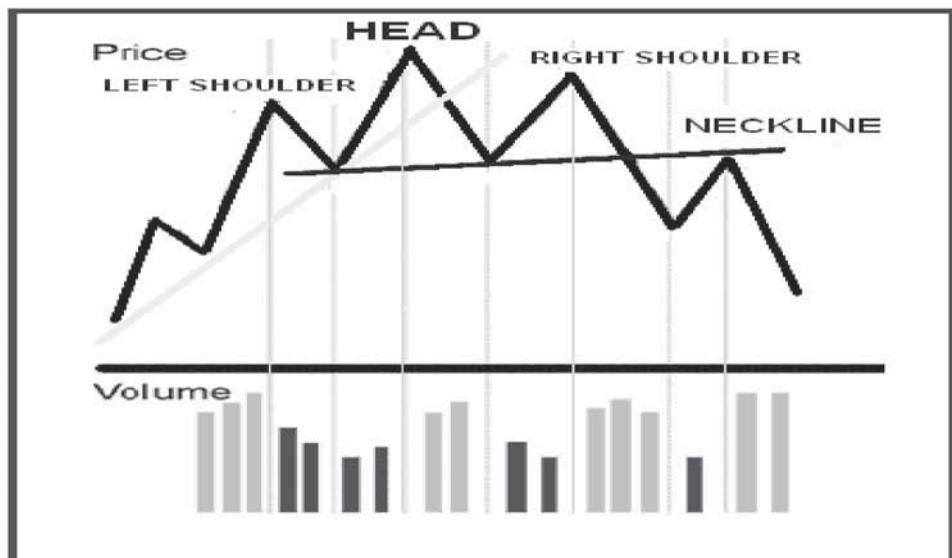
Potato futures (MCX) showing H&S Pattern

Signals generated by head and shoulder pattern



- The support line is based on points B and C.
- The resistance line. After giving in at point D, the market may retest the neckline at point E.
- The price direction. If the neckline holds the buying pressure at point E, then the formation provides information regarding the price direction: diametrically opposed to the direction of the head-and-shoulders (bearish).
- The price target D to F. This is provided by the confirmation of the formation (by breaking through the neckline under heavy trading volume). This is equal to the range from top of the head to neckline.

Volume study

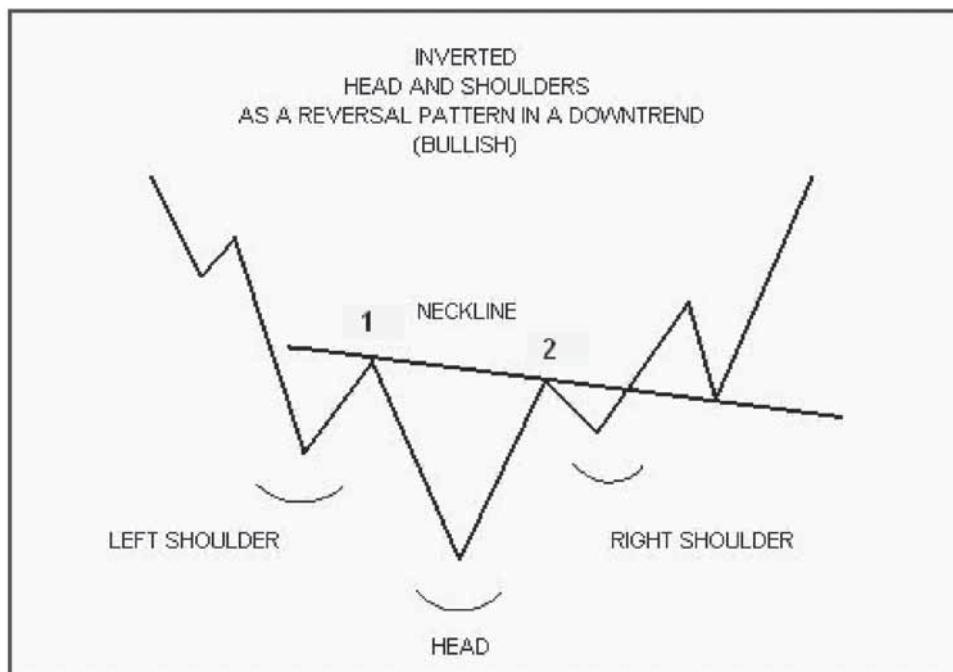


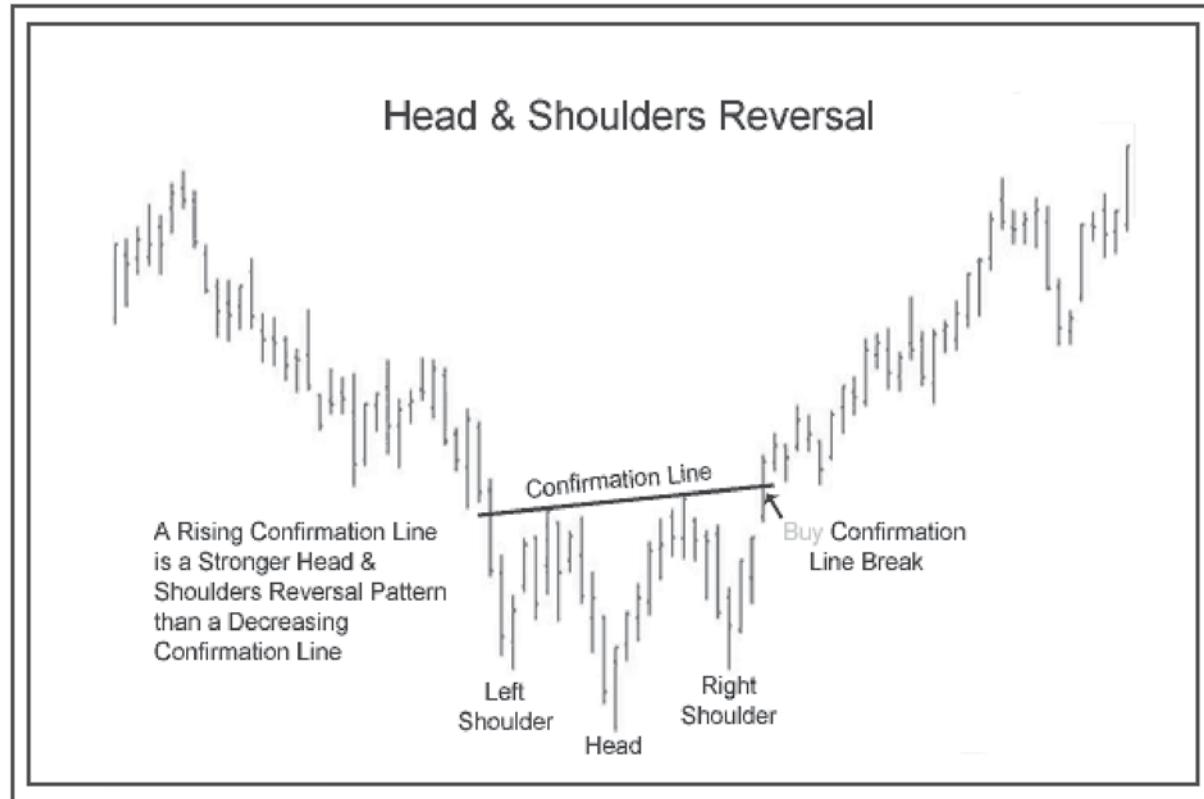
Some important points to remember

- The head and shoulders pattern is one of the most common reversal formations. It occurs after an uptrend and usually marks a major trend reversal when complete.
- It is preferable that the left and right shoulders be symmetrical, it is not an absolute requirement. They can be different widths as well as different heights.
- Volume support and neckline support identification are considered to be the most critical factors. The support break indicates a new willingness to sell at lower prices. There is an increase in supply combined with lower prices and increasing volume .The combination can be lethal, and sometimes, there is no second chance return to the support break.
- Measuring the expected length of the decline after the breakout can be helpful, but it is not always necessary target. As the pattern unfolds over time, other aspects of the technical picture are likely to take precedence.

3.2.2 Inverted head and shoulders

The head and shoulders bottom is the inverse of the H&S Top. In the chart below, after a period, the downward trend reaches a climax, which is followed by a rally that tends to carry the share back approximately to the neckline. After a decline below the previous low followed by a rally, the head is formed. This is followed by the third decline which fails to reach the previous low. The advance from this point continues across the neckline and constitutes the breakthrough.





The main difference between this and the Head and Shoulders Top is in the **volume pattern** associated with the share price movements.

The volume should increase with the increase in the price from the bottom of the head and then it should start increasing even more on the rally which is followed by the right shoulder. If the neckline is broken but volume is low, you should be skeptical about the validity of the formation.

As a major reversal pattern, the head and shoulders bottom forms after a downtrend, and its completion marks a change in trend. The pattern contains three troughs in successive manner with the two outside troughs namely the right and the shoulder being lower in height than the middle trough (head) which is the deepest. Ideally, the two shoulders i.e. the right and the left shoulder should be equal in height and width. The reaction highs in the middle of the pattern can be connected to form resistance, or a neckline.

3.2.3 Head and shoulders bottom

The price action remains roughly the same for both the head and shoulders top and bottom, but in a reversed manner. The biggest difference between the two is played by the volume. While an increase in volume on the neckline breakout for a head and shoulders top is welcomed, it

is absolutely required for a bottom. Lets look at each part of the pattern individually, keeping volume in mind:

1. Prior trend: For this to be a reversal pattern it is important to establish the existence of a prior downtrend for this to be a reversal pattern. There cannot be a head and shoulders bottom formation, without a prior downtrend to reverse.

2. Left shoulder: It is formed after an extensive increase in price, usually supported by high volume. While in a downtrend, the left shoulder forms a trough that marks a new reaction low in the current trend. After forming this trough, an advance ensues to complete the formation of the left shoulder. The high of the decline usually remains below any longer trend line, thus keeping the downtrend intact.

3. Head: After the formation of the left shoulder, a decline begins that exceeds the previous low and forms a point at an even lower point. After making a bottom, the high of the subsequent advance forms the second point of the neckline.

4. Right shoulder: Right shoulder is formed when the high of the head begins to decline. The height of the right shoulder is always less than the head and is usually in line with the left shoulder, though it can be narrower or wider. When the advance from the low of the right shoulder breaks the neckline, the head and shoulders reversal is complete.

5. Neckline: The neckline is drawn through the highest points of the two intervening troughs and may slope upward or downward. The neckline forms by connecting two reaction highs. The first reaction marks the end of the left shoulder and the beginning of the head. The second reaction marks the end of the head and the beginning of the right shoulder. Depending on the relationship between the two reaction highs, the neckline can slope up, slope down, or be horizontal. The slope of the neckline will affect the pattern's degree of bullishness: an upward slope is more bullish than downward slope.

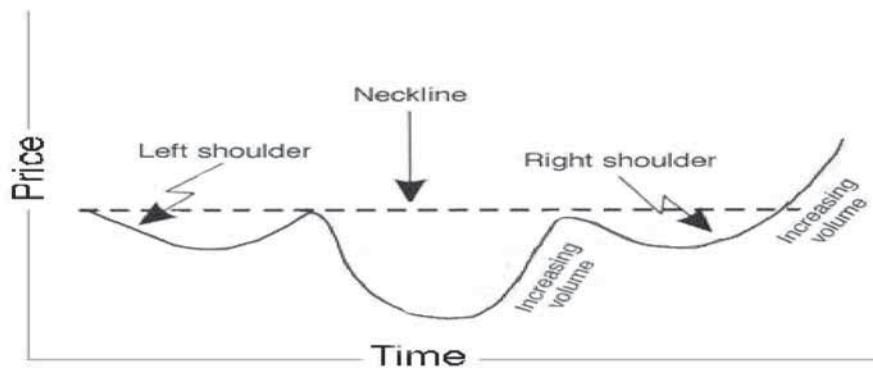
6. Volume: Volume plays a very important role in head and shoulders bottom.

Without the proper expansion of volume, the validity of any breakout becomes suspect. Volume can be measured as an indicator (OBV, Chaikin Money Flow) or simply by analyzing the absolute levels associated with each peak and trough.

Volume levels during the second half of the pattern are more important than the first half. The decline of the volume of the left shoulder is usually heavy and selling pressure is also very intense. The selling continues to be intense even during the decline that forms the low of the head. After this low, subsequent volume patterns should be watched carefully to look for expansion during the advances.

The advance from the low of the head should be accompanied by an increase in volume and/or better indicator readings (e.g. CMF > 0 or strength in OBV). After the formation the

second neckline point by the reaction high, there should be a decline in the right shoulder accompanied with light volume. It is normal to experience profit-taking after an advance. Volume analysis helps distinguish between normal profit-taking and heavy selling pressure. With light volume on the pullback, indicators like CMF and OBV should remain strong. The most important moment for volume occurs on the advance from the low of the right shoulder. For a breakout to be considered valid there needs to be an expansion of volume on the advance and during the breakout.

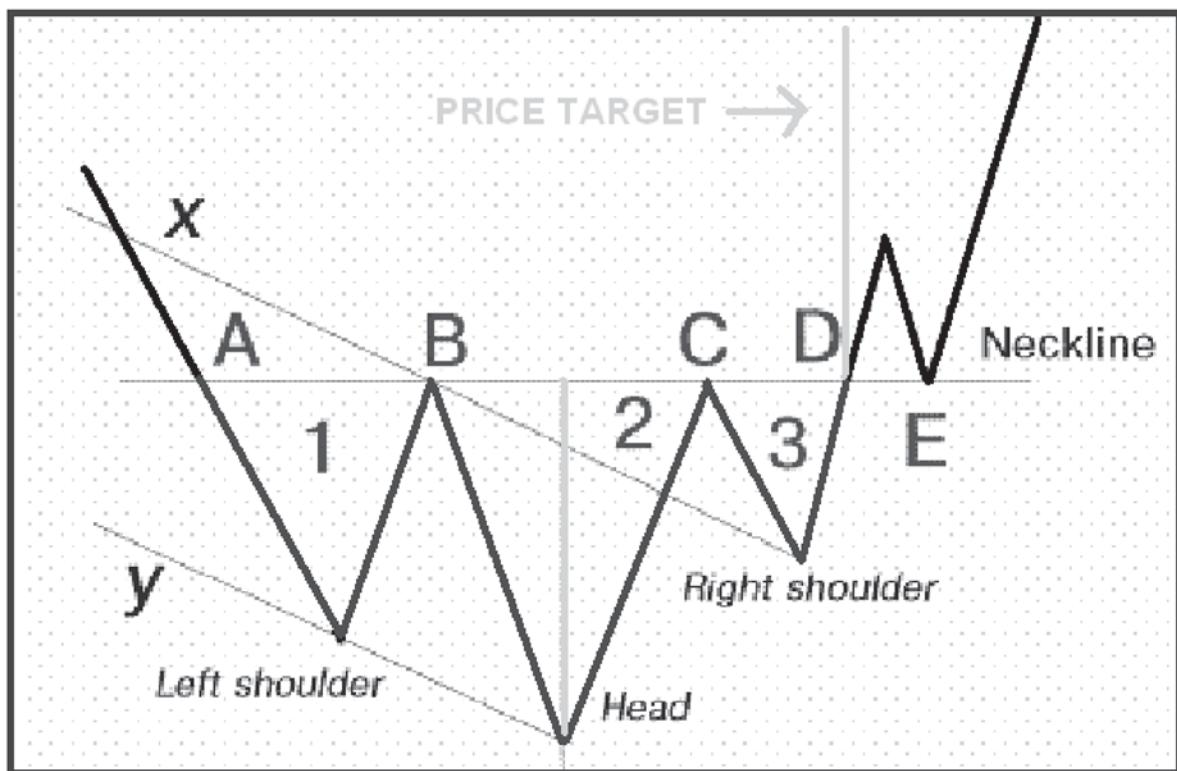


- 1. Neckline break:** The head and shoulders pattern is said to be complete only when neckline resistance is broken. For a head and shoulders bottom, this must occur in a convincing manner with an expansion of volume.
- 2. Resistance turned support:** The same resistance level can turn into support, if the resistance is broken. Price will return to the resistance break and provide a second chance to buy.
- 3. Price target:** Once the neckline resistance is broken, the projected advance is calculated by measuring the distance from the neckline to the bottom of the head. This distance is then added to the neckline to reach a price target. Any price target should serve as a rough guide and other factors should be considered as well. These factors might include previous resistance levels, Fibonacci retracements or long-term moving averages.



CNX IT INDEX Chart Showing Inverse Head and Shoulders Pattern

Once the neckline breaches the prices of index starts rising

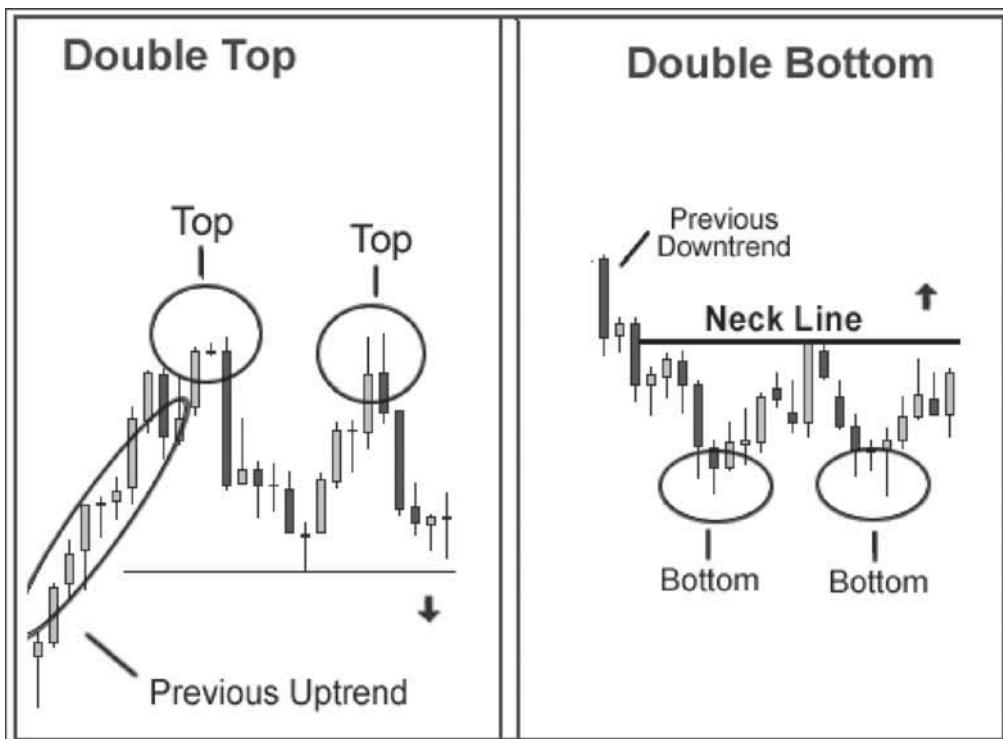


Once the resistance is broken at point D the price target will be equal to the bottom of the head from neckline. It may test the line again at point E therefore the stop should be below the neckline.

Some important points to remember:

- Head and shoulder bottom is one of the most common and reliable reversal formations. They occur after a downtrend and usually mark a major trend reversal when complete.
- It is preferable but not a necessary requirement that the left and right shoulders be symmetrical. Shoulders can be of different widths as well as different heights. If you are looking for the perfect pattern, then it will take a long time to come.
- The major focus of the analysis of the head and shoulders bottom should be the correct identification of neckline resistance and volume patterns. These are two of the most important aspects to a successful trade. The neckline resistance breakout combined with an increase in volume indicates an increase in demand at higher prices. Buyers are exerting greater force and the price is being affected.
- As seen from the examples, traders do not always have to choose a stock after the neckline breakout. Many times, the price will return to this new support level and offer a second chance to buy. Measuring the expected length of the advance after the breakout can be helpful, but it is not always necessary to achieve the final target. As the pattern unfolds over time, other aspects of the technical picture are likely to take precedent.

3.3 Double tops and bottoms



These are considered to be among the most familiar of all chart patterns and often signal turning points, or reversals. The double top resembles the letter "M". Conversely, the double bottom resembles a "W" formation; in reverse of the double top.

3.3.1 Double top

It is a term used in technical analysis to describe the rise of a stock, a drop and another rise roughly of the same level as the previous top and finally followed by another drop.

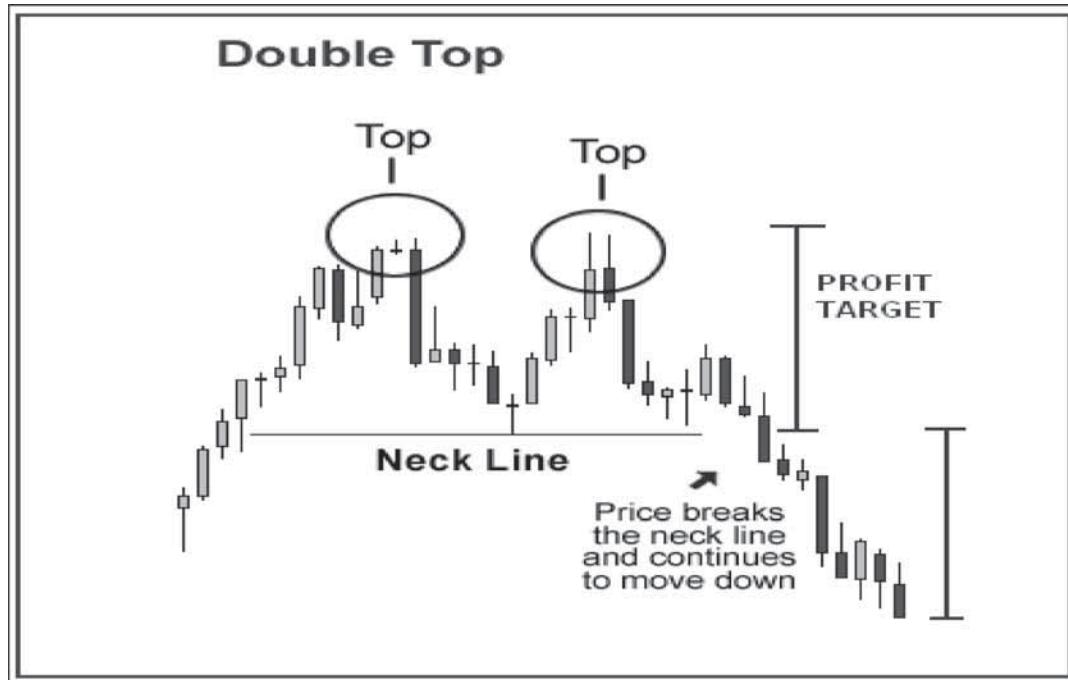
A double top is a reversal pattern which occurs following an extended uptrend. This name is given to the pair of peaks which is formed when price is unable to reach a new high. It is desirable to sell when the price breaks below the reaction low that is formed between the two peaks.

Context: The double top must be followed by an extended price rise or uptrend. The two peaks formed need not be equal in price, but should be same in the area with a minor reaction low between them. This is a reliable indicator of a potential reversal to the downside.

Appearance: Price moves higher and forms a new high. This is followed by a downside retracement, which forms a reaction low before one final low-volume assault is made on the area of the recent high. In some cases the previous high is never reached, and sometimes it is briefly but does not hold. This pattern is said to be complete once price makes the second peak and then penetrates the lowest point between the highs, called the reaction low. The sell indication from this topping pattern occurs when price breaks the reaction low to the downside.

Breakout expectation: When the reaction low is penetrated to the downside, accompanied by expanding volume the double top pattern becomes official. Downside price target is calculated by subtracting the distance from the reaction low to the peak from the reaction low. Often times a double top will mark a lasting top and lead to a significant decline which exceeds the price target to the downside.

Although there can be variations but if the trend is from bullish to bearish, the classic double top will mark at least an intermediate change, if not long-term change. Many potential double tops can form along the way up, but until key support is broken, a reversal cannot be confirmed. Let's look at the key points in the formation.



- 1. Prior trend:** With any reversal pattern, there must be an existing trend to reverse. In the case of the double top, a significant uptrend of several months should be in place.
- 2. First peak:** The first peak marks the highest point of the current trend.
- 3. Trough:** Once the first peak is reached, a decline takes place that typically ranges from 10-20%. The lows are sometimes rounded or drawn out a bit, which can be a sign of tepid demand.
- 4. Second peak:** The advance off the lows usually occurs with low volume and meets resistance from the previous high. Resistance from the previous high should be expected and after the resistance is met, only the possibility of a double top exists. The pattern still needs to be confirmed. The time period between peaks can vary from a few weeks to many months, with the norm being 1-3 months. While exact peaks are preferable, there is some leeway. Usually a peak within 3% of the previous high is adequate.
- 5. Decline from peak:** Decline in the second peak is witnessed by an expanding volume and/or an accelerated descent, perhaps marked with a gap or two. Such a decline shows that the forces of supply are stronger than the forces of demand and a support test is imminent.
- 6. Support break:** The double top and trend reversal are not complete even when the trading till the support is done. The double top pattern is said to be complete when the support breaks from the lowest point between the peaks. This too should occur with an increase in volume and/or an accelerated descent.

7. Support turned resistance: Broken support becomes potential resistance and there is sometimes a test of this newfound resistance level with a reaction rally

8. Price target: Price target is calculated by subtracting the distance from the support break to peak from the support break. The larger the potential decline the bigger will be the formation.

ALEMBIC LTD Chart Showing Double Top



BHEL Chart showing Double Top

- This stock formed a double top after a big price advance. But it fails to breach the resistance and results in price falls.

Points to be kept in mind:

- Technicians should take proper steps to avoid deceptive double tops. The peaks should be separated by a time period of at least a month. If the peaks are too close, they could just represent normal resistance rather than a lasting change in the supply/demand picture. Ensure that the low between the peaks declines at least 10%. Declines less than 10% may not be indicative of a significant increase in selling pressure. After the decline, analyze the trough for clues on the strength of demand. If the trough drags on a bit and has trouble moving back up, demand could be drying up. When the security does advance, look for a contraction in volume as a further indication of weakening demand.
- The most important aspect of a double top is to avoid jumping the gun. The support should be broken in a convincing manner and with an expansion of volume. A price or time filter

can be applied to differentiate between valid and false support breaks. A price filter might require a 3% support break before validation. A time filter might require the support break to hold for 3 days before considering it valid. The trend is in force until proven otherwise. This applies to the double top as well. Until support is broken in a convincing manner, the trend remains up.

3.3.2 Double bottom

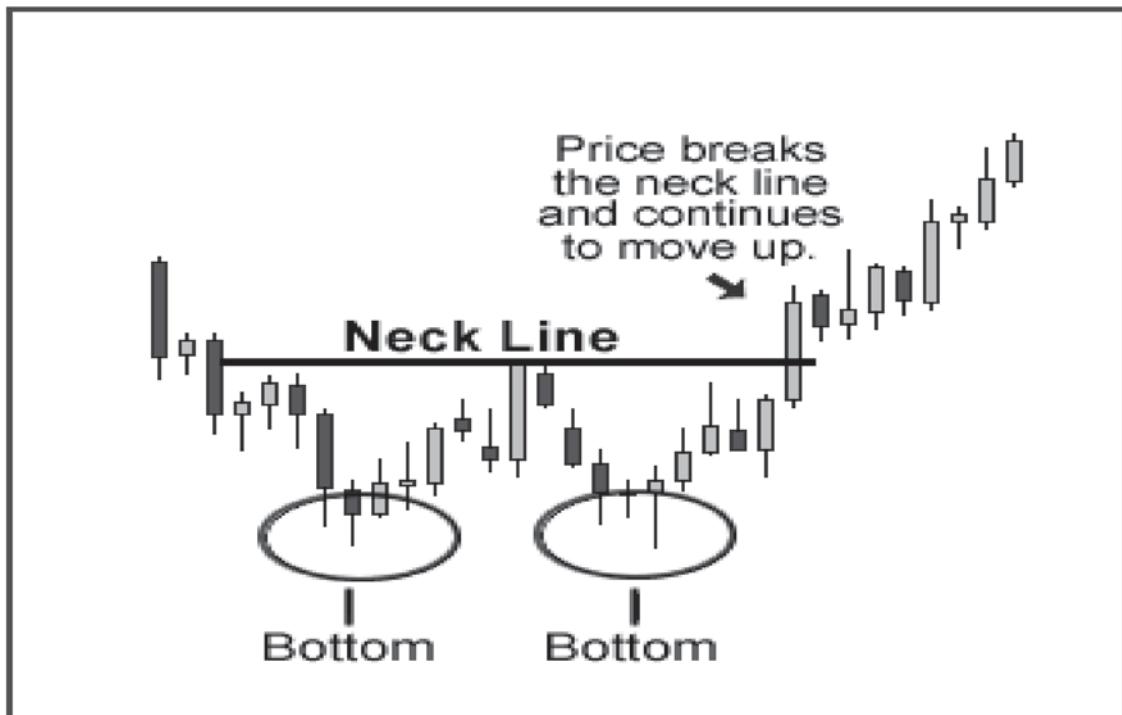
Double bottom is a charting technique used in technical analysis. It is used to describe a drop in the value of a stock (index), bounces back and then another drop to the similar level as the previous low and finally rebounds again. A double bottom is a reversal pattern which occurs following an extended downtrend. The buy signal is when price breaks above the reaction high which is formed between the two lows.

Context: The double bottom must be followed by an extended decline in prices. The two lows formed have to be equal in areas with a minor reaction high between them, though they need not to be equal in price. This is a reliable indicator of a potential reversal to the upside.

Appearance: Price reduces further to form a new low. This is followed by upside retracement or minor bounce, which forms a reaction high before one final low-volume downward push is made to the area of the recent low. In some cases the previous low is never reached, while in others it is briefly penetrated to the downside, but price does not remain below it. This pattern is considered complete once price makes the second low and then penetrates the highest point between the lows, called the reaction high. The buy indication from this bottom pattern occurs when price breaks the reaction high to the upside.

Breakout expectation: A double bottom pattern becomes official when the reaction high is penetrated to the upside, ideally accompanied by expanding **volume**. Upside price target is calculated adding the distance from the reaction high to the low to that of reaction high. Often times a double bottom will mark a lasting low and lead to a significant price advance which exceeds the price target to the upside.

There can be many variations that can occur in the double bottom, but the classic double bottom usually marks an intermediate or a long-term change in trend. Many potential double bottoms can be formed along the way down, but a reversal cannot be confirmed until key resistance is broken. The key points in the formation are as follows:

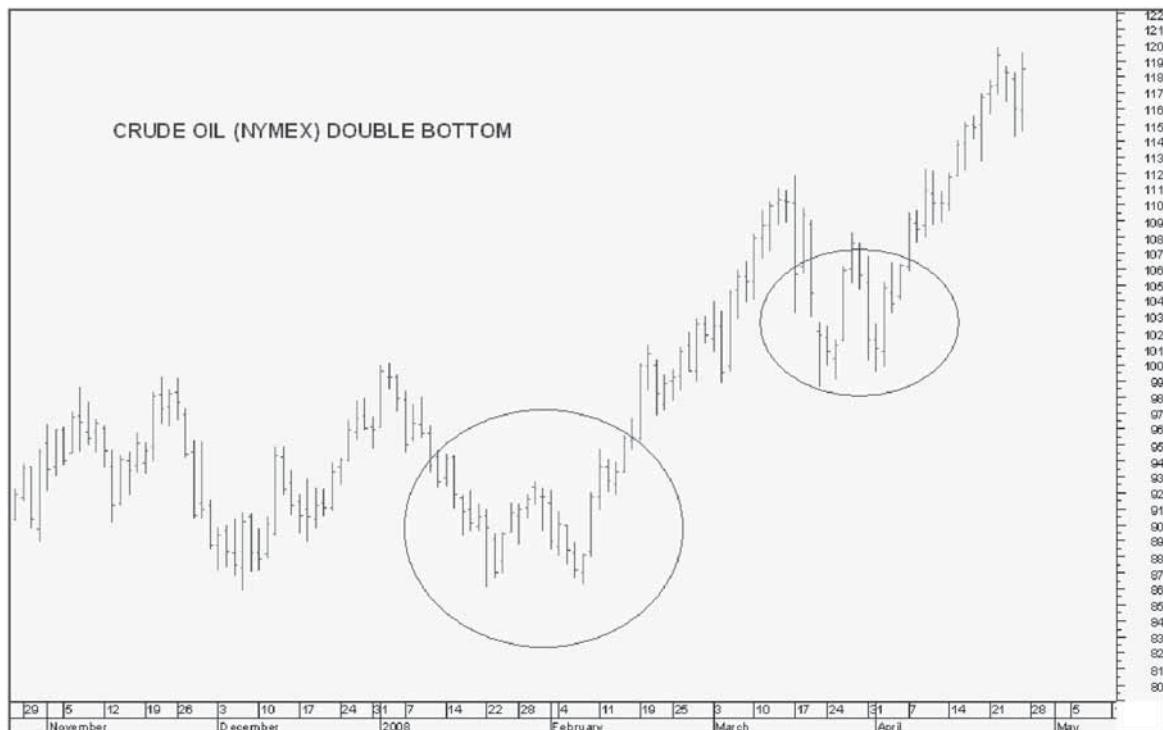


- 1. Prior trend:** With any reversal pattern, there must be an existing trend to reverse. In the case of the double bottom, a significant downtrend of several months should be in place.
- 2. First trough:** It marks the lowest point of the current trend. Though it is fairly normal in appearance and the downtrend remains firmly in place.
- 3. Peak:** After the first trough is reached, an advance ranging from 10-20% usually takes place. An increase in the volume from the first trough signals an early accumulation. The peaks high is sometimes rounded or drawn out a bit because of the hesitation in going back. This hesitation is an indication of an increase in demand, but this increase is not strong enough for a breakout.
- 4. Second trough:** The decline off the reaction high usually occurs with low volume and meets support from the previous low. Support from the previous low should be expected. Even after establishing support, only the possibility of a double bottom exists, it still needs to be confirmed. The time period between troughs can vary from a few weeks to many months, with the norm being 1-3 months. While exact troughs are preferable, there is some room to maneuver and usually a trough within 3% of the previous is considered valid.
- 5. Advance from trough:** Volume gains more importance in the double bottom than in the double top. The advance of the second trough should be clearly evidenced by the increasing volume and buying pressure. An accelerated ascent, perhaps marked with a gap or two, also indicates a potential change in sentiment.

6. Resistance break: The double top and trend reversal are considered incomplete, even after they trade up to resistance. Breaking resistance from the highest point between the troughs completes the double bottom. This too should occur with an increase in volume and/or an accelerated ascent.

7. Resistance turned support: Broken resistance becomes potential support and there is sometimes a test of this newfound support level with the first correction. Such a test can offer a second chance to close a short position or initiate a long.

8. Price target: Target is estimated by adding the distance from the resistance breakout to trough lows on top of the resistance break. This would imply that the bigger the formation is, the larger the potential advance.



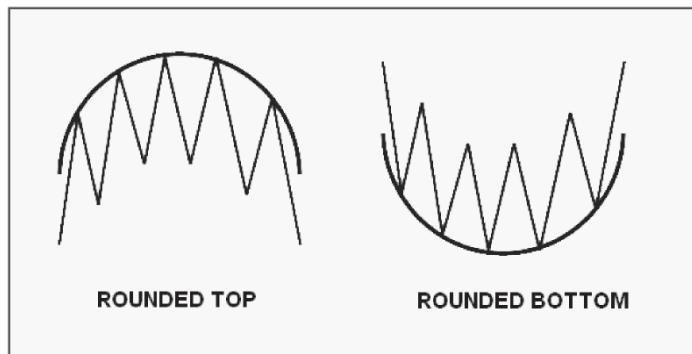
Crude oil chart showing Double Bottom

Points to be kept In Mind

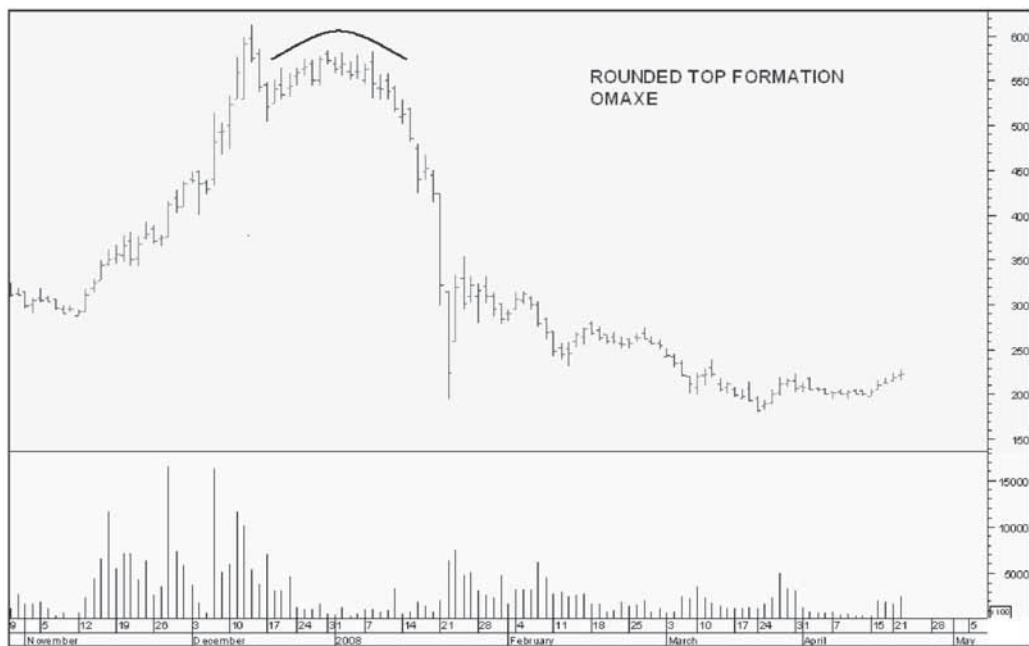
- The double bottom is an intermediate to long-term reversal pattern that will not form in a few days. Though it can be formed in a time span of few weeks, but it is preferable to have at least a time of 4 weeks between the two lows. Bottoms usually take more time than the top. This pattern should be given proper time to develop.
- The advance off of the first trough should be 10-20%. The second trough should form a low within 3% of the previous low and volume on the ensuing advance should increase. Signs of buying pressure can be checked by the volume indicators such

as Chaikin Money Flow, OBV and Accumulation/Distribution. The formation is not complete until the previous reaction high is taken out.

3.3.3 *Rounded top and bottom*

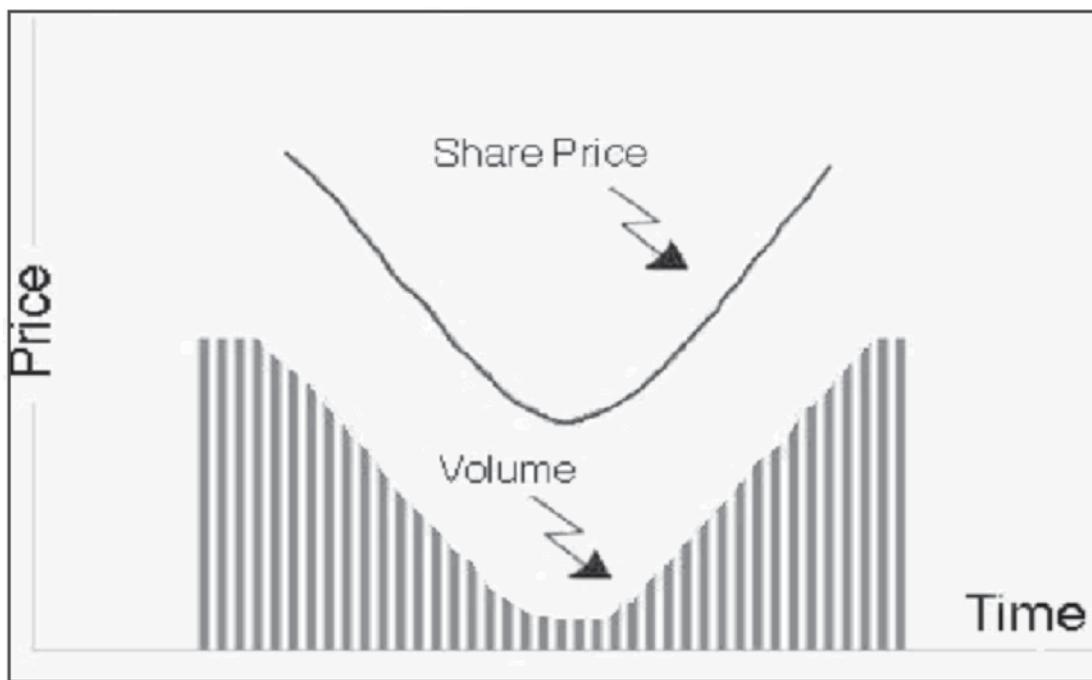


Another shape which a top and bottom can take is one in which the reversal is "rounded". The rounded bottom formation forms when the market gradually yet steadily shifts from a bearish to bullish outlook while in the case of a rounded top, from bullish to bearish. The Rounded Top formation consists of a gradual change in trend from up to down. The Rounded Bottom formation consists of a gradual change in trend from down to up. This formation is the exact opposite of a Rounded Top Formation. The prices take on a bowl shaped pattern as the market slowly and casually changes from an upward to a downward trend



OMAXE Chart showing Rounded Top

It is very (remove) considered very difficult to separate a rounded bottom, where the price continues to decrease from a consolidation pattern and where price stays at a level, but the clue, as always, is in volume. In a true Rounded Bottom, **the volume decreases as the price decreases**, this signifies a decrease in the selling pressure. A very little trading activity can be seen when the price movement becomes neutral and goes sideways and the volumes are also low. Then, as prices start to increase, the volume increases.



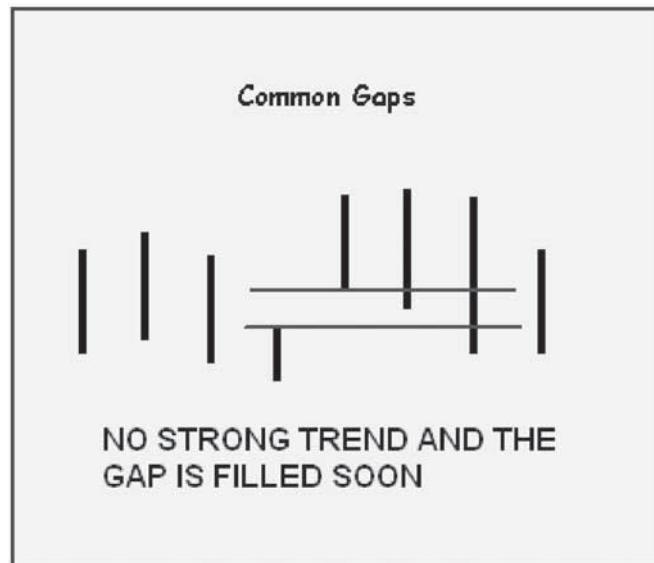
3.4 Gap theory

A gap is an area on a price chart in which there were no trades. Normally this occurs after the close of the market on one day and the next day's open. Lot's of things can cause this, such as an earnings report coming out after the stock market had closed for the day. If the earnings were significantly higher than expected, this could result in the price opening higher than the previous day's close. If the trading that day continues to trade above that point, a gap will exist in the price chart. Gaps can offer evidence that something important has happened to the fundamentals or the psychology of the crowd that accompanies this market movement.

Gaps appear more frequently on daily charts, where every day is an opportunity to create an opening gap. Gaps can be subdivided into four basic categories:

- Common gap
- Breakaway gap
- Runaway/ Continuation gap
- Exhaustion gap

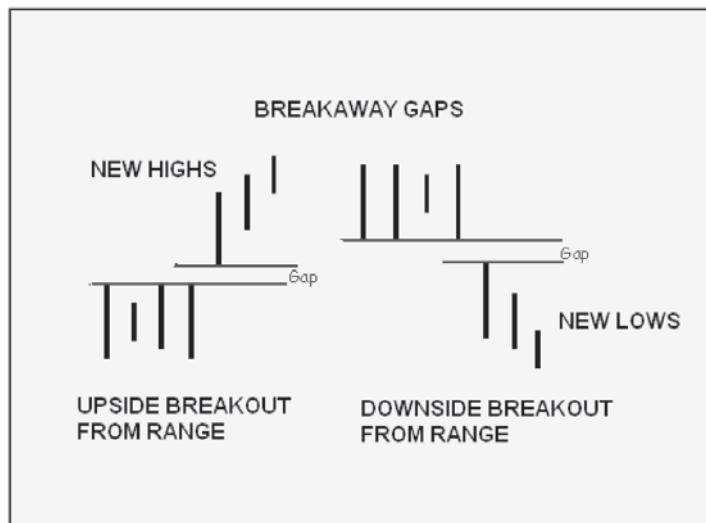
3.4.1 Common gaps



Sometimes referred to as a trading gap or an area gap, the common gap is usually uneventful. This gap occurs characteristically in nervous markets and is generally closed within few days. In fact, they can be caused by a stock going ex-dividend when the trading volume is low. Getting closed means that the price action at a later time (few days to a few weeks) usually retraces to at least the last day before the gap. This is also known as filling the gap.

A common gap usually appears in a trading range or congestion area and reinforces the apparent lack of interest in the stock at that time. Many times this is further exacerbated by low trading volume. Being aware of these types of gaps is good, but doubtful that they will produce trading opportunities.

3.4.2 Breakaway gaps

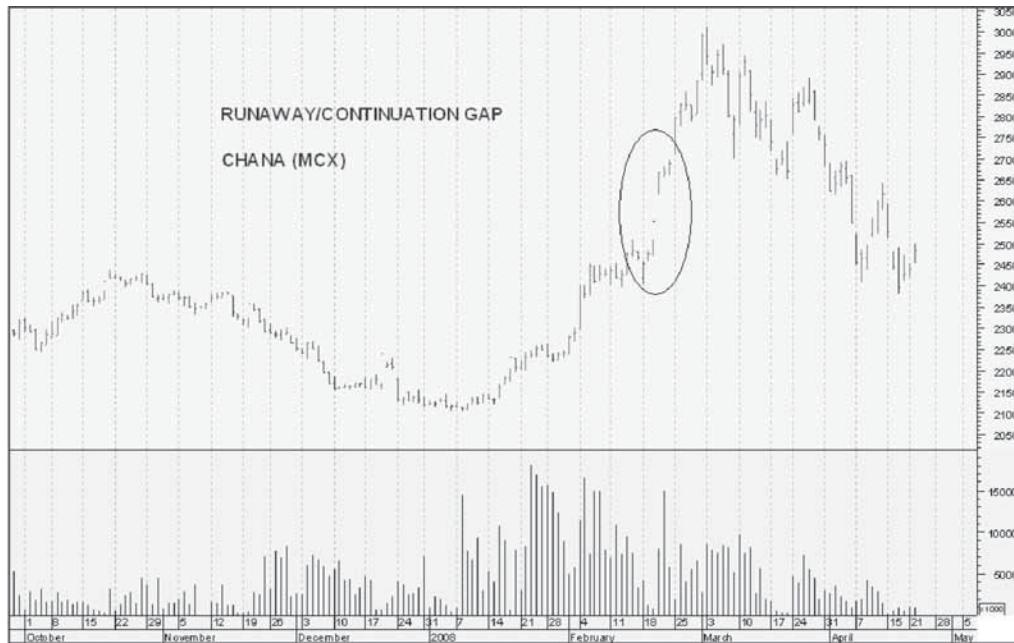


Breakaway gaps are the exciting ones. They occur when the price action is breaking out of their trading range or congestion area. To understand gaps, one has to understand the nature of congestion areas in the market. A congestion area is just a price range in which the market has traded for some period of time, usually a few weeks or so. The area near the top of the congestion area is usually resistance when approached from below. Likewise, the area near the bottom of the congestion area is support when approached from above. To break out of these areas requires market enthusiasm and either many more buyers than sellers for upside breakouts or more sellers than buyers for downside breakouts.

Volume will (should) pick up significantly, for not only the increased enthusiasm, but many are holding positions on the wrong side of the breakout and need to cover or sell them. It is better if the volume does not happen until the gap occurs. This means that the new change in market direction has a chance of continuing. The point of breakout now becomes the new support (if an upside breakout) or resistance (if a downside breakout). Don't fall into the trap of thinking this type of gap, if associated with good volume, will be filled soon. It might take a long time. Go with the fact that a new trend in the direction of the stock has taken place and trade accordingly.

A good confirmation for trading gaps is if they are associated with classic chart patterns. For example, if an ascending triangle all of a sudden has a breakout gap to the upside, this can be a much better trade than a breakaway gap without a good chart pattern associated with it.

3.4.3 Runaway gaps



Runaway gaps are also called measuring gaps and are best described as gaps that are caused by increased interest in the stock. For runaway gaps to the upside, it usually represents traders who did not get in during the initial move of the up trend and while waiting for a retracement in price, decided it was not going to happen. Increased buying interest happens all of a sudden and the price gaps above the previous day's close. This type of runaway gap represents an almost panic state in traders. Also, a good uptrend can have runaway gaps caused by significant news events that cause new interest in the stock.

Runaway gaps can also happen in down trends. This usually represents increased liquidation of that stock by traders and buyers who are standing on the sidelines. These can become very serious as those who are holding onto the stock will eventually panic and sell, but sell to whom? The price has to continue to drop and gap down to find buyers. Not a good situation.

The futures market at times will have runaway gaps that are caused by trading limits imposed by the exchanges. Getting caught on the wrong side of the trend when you have these limit moves in futures can be horrifying. The good news is that you can also be on the right side of them. These are not common occurrences in the futures market despite all the wrong information being touted by those who do not understand it and are only repeating something they read from an uninformed reporter.

3.4.4 *Exhaustion gaps*



Exhaustion gaps are those that happen near the end of a good up or down trend. They are many times the first signal of the end of that move. They are identified by high volume and

large price difference between the previous day's close and the new opening price. They can easily be mistaken for runaway gaps if one does not notice the exceptionally high volume.

It is almost a state of panic if during a long down move pessimism has set in. Selling all positions to liquidate holdings in the market is not uncommon. Exhaustion gaps are quickly filled as prices reverse their trend. Likewise if they happen during a bull move, some bullish euphoria overcomes trades and they cannot get enough of that stock. The prices gap up with huge volume, then there is great profit taking and the demand for the stock totally dries up. Prices drop and a significant change in trend occurs.

Exhaustion gaps are probably the easiest to trade and profit from. In the chart, notice that there was one more day of trading to the upside before the stock plunged. The high volume was the giveaway that this was going to be either an exhaustion gap or a runaway gap. Because of the size of the gap and an almost doubling of volume, an exhaustion gap was in the making here.

3.4.5 Island cluster



Island clusters are identified by an exhaustion gap followed by a breakaway gap in opposite direction. They are powerful reversal signals

Conclusion

There is an old saying that the market abhors a vacuum and all gaps will eventually be filled. While this may have some merit for common and exhaustion gaps, holding positions waiting for breakout or runaway gaps to be filled can be devastating to your portfolio. Likewise if

waiting to get on board a trend by waiting for prices to fill a gap just might mean you never participate in the move. Gaps are a significant technical development in price action and in chart analysis, and should not be ignored. Japanese candlestick analysis is filled with patterns that rely on gaps to fulfill their objectives.

New terms

Breakout: A price movement through an identified level of support or resistance, which is usually followed by heavy volume and increased volatility, is a 'breakout'. Traders will buy the underlying asset when the price breaks above a level of resistance and sell when it breaks below support. A breakout is the bullish counterpart to a breakdown.

Climax: Following a protracted period of selling or buying, a point wherein market trends are retarded or discontinued. At a selling climax, the market is characterized by a trend reversal whereby the market begins to buy stocks and prices rise. For a buying climax, the opposite occurs, and the market begins to sell, resulting in lower prices. The climax is merely the highest point of selling or buying and can be followed by many trend reversals

Distribution: Distribution is when trading volume is higher than that of the previous day without any price appreciation.

Double Top: A term used in technical analysis to describe the rise of a stock, a drop, another rise to the same level as the original rise, and finally another drop.

Double Bottom: A charting pattern used in technical analysis. It describes the drop of a stock (or index), a rebound, another drop to the same (or similar) level as the original drop, and finally another rebound.

Downtrend: A Downtrend describes the price movement of a financial asset when the overall direction is downward. A formal downtrend occurs when each successive peak and trough is lower than the ones found earlier in the trend.

Exhaustion: Situation in which a majority of participants trading in the same asset are either long or short, leaving few investors to take the other side of the transaction when participants wish to close their positions. Exhaustion signals the reversal of the current trend because it illustrates excess levels of supply or demand.

Long: The buying of a security such as a stock, commodity, or currency, with the expectation that the asset will rise in value is called 'Long'.

Overbought: An asset that has experienced sharp upward movements over a very short period of time is often deemed to be overbought. Determining the degree in which an asset is overbought is very subjective and can differ between investors.

Oversold: Assets that have experienced sharp declines over a brief period of time are often deemed to be oversold. Determining the degree to which an asset is oversold is very subjective and could easily differ between investors.

Peak: The highest point between the end of an economic expansion and the start of a contraction in a business cycle indicates the 'Peak'. The peak of the cycle refers to the last month before several key economic indicators, such as employment and new housing starts, begin to fall. It is at this point that real GDP spending in an economy is its highest level.

Recession: A significant decline in activity spread across the economy, lasting longer than a few months. It is visible in industrial production, employment, real income and wholesale-retail trade. The technical indicator of a recession is two consecutive quarters of negative economic growth as measured by a country's gross domestic product (GDP).

Recession is a normal (albeit unpleasant) part of the business cycle. A recession generally lasts from six to 18 months. Interest rates usually fall in recessionary times to stimulate the economy by offering cheap rates at which to borrow money.

Resistance: The price at which a stock or market can trade, but not exceed, for a certain period of time. This is often referred to as "resistance level". The stock or market stops rising because sellers start to outnumber buyers.

Support: 'Support' is the price level which historically, a stock has had difficulty falling below. It is thought of as the level at which a lot of buyers tend to enter the stock.

Trough: The stage of the economy's business cycle that marks the end of a period of declining business activity and the transition to expansion is the Trough.

Model Question

- Q1 What does a decline below support level indicate?
- a) there is lack of sellers
 - b) buyers are pushing down the price
 - c) there is lack of buyers and sellers are willing to sell even at lower prices
 - d) none of the above
- Q2 Bulls bid __ the price by increasing demand, bears take it ____by increasing supply
- a) down, up
 - b) up, down
 - c) up, up
 - d) down, down
- Q3 In Head & Shoulders pattern, which level is achieved by the second rally?
- a) Highest point
 - b) Lowest point
 - c) Either highest or lowest point
 - d) Neither highest nor lowest point
- Q4 In top reversal head and shoulders pattern, the decline from peak of _____ should break the neckline.
- a) left shoulder
 - b) right shoulder
 - c) head
 - d) neckline
- Q5 In an inverted head and shoulders pattern, which of the following represent highest potential for trend reversal?
- a) upward sloping neckline
 - b) downward sloping neckline
 - c) horizontal neckline
 - d) vertical neckline
- Q6 A break down the support line shows that the____ have won out over the ____
- a) bulls; bears
 - b) bears; bulls

- Q7 In an uptrend, _____ pattern is identified when the price of an asset creates three peaks, and all the three peaks are of nearly the same level, at the same price level.
- a) Double Bottom
 - b) Double Top
 - c) Triple Bottom
 - d) Triple Top
- Q8 Double top is the name given to a pair of peak which is formed when price is unable to reach a
- a) New high
 - b) New Low
 - c) Any of the above
 - d) None of the above
- Q9 Which gaps are also known as measuring gaps ?
- a) Common gaps
 - b) Breakaway gaps
 - c) Runaway gaps
 - d) Exhaustion gaps
- Q10 The Rounded Top formation consists of a gradual change in trend from:
- a) Down to up
 - b) Up to Down
 - c) Up to Up
 - d) Down to Down

CHAPTER 4 MAJOR INDICATORS AND OSCILLATORS

Learning objectives

After studying this chapter the student should be able to understand:

- What are technical indicators and how to interpret them
- Difference between leading and lagging indicators
- Moving Averages – the trend following indicator
- Oscillators – MACD and RSI
- How to look at divergences
- Using multiple indicators for trading signals

A Technical indicator is a mathematical formula applied to the security's price, volume or open interest. The result is a value that is used to anticipate future changes in prices.

A technical indicator is a series of data points derived by applying a formula to the price data of a security. Price data includes any combination of the open, high, low or close over a period of time. Some indicators may use only the closing prices, while others incorporate volume and open interest into their formulas. The price data is entered into the formula and a data point is produced.

4.1 What Does a Technical indicator offer?

Technical analysts use indicators to look into a different perspective from which stock prices can be analyzed. Technical indicators provide unique outlook on the strength and direction of the underlying price action for a given timeframe.

4.1.1 Why use indicators?

Technical Indicators broadly serve three functions: to alert, to confirm and to predict. Indicator acts as an alert to study price action, sometimes it also gives a signal to watch for a break of support. A large positive divergence can act as an alert to watch for a resistance breakout. Indicators can be used to confirm other technical analysis tools. Some investors and traders use indicators to predict the direction of future prices.

4.1.2 Tips for using indicators

There are a large number of Technical Indicators that can be used to assist you in selection of stocks and in tracking the right entry and exit points. In short, indicators indicate. But it

doesn't mean that traders should ignore the price action of a stock and focus solely on the indicator. Indicators just filter price action with formulas. As such, they are derivatives and not direct reflections of the price action. While applying the indicators, the analyst should consider: What is the indicator saying about the price action of a security? Is the price action getting stronger? Is it getting weaker?

The buy and sell signals generated by the indicators, should be read in context with other technical analysis tools like candlesticks, trends, patterns etc. For example, an indicator may flash a buy signal, but if the chart pattern shows a descending triangle with a series of declining peaks, it may be a false signal.

An indicator should be selected with due care and attention. It would be a futile exercise to cover more than five indicators. It is best to focus on two or three indicators and learn their intricacies inside and out. One should always choose indicators that complement each other, instead of those that move in unison and generate the same signals. For example, it would be redundant to use two indicators that are good for showing overbought and oversold levels, such as Stochastic and RSI. Both of these indicators measure momentum and both have overbought/oversold levels.

4.1.3 Types of indicators

Indicators can broadly be divided into two types "LEADING" and "LAGGING".

Leading indicators

Leading indicators are designed to lead price movements. Benefits of leading indicators are early signaling for entry and exit, generating more signals and allow more opportunities to trade. They represent a form of price momentum over a fixed look-back period, which is the number of periods used to calculate the indicator. Some of the wellmore popular leading indicators include Commodity Channel Index (CCI), Momentum, Relative Strength Index (RSI), Stochastic Oscillator and Williams %R.

Lagging Indicators

Lagging Indicators are the indicators that would follow a trend rather then predicting a reversal. A lagging indicator follows an event. These indicators work well when prices move in relatively long trends. They don't warn you of upcoming changes in prices, they simply tell you what prices are doing (i.e., rising or falling) so that you can invest accordingly. These trend following indicators makes you buy and sell late and, in exchange for missing the early opportunities, they greatly reduce your risk by keeping you on the right side of the market. Moving averages and the MACD are examples of trend following, or "lagging," indicators.

Moving averages

One of the most common and familiar trend-following indicators is the moving averages. They smooth a data series and make it easier to spot trends, something that is especially helpful in volatile markets. They also form the building blocks for many other technical indicators and overlays.

The two most popular types of moving averages are the Simple Moving Average (SMA) and the Exponential Moving Average (EMA). They are described in more detail below.

4.1.4 Simple moving average (SMA)

A simple moving average is formed by computing the average (mean) price of a security over a specified number of periods. It places equal value on every price for the time span selected. While it is possible to create moving averages from the Open, the High, and the Low data points, most moving averages are created using the closing price. For example: a 5-day simple moving average is calculated by adding the closing prices for the last 5 days and dividing the total by 5.

$$10 + 11 + 12 + 13 + 14 = 60$$

$$60 \div 5 = 12$$

The calculation is repeated for each price bar on the chart. The averages are then joined to form a smooth curving line - the **moving** average line. Continuing our example, if the next closing price in the average is 15, then this new period would be added and the oldest day, which is 10, would be dropped.

The new 5-day simple moving average would be calculated as follows:

$$11 + 12 + 13 + 14 + 15 = 65$$

$$65 \div 5 = 13$$

Over the last 2 days, the SMA moved from 12 to 13. As new days are added, the old days will be subtracted and the moving average will continue to move over time.

4.1.5 Exponential moving average (EMA)

Exponential moving average also called as exponentially weighted moving average is calculated by applying more weight to recent prices relative to older prices. In order to reduce the lag in simple moving averages, technicians often use exponential moving averages. The weighting applied to the most recent price depends on the specified period of the moving average. The

shorter the EMA's period, weight is applied to the most recent price. For example: a 10-period exponential moving average weighs the most recent price 18.18% while a 20-period EMA weighs the most recent price 9.52%. As we'll see, the calculating and EMA is much harder than calculating an SMA. The important thing to remember is that the exponential moving average puts more weight on recent prices. As such, it will react quicker to recent price changes than a simple moving average. Here's the calculation formula.

Exponential moving average calculation

Exponential Moving Averages can be specified in two ways - as a percent-based EMA or as a period-based EMA. A percent-based EMA has a percentage as its single parameter while a period-based EMA has a parameter that represents the duration of the EMA. The formula for an exponential moving average is:

$$\text{EMA (current)} = ((\text{Price (current)} - \text{EMA (prev)}) \times (\text{Multiplier}) + \text{EMA (prev)})$$

For a percentage-based EMA, "Multiplier" is equal to the EMA's specified percentage. For a period-based EMA, "Multiplier" is equal to $2 / (1 + N)$ where N is the specified number of periods.

For example, a 10-period EMA's Multiplier is calculated like this:

$$\frac{2}{(\text{Time periods} + 1)} = \frac{2}{(10 + 1)} = .1818 \quad (18.18\%)$$

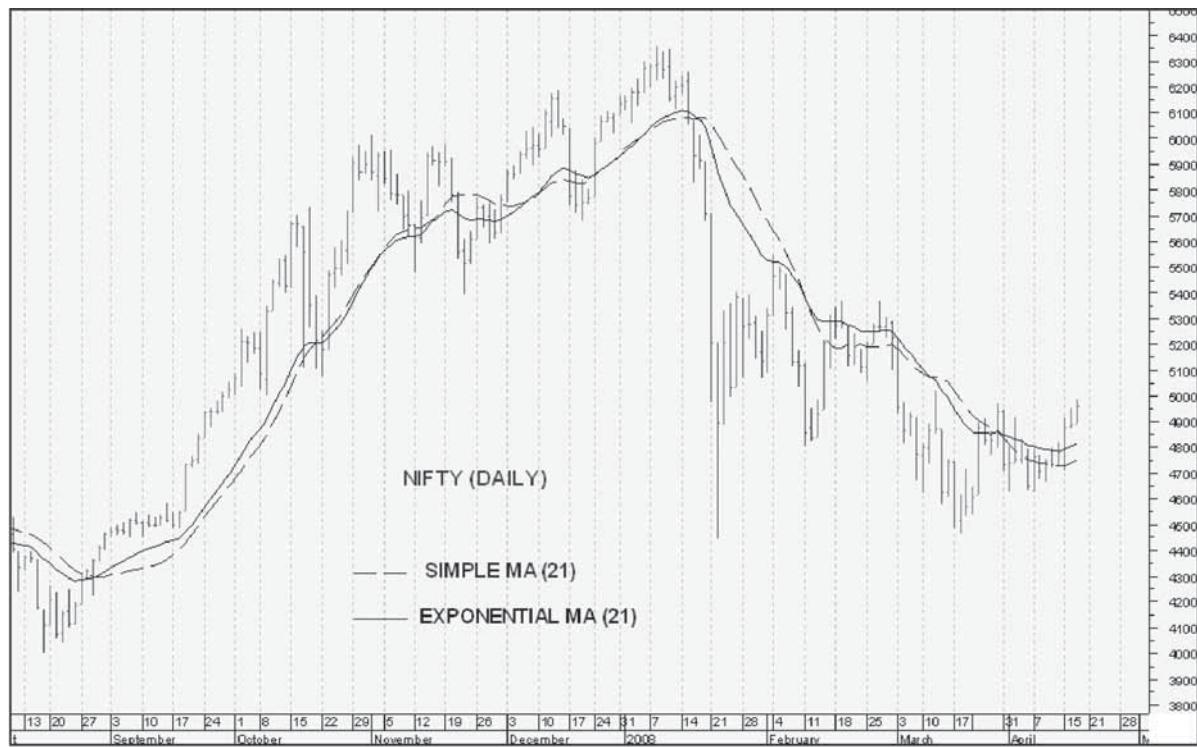
This means that a 10-period EMA is equivalent to an 18.18% EMA.

The 10-period simple moving average is used for the first calculation only. After that the previous period's EMA is used.

Note that, in exponential moving average, every previous closing price in the data set is used in the calculation. The impact of the older data never disappears though it diminishes over a period of time. This is true regardless of the EMA's specified period. The effects of older data diminish rapidly for shorter EMA's than for longer ones but, again, they never completely disappear.

Simple versus exponential

Generally you will find very little difference between an exponential moving average and a simple moving average. Consider this example which uses only 21 trading days, the difference is minimal but a difference nonetheless. The exponential moving average is consistently closer to the actual price. On average, the EMA is 3/8 of a point closer to the actual price than the SMA.



4.1.6 Which is better?

A question about moving averages that seems to weigh heavily on traders' minds is whether to use the "simple" or "exponential" moving average. Regardless of the type you choose, the basic principle is that if there is more buying pressure than selling pressure, prices will move above the average and the market will be in an uptrend. On the other hand heavy selling pressure will make the prices drop below the moving average, indicating a downtrend.

The choice of moving average depends on various factors like your trading frequency, investing style and the stock which has been traded by you. The simple moving average obviously has a lag, but the exponential moving average may be prone to quicker breaks. Some traders prefer to use exponential moving averages for shorter time periods to capture changes quicker. Some investors prefer simple moving averages over long time periods to identify long-term trend changes. In addition, much will depend on the individual security in question. A 50-day SMA might work great for identifying support levels in INFOSYS but a 100-day EMA may work better for the ACC. Moving average type and length of time will depend greatly on the individual security and how it has reacted in the past.

The dilemma of an investor whether to select exponential moving average or simple moving average can be solved only by obtaining an optimum trade off between sensitivity and reliability. The more sensitive an indicator is the more signals that will be given. Although these signals may prove timely, but they are highly sensitive and may generate false signals. The less

sensitive an indicator is the fewer signals that will be given by it. However, less sensitivity leads to fewer and more reliable signals. Sometimes these signals can be late as well.

Shorter moving averages are very sensitive and generate more signals. The EMA, which is generally more sensitive than the SMA, will also be likely to generate more signals. But along with it numbers of false signals are also high. Longer moving averages will move slower and generate fewer signals. These signals will likely prove more reliable, but they also may come late. Thus it requires every investor to experiment on different moving averages –lengths and their types to examine the trade-off between sensitivity and signal reliability.

4.2 Trend-following indicator

Moving averages are used to determine the direction of trend and are basis of many trend-following systems. Moving averages smooth out a data series and make it easier to identify the direction of the trend. Instead of predicting a change in trend, moving averages follow behind the current trend because past price data is used to form moving averages, they are considered lagging or trend following. Therefore, you can use moving averages for trend identification and trend following purposes, not for prediction.

4.2.1 When to use?

Because moving average is a trend following indicator, you should use it when a security is trending. Application of moving averages would be ineffective when a security moves in a trading range. With this in mind, investors and traders should first identify securities that display some trending characteristics before attempting to analyze with moving averages. With a simple visual assessment of the price chart you can determine if a security exhibits characteristics of trend.

Using price chart you can analyse whether a stock is trending up, trending down or trading in a range. When a security forms a series of higher highs and higher lows it is said to be in uptrend. A downtrend is established when a security forms a series of lower lows and lower highs. A trading range is established if a security cannot establish an uptrend or downtrend. If a security is in a trading range, an uptrend is started when the upper boundary of the range is broken and a downtrend begins when the lower boundary is broken.

It is sometimes difficult to determine when a trend will stop and a trading range will begin or when a trading range will stop and a trend will begin. The basic rules for trends and trading ranges laid out above can be applied.

4.2.2 Moving average settings

Once the security exhibiting the above characteristics is selected the next task is to select the number of moving average periods and type of moving average. The number of periods in

a moving average will depend upon the security's volatility, trend and personal preferences. Shorter length moving averages are more sensitive and identify new trends earlier, but also give more false alarms. Longer moving averages are more reliable but less responsive, only picking up the big trends. There is no predetermined or fixed length of moving averages, but some of the more popular lengths include 21, 50, 89, 150 and 200 days as well as 10, 30 and 40 weeks. Short-term traders may look for evidence of 2-3 week trends with a 21-day moving average, while longer-term investors may look for evidence of 3-4 month trends with a 40-week moving average. You should examine how the moving average fits with the price data. If there are too many breaks, lengthen the moving average to decrease its sensitivity. If the moving average is slow to react, shorten the moving average to increase its sensitivity. In addition, you may want to try using both simple and exponential moving averages. Exponential moving averages are usually best for short-term situations that require a responsive moving average. Simple moving averages work well for longer-term situations that do not require a lot of sensitivity.

4.2.3 *Uses of moving averages*

There are many uses for moving averages, but three basic uses stand out:

- Trend identification/confirmation
- Support and resistance level identification/confirmation
- Trading systems

Trend identification/ Confirmation

Moving averages are helpful in keeping you in line with the price trend by providing buy signals shortly after the market bottoms out and sell signals shortly after it tops, rather than trying to catch the exact bottom or top.

There are three ways to identify the trend with moving averages: direction, location and crossovers.

The first trend identification technique uses the direction of the moving average to determine the trend. The trend is considered up when moving average is continuously rising. If the moving average is declining, the trend is considered down. The direction of a moving average can be determined simply by looking at a plot of the moving average or by applying an indicator to the moving average. In either case, we would not want to act on every subtle change, but rather look at general directional movement and changes.

The second technique for trend identification is price location. The basic trend can be determined through location of the price relative to the moving average. If the price is located below the

moving average then there is a downward trend in place and visa versa for the price being located above the moving average.

The third technique for trend identification is the location of the shorter moving average relative to the longer moving average. The trend will go up if the shorter moving average is above the longer moving average. If the shorter moving average is below the longer moving average, the trend is considered down.

Moving averages - key points

The Moving Average (MA) is the simplest and most widely used technical analysis tool. The MA attempts to tone down the fluctuations of market prices to a smoothed trend, so that distortions are reduced to a minimum. MAs help in tracking trends and signaling reversals. The most important merit of moving average system is that you will always be on "right" side of the market.

Interpretation

Signals to buy or sell are generated when the price crosses the MA or when one MA crosses another, in the case of multiple MAs. Buy when prices move above the moving average line on the chart and sell when prices drop below the moving average line

Another method used by technical analysts is using the two moving averages on the same chart with different time periods. Since the MA is a lagging indicator, a crossover will usually signal a trend reversal well after a new trend has begun and is used largely for confirmation. Generally speaking, the longer the time span covered by an MA, the greater the significance of a crossover signal. For example, the crossover of a 100 or 200-day MA is significantly more important than the crossover of a 20-day MA.

Moving averages differ according to the weight assigned to the most recent data. Simple moving averages apply equal weight to all prices. More weight is applied to recent prices in the case of exponential and weighted averages. Variable moving averages change the weighting based on the volatility of prices.

When prices fluctuate up and down in a broad sideways pattern for an extended period (trading-range market), longer term MAs are slow to react to reversals in trend, and when prices move sideways in a narrow range shorter term MAs often produce false signals. Flat and conflicting MAs generally indicate a trading-range market and one to avoid, unless there is pronounced rounding that suggests a possible new trend.

Type of MA	Description	Methods Used
Simple (This is the most commonly used MA)	Use of multiple MAs can provide good signals Useful periods <ul style="list-style-type: none"> • Short term 10-30 day • Mid term 30-100-day • Long term 100-200+day There is no perfect time span	<ul style="list-style-type: none"> • Crossover of short term through long term • Convergence/ Divergence • Crossover of MA by price
Linearly Weighted	With this MA, data is weighted in favour of most recent observations. Has the ability to turn or reverse more quickly than simple MA.	Warning of trend reversal given by change in direction of the average rather than crossover.
Exponential (EMA)	An exponential (or exponentially weighted) moving average is calculated by applying a percentage of today's closing price to yesterday's moving average value. Exponential moving averages place more weight on recent prices.	<ul style="list-style-type: none"> • Crossover of short term through long term • Convergence/ Divergence • Crossover of MA by price
Variable	An automatically adjusting exponential moving average based on the volatility of the data.	The more volatile the data, the greater the weight given to the current data and the more smoothing used in the moving average calculation.

A variable moving average is an exponential moving average that automatically adjusts the smoothing percentage based on the volatility of the data series. Such moving average compensates for trading-range versus trending markets. This MA automatically adjusts the smoothing constant to adjust its sensitivity, often allowing it to outperform the other moving averages in these difficult markets.

Because of the potential for false signals MAs should always be used in conjunction with the other indicators. For example Bollinger bands adjust in distance from a moving average based on volatility, using standard deviation above and below the moving average rather than percentages.

Indicators which are especially well-suited for being used with moving averages include MACD, Price ROC, Momentum, and Stochastic. A moving average of another moving average is also common.

4.2.4 Signals - moving average price crossover

A price break upwards through an MA is generally a buy signal, and a price break downwards through an MA is generally a sell signal. As we have seen, the longer the time span or period covered by an MA, the greater the significance of a crossover signal.

If the MA is flat or has already changed direction, its violation is fairly conclusive proof that the previous trend has reversed.

False signals can be avoided by using a filtering mechanism. Many traders, for example, recommend waiting for one period - that is one day for daily data and one week for weekly data.

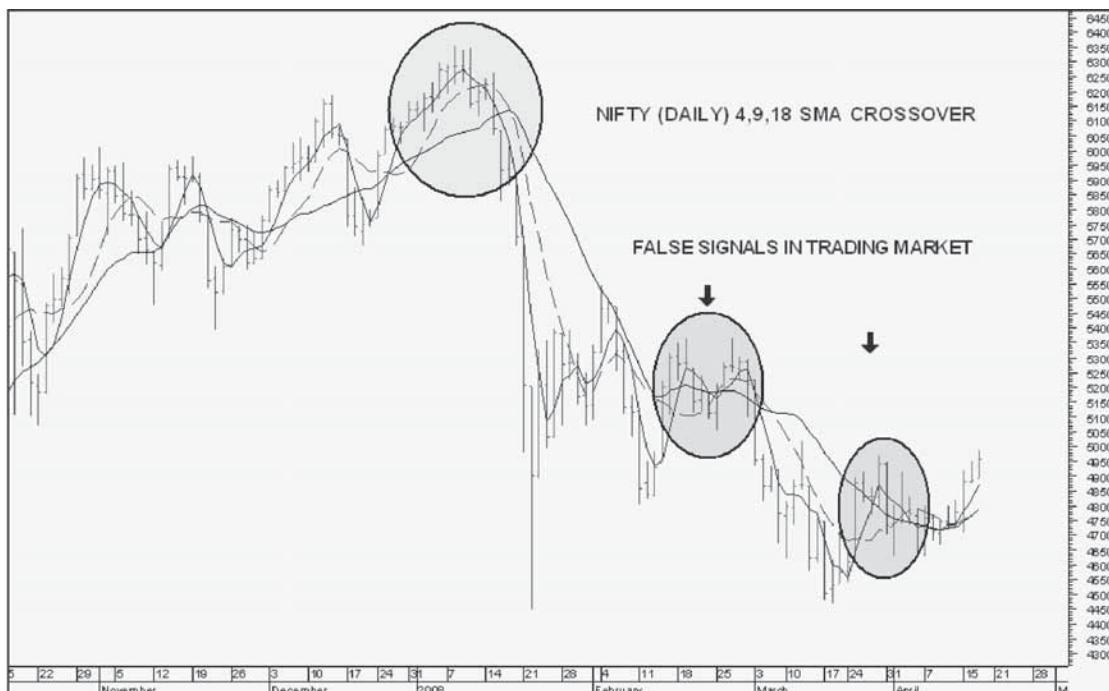
Whenever possible try to use a combination of signals. MA crossovers that take place at the same time as trend line violations or price pattern signals often provide strong confirmation.

4.2.5 Signals - multiple moving averages

It is usually advantageous to employ more than one moving average. Double and triple MAs often provide useful signals.

With two MAs the double crossover is used. When the short term moving average crosses the long term moving average to the downside, then a sell signal would be triggered and visa versa. For example, two popular combinations are the 5 and 20-day averages and the 20 and 100-day averages. The technique of using two averages together lags the market a bit more than a single moving average but produces fewer whipsaws.

Many investors use the triple moving average crossover system to buy and sell stock. The most widely used triple crossover system is the popular 4-9-18-day MA combination. A buy signal is generated when the shortest (and most sensitive) average - the 4 day - crosses first the 9-day and then the 18-day averages, each crossover confirming the change in trend.



Additional points

- The 200-day MA (or 40-week MA), should be carefully watched as a pivotal level of support or resistance for the long-term trend. Many people watch carefully when the

200-day MA is approached by the price. The relationship between the price and its 200-day MA can often provide excellent buy or sell signals.

- The 200-day MA is also particularly significant for the various indexes, such as the Nifty, Sensex or NASDAQ. A crossover of this MA has often signaled a correction or period of consolidation.
- Moving averages can also be calculated and plotted for other indicators, not just the price. A continued upward movement by the indicator is signified by the indicator rising above its moving average. A continued downward movement is signified by the indicator falling below its moving average.

4.3 Oscillators

4.3.1 Relative Strength Index (RSI)

The RSI is part of a class of indicators called **momentum oscillators**.

There are a number of indicators that fall in this category, the most common being Relative Strength Index, Stochastic, Rate of Change, Williams %R. Although these indicators are all calculated differently, there are a number of common elements to their use which shall be discussed in the context of the RSI.

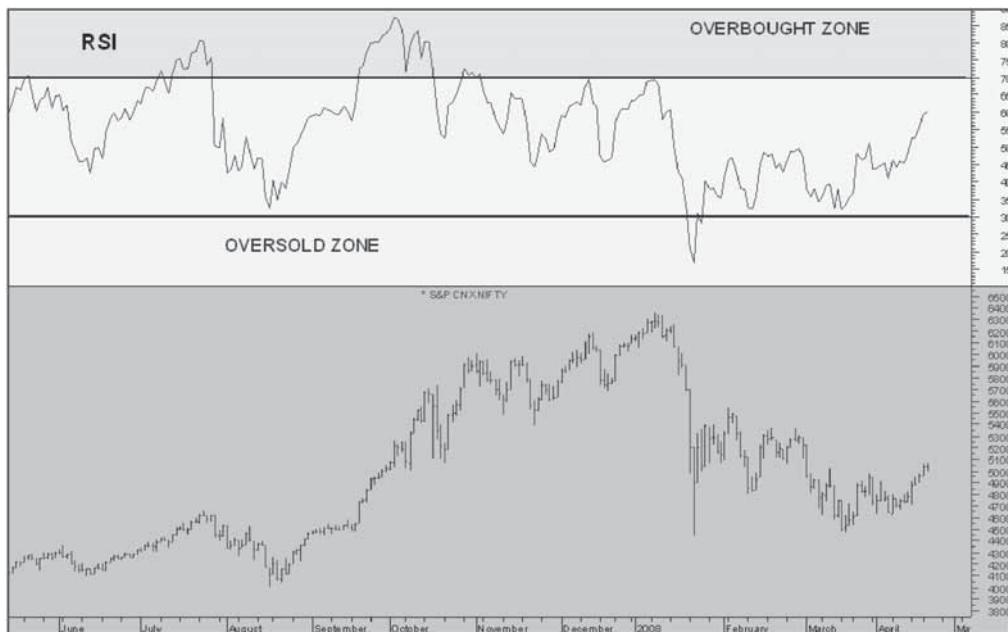
4.3.1.1 What is momentum?

Momentum is simply the rate of change – the speed or slope at which a stock or commodity ascends or declines. Measuring speed is a useful gage of impending change. For example, assume that you were riding in a friends' car, not looking at what was happening ahead but instead just at the speedometer. You can see when the car starts to slow down and if it continues to do so you can reasonably assume it's going to stop very shortly. You may not know the reason for it coming to a stop...it could be the end of the journey, approaching an intersection or because the road is a little rougher ahead. In this manner watching the speed provides a guide for what may happen in the future.

An oscillator is an indicator that moves back and forth across a reference line or between prescribed upper and lower limits. When an oscillator reaches a new high, it shows that an uptrend is gaining speed and is likely to continue. When an oscillator traces a lower peak, it means that the trend has stopped accelerating and a reversal can be expected from there, much like a car slowing down to make a U-Turn.

In the same way watching a stock for impending momentum change can provide a glimpse of what may happen in the future – momentum oscillators, such as RSI are referred to as trend leading indicators.

The chart below illustrates the typical construction of the RSI which oscillates between 0% and 100%. You will notice there is a pair of horizontal reference lines: 70% 'overbought' and 30% 'oversold' lines. The overbought region refers to the case where the RSI oscillator has moved into a region of significant buying pressure relative to the recent past and is often an indication that an upward trend is about to end. Similarly the oversold region refers to the lower part of the momentum oscillator where there is a significant amount of selling pressure relative to the recent past and is indicative of an end to a down swing.



Nifty Chart with RSI

4.3.1.2 Application of RSI

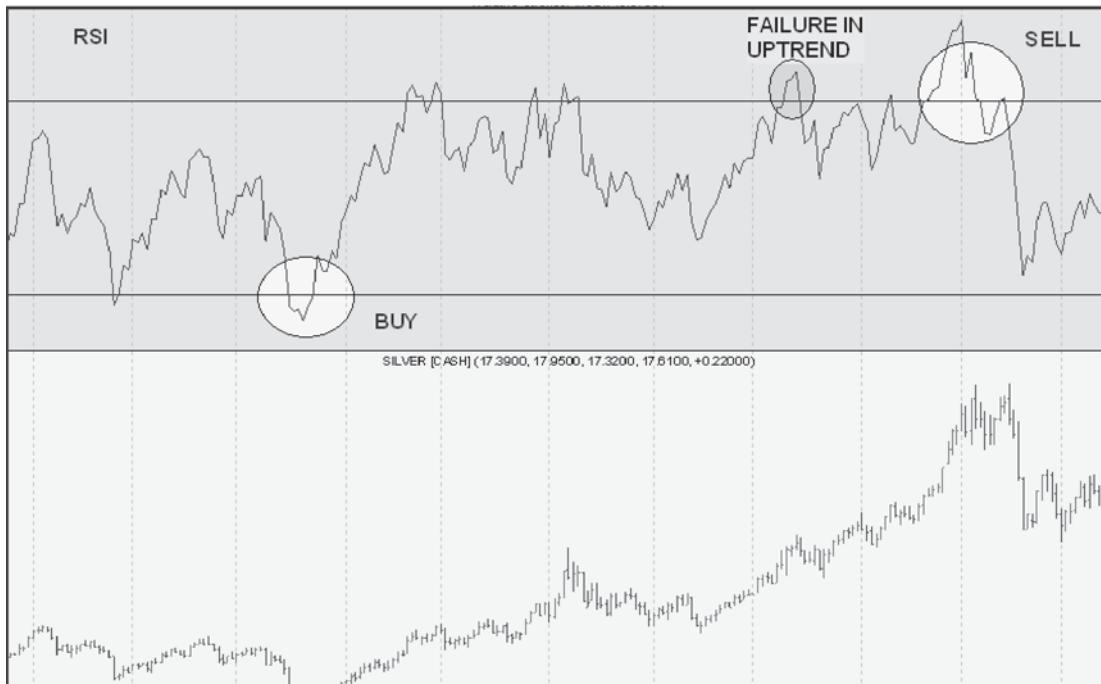
RSI is a momentum oscillator generally used in sideways or ranging markets where the price moves between support and resistance levels. It is one of the most useful technical tool employed by many traders to measure the velocity of directional price movement.

4.3.1.3 Overbought and Oversold

The RSI is a price-following oscillator that ranges between 0 and 100. Generally, technical analysts use 30% oversold and 70% overbought lines to generate the buy and sell signals.

- Go long when the indicator moves from below to above the oversold line.
- Go short when the indicator moves from above to below the overbought line.

Note here that the direction of crossing is important; the indicator needs to first go past the overbought/oversold lines and then cross back through them.



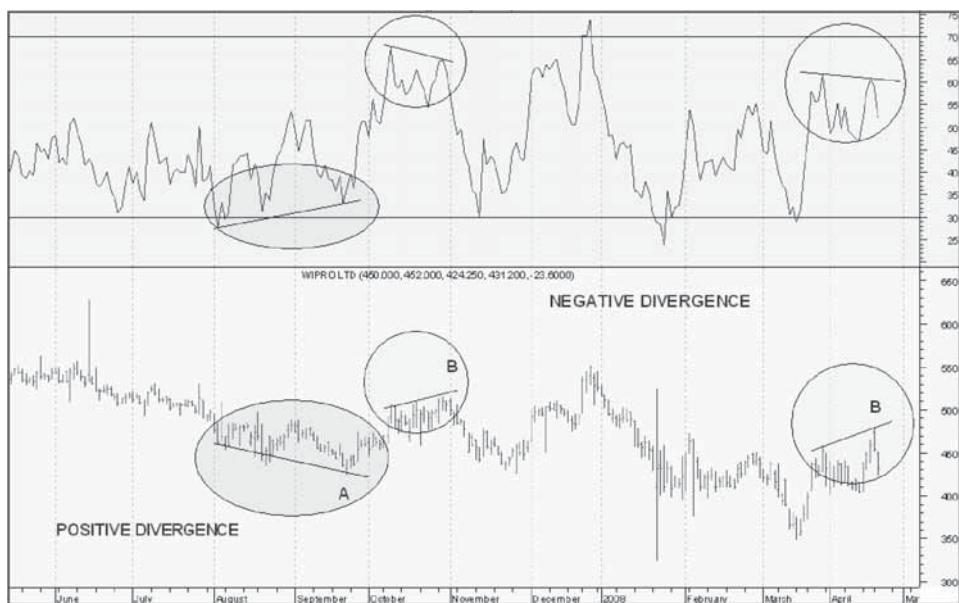
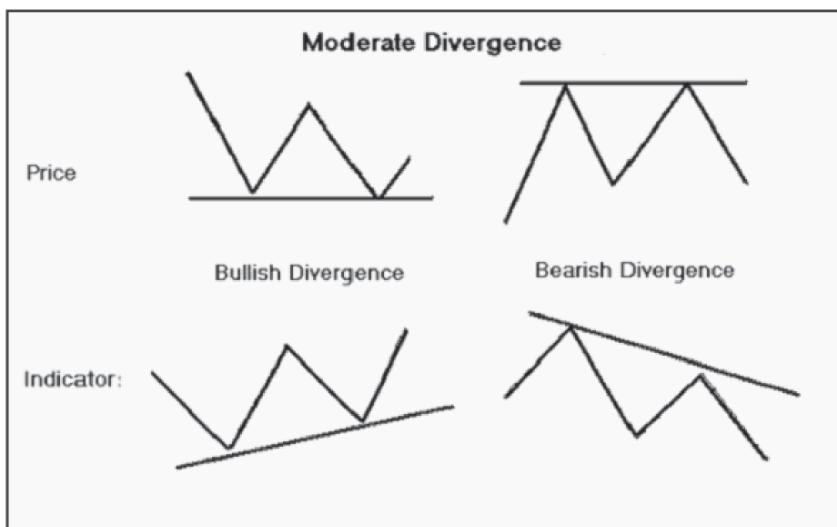
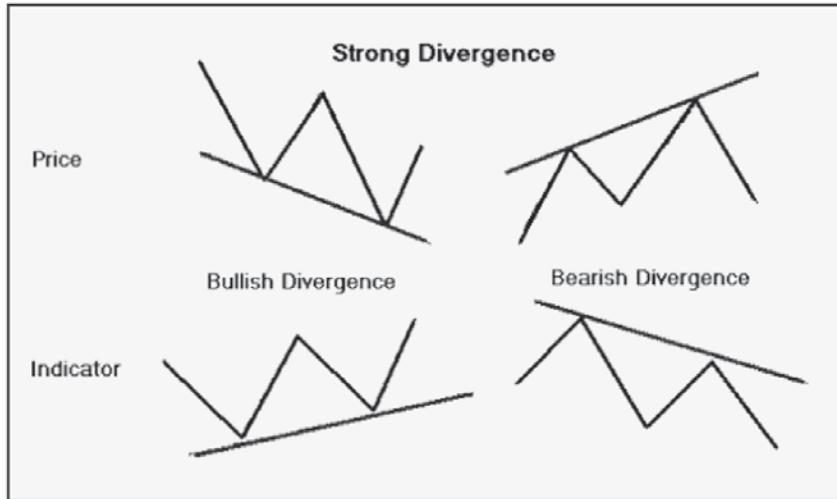
Silver Chart showing buy and sell points and also the failure in trending market

4.3.1.4 Divergence

The other means of using RSI is to look at divergences between price peaks/troughs and indicator peaks/ troughs.

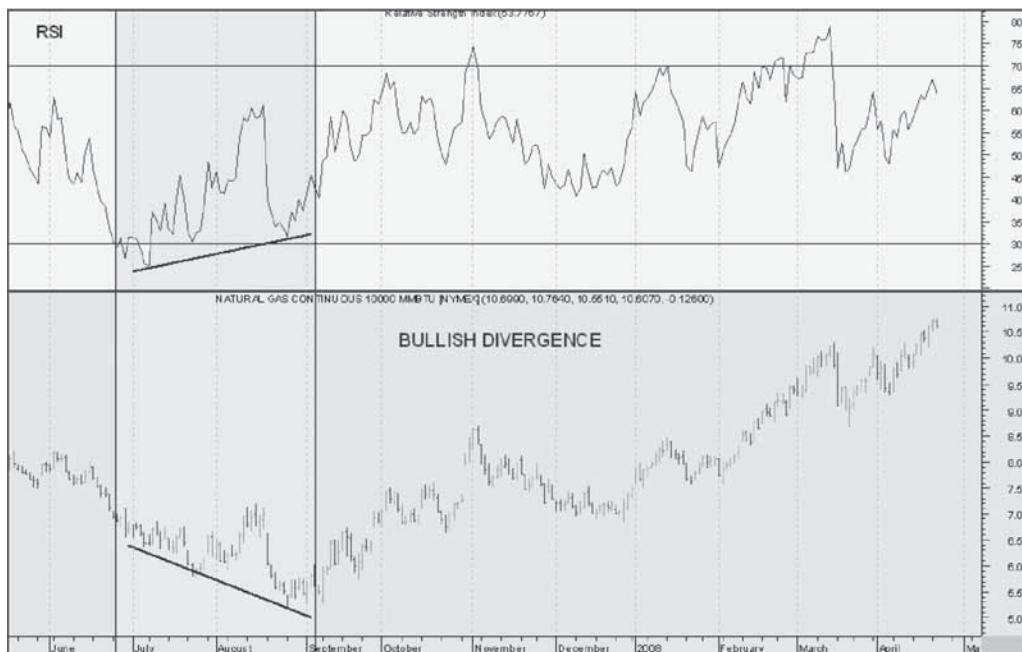
If the price makes a new higher peak but the momentum does not make a corresponding higher peak this indicates there is less power driving the new price high. Since there is less power or support for the new higher price a reversal could be expected.

Similarly if the price makes a new lower trough but the momentum indicator does not make a corresponding lower trough, then it can be surmised that the downward movement is running out of strength and a reversal upward could soon be expected. This is illustrated in the chart below. A bullish divergence represents upward price pressure and a bearish divergence represents downward price pressure.



Wipro Chart showing Negative and Positive Divergence

- The first divergence shows a new lower trough forming at point 'A' but the RSI oscillator does not reach a new lower trough. This indicates the downward movement is exhausting and an upward move is imminent.
- The second and third are a bearish divergence with a new sharply higher peak formed at 'B' but it is not supported by at least an equal high in the RSI, hence a downward move is expected.



Natural Gas Chart showing Strong Bullish Divergence

4.3.1.5 Stochastic

The Stochastic indicator was developed by George Lane. It compares where a security's price closes over a selected number of period. The most commonly 14 periods stochastic is used.

The Stochastic indicator is designated by "%K" which is just a mathematical representation of a ratio.

$$\%K = \frac{(\text{today's Close}) - (\text{Lowest low over a selected period})}{(\text{Highest over a selected period}) - (\text{Lowest low over a selected period})}$$

For example, if today's close is 50 and high and low over last 14 days is 40 and 55 respectively then,

$$\%K = \frac{50-40}{55-40} = 0.666$$

Finally these values are multiplied by 100 to change decimal value into percentage for better scaling.

This 0.666 signifies that today's close was at 66.6% level relative to its trading range over last 14 days.

A moving average of %K is then calculated which is designated by %D. The most commonly 3 period's %D is used.

The stochastic indicator always moves between zero and hundred, hence it is also known as stochastic oscillator. The value of stochastic oscillator near to zero signifies that today's close is near to lowest price security traded over a selected period and similarly value of stochastic oscillator near to hundred signifies that today's close is near to highest price security traded over a selected period.

Interpretation of Stochastic Indicator

Most popularly stochastic indicator is used in three ways

a. To define overbought and oversold zone- Generally stochastic oscillator reading above 80 is considered overbought and stochastic oscillator reading below 20 is considered oversold.

It basically suggests that

- One should book profit in buy side positions and should avoid new buy side positions in an overbought zone.
- One should book profit in sell side positions and should avoid new sell side positions in an oversold zone

This would be clearer from figure

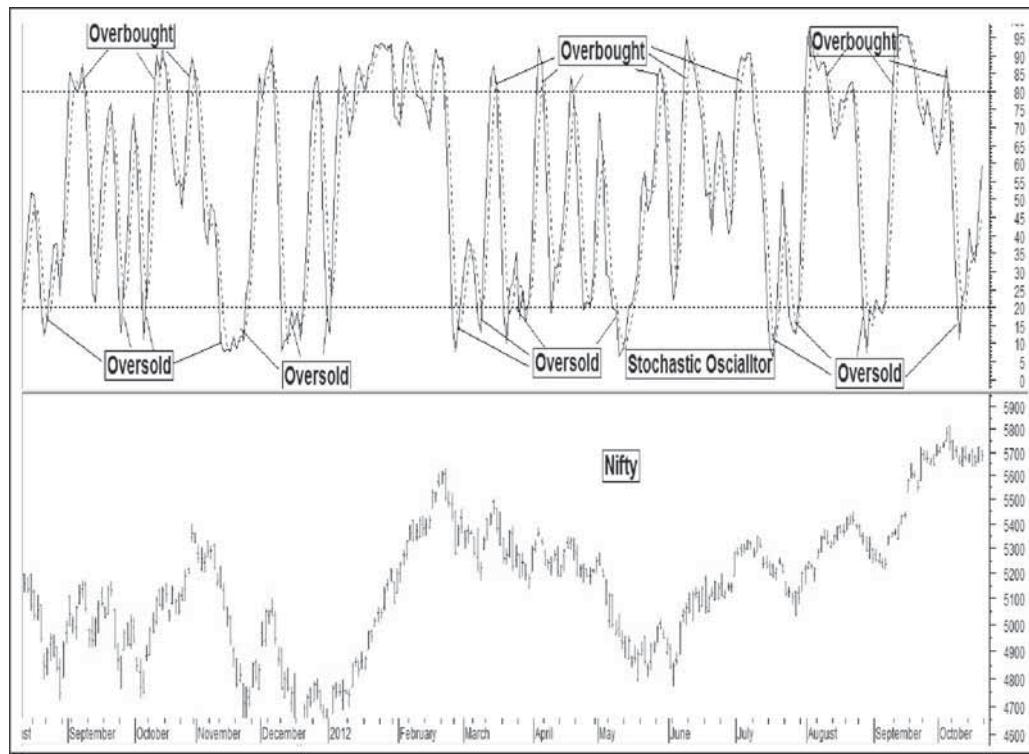


Figure illustrates overbought and oversold zones for spot Nifty. It is clearly visible that in most of the cases prices have corrected from overbought zone and similarly prices have rallied from oversold zone.

- b. Buy when %K line crosses %D line(dotted line) to the upside in oversold zone and sell when %K line crosses %D line(dotted line) to the downside in overbought zone-**

This would be clearer from figure below

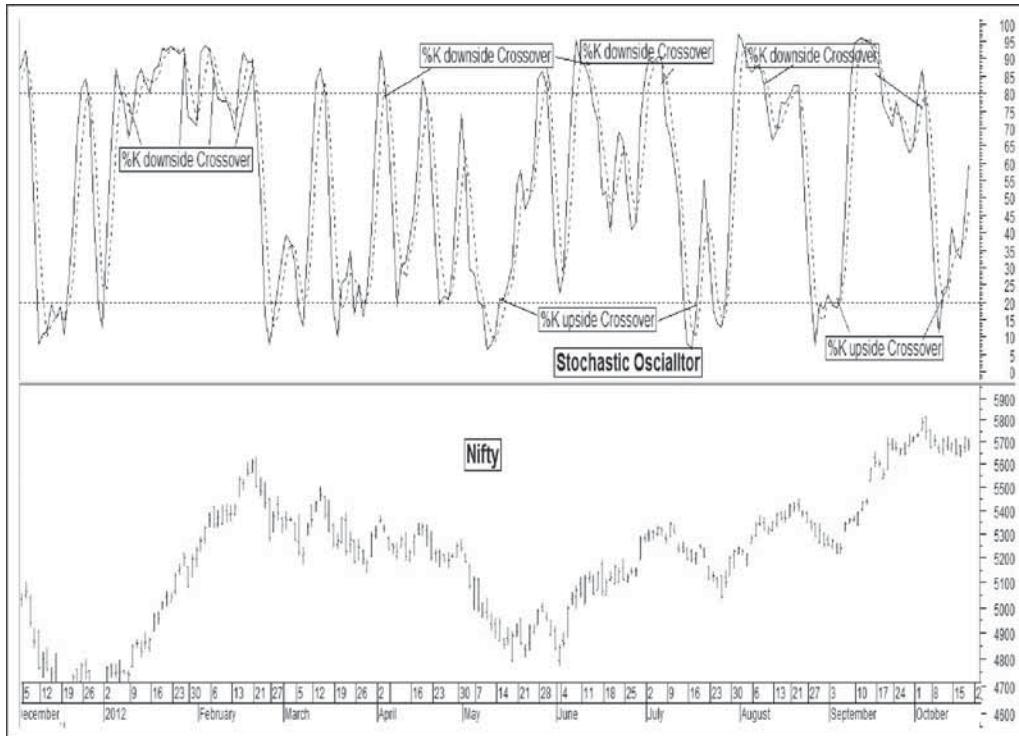


Figure illustrates buying signals being generated by %K upside crossover in an oversold zone and selling signals being generated by %K downside crossover in an overbought zone on a Nifty spot price chart.

- c. Look for Divergences- Divergences are of two types i.e. positive and negative.**

Positive Divergence-are formed when price makes new low, but stochastic oscillator fails to make new low. This divergence suggests a reversal of trend from down to up. This would be clearer from figure below.

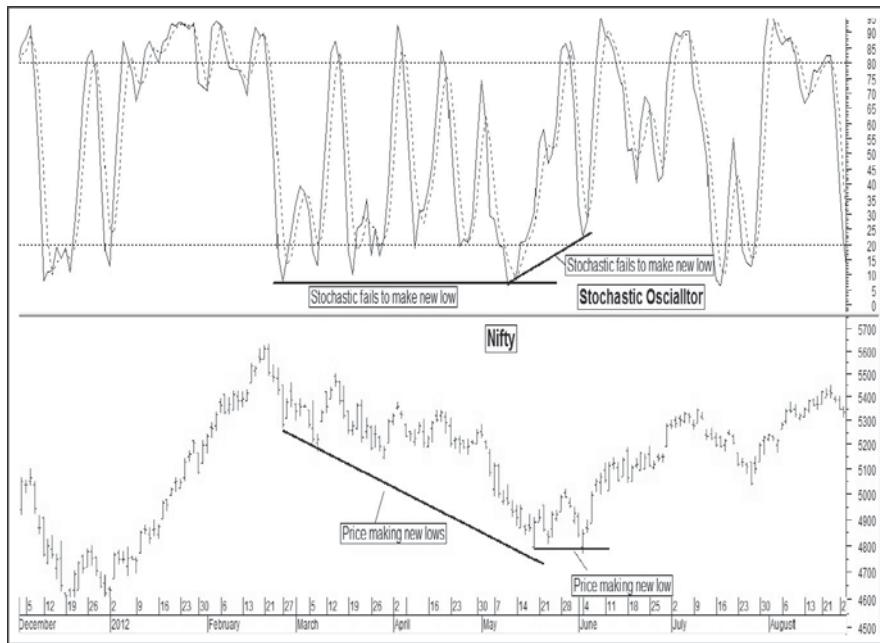


Figure illustrates Nifty spot making new lows whereas stochastic oscillator fails to make new low, finally Nifty trend reversed from down to up.

Negative Divergence-are formed when price makes new high, but stochastic oscillator fails to make new high. This divergence suggests a reversal of trend from up to down. This would be clearer from figure below.

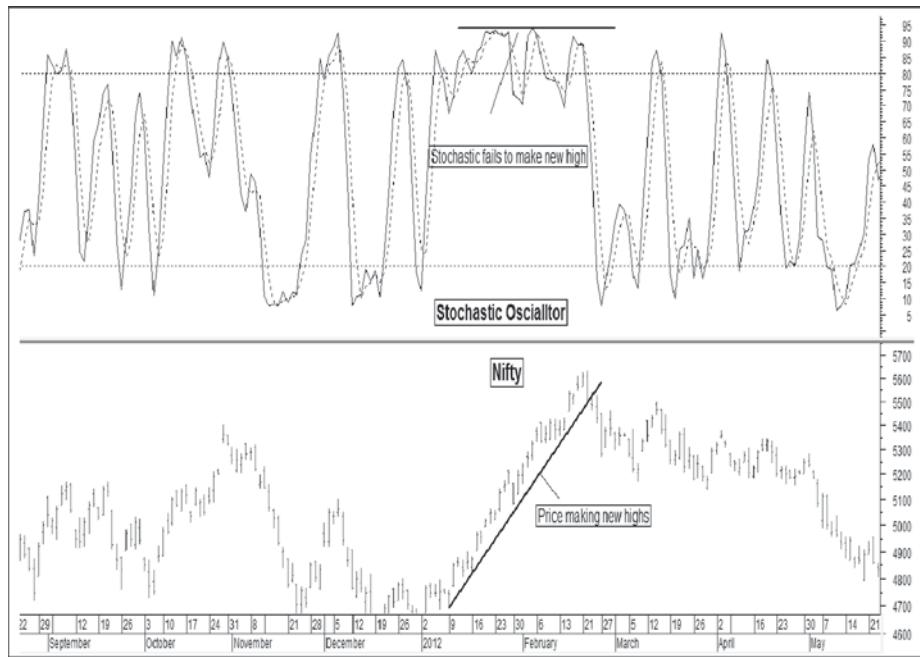


Figure illustrates Nifty spot making new highs whereas stochastic oscillator fails to make new high, finally Nifty trend reversed from up to down.

4.3.1.6 William %R

The William %R indicator was developed by Larry Williams. This is almost similar to stochastic oscillator except for a negative scale. The William %R indicator always moves between zero and minus hundred (-100)

Interpretation of William %R Indicator

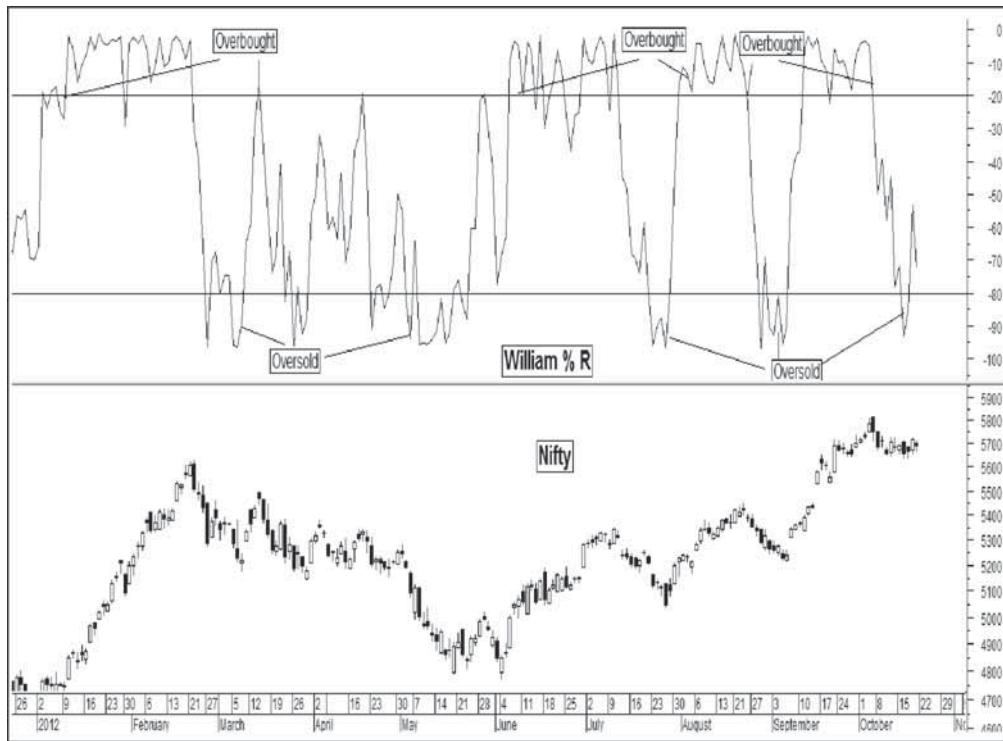
Most popularly stochastic indicator is used in two ways

a. To define overbought and oversold zone- Generally William % R reading between 0 and -20 are considered overbought and William % R reading between -80 to -100 are considered oversold. It basically suggests that

- One should book profit in buy side positions and should avoid new buy side positions in an overbought zone.
- One should book profit in sell side positions and should avoid new sell side positions in an oversold zone

This would be clearer from figure 138 below.

Figure illustrates overbought and oversold zones for spot Nifty. It is clearly visible that in most of the cases prices have corrected from overbought zone and similarly prices have rallied from oversold zone.



b. Look for Divergences- Divergences are of two types i.e. positive and negative.

Positive Divergence-are formed when price makes new low, but William % R fails to make new low. This divergence suggests a reversal of trend from down to up. This would be clearer from figure below.

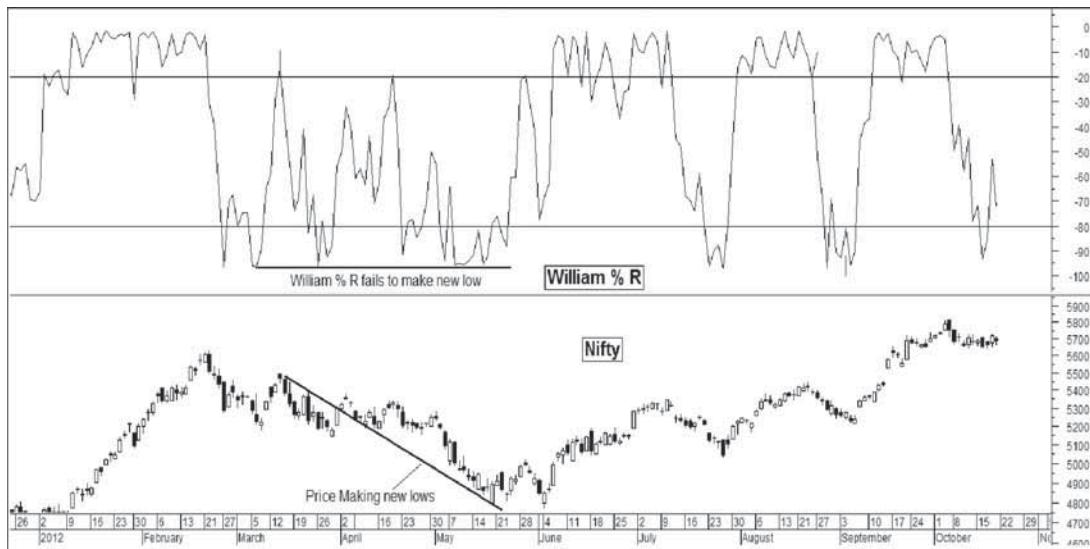


Figure illustrates Nifty spot making new lows whereas William % R fails to make new low, finally Nifty trend reversed from down to up.

Negative Divergence-are formed when price makes new high, but William % R fails to make new high. This divergence suggests a reversal of trend from up to down. This would be clearer from figure below.

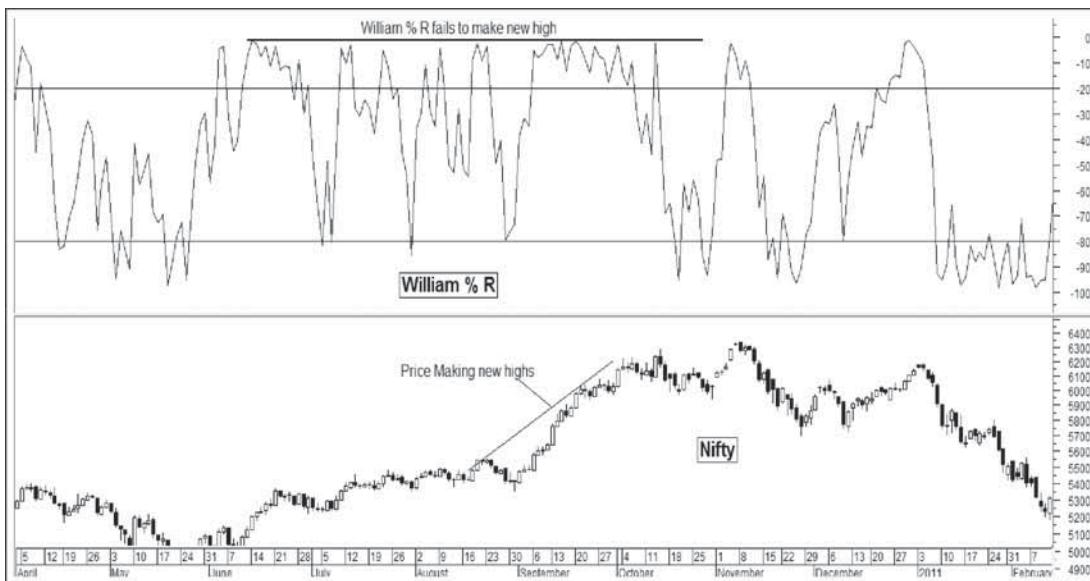


Figure illustrates Nifty spot making new highs whereas William % R fails to make new high, finally Nifty trend reversed from up to down.

To Summarize

The RSI belongs to a class of indicators called trend leading indicators. These are usually used in ranging markets and are not suitable for trending markets. We have discussed the basic concept of momentum, being a measure of speed of price movement. The RSI has oversold and overbought lines or zones at a predefined level. For the RSI, oversold and overbought levels are defined by lines that pass through the significant peaks and troughs of the indicator.

There are two basic methods of using these oscillators in ranging markets; using the overbought/oversold regions and divergence between the price and oscillator.

When the indicator first moves into the overbought zone and then crosses back through the overbought line this is a signal to go short. Similarly when the indicator moves into the oversold region and then crosses back across the oversold line this is a signal to go long.

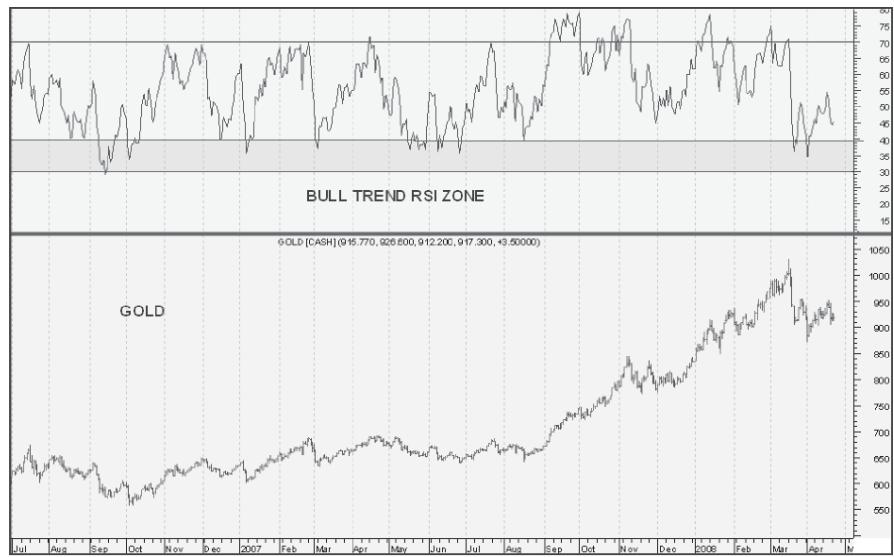
There are two main types of divergence, a strong and moderate divergence. A strong divergence occurs when the price makes a new higher peak but the momentum indicator makes a corresponding lower peak indicating a loss of momentum in the current up trend. When this occurs it is a signal to go short. Lower price troughs and higher momentum troughs indicate a bullish move and is a signal to go long.

4.3.1.7 Real-life Problems in use of RSI

- RSI in overbought levels does not always signify an overbought Market.
- RSI in oversold levels does not always signify an oversold Market.
- The RSI can remain in overbought / oversold zones for long periods of time.
- A bullish divergence may not always lead to a rally
- A bearish divergence may not always lead to a decline.

4.3.1.8 Advanced Concepts

In Bull Markets the level is 70 and 40.



Gold Chart in Uptrend showing RSI Oversold levels below 40

IN Bear Markets the level is 60 and 30.



Infosys in Downtrend showing Overbought level above 60

RSI moves into overbought and oversold zones

- Overbought and oversold levels cannot be used to buy and sell under all circumstances. When the RSI goes above 70, we say that it is overbought. This leads to the erroneous conclusion that we should be selling the security. IF the RSI goes below 30, we say that it is oversold. This leads to the erroneous conclusion that we should be buying the security.
- We should consider the upper and lower boundaries of 70 and 30 as 'extreme zones'. When the RSI moves inside an extreme zone, we receive an alert that the security may be ready for a buy or sell trade. But, the trade may or may not actually happen.

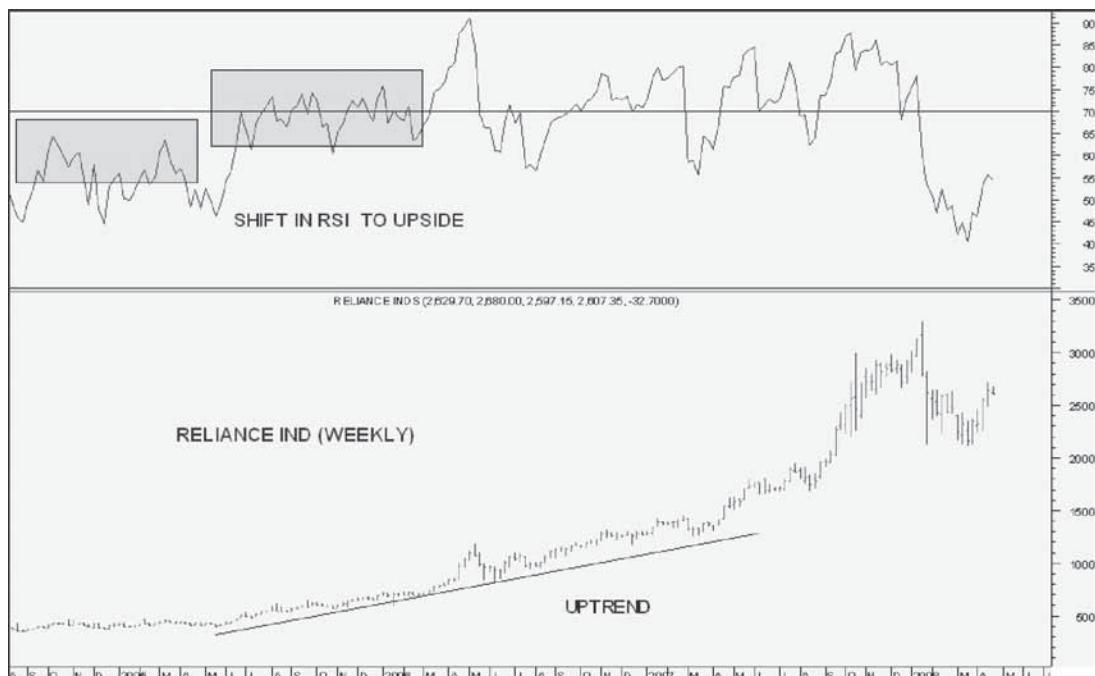
Low risk trades when RSI is in extreme zones

- The level of extreme zones changes in bull and bear markets. In general, in a bull market, the extreme zones are located at 70 and 40. In a bear market, the extreme zones are located at 60 and 30.
- A zone shift is an indication of a change in trend. When the RSI shifts zones, this is one of the first indications that a change in trend is taking place.
- In a bear market, the RSI moves up during periods of bear rallies. It usually finds resistance around 60. Now, in one such rally, the RSI crosses 60 and finds resistance around 70. A zone shift has taken place. This is one of the first signs that the market may be shifting from a bearish to bullish environment.

In a bear market, look for these signs

- The RSI moves up during periods of bear rallies. It usually finds resistance around 60. Now, in one such rally, the RSI crosses 60 and finds resistance around 70. A zone shift has taken place. This is one of the first signs that the market may be shifting from a bearish to bullish environment.
- The RSI falls and finds support between 20 to 30. During a decline, the RSI falls but finds support around 40. This may be a sign that the market is changing from bearish to bullish. This is also an example of zone shift.

Shift from Bear to Bull



Reliance Chart showing Upward Shift in RSI

In a bull market, look for these signs

- The RSI moves down during periods of declines decline. It usually finds support around 40. Now, in one such decline, the RSI crosses 40 and finds support around 30. A zone shift has taken place. This is one of the first signs that the market may be shifting from a bullish to bearish environment.
- The RSI rallies and finds resistance around 70. During a rally, the RSI rises but finds resistance around 60. This may be a sign that the market is changing from bullish to bearish. This is also an example of zone shift.

Shift from bull to bear

When a zone shift is detected, look for a signal to trade in the direction of the new trend. If possible, step down to a lower time frame to take the trade.

If a zone shift from Up to Down is detected on a daily chart, move to a 60-minute chart. Sell when the trend indicators on this 60 minute chart give a sell signal.

- Use the ADX to determine a strong trend. When the ADX is above 30 and rising, assume that a strong trend is in place. The direction of the trend, up or down should be available by simple chart examination. When the market is trending use the extreme levels to identify trades only in the direction of the trend.

IF the market is in an up trend, then a dip to 40 should be considered as an opportunity to buy. But a rally to 70 is NOT an opportunity to short sell.

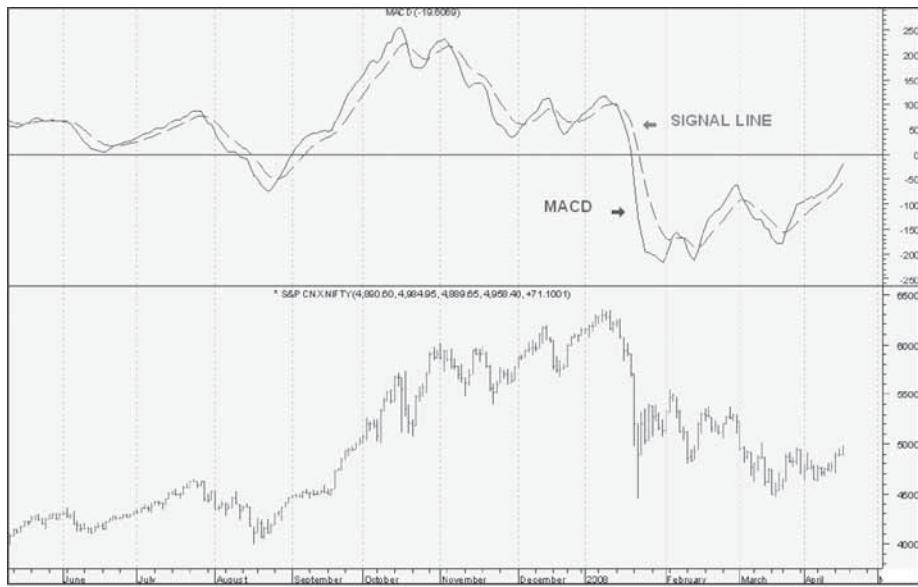
4.3.2 Moving Average Convergence/Divergence (MACD)

MACD stands for Moving Average Convergence / Divergence. It is a technical analysis indicator created by Gerald Appel in the late 1970s. The MACD indicator is basically a refinement of the two moving averages system and measures the distance between the two moving average lines.

4.3.2.1 What is the MACD and how is it calculated?

The MACD does not completely fall into either the trend-leading indicator or trend following indicator; it is in fact a hybrid with elements of both. The MACD comprises two lines, the fast line and the slow or signal line. These are easy to identify as the slow line will be the smoother of the two.

NIFTY chart below illustrates the basic MACD lines



The procedure for calculating the MACD lines is as follows:

Step1. Calculate a 12 period exponential moving average of the close price.

Step2. Calculate a 26 period exponential moving average of the close price.

Step3. Subtract the 26 period moving average from the 12 period moving average. This is the **fast MACD line**.

Step4. Calculate a 9 period exponential moving average of the fast MACD line calculated above. This is the **slow or signal MACD line**.

4.3.2.2 MACD benefits

The importance of MACD lies in the fact that it takes into account the aspects of both momentum and trend in one indicator. As a trend-following indicator, it will not be wrong for very long. The use of moving averages ensures that the indicator will eventually follow the movements of the underlying security. By using exponential moving averages, as opposed to simple moving averages, some of the lag has been taken out. As a momentum indicator, MACD has the ability to foreshadow moves in the underlying security. MACD divergences can be key factors in predicting a trend change. A negative divergence signals that bullish momentum is going to end and there could be a potential change in trend from bullish to bearish. This can serve as an alert for traders to take some profits in long positions, or for aggressive traders to consider initiating a short position.

MACD can be applied to daily, weekly or monthly charts. The MACD indicator is basically a refinement of the two moving averages system and measures the distance between the two moving average. The standard setting for MACD is the difference between the 12 and 26-period EMA. However, any combination of moving averages can be used. The set of moving

averages used in MACD can be tailored for each individual security. For weekly charts, a faster set of moving averages may be appropriate. For volatile stocks, slower moving averages may be needed to help smooth the data. No matter what the characteristics of the underlying security, each individual can set MACD to suit his or her own trading style, objectives and risk tolerance.

4.3.2.3 Use of MACD lines

MACD generates signals from three main sources:

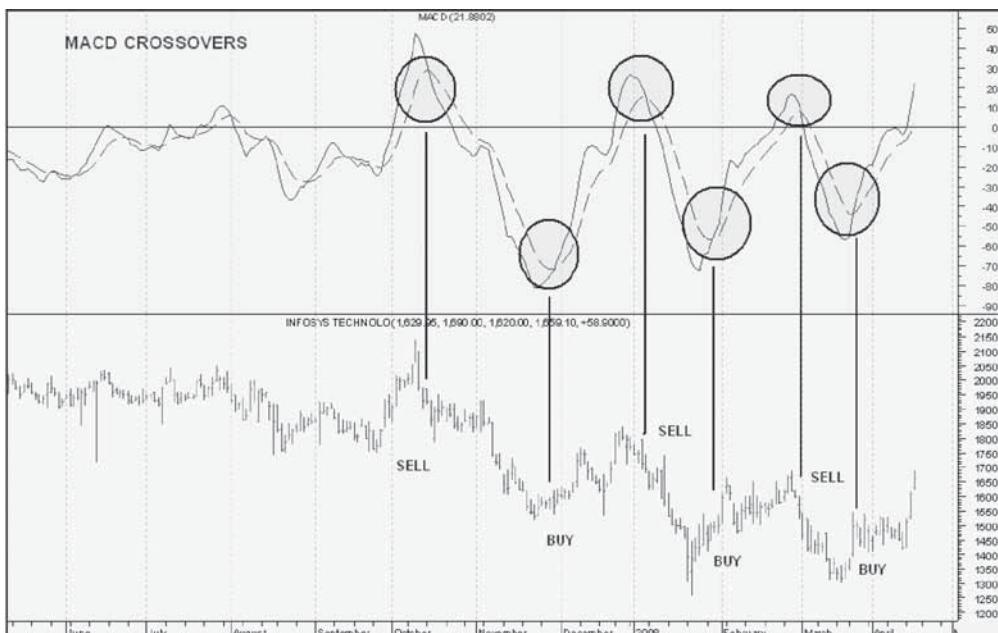
- Moving average crossover
- Centerline crossover
- Divergence

Crossover of fast and slow lines

The MACD proves most effective in wide-swinging trading markets. We will first consider the use of the two MACD lines. The signals to go long or short are provided by a crossing of the fast and slow lines. The basic MACD trading rules are as follows:

- Go **long** when the **fast** line crosses **above** the **slow** line.
- Go **short** when the **fast** line crosses **below** the **slow** line.

These signals are best when they occur some distance above or below the reference line. If the lines remain near the reference line for an extended period as usually occurs in a sideways market, then the signals should be ignored.

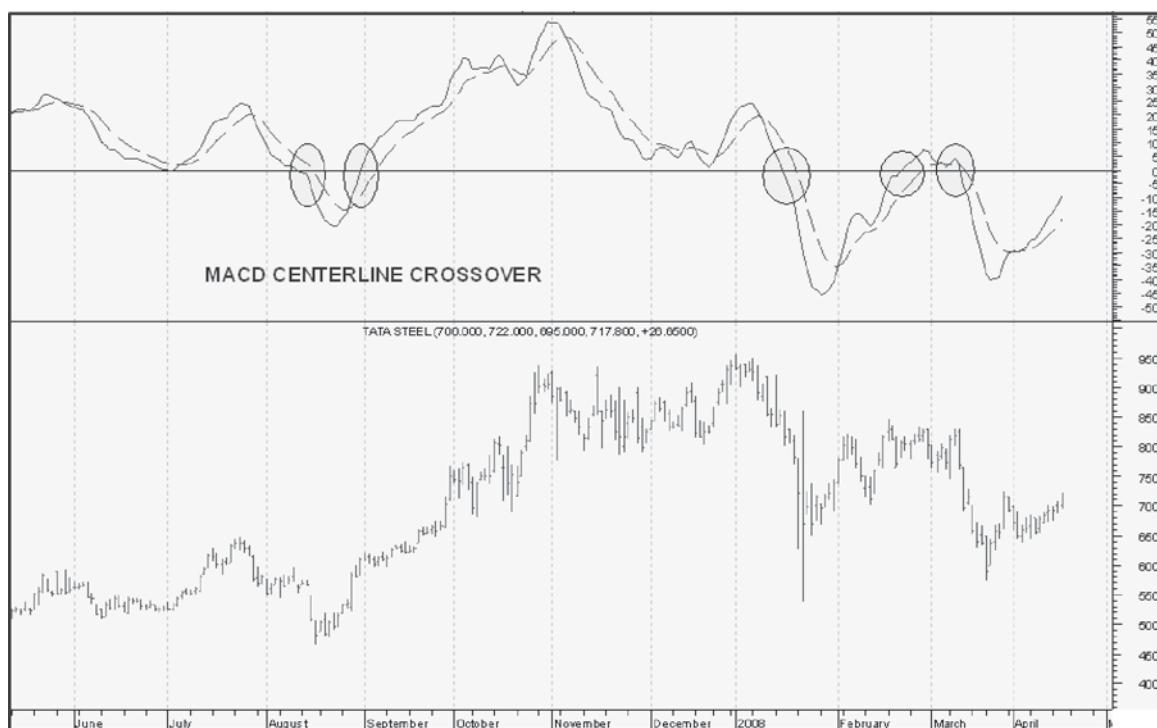


INFOSYS chart showing MACD crossovers

Center line crossover

A bullish centerline crossover occurs when MACD moves above the zero line and into positive territory. This is a clear indication that momentum has changed from negative to positive or from bearish to bullish. After a positive divergence and bullish moving average crossover, the centerline crossover can act as a confirmation signal. Of the three signals, moving average crossover are probably the second most common signals.

A bearish centerline crossover occurs when MACD moves below zero and into negative territory. This is a clear indication that momentum has changed from positive to negative or from bullish to bearish. The centerline crossover can act as an independent signal, or confirm a prior signal such as a moving average crossover or negative divergence. Once MACD crosses into negative territory, momentum, at least for the short term, has turned bearish.

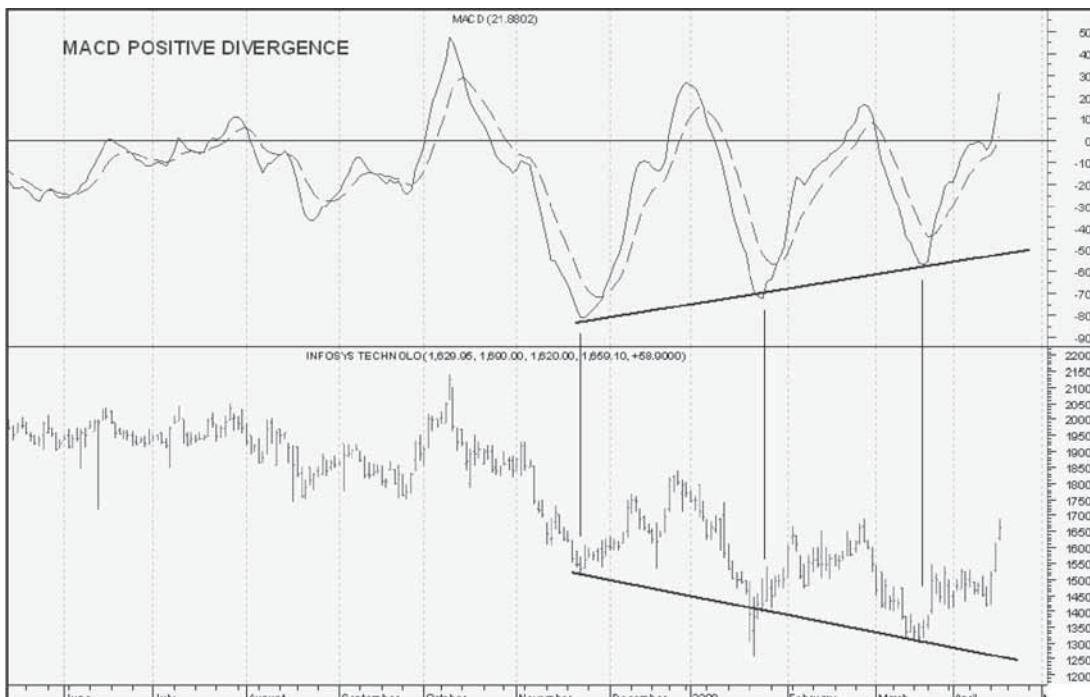


Tata Steel Chart showing Centerline crossover

Divergence

An indication that an end to the current trend may be near occurs when the MACD diverges from the security. A positive divergence occurs when MACD begins to advance and the security is still in a downtrend and makes a lower reaction low. MACD can either form as a series of higher lows or a second low that is higher than the previous low. Positive divergences are probably the least common of the three signals, but are usually the most reliable and lead to the biggest moves.

A negative divergence forms when the security advances or moves sideways and MACD declines. The negative divergence in MACD can take the form of either a lower high or a straight decline. Negative divergences are probably the least common of the three signals, but are usually the most reliable and can warn of an impending peak.



INFOSYS chart showing MACD Positive Divergence



NIFTY chart showing MACD Negative Divergence

To Summarize

- The MACD is a hybrid trend following and trend leading indicator.
- The MACD consists of two lines; a fast line and a slow 'signal' line.
- A long position is indicated by a cross of the fast line from below to above the slow line.
- A short position is indicated by a cross of the fast line from above to below the slow line.
- MACD should be avoided in trading markets
- The MACD is useful for determining the presence of divergences with the price data.

4.3.2.4 Money Flow Index

Money flow index takes into account volume action and on the basis of volume action; it attempts to measure the strength of money flowing in and out the security which now a days is also known as smart money flow indicator.

To understand calculation aspect of MFI, one should first understand positive money flow and negative money flow which is the basis of MFI. When day's average price is greater than previous day's average price, it's said to be positive money flow and similarly when day's average price is less than previous day's average price; it's said to be negative money flow. Money flow for a specific day is calculated by multiplying the average price by the volume. Positive money flow is calculated by summing the positive money flow over a specified number of periods. Negative money flow is calculated by summing the negative money flow over a specified number of periods.

When one divides positive money flow by negative money flow, one gets money ratio.

Finally $MFI = 100 - \frac{100}{1 + \text{money ratio}}$

Interpretation of MFI

Most popularly MFI indicator is used in two ways

- a. To define overbought and oversold zone- Generally MFI reading above 80 is considered overbought and MFI reading below 20 is considered oversold. It basically suggests that
 - One should book profit in buy side positions and should avoid new buy side positions in an overbought zone.
 - One should book profit in sell side positions and should avoid new sell side positions in an oversold zone

This would be clearer from figure below.

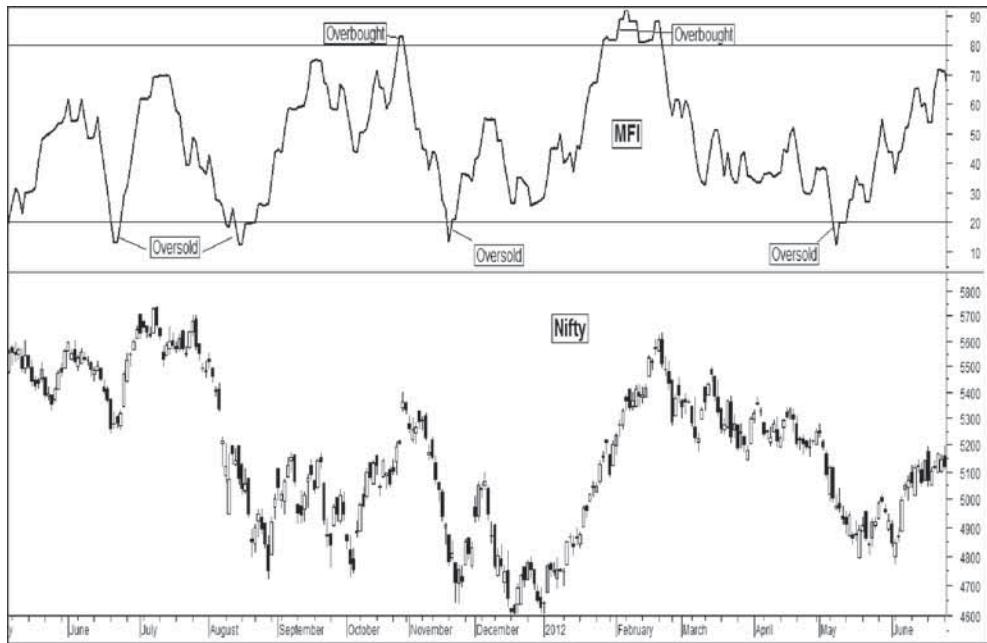


Figure illustrates overbought and oversold zones for spot Nifty. It is clearly visible that in most of the cases prices have corrected from overbought zone and similarly prices have rallied from oversold zone.

b. Look for Divergences- Divergences are of two types i.e. positive and negative.

Positive Divergence-are formed when price is making new lows, but MFI fails to break previous lows. This divergence suggests a reversal of trend from down to up.

Figure illustrates Nifty making new lows, where as MFI fails to break previous lows.

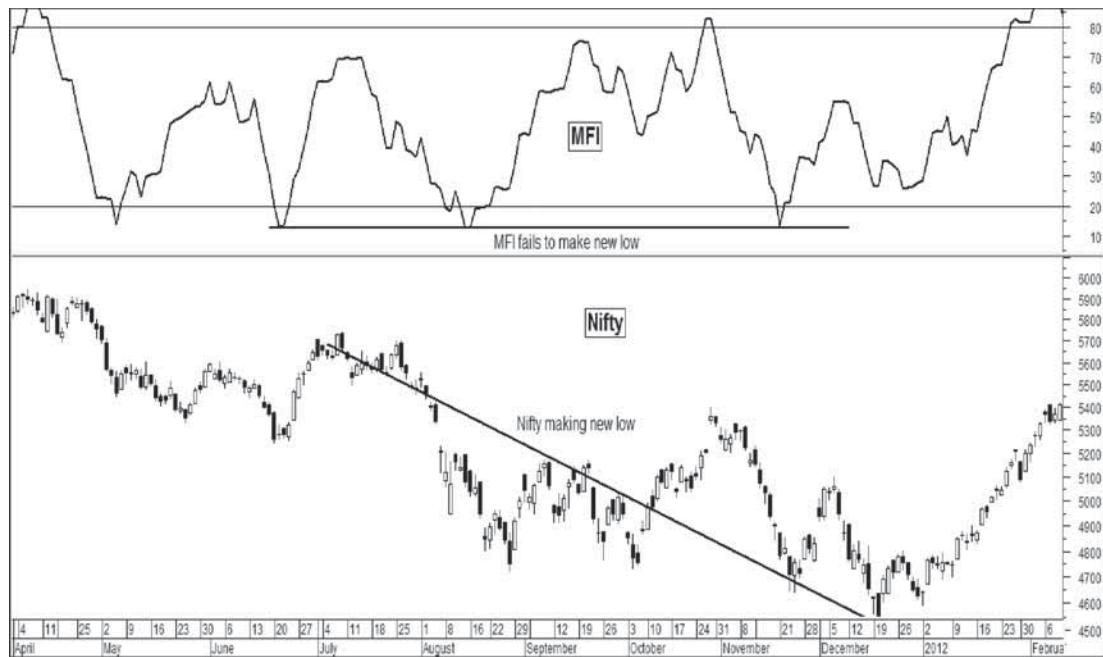


Figure illustrates Nifty making new lows whereas MFI fails to make new low, finally Nifty trend reversed from down to up.

Negative Divergence-are formed when price is making new highs, but MFI fails to make new high. This divergence suggests a reversal of trend from up to down.

Figure below illustrates Nifty making new highs, where as MFI fails to make new high.



Figure illustrates Nifty making new highs whereas MFI fails to make new high, finally Nifty Future trend reversed from up to down.

4.3.2.5 Bollinger Bands

Bollinger bands are trading bands developed by John Bollinger.

It consists of a 20 period simple moving average with upper and lower bands. The upper band is 2 standard deviation above the moving average and similarly lower band is 2 standard deviation below the moving average. This makes these bands more dynamic and adaptive to volatility.

This would be clearer from figure below



Figure illustrates Bollinger band plotted on Nifty price chart.

Interpretation of Bollinger Bands

Mr. John Bollinger described following important interpretation of Bollinger bands in projecting price trends.

1. Big move in price is witnessed on either side when bands tightens/contracts as volatility lessens.
2. The upper band act as area of resistance and lower band act as area of support.
3. When prices move outside the band, it signifies breakout, hence continuation of the trend.
4. Bottoms and tops made outside the band, followed by tops and bottoms made inside the band suggests reversal of the trend.

4.4 Using multiple indicators for trading signals

4.4.1 Price-sensitive techniques

Moving Averages — Gives the general trend of price based on its recent behavior and tells when the trend has been broken.

Relative Strength — Measures the strength left in a price trend by comparing number of up and down days over a recent timeframe.

Percentage R — This compares a day's closing price to a recent range of prices to determine if a market is overbought or oversold.

Oscillators — Measure the momentum of a price trend based on recent price behavior.

Stochastic — Combines indicators like moving average and relative strength to measure overbought and oversold tendencies.

Point-and-Figure/ kagi — Plots trends and reversals in price movement and then gives buy/sell signals based on recognizable patterns.

Basic Charting — Techniques for recognizing common price movement patterns and gauging market movements.

Swing Charting — Provides rigid entry and exit signals based on recent price history.

4.4.2 Volume-sensitive techniques

Tic Volume — This is similar to On-Balance Volume, but looks at the volume and directions of individual trades.

On-Balance Volume — Discovers "smart money's" moves by balancing the volume of days with rising prices against falling days.

4.4.3 Composite methods

Elliott Wave — Uses rules of cyclic market behavior and pattern formations to predict future price levels, trends, and reversal points.

4.4.4 How to use the tool kit of trading techniques

Price-sensitive techniques

Moving Averages — Gives very good signals in a trending market, but can reduce profits in a trading market.

Relative Strength — This confirms other methods in trading markets. Users have to keep adjusting the scale in trending markets.

Oscillators — Can confirm other techniques and indicate whether market is overbought or oversold and should be sold or bought.

Stochastic — Accurate for predicting trading market lows and highs.

Point-and-Figure — Gives acceptable results most of the time, but can be unreliable in strongly trending markets.

Basic Charting — Gives general framework for interpreting most other techniques. Volume analysis is an offshoot of basic charting.

Swing Charting — Works in trending markets. Combine longer and shorter period charts to avoid choppiness in trading markets.

Volume-sensitive techniques

Tic Volume — Same observations apply as for On-Balance Volume. Does not work well in a market with no big players.

On-Balance Volume — Gives good advance warning of when the market will move off the bottom, but is late on tops.

Composite techniques

Elliott Wave — Predicts major market moves. Use other techniques to confirm the times and price levels.

4.4.5 Trading market tool kit application

- 1) *Moving Averages* — Fade breakouts
- 2) *RSI, and Oscillators* — Sell overbought, buy oversold
- 3) *Stochastic* — Sell crossovers to downside and buy crossovers to upside
- 4) *On-Balance Volume and Tic Volume* — Useless as forecasting indicators but can be viable as confirming indicators
- 5) *Elliott Wave* — Verifies the existence of trading market via flat-type corrections classification and shows possible end of trading range

4.4.6 Bull market tool kit application

- 1) *Moving Averages* — Buy the upside crossovers
- 2) *RSI, and Oscillators* — Buy oversold indicators and ignore the overbought indicators
- 3) *Stochastics* — Buy the crossovers to the upside; do not sell crossovers to the downside
- 4) *On-Balance Volume and Tic Volume* — Useless as forecasting indicators, but viable as confirming indicators, since OBV curves would continually display new breakout highs
- 5) *Elliott Wave* — Buy breakouts of previous highs

4.4.7 Bear market toolkit application

- 1) *Moving Averages* — Sell the downside crossovers
- 2) *RSI, and Oscillators* — Sell the overbought indicators and ignore the oversold indicators
- 3) *Stochastics* — Sell the crossovers to the downside; do not buy crossovers to the upside
- 4) *On-Balance Volume and Tic Volume* — Too late for forecasting, and non-effective as confirming indicators
- 5) *Elliott Wave* — Sell the breakdowns of previous lows

4.4.8 Trading market changing to bull market toolkit application

- 1) *Moving Averages* — If traders are fading the false breakouts in the trading market, one trade will finally go against them for a greater than normal loss (short in a bull market). This will signal to them that the markets are about to change.
- 2) *RSI, and Oscillators* — If traders have been selling overbought and buying oversold, they will find a trade which will show a loss even though they sold the overbought signal (short in bull market). This will signal to them that the markets are changing.
- 3) *Stochastics* — Traders must buy all crossovers from the oversold conditions and not execute trades on overbought signals.
- 4) *On-Balance Volume and Tic Volume* — Accumulation can be observed and hence eventual upside price breakouts can be forecasted with high accuracy.
- 5) *Elliott Wave* — The theory will show a possible breakout to the upside. Cautiously buy at the trading range for an impending move and aggressively buy when the price breaks into new highs moving above the trading range high.

4.4.9 Trading market changing to bear market toolkit application

- 1) *Moving Averages* — If traders had been fading the false breakouts to the upside and false breakdowns to the downside in a trading market, they would find their last trade to be a disproportionate loss (long in a bear market). There really isn't much chance to recoup this loss because the breakdown is fast and severe. It is best not to fade the markets on the buy side using moving averages after the markets have had a severe run up going into a trading range market.
- 2) *RSI, %R and Oscillators* — If traders had been selling overbought and buying oversold indicators in a trading market, they would suffer a large loss on the last trade. Traders would also find a growing number of oversold indicators and a diminishing number of overbought signals using standard parameters. This signals an impending change in the state of the market condition.
- 3) *Stochastic* — Crossovers from the overbought side to the downside are more valid than crossovers to the upside from the oversold level.
- 4) *On-Balance Volume and Tic Volume* — These two indicators are unreliable for forewarning traders of impending weakness. The best that traders can expect from these indicators is a flattening of the OBV pattern, implying a possible, but not certain, breakdown. The prices would drop dramatically and then the volume indicators would indicate a breakdown.
- 5) *Elliott Wave* — In Elliott Wave corrections, traders have a one-in-two chance that the correction could possibly turn into a bear market sell-off (a zigzag instead of a flat correction). However, in the formation of this correction traders cannot tell until

they approach the forecasted event that the correction could turn into a bear market correction instead of a flat correction. If the market turns into a bear market correction they only have to sell into new lows and maintain a short position to profit from the move downwards. If, however, it turns into a flat correction, they will find themselves selling the bottom. Elliott Wave analysis does offer inkling about what type of correction traders can expect, based on the existence of alternative patterns prior to the one currently under examination.

4.4.10 Bull market changing to trading market toolkit application

- 1)** *Moving Averages* — Price finally crosses the moving averages to the downside after leading the averages from above. If traders didn't buy the price breakout to the upside, traders mustn't do it now but, instead, start to fade the upside breakouts carefully and fade the downside breakdowns.
- 2)** *RSI, and Oscillators* — After a solid series of bad overbought signals in the bull market, traders finally find more oversold indicators appearing. As the trading market continues, oversold and overbought indicators become equal in number. The fact that the numbers even out indicates the complexion of the market is changing from uptrend to trading.
- 3)** *Stochastics* — In the bull trend, the crossovers from overbought were more often than not false signals and the crossovers from oversold, if they did happen, were valid buy signals. Now, as the market flattens out, traders will find the crossovers from either side to be valid and can also initiate positions with profitability.
- 4)** *On-Balance Volume and Tic Volume* — This technique fails when you try to use it to forecast imminent price breakdowns. These cumulative volume indicators would not begin to signal distribution until price deterioration was well underway. The best signal that could be emitted would be a flattening of the price trend signal.
- 5)** *Elliott Wave* — According to strict Elliott Wave tenets, this application does not exist per se: A bull market turns to a bear market upon its completion. Elliott Wave would not consider the existence of trading to bear market designation, but bull to bear immediately. Yet, traders can observe that the two types of corrective markets alternate with each other: if a previous correction was one of two types (flat or zigzag) then the second of the set will be the alternate type to the first. In this way, traders can predict something about the nature of this market phase

4.4.11 Bear market changing to trading market tool kit application

- 1)** *Moving Averages* — When the market changes to a trading market from a bear market the moving averages will no longer lag as far behind the actual price or shorter moving

average as was the case in the preceding bear market. Traders can now expect a flattening out of the moving average curve to correspond with the flattening of market prices. If they continued to sell the breakdowns and defer from buying as before, they would be continually whipsawed (instead, they should sell the breakouts and buy the breakdowns).

- 2) *RSI, and Oscillators* — In the bear down trend traders would have an overwhelming number of oversold signals and a dearth of overbought signals. They could have adjusted the overbought parameter to the downside to give themselves, in effect, "overbought" signals to initiate short positions on. At the changing point, the number of oversold and overbought signals begins to equal each other in numbers. They could sell the overbought and buy the oversold with confidence at this point.
- 3) *Stochastics* — During the bear market, crossovers from the oversold side were less valid as buy signals than crossovers from the overbought side were as sell signals. They will now appear equally valid as the trading market appears.
- 4) *On-Balance Volume and Tic Volume* — The OBV curve and Tic Volume flatten out after the bottom price is made, thereby giving traders an after-the-fact confirmation of the end of the down move, but not a reliable anticipatory signal.
- 5) *Elliott Wave* — The 'bear move down' would have been an impulse wave down and the trading market would have been a corrective wave to this. Once traders have determined which of the three impulse waves (1,3, or 5 of an impulse 1-2-3-4-5, or even in a larger dimension or c of an a-b-c correction) they were in the process of completing they would have a better idea of what type of correction was beginning

New terms

Breakdown: A price movement through an identified level of support, which is usually followed by heavy volumes and a sharp decline, is defined as a 'breakdown'. Technical traders will short sell the underlying asset when the price of the security breaks below a support level because it is a clear indication that the bears are in control and that additional selling pressure is likely to follow.

Consolidation: Consolidation is the movement of an asset's price within a well-defined pattern or barrier of trading levels. Consolidation is generally regarded as a period of indecision, which ends when the price of the asset breaks beyond the restrictive barriers. Periods of consolidation can be found in charts covering any time interval (i.e. hours, days, etc.), and these periods can last for minutes, days, months or even years. Lengthy periods of consolidation are often known as a base.

Correction: A reverse movement, usually negative, of at least 10% in a stock, bond, commodity or index. Corrections are generally temporary price declines, interrupting an uptrend in the market or asset. Its part of health market.

Divergence: Divergence is when the price of an asset and an indicator, index or other related asset move in opposite directions. In technical analysis, traders make transaction decisions by identifying situations of divergence, where the price of a stock and a set of relevant indicators, such as the money flow index (MFI), are moving in opposite directions. In technical analysis, divergence is considered either positive or negative, both of which are signals of major shifts in the direction of the price. Positive divergence occurs when the price of a security makes a new low while the indicator starts to climb upward. Negative divergence happens when the price of the security makes a new high, but the indicator fails to do the same and instead closes lower than the previous high.

Momentum: Momentum is the rate of acceleration of a security's price or volume.

Moving average: An indicator frequently used in technical analysis showing the average value of a security's price over a set period. Moving averages are generally used to measure momentum and define areas of possible support and resistance.

Open interest: Open Interest is the total number of outstanding contracts that are held by market participants at the end of the day. It can also be defined as the total number of futures contracts or option contracts that have not yet been exercised (squared off), expired, or fulfilled by delivery. Open interest applies primarily to the futures market. Open interest, or the total number of open contracts on a security, is often used to confirm trends and trend reversals for futures and options contracts.

Simple moving average: A simple, or arithmetic moving average that is calculated by adding the closing price of the security for a number of time periods and then dividing this total by the number of time periods. Short-term averages respond quickly to changes in the price of the underlying, while long-term averages are slow to react. In general, the 50- and 200-day EMAs are used as signals of long-term trends.

Exponential moving average: A type of moving average that is similar to a simple moving average, except that more weight is given to the latest data. This is also known as "exponentially weighted moving average".

This type of moving average reacts faster to recent price changes than a simple moving average. The 12- and 26-day EMAs are the most popular short-term averages, and they are used to create indicators like the moving average convergence divergence (MACD).

Swing trading: 'Swing Trading' is a style of trading that attempts to capture gains in a stock within one to four days.

Uptrend: An uptrend describes the price movement of a financial asset when the overall direction is upward. A formal uptrend is when each successive peak and trough is higher than the ones found earlier in the trend.

Volume: The number of shares or contracts traded in a security or an entire market during a given period of time. It is simply the amount of shares that trade hands from sellers to buyers as a measure of activity. If a buyer of a stock purchases 100 shares from a seller, then the volume for that period increases by 100 shares based on that transaction

Volume is an important indicator in technical analysis as it is used to measure the worth of a market move. If the markets have made strong price move either up or down the perceived strength of that move depends on the volume for that period. The higher the volume during that price move the more significant the move.

Indicators: Technical Indicator is a result of mathematical calculations based on indications of price and/or volume. The values obtained are used to forecast probable price changes.

Model Questions

Q1 Which of the following functions are served by technical indicators?

- a) to alert
- b) to confirm
- c) to predict
- d) all of the above

Q2 Ideally how many indicators should be used at a time to make the analysis sound and effective?

- a) more than 20
- b) 5 or less than 5
- c) 50
- d) More than 70

Q3 A simple moving average is formed by computing the _____ price of a security over a specified number of periods.

- a) Mode
- b) Median
- c) Mean
- d) Variance

Q4 For a percentage-based EMA, "Multiplier" is equal to the _____ specified percentage.

- a) RSI's
- b) MFI's
- c) EMA's
- d) DMI's

Q5 Which of the following is not a momentum oscillator?

- a) RSI
- b) Stochastic
- c) Rate of change
- d) Moving average crossovers

Q6 _____ is a very important indicator as it takes into account the aspects of both momentum and trend in one indicator.

- a) MACD
- b) Moving Average Crossovers
- c) William %R
- d) EMA

- Q7 When MACD is above zero, it means the ____ day moving average is higher than ____ day moving average.
- a) 32, 26
 - b) 26, 32
 - c) 12, 26
 - d) 26, 12
- Q8 RSI is a _____ indicator.
- a) leading
 - b) lagging
 - c) supplementary
 - d) complementary
- Q9 _____ compares a day's closing price to a recent range of prices to determine if a market is overbought or oversold.
- a) Percentage R
 - b) RSI
 - c) Bollinger Bands
 - d) MACD
- Q10 Which of the following indicator should not be used in trending highly trending markets?
- a) RSI
 - b) Point and Figure
 - c) MACD
 - d) Moving average crossovers

CHAPTER 5 TRADING STRATEGIES

Learning objectives

After studying this chapter the student should be able to understand:

- Meaning and advantages of day trading
- Risks involved in day trading
- Strategies for day trading
- Momentum trading strategy
- Techniques for entry and exit in momentum trade

5.1 Day trading

Day trading means buying and selling a stock within the same day. The positions are closed before the market close for the trading day. Day trading is about discipline and training of mind. It is about waiting in the trenches till the right opportunity appears. The goal of a day trader is to capitalize on price movement within one trading day. Day traders maximize profits by leveraging large amounts of capital to take advantage of small price movements in highly liquid stocks or indexes. Because of the nature of financial leverage and the rapid returns that are possible, day trading can be either extremely profitable or extremely unprofitable, and high-risk profile traders can generate either huge percentage returns or huge percentage losses. Some day traders manage to earn millions per year solely by day trading.

5.1.1 Advantages of day trading:

Zero Overnight risk: One of the best advantages of day trading is ability to close your position at or before the end of the trading day. Since positions are closed prior to the end of the trading day, news and events that affect the next trading day's opening prices do not effect your portfolio.

When you open and close your position before the trading day ends, the risks of holding a stock overnight are erased. A traditional trader's profits can disappear overnight with traditional, long-term trading, but with day trading your profits are secure as long as you close your positions before the end of the trading day. No overnight crises or calamities in the financial markets can affect your income for that day.

Increased leverage: Unlike positions trading where you would have to have high levels of investment to put up in the market to gain a profit, in day trading it is quite the opposite. Day traders usually need to put up less money to get into day trading and succeed at it. Because of

low margin requirements for day trades you enjoy a greater leverage on your trading capital. This increased leverage can multiply your profits.

Profit in any market direction: Unlike long term investors who keep their stocks for long duration to capitalize only bull market, day traders can take advantage of both rising and falling market. Day traders can often take advantage of a struggling market by utilizing short-selling trading strategies to take advantage of falling stock prices. The ability to lock in profits even as markets fall throughout the trading day is extremely useful during bear market conditions.

High returns: If successful, the rewards of day trading can far exceed the risks. Of course if you begin day trading it will not always mean that you get high returns all the time. In the beginning you have to learn the ins and outs and fluctuations of the market to keep up. However, over time, you will hone a certain skill to make day trading profitable for you.

Unlike in ordinary stock market trading or position trading, day trading only requires you to trade intensely within market hours. Day trading requires discipline and time management, but it also affords an individual to make their own hours without a manager or boss standing over their back. And, in addition to the amount of money an individual can make from the comfort of their own home, day trading offers individuals many advantages they will not encounter in the more traditional forms of trading stocks and other financial instruments.

5.1.2 *Risks associated with day trading:*

Day trading can be very risky. Not being able to manage losses, or letting them run, is biggest reason why day traders lose money. Day traders should not risk the money that they cannot afford to lose. It is essential that you have the discipline and proper knowledge to succeed in day trading. You need to have an internal system of checks and balance to make sure you don't take too many risks or begin to overtrade. You need to learn how to take a loss, because losses will occur, especially at the beginning stages. The rewards of day trading are high, but so are the risks.

Possibility of large losses

Depending on the decisions made during the day, a trader could either make or lose huge amount of money. You should be prepared to suffer severe financial losses; this is part of the process. Losses are inevitable. Nobody makes money everyday. Many novice day traders suffer severe monetary losses in their first months of trading, and couldn't stay in the game long enough to see a profit.

Demands of day trading

Day trading requires a lot of time and attention paid to the markets, trends, technical indicators

and national and international news regarding capital markets. A lot of time has to be put to focus the market hours. In addition to the time commitment, day trading requires a lot of study outside of your trading hours. An intensive amount of knowledge is needed in order to be successful at this highly demanding profession.

Stress

Stress is a routine part of every day trading job. Stress and anxiety arises while tracking various movements within few minutes. In addition to this, the job requires that you make quick decisions concerning the acquisition or selling of securities, with intensive time constraints.

Overtrading

Overtrading means taking highly risky trades or/and trading too large shares. Novice day traders generally get overwhelmed with the fast pace of day trading and let their emotions, instead of their knowledge and analysis, make the decisions for them.

Borrowed money

Day traders rely heavily on exposure provided by broker or buying stocks on margin. Borrowing money to trade stocks always holds some risks. Day traders utilize the leveraged money to increase returns. If not successful, this could lead to the trader losing large sums of money, and possibly an accruement of debt. This is why it is very important to have knowledge of the basics of day trading before venturing into the field.

Understanding market trends

The focus of a day trader is on watching the stocks movement on regular basis. They tend to follow a stock's momentum and make a quick transaction before it changes course. Since day traders intend to make profits on all major and minor stock movements, it is very important that they have knowledge of market trends, technical analysis and investment charts. If this knowledge is absent form a day trader's skill base, then in spite of making profits, he may run into huge losses.

Out-of-pocket expenses

Starting out as a day trader can cost a lot of money out of pocket. These expenses can include: software (and hardware), commissions, manuals, and other resources. It is very important to develop a budget for these out-o-pocket expenses before entering the arena of day trading.

Technology

Operational problems like power outages, software/hardware issues, disrupted internet connections etc. could hamper your day trading.

5.2 Strategies

5.2.1 Strategies for day trading:

Scalping: Scalping is one of the most popular strategies. Scalping is a trading style focusing on taking profits on small price changes, generally immediately after one enters a trade becomes profitable. It requires a strict and aggressive exit strategy because one large loss could wipe out the several small gains realized. Having the right tools such as a live feed, a direct-access broker and the propensity to execute many trades is required for this strategy to be successful. A scalper's main objective is to take as many small profits as possible.

Fading: Fading involves shorting stocks after rapid moves upwards. This strategy involves a considerable amount of risk. But it is also more profitable; and can work well for novice traders as it does not involve extensive technical analysis. The fading strategy is based on three assumptions: i) the stock is overbought, ii) early buyers are ready to begin taking profits and iii) existing buyers may be scared out. Although risky, this strategy can be extremely rewarding. Here the price target is when buyers begin stepping in again.

Daily pivots: This strategy involves profiting from a stock's daily volatility. For many years, traders and market makers have used pivot points to determine critical support and/or resistance levels. This is done by attempting to buy at the low of the day (LOD) and sell at the high of the day (HOD). Pivots are extremely useful tool for range-bound traders to identify points of entry and for trend traders and breakout traders to spot the key levels that need to be broken for a move to qualify as a breakout.

Momentum trading

Momentum trading is when a trader sees a stock price picking up and joins it. This strategy usually involves trading on news releases or finding strong trending moves supported by high volume. The investor will take a short or long position in the stock anticipating that the momentum of the stock will continue. Here the price target is when volume begins to decrease and bearish candles start appearing.

5.2.2 Momentum trading Strategies:

Momentum traders are truly a unique group of individuals. To engage in momentum trading, you must have the mental focus to remain steadfast when things are going your way and to wait when targets are yet to be reached. Unlike other traders or analysts who dissect a company's financial statements or chart patterns, a momentum trader is only concerned with stocks in the news. These stocks will be the high percentage and volume movers of the day. Momentum trading requires a massive display of discipline, a rare personality attribute that

makes short-term momentum trading one of the more difficult means of making a profit. Let's look at a few techniques for successful momentum trading.

Techniques for entry

Dr. Alexander Elder had designed an impulse system for momentum trading. To identifying appropriate entry points the system simultaneously uses two indicators:

- i) Exponential moving average - EMA is used to measure market inertia i.e for finding uptrends and downtrends
- ii) Moving Average Convergence-Divergence – MACD measures market momentum.

When EMA rises, the inertia favors the bulls, and when EMA falls, inertia favors the bears. To measure market momentum, the trader uses MACD histogram, which is an oscillator displaying a slope reflecting the changes of power among bulls and bears. When the slope of the MACD histogram rises, bulls are becoming stronger. When it falls, the bears are gaining strength. The system issues an entry signal when both the EMA and MACD move in the same direction, and an exit signal is issued when these two indicators diverge. If signals from both the EMA and the MACD histogram point in the same direction, both inertia and momentum are working together toward clear uptrends or downtrends. When both the EMA and the MACD histogram are rising, the bulls have control of the trend, and the uptrend is accelerating. When both EMA and MACD histogram fall, the bears are in control, and the downtrend is paramount.

Times You trade

The unfavorable time for momentum traders is during lunch (12 - 2pm), where volume dries up and the moves are choppy to flat. So momentum traders should limit the times they trade to the first and last hour of the day trading session. This is because volatility is very high during these two time slots.

Techniques for exiting positions

The key to being a successful momentum trader is to know when to exit the position. Once you have identified and entered into a strong momentum trade i.e. when daily EMA and MACD histogram are both rising, you should exit your position at the very moment either indicator turns down. Since momentum traders initiate positions during the most volatile times during the trading day, sharp corrections are commonplace. This is why it is imperative that prior to plunging into the momentum trade, the traders must become acclimated to the speed of the market.

New Terms

Day trader: A stock trader who holds positions for a very short time (from minutes to hours) and makes numerous trades each day. Most trades are entered and closed out within the same day.

Position: The amount of a security either owned (which constitutes a long position) or borrowed (which constitutes a short position) by an individual or by a dealer. In other words, it's a trade an investor currently holds open.

Short: The sale of a security, commodity, or currency with the expectation that the asset will fall in value is defined as 'Short'. The intention is to buy back at lower prices.

Volatility: A statistical measure of the dispersion of returns for a given security or market index depicts its volatility. Volatility can either be measured by using the standard deviation or variance between returns from that same security or market index. It must be understood that the higher the volatility, the riskier the security.

Whipsaw: Whipsaw is a condition where a security's price heads in one direction, but then is followed quickly by a movement in the opposite direction, thus generating frequent Buy and Sell signals. The origin of the term is from the push-and-pull action used by lumberjacks to cut wood with a type of saw with the same name.

Fading: A contrarian investment strategy used to trade against the prevailing trend. "Fading the market" is typically very high risk, requiring the trader to have a high risk tolerance. A fade trader would sell when a price is rising and buy when it's falling. Also known as "fading".

Model Questions

- Q1 Because of _____ and the _____ that are possible, day trading is preferred by traders?
- Financial leverage and high returns
 - Out of pocket expenses and overtrading
 - Overtrading and high returns
 - No risk and high returns
- Q2 Day traders must have proper knowledge of:
- technical analysis
 - SWOT analysis
 - Both a) and b) above
 - None of the above
- Q3 Which of the following day trading style focus on taking profits on small price changes, generally immediately after one enters a trade becomes profitable.
- scalping
 - fading
 - daily pivots
 - momentum
- Q4 Day trading and momentum trading can be categorized into:
- Over trading
 - Under trading
 - Short term trading
 - Long term trading
- Q5 Which of the following systems give exit signal is issued when EMA and MACD diverge?
- Fading system
 - impulse system of momentum trading
 - RSI
 - Centerline crossover

CHAPTER 6 DOW Theory and Elliot Wave Theory

6.1 Introduction

Dow Theory is named after Charles H Dow, who is considered as the father of Technical Analysis. Dow Theory is very basic and more than 100 years old but still remains the foundation of Technical Analysis.

Charles H Dow(1851-1902) ,however neither wrote a book nor published his complete theory on the market, but several followers and associates have published work based on his theory from 255 Wall Street Journal editorials written by him. These editorials reflected his belief on stock market behavior. Some of the most important contributors to Dow Theory are

- a. **Samuel A. Nelson**- He is the first person to use the term Dow Theory and he selected fifteen articles by Charles Dow for his book The ABC of Stock Speculation.
- b. **William P. Hamilton**-He wrote a book titled The Stock Market Barometer which is a comprehensive summary of the findings that Charles H Dow and Samuel A. Nelson have gathered.
- c. **Robert Rhea**- He wrote a book titled The Dow Theory.
- d. **George E Schaefer**- He wrote a book titled How I Helped More than 10000 Investors to profit in Stocks.
- e. **Richard Russell**- He wrote a book titled The Dow Theory Today.

6.2 Principles of Dow Theory

The Dow Theory is made up of six basic principles. Let's understand the principles of Dow Theory.

First Principle: The Stock Market Discounts All Information

The first principle of Dow Theory suggests that stock price represents sum total of hopes, fears and expectation of all participants and stock prices discounts all information that is known about stock i.e. past, current and above all stock price discounts future in advance i.e. the stock market makes tops and bottoms ahead of the economy.

It suggests stock market discounts all information be it interest rate movement, macroeconomic data, central bank decision, future earnings announcement by the company etc. The only information which stock market does not discount is natural calamities like tsunami, earthquake, cyclone etc.

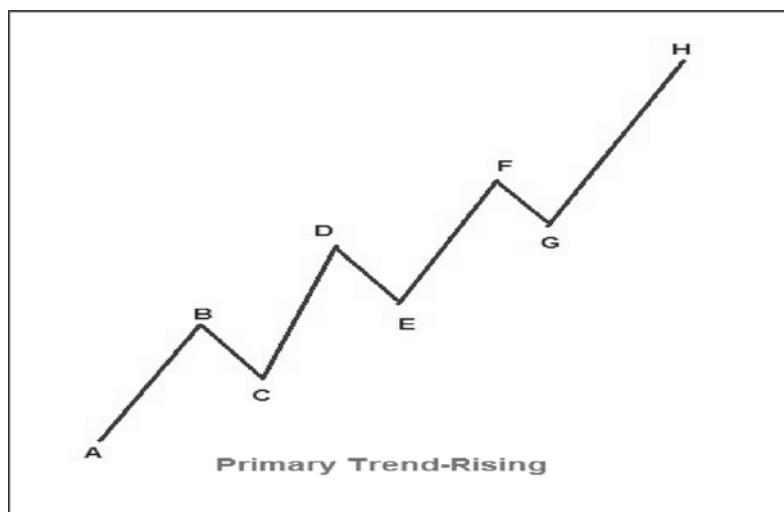
Second Principle: The Stock Market Have Three Trends

Dow Theory says stock market is made up of three trends

- a. Primary Trend
- b. Secondary trend
- c. Minor Trend

Dow Theory says primary trend is the main trend and trader should trade in direction of this trend. It says primary trend is trader's best friend which would never ditch trader in this volatile stock market. If primary trend is rising then trend is considered rising (bullish) else trend is considered falling (bearish). The primary trend is the largest trend lasting for more than a year.

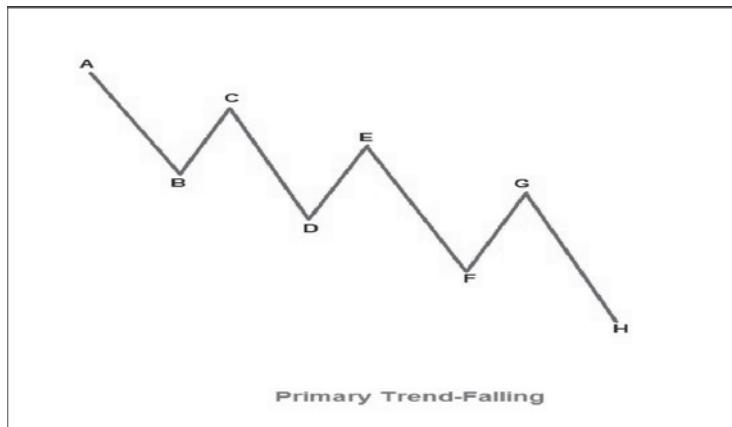
The primary trend is considered rising if each peak in the rally is higher than previous peak in the rally and each trough in the rally is higher than previous trough in the rally. In other words as long as each successive top is higher than previous top and each successive bottom is higher than previous bottom, primary trend is considered rising and we say markets are bullish. This would be clearer from (Figure 1)



(Figure 1)

(Figure 1) illustrates that each successive top that is D, F, and H are higher than previous tops and each successive bottom that is E and G are higher than previous bottoms, hence primary trend is considered rising.

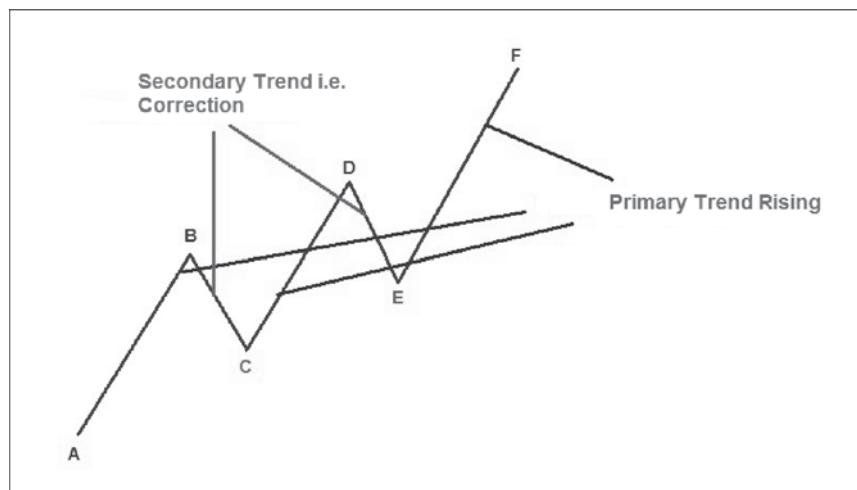
The primary trend is considered falling if each peak in the rally is lower than previous peak in the rally and each trough in the rally is lower than previous trough in the rally. In other words as long as each successive bottom is lower than previous bottom and each successive top is lower than previous top, primary trend is considered falling and we say markets are bearish. This would be clearer from (Figure 2)



(Figure 2)

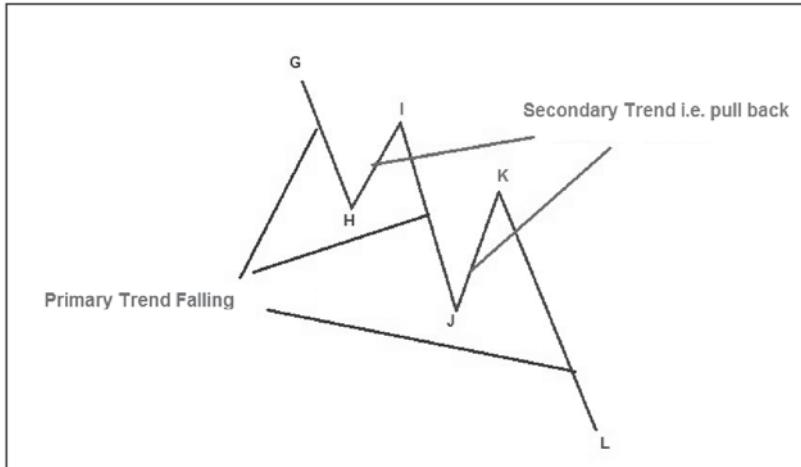
(Figure 2) illustrates that each successive bottom that is D, F, and H are lower than previous bottoms and each successive top that is E and G are lower than previous tops, hence primary trend is considered falling.

Dow Theory says secondary trends are found within the primary trend i.e. corrections when primary trend is rising and pullback when primary trend is falling. More precisely secondary trend is the move against the direction of the primary trend .The secondary trend usually lasts for three weeks to three months. This would be more clearer from (Figure 3) & (Figure 4).



(Figure 3) illustrates primary trend is rising and A-B, C-D, E-F is Primary Trend and B-C, D-E is Secondary Trend. Here secondary trend is correction in the rising market.

(Figure 3)



(Figure 4)

(Figure 4) illustrates primary trend is falling and G-H, I-J, K-L is Primary Trend and H-I, J-K is Secondary Trend. Here secondary trend is pull back in the falling market.

Dow Theory says that secondary trend consist of short term price movements which is known as minor trends. The minor trend is generally the corrective move within a secondary trend, more precisely moves against the direction of the secondary trend. The minor trend usually lasts for one day to three weeks. The Dow Theory says minor trends are unimportant and needs no attention. If too much focus is placed on minor trends, it can lead to total loss of capital as trader gets trapped in short term market volatility.

Third Principle: Primary Trend Have Three Phases

The Dow Theory says primary trend have three phases

- Accumulation Phase
- Participation Phase
- Distribution Phase

The Dow Theory says that the accumulation phase is made up of buying by intelligent investor who thinks stock is undervalued and expects economic recovery and long term growth. During this phase environment is totally pessimistic and majority of investors are against equities and above all nobody at this time believes that market could rally from here. This is because accumulation phase comes after a significant down move in the market and everything appears at its worst. Practically this is the beginning of the new bull market.

The participation phase is characterized by improving fundamentals, rising corporate profits and improving public sentiment. More and more trader participates in the market, sending prices higher. This is the longest phase of the primary trend during which largest price movement takes place. This is the best phase for the technical trader.

The distribution phase is characterized by too much optimism, robust fundamental and above all nobody at this time believes that market could decline. The general public now feels comfortable buying more and more in the market. It is during this phase that those investors

who bought during accumulation phase begin to sell in anticipation of a decline in the market. This is time when Technical Analyst should look for reversal in the trend to initiate sell side position in the stock market.

Three phases of primary trend would be clearer from (Figure 5)



(Figure 5)

(Figure 5) illustrates –

- Accumulation phase from April 2003 to June 2003 during which nobody believed that markets could rally but intelligent investor took buy side positions in the stock market.
- Participation phase from July 2003 to January 2004 during which largest and longest price movement occurred.
- Distribution phase from February 2004 to May 2004 during which smart money closed buy side positions in the market.

Fourth Principle: Stock Market Indexes Must Confirm Each Other

Charles H Dow believed that stock market as a whole reflected the overall business condition of the country. In other words stock market as a whole is a benchmark indicator to measure the economic condition of the country.

Dow first used basis of his theory to create two indexes namely (i) Dow Jones Industrial Index and (ii) Dow Jones Rail Index (now Transportation Index). Dow created these two indexes because those days U.S was a growing industrial nation and urban centers and production centers were apart. Factories have to transport their goods to urban centers by rail road. Hence these two indexes covered two major economic segments i.e. Industrial and transportation.

Dow felt these two indexes would reflect true business condition within the economy.

According to Dow

- (a) Rise in these two indexes reflects that overall business condition of the economy is good. The basic concept behind this is that if production is increasing then transportation of goods to customer should also increase i.e. performance of companies transporting goods to consumer should improve. According to Dow Theory, two averages should move in the same direction and rising Industrial Index is not sustainable as long as Transportation Index is not rising.
- (b) The divergence in these two indexes is a warning signal.

Under Dow Theory, a reversal from a bull market to bear market or vice versa is not signaled until and unless both indexes i.e. Industrial Index and Transportation Index confirm the same.

In simple words, if one index is confirming a new primary uptrend but another index remains in a primary downtrend, then there is no clear trend.

Basically Dow Theory says that stock market will rise if business conditions are good and stock market would decline if business conditions are poor.

Fifth Principle: Volume Must Confirm the Trend

Dow Theory says that trend should be confirmed by the volume. It says volume should increase in the direction of the primary trend i.e.

- If primary trend is down then volume should increase with the market decline.
- If primary trend is up then volume should increase with the market rally.

Basically volume is used as a secondary indicator to confirm the price trend and once the trend is confirmed by volume, one should always remain in the direction of the trend.

Sixth Principle: Trend Remains Intact Until and Unless Clear Reversal Signals Occur

As we are dealing in stock market which is controlled by only one "M" i.e. Money and this money flows very fast across borders. Hence stock prices do not move smoothly in a single line, one day it's up next day it might be down.

Basically Dow Theory suggests that one should never assume reversal of the trend until and unless clear reversal signals are there and one should always trade in the direction of the primary trend.

6.3 Significance of Dow Theory

It's Dow Theory which gave birth to concept of higher top-higher bottom formations and lower top-lower bottom formations which is the basic foundation of Technical Analysis. This helps investors to improve their understanding on the market so that they could succeed in their investment/trading decisions. Most of the technical analysts follow this concept and if you go through any technical write up, you would definitely find this concept.

6.4 Problems with Dow Theory

- a. One misses the large gain due to conservative nature of a trend reversal signal i.e. uptrend would reverse when stock prices make lower top-lower bottom formation and downtrend would reverse when stock prices make higher top-higher bottom formation.
- b. Charles Dow considered only two indexes namely Industrial and Transportation which is not major part of the economy today. Technology and financial services i.e. banking constitutes major part of the economy today. We have seen in 1998-1999, one sided rally in Nifty led by technology stocks. In this rally none of industrial stock participated and if one waited for buy confirmation from Industrial and Transportation indexes then one must have missed the classic bull run of technology stocks.

6.5 Elliott Wave

6.5.1 Introduction

Elliott Wave theory is developed by Ralph Nelson Elliott (1871-1948) and is successfully being used by market participants to analyze stock market to forecast market trends.

Elliott Wave theory is based on the hypothesis that stock prices move between optimism and pessimism of all market participants' psychology and wide swings in the participants' psychology makes stock prices move in a certain patterns/trends.

6.5.2 Fundamental Concept

Elliott Wave theory suggests that stock prices move in clear trends. These trends can be classified in two parts i.e.

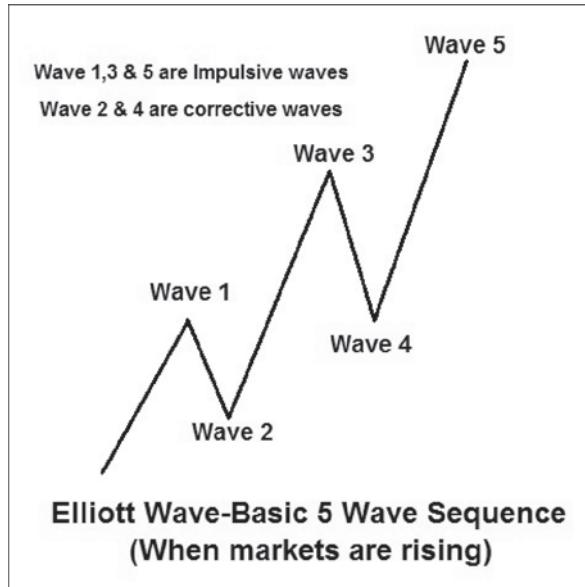
- A. Dominant trend (Five wave pattern)
 - B. Corrective trend (Three wave pattern)
- A. Dominant Trend (Five wave pattern)

Basically Dominant Trend consists of five waves. These five waves can be in either direction, up or down.

When five waves directions is up then advancing waves are known as impulsive waves and declining waves are known as corrective waves.

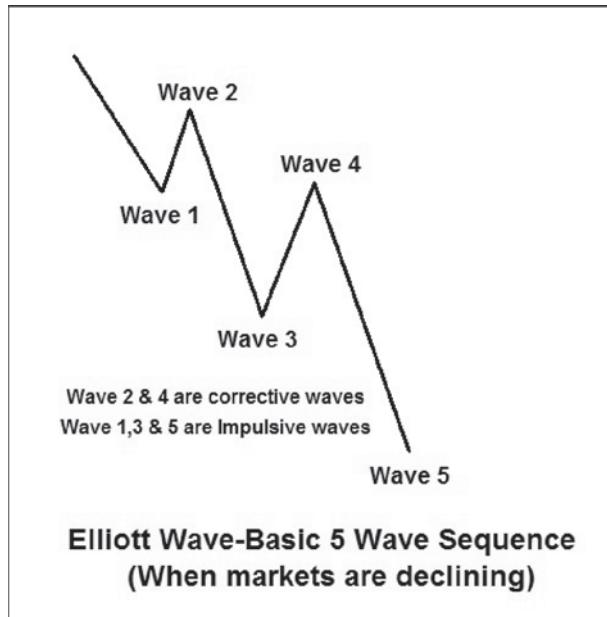
Similarly when five waves directions is down then declining waves are known as impulsive waves and advancing waves are known as corrective waves.

This would be more clearer from (Figure 6) & (Figure7)



(Figure 6)

(Figure 6) illustrates a rising 5-wave sequence. Here markets are rising. Wave 1, 3 & 5 are impulse waves. Wave 2 & 4 is corrective waves.



(Figure 7)

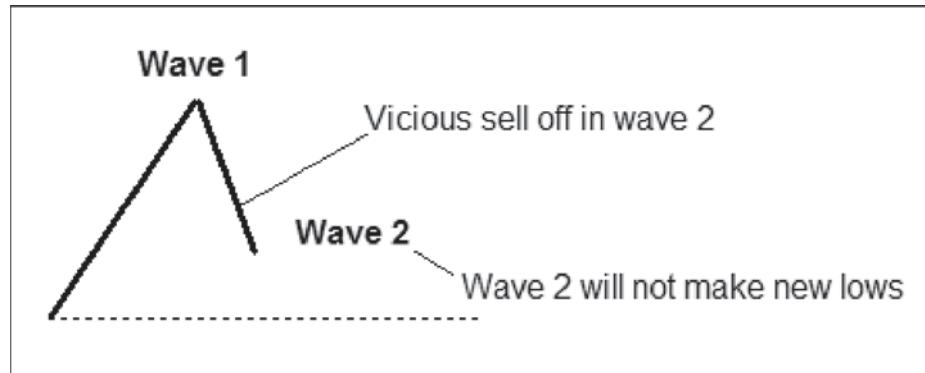
(Figure 7) illustrates a declining 5-wave sequence. Here markets are declining. Wave 1, 3 & 5 are impulsive waves. Wave 2 & 4 is corrective waves.

Characteristic of Dominant Trend (when markets are rising)

Each individual Wave of the dominant trend has its own characteristic. One should understand

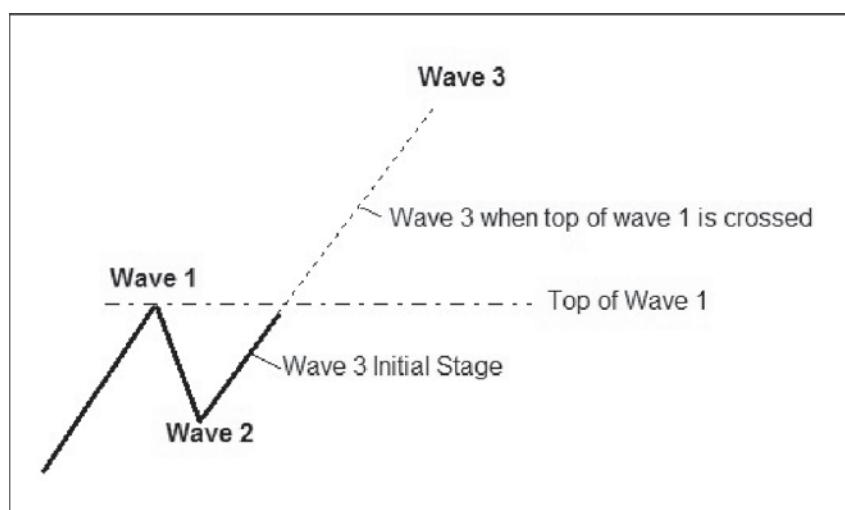
these characteristics which is the key to practical application of Elliott Theory. These are described as-

- ❖ Wave 1: Wave 1 is usually a weak rally with only small number of traders participating in the market. This is because fundamental news is still negative and above all previous trend which was declining is still considered strong to be in force.
- ❖ Wave 2: Wave 2 is a sell off once wave 1 is over and these sell off is very vicious (sharp). But wave 2 never extends beyond the starting point of wave 1. Wave 2 finally ends without making new lows and prices turn for another rally.



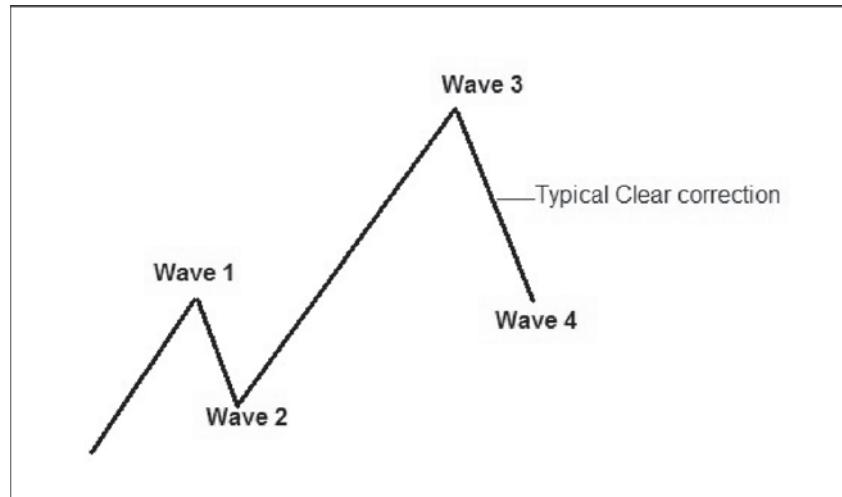
(Figure 8)

- ❖ Wave 3: The initial stage of the wave 3 is a slow rally as market participants are not convinced about the rally. Practically lot of sell side positions are there in the market and these get squared off as and when markets rally and finally sell side positions are closed when top of wave 1 is crossed. This is the time when top of wave 1 is crossed market participants are convinced about the rally and there is sudden buy side interest in the market. Wave 3 is usually the largest and most powerful wave of dominant trend.



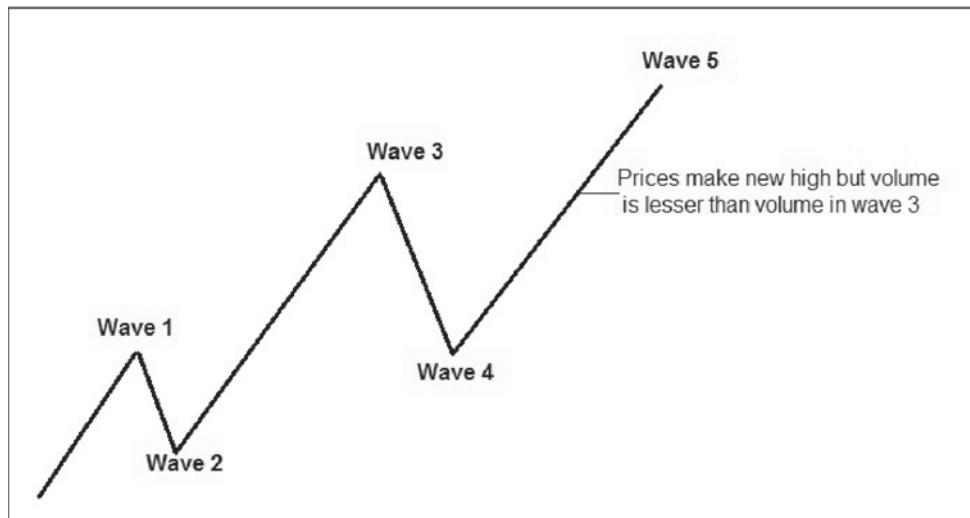
(Figure 9)

- ❖ Wave 4: Finally wave 3 ends as traders who were long from the lower levels takes profits, hence profit taking starts. Basically wave 4 is a clear correction on lesser volume than wave 3. While profit taking is on, majority of the market participants are convinced that trend is up. There are two schools of thoughts here to trade Wave 4. One is to buy on decline if one understands the potential ahead for wave 5. The other is to wait for wave 4 to end and buy when market rallies again.



(Figure 10)

- ❖ Wave 5: Wave 5 is the last wave of dominant trend. Although prices make new high above wave 3 but volumes is usually lesser than volume in wave 3. The wave 5 lacks the strength witnessed in wave 3 rallies and finally markets tops out and enter new phase.



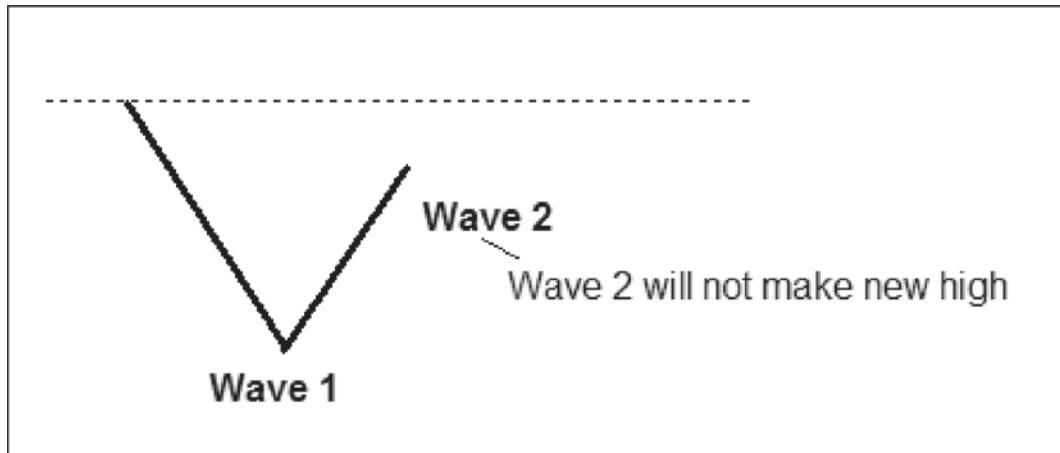
(Figure 11)

Characteristic of Dominant Trend (when markets are declining)

- ❖ Wave 1: Wave 1 is usually a small correction with only small number of traders participating

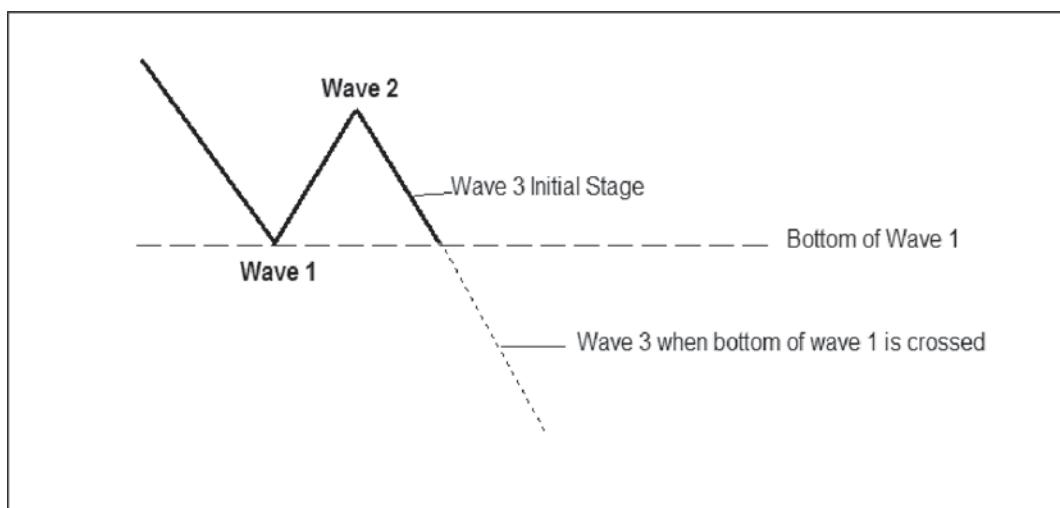
in the market. This is because fundamental news is still positive and above all previous trend which was rising is still considered to be strong in force.

- ❖ Wave 2: Wave 2 is a strong rally once wave 1 is over. But wave 2 never extends beyond the starting point of wave 1. Wave 2 finally ends without making new highs and prices starts declining again.



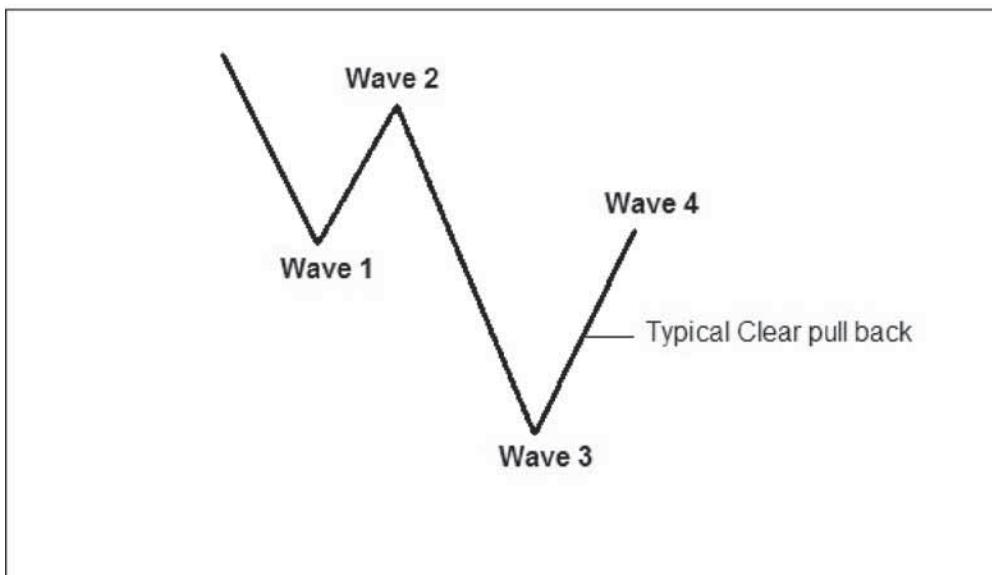
(Figure 12)

- ❖ Wave 3: The initial stage of the wave 3 is a slow decline as market participants are not convinced about the decline. Practically lot of buy side positions are there in the market and these get squared off as and when markets declines and finally buy side positions are closed when bottom of wave 1 is crossed. This is the time when bottom of wave 1 is crossed, market participants are convinced about the decline and there is sudden sell side interest in the market. Wave 3 is usually the largest and most powerful wave of dominant trend.



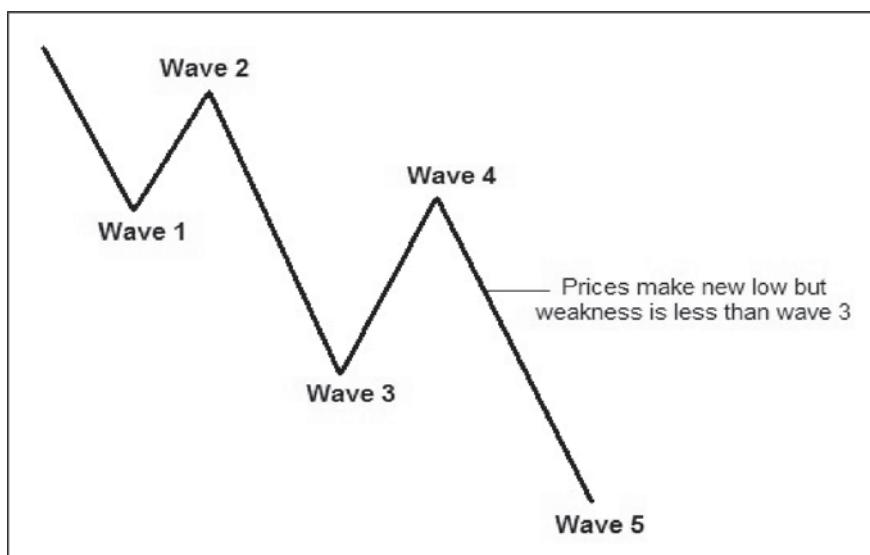
(Figure 13)

- ❖ Wave 4: Finally wave 3 ends as traders who were short from the higher levels takes profit, hence profit taking starts. Basically wave 4 is a clear pull back on lesser volume than wave 3. While profit taking is on, majority of the market participants are convinced that trend is down. There are two schools of thoughts here to trade Wave 4. One is to sell on rally if one understands the potential ahead for wave 5. The other is to wait for wave 4 to end and sell when market declines again.



(Figure 14)

- ❖ Wave 5: Wave 5 is the last wave of dominant trend. Although prices make new low below the wave 3 but volumes is usually lesser than volume in wave 3. The wave 5 lacks weakness found in wave 3 declines and finally markets bottoms out and enter new phase.

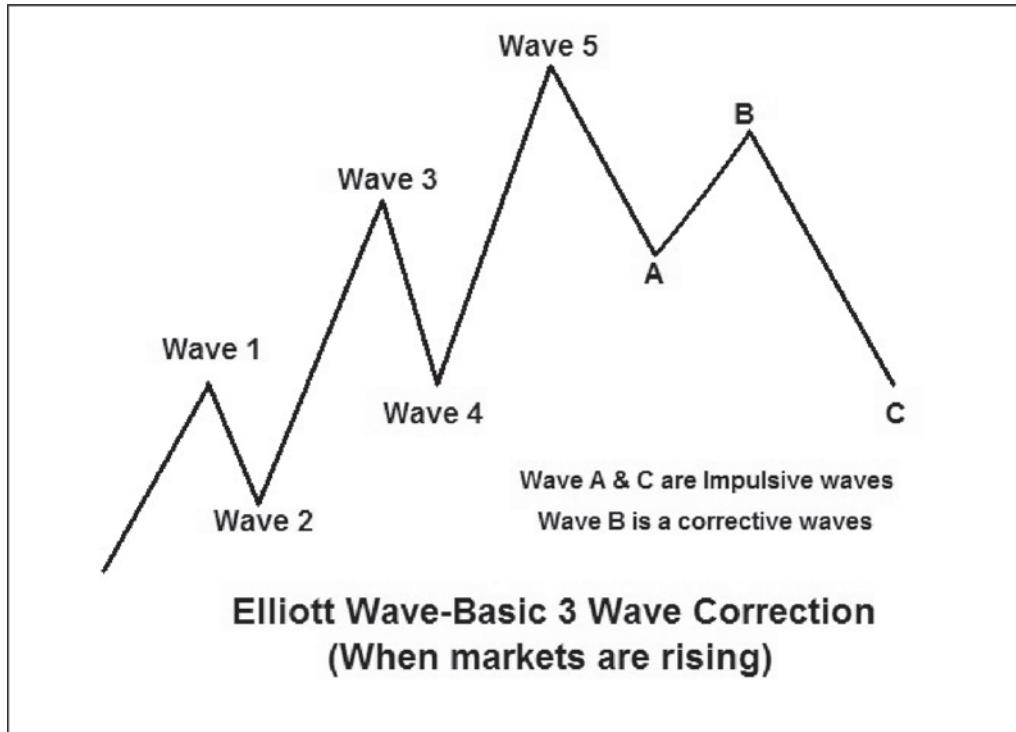


(Figure 15)

B. Corrective trend (Three wave pattern)

Corrective Trend consists of three waves. Basically three wave corrective trend starts when five wave dominant trend ends.

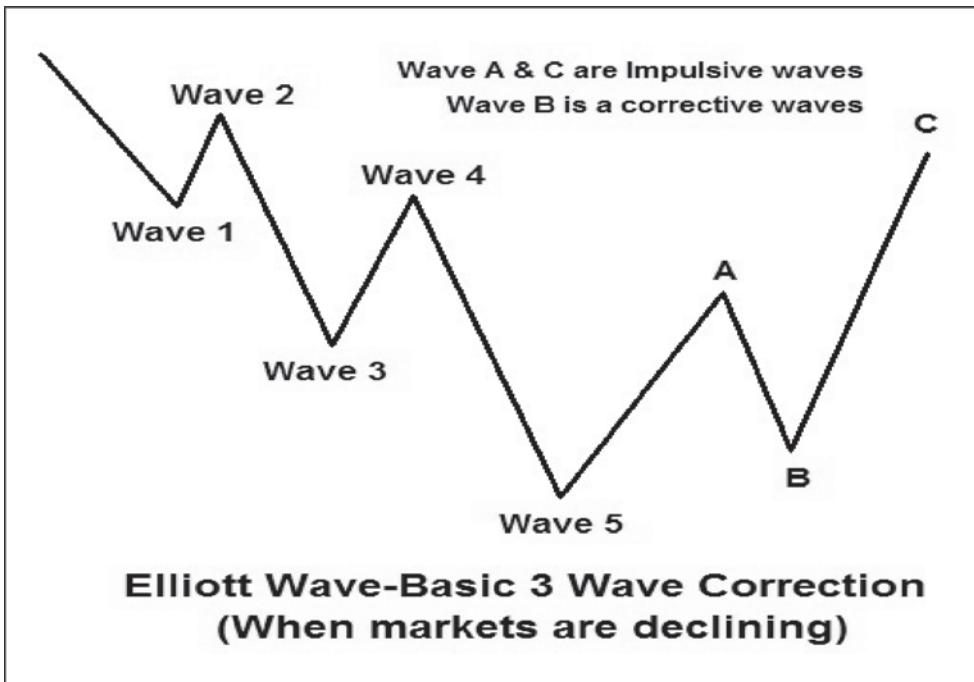
After market rallies in a basic 5 wave sequence, market top is made and markets enter a new phase i.e. three wave downward corrective phase i.e. A, B and C which would be clearer from (Figure 16).



(Figure 16)

(Figure 16) illustrates ABC corrective sequence after market rallied in a basic five wave sequence. Here entire move is clearly down after Wave 5 is formed. Hence Wave A and C are impulse waves and wave B is a corrective wave.

Similarly After market declines in a basic 5 wave sequence, market bottom is made and markets enter a new phase i.e. three wave upward corrective phase i.e. A, B and C which would be clearer from (Figure 17).



(Figure 17)

(Figure17) illustrates ABC corrective sequence after market declined in a basic five wave sequence. Here entire move is clearly up after Wave 5 is formed. Hence Wave A and C are impulse waves and wave B is a corrective wave.

Characteristic of Corrective Waves after market rallies in a basic five wave sequence

Each individual Wave of the corrective trend has its own characteristic. One should understand these characteristics which is the key to practical application of Elliott Theory. These are described as-

- ❖ Wave A: Wave A is the beginning of a new bear market, fundamental news is still positive and nobody is ready to accept the fact that markets can decline.
- ❖ Wave B: Wave B is basically a small rally which gives the feeling that Bull Run has again started but prices fail to make new high and typical volume characteristic here is that Volume in Wave B is lesser than Wave A.
- ❖ Wave C: Here prices again starts declining and volume also pick up and it's in Wave C that everyone realizes that market decline is likely to continue and hence market participation on the sell side increases.

Characteristic of Corrective Waves after market declines in a basic five wave sequence

- ❖ Wave A: Wave A is the beginning of a new bull market, fundamental news is still negative and nobody is ready to accept the fact that markets could rally.

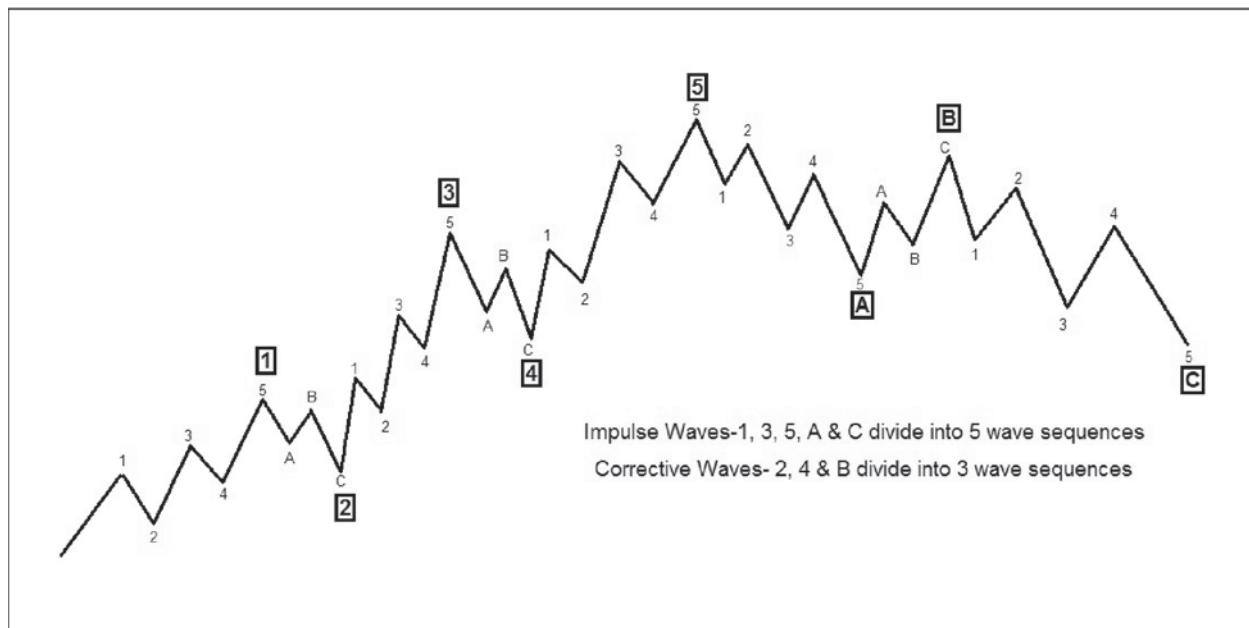
- ❖ Wave B: Wave B is basically a small decline which gives the feeling that decline has again started but prices fail to make new low and typical volume characteristic here is that Volume in Wave B is lesser than Wave A.
- ❖ Wave C: Here prices again starts rising and volume also pick up and it's in Wave C that everyone realizes that market rally is likely to continue and hence market participation on the buy side increases.

Combining five wave dominant sequences with a three wave corrective sequence completes basic fundamental concept behind Elliott Theory.

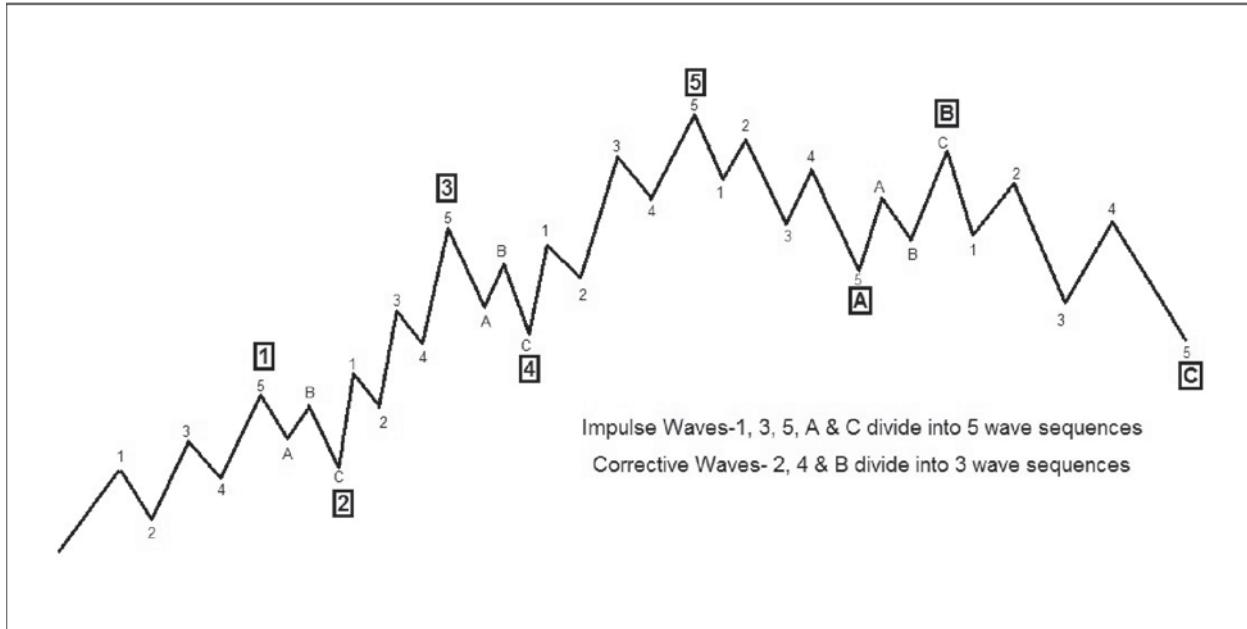
C. Pattern Recognition and Fractals

Elliott Wave theory suggests that stock prices move in clear trends which can be defined as five wave dominant trends followed by three wave corrective trend. Basically one looks at price chart to define these trends i.e. dominant trend or corrective trend. Hence it can be said that these waves move in certain patterns and application of Elliott Wave theory is a form of pattern recognition.

Elliott Wave theory suggests that irrespective of size of the wave, all impulse waves are subdivided into five smaller waves and all corrective waves are subdivided into three smaller waves. Hence Elliot Wave is a fractal (Fractal is typically a self similar patterns appearing at every degree of trend where self similar means they are "the same from near as from far"). This would be more clearer for (Figure 18) and (Figure 19) which shows fractal nature of Elliott Wave.



(Figure 18)



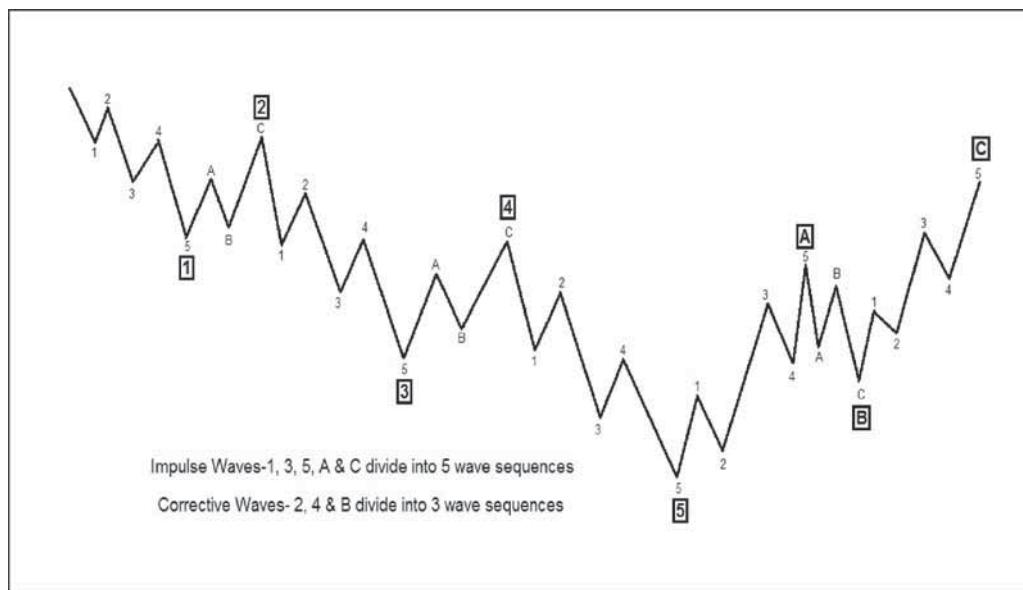
(Figure 19)

D. Elliott Wave Rules and Guidelines

Elliot Wave Rules-There is basically three indispensable rules i.e. it's necessary that these rules should hold true all of the time.

Rule 1: Wave 2 cannot retrace more than 100% of Wave 1 i.e. in the rising market Wave 2 would not break bottom of Wave 1 and similarly in declining market Wave 2 would not break top of Wave 1. This would be clearer from (Figure 20)

If Wave 2 retraces more than 100% of Wave 1 then it means something is wrong with the wave count and there is a crucial need for a wave re-count.

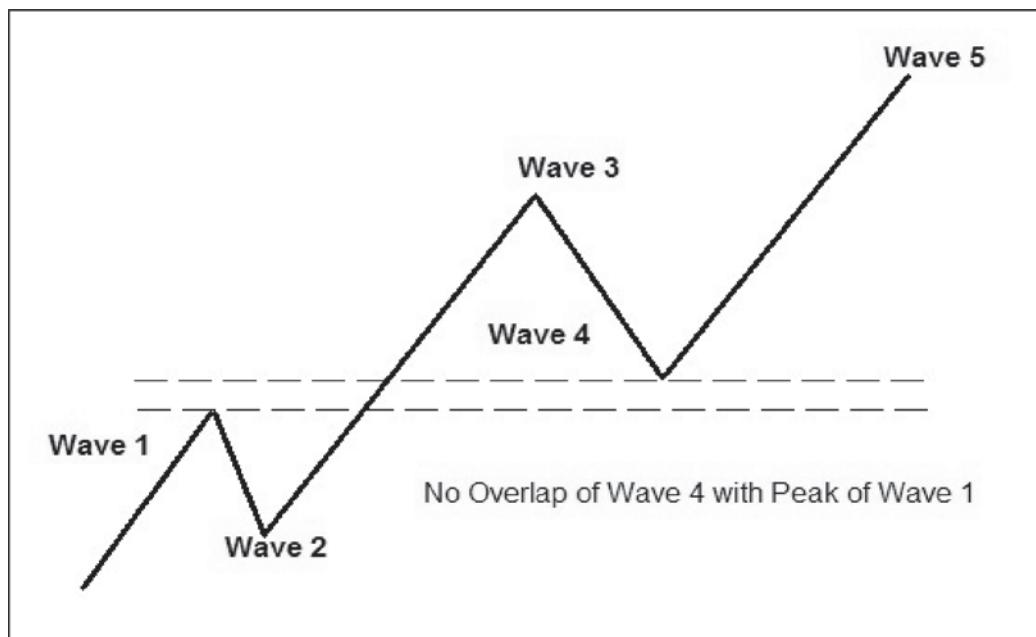


(Figure 20)

Rule 2: Wave 3 is never the shortest- This means that Wave 3 is always longer than other two waves i.e. Wave 1 or Wave 2. Practically Wave 3 is longer than other two waves. If you find wave 3 shorter than other two waves then it means something is wrong with the wave count and there is a crucial need for a wave re-count. Wave 3 may end up being equal in length but never shortest.

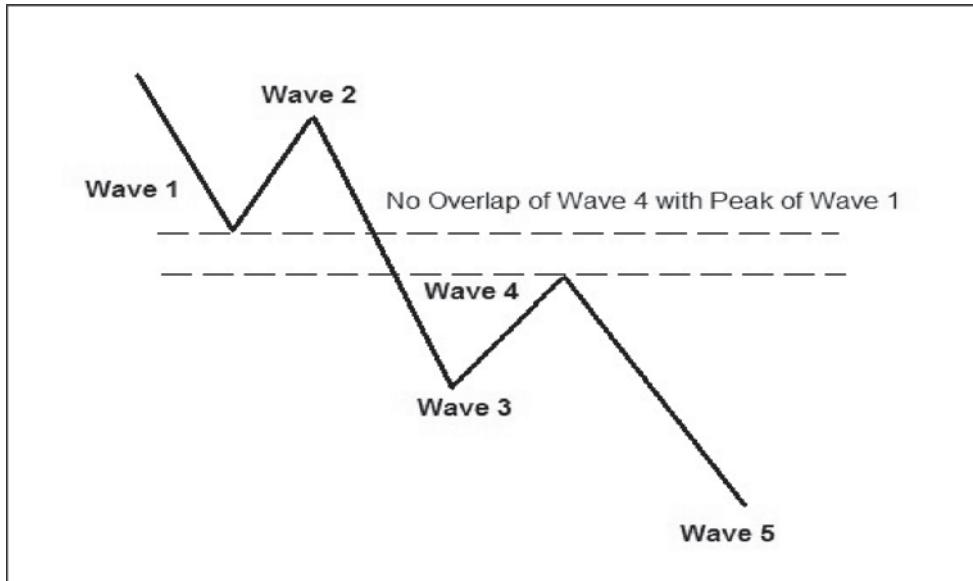
Rule 3: Wave 4 can never overlap Wave 1 – This means that end of wave 4 should not trade below the peak of wave 1. This would be more clearer from (Figure 21) and (Figure 22).

This rule is for cash market i.e. capital market segment on NSE and for derivative market segment on NSE 5-7% overlap is allowed for both equity futures and currency futures. This is so because cost of carry is there and higher side overlaps are basically seen in declining market.



(Figure 21)

(Figure 21) illustrates that Wave 4 ends above the peak of Wave 1.



(Figure 22)

(Figure 22) illustrates that Wave 4 ends above the peak of Wave 1.

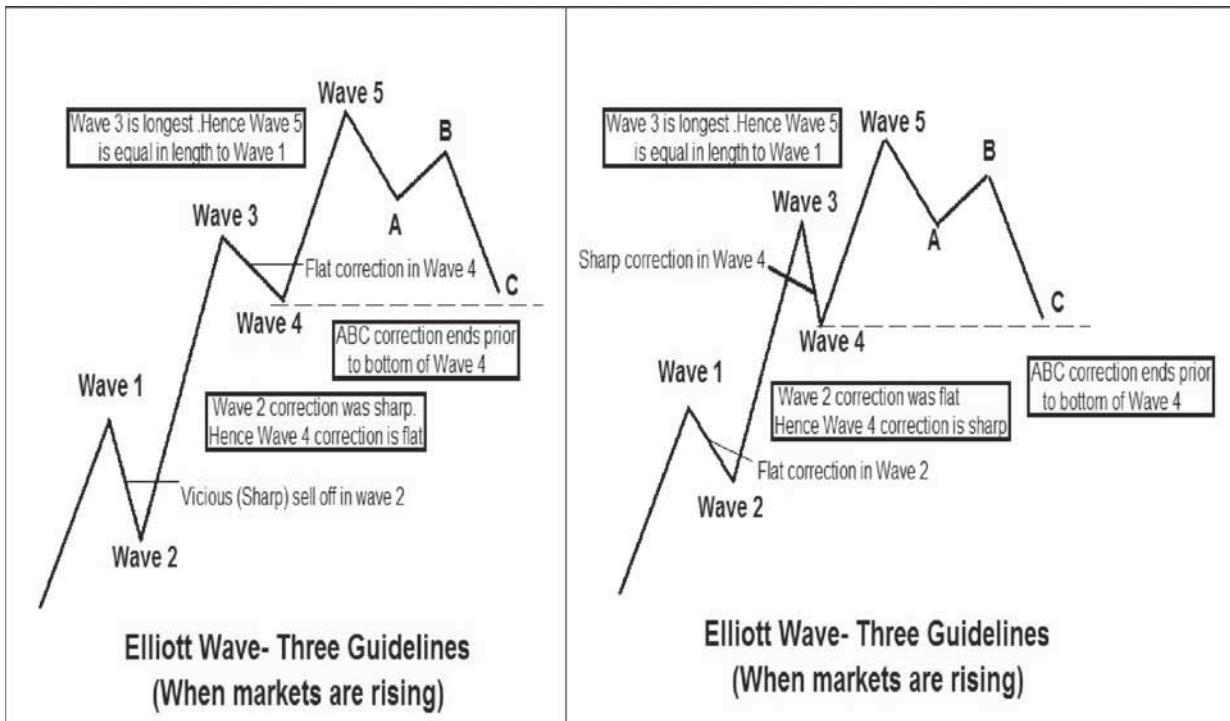
Elliot Wave guidelines- There are basically three guidelines. The difference between rules and guidelines is that it's necessary that rules should hold true all of the time but it's not necessary that guidelines should hold true all of the time, basically guideline hold true most of the time.

Guideline 1: When Wave 3 is longest wave then mostly wave 5 is equal in length to Wave 1. This provides target for end of Wave 5. Even though Wave 5 can be longer than Wave 3 and Wave 3 could still be longer than Wave 1 but this helps in providing at least conservative target for end of Wave 5.

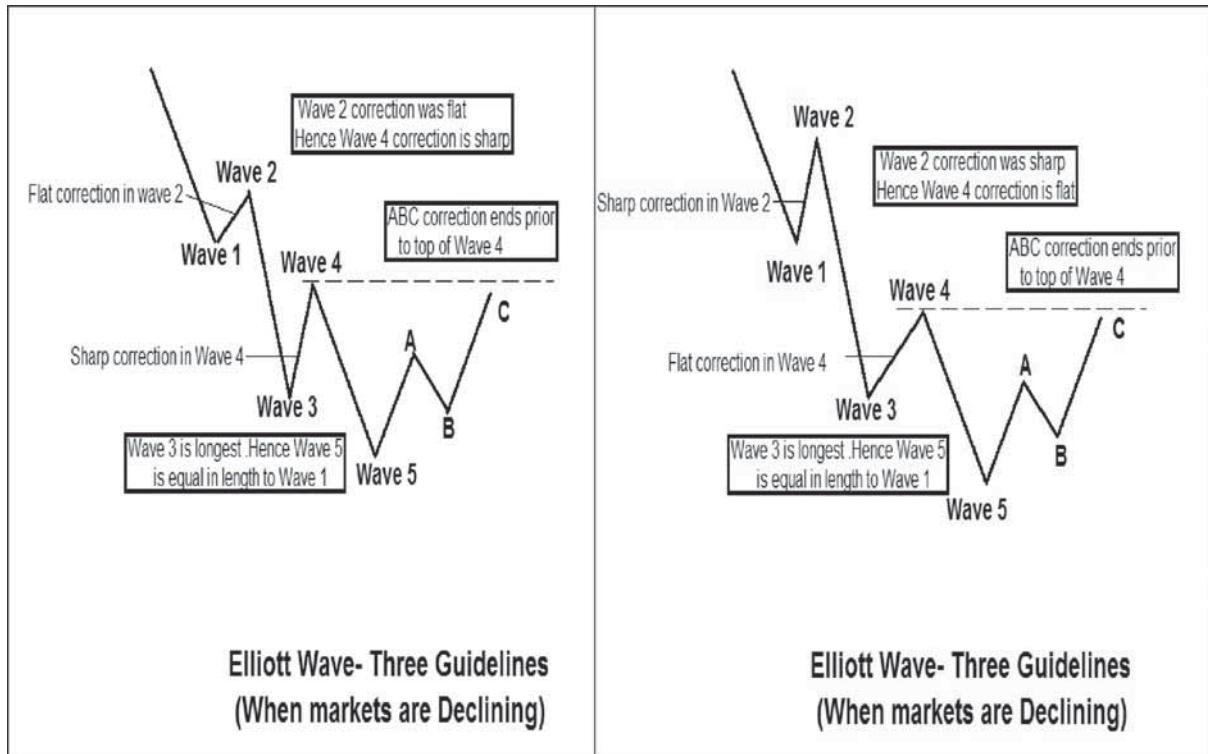
Guideline 2: The form of Wave 2 and Wave 4 corrections are alternate i.e. if Wave 2 is vicious (sharp) sell off then Wave 4 would be flat correction and if Wave 2 is flat correction then Wave 4 would be vicious (sharp) sell off.

Guideline 3: Three Wave corrective pattern (A, B, C) after five wave dominant pattern (1, 2, 3, 4, 5) ends prior to end of Wave 4 of dominant trend.

This would be more clearer from (Figure 23) and (Figure 24)



(Figure 23)



(Figure 24)

E. Fibonacci Sequence

Fibonacci sequence is named after Leonardo Pisano Bogollo (1170-1250), and he lived in Italy.

The Fibonacci sequence is the series of numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34

The next number is found by adding up the two numbers before it. For example

- i. The 2 is found by adding the two numbers before it (1+1)
- ii. The 3 is found by adding the two numbers before it (1+2),
- iii. The 5 is found by adding the two numbers before it (2+3)
- iv. and the next number in the sequence above would be 21+34 = 55

Hence Fibonacci sequence can be defined by a mathematical formula i.e.

$$X_N = X_{N-1} + X_{N-2}$$

Where X_N and N stands for

N =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	...
$X_N =$	0	1	1	2	3	5	8	13	21	34	55	89	144	233	377	...

Here

X_N is term number "N"

X_{N-1} is the previous term (N-1)

X_{N-2} is the term before that (N-2)

The Fibonacci sequence is used in many fields including stock market. Basically for stock market trading, one needs to know only this regarding Fibonacci sequence.

The most common Fibonacci sequence used in the stock markets is:

Multiples	1	1.618	2.618	4.23	6.85
Ratios	0.14	0.25	0.38	0.5	0.618

Basically stock price movement reflects human opinion, expectation, fear, greed and valuation etc. Fibonacci sequence has been successfully used to predict and analyze price trends. This is explained ahead in Golden Ratio, Fibonacci retracement and Fibonacci relationship.

F. Golden Ratio

In Mathematics and in arts, ratio is considered Golden, if ratio of the sum of two quantities to the larger quantity is equal to the ratio of the larger quantity to the smaller quantity. Let's understand this with an example. There are two quantities say A and B, where A is larger than B.

If $(A+B)/A = A/B$ then answer is Golden Ratio which is 1.6180339887...

This Golden ratio is observed, if you take ratio of any two successive Fibonacci numbers. It comes very close to 1.618034..... .

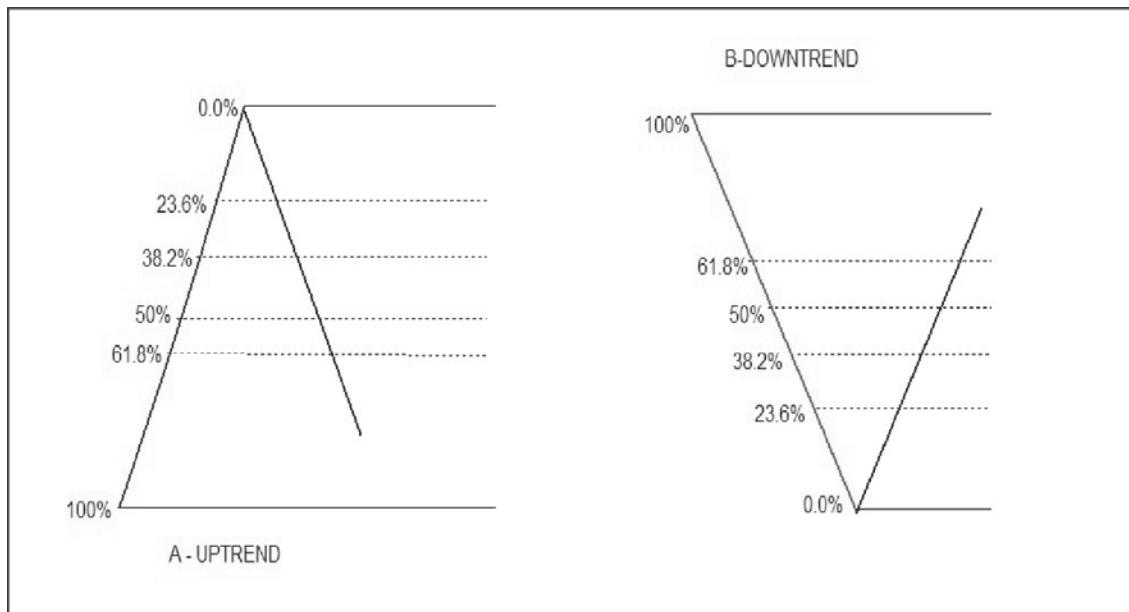
Practically bigger the pair of Fibonacci numbers closer the approximation to the Golden ratio.

For example

A	B	B / A
2	3	1.5
3	5	1.666666666...
5	8	1.6
8	13	1.625
144	233	1.618055556...
233	377	1.618025751...

This Golden ratio appears frequently in stock market, basically near to levels where wave tops and bottoms are being made. Therefore Golden ratio helps in identifying key turning points of the waves and thus helps in predicting the price trend. This would be clearer from Fibonacci relationships.

G. Fibonacci Retracement- It's based on the numbers identified in Fibonacci sequence to define area of support and resistance. It is created by taking two extreme points (usually a major peak and trough) on a price chart and then dividing the vertical distance by key Fibonacci ratios of 23.6%, 38.2%, 50%, 61.8% and 100%. Once these levels are identified, horizontal lines are drawn to indicate areas of support or resistance at the key Fibonacci levels before prices continue to move in the original direction. This is illustrated in (Figure 25). Practical application of Fibonacci retracements would be clearer from Fibonacci relationship.



(Figure 25)

H. Fibonacci Relationship

It has been observed that the Fibonacci summation series is the basis of Elliot Wave theory as Fibonacci numbers come up repeatedly in Elliot Wave Structure. But interesting thing is that after Elliott theory was developed, it was observed that it reflected Fibonacci sequence.

The first wave in Elliott Theory is Wave 1. The length of Wave 1 is used for predicting the length of other waves with the help of Fibonacci retracements and ratios. Hence each wave is related to some other wave in terms of Fibonacci ratio or retracement and these relationships are known as Fibonacci relationship. These relationships are not rules but guidelines in estimating length of the other waves and it's defined as

I. Fibonacci relationship for wave 2:

Wave 2 is always related to Wave 1.

Wave 2 = either 50 % retracement of Wave 1 or

Wave 2 = 61.8 % retracement of Wave 1.

Fibonacci relationship for Wave 3:

Wave 3 is always related to Wave 1.

Wave 3 = either 1.618 times the length of Wave 1 or

Wave 3 = 2.618 times the length of Wave 1 or

Wave 3 = 4.23 times the length of Wave 1

II. Fibonacci Relationship for Wave 4:

Wave 4 is always related to Wave 3.

Wave 4= either 23.6% retracement of Wave 3 or

Wave 4= 38.2% retracement of Wave 3 or

Wave 4= either 50 % retracement of Wave 3

In any case Wave 4 is not more than 61.8% retracement of Wave3.

III. Fibonacci Relationship for Wave 5:

i. Wave 5 is related to Wave 1. If Wave 3 is more than 1.618 times the length of Wave 1 then

Wave 5 = either Wave 1 or

Wave 5 = 1.618 times the length of Wave 1 or

Wave 5 = 2.618 times the length of Wave 1.

ii. Wave 5 is related to entire length from bottom of Wave 1 to the top of Wave 3. If Wave 3 is less than 1.618 times the length of Wave 1 then

Wave 5 = either 1.618 times the entire length from bottom of Wave 1 to the top of Wave 3 or

Wave 5 = 2.618 times the entire length from bottom of Wave 1 to the top of Wave 3.

IV. Fibonacci Relationship for Wave A:

Wave A is related to Wave 5.

Wave A= either 23.6% retracement of Wave 5 or

Wave A= 38.2% retracement of Wave 5.

V. Fibonacci Relationship for Wave B:

Wave B is related to Wave A.

Wave B = either 50 % retracement of Wave A or

Wave B = 61.8 % retracement of Wave A.

VI. Fibonacci Relationship for Wave C:

Wave C is related to Wave A.

Wave C = either 1.618 times the length of Wave A or

Wave 3 = 2.618 times the length of Wave A.

6.5.3 After Elliott

A. Rediscovery and current use

Ralph Nelson Elliott died in 1948. After his death other analyst continued the use of wave theory. Charles Collins, published Elliot's "Wave Principle" and ranked Elliot's contribution in the field of technical analysis at par with Charles Dow. Hamilton Bolton

Founder of The Bank Credit Analyst provided Wave analysis. Many other analysts wrote on wave theory but today most widely known wave analyst after Elliott is Robert Prechter. He forecasted the bull run of 1980s and this increased awareness about Elliott's work across financial markets.

Today Elliott wave theory is important part of technical analysis and Elliot Wave theory is part of Chartered Market Technician (CMT), the professional certification developed by the Market Technicians Association (MTA). Now it's part of National Stock Exchange Module on Technical Analysis.

A lot of work has been done on Wave theory, both on academic front and trading front.

Wave theory is widely used by retail and institutional investors.

B. Criticism

Criticism is an integral part of life. Critics would criticize you for doing something and they will even criticize if you don't do same thing.

Firstly efficient market theory states that prices cannot be predicted from market data i.e. price and volume. It says that successful market forecast is not possible, otherwise each market participant would buy when prices are about to rise and sell when prices are about to

decline, thus destroying the profitability and price predictive power of the method. This theory criticizes not only wave theory but all forms of technical analysis.

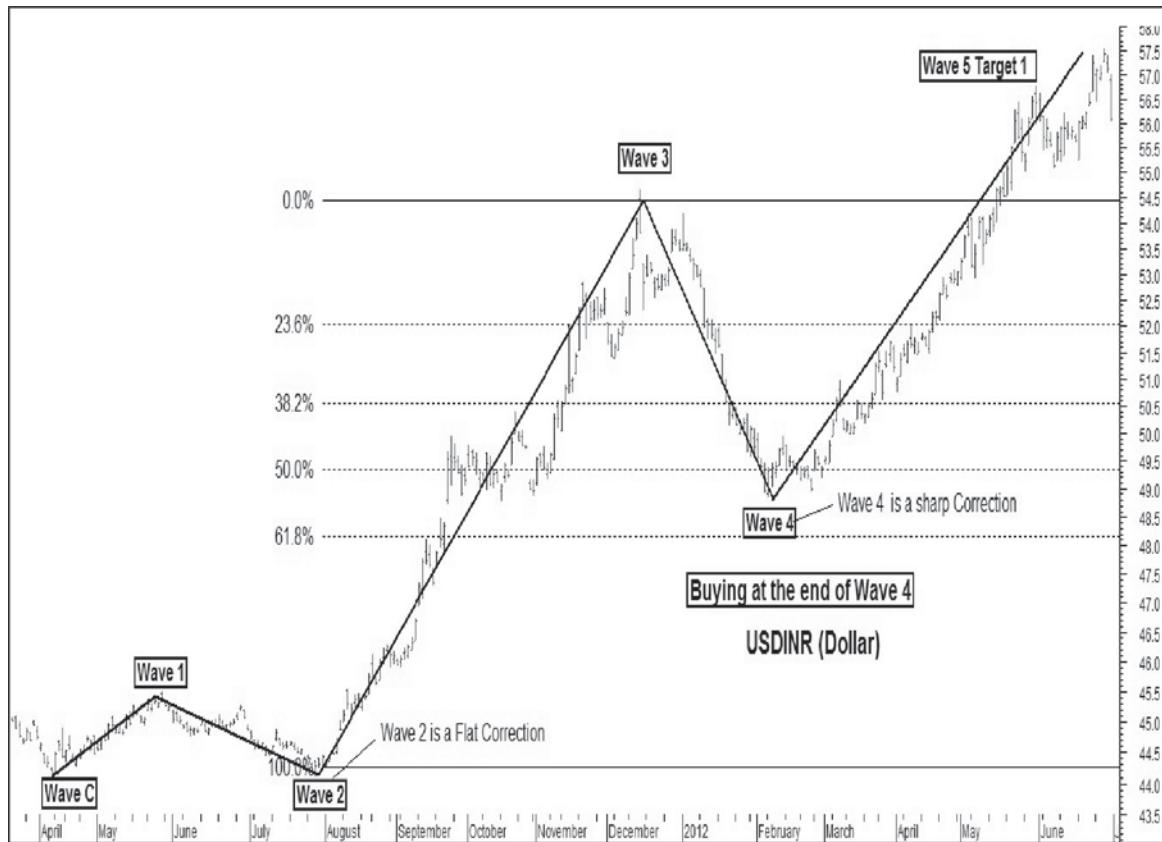
Secondly price prediction using wave theory is an art with a subjective judgment of an analyst. Hence some critics say it is an uncertain business.

Thirdly critics say wave theory does not identify when wave begins and ends. Basically wave is identified when some distance has been covered but if anybody wants to buy at bottom and sell at top then Wave theory is not blamed.

Fourthly critics say it's only a popular theory and not a valid theory. How can theory become popular if it's not profit making.

C. Practical Application:

1. Trading stock markets using wave theory is not an easy path to walk. It requires lot of hard work and practice. To begin with, 70% of the Elliot Wave patterns are simple whereas remaining 30% are complex. Hence first recommendation is to trade 70 % of the patterns which are clear at least for beginner.
2. Corrections are difficult to trade as these are short lived and moreover corrective waves have potential to come to an end overnight. Hence second recommendation is that one should not trade in direction of the corrective waves i.e. Wave 2, Wave 4 and Wave A.
3. Third recommendation is to take position in the market when Wave 4 ends. This is subdivided into two parts-
 - (i) Buying at the end of Wave 4 when prices are advancing.
 - Before buying at end of Wave 4, make sure that Wave 4 is not more than 61.8% retracement level of Wave 3, otherwise odds for Wave 5 failure increases.
 - Stop Loss for buying at end of Wave 4 is placed below the 61.8 % retracement level of Wave 3.
 - Use Fibonacci relationship to predict Wave 5 target. Then observe risk reward ratio as both stop loss and target is known. If reward is less than 1.5 times the risk, then one should strictly avoid taking buy side position.
 - (Figure 26) illustrates buy setup in Dollar when Wave 4 ends. Here Wave 2 is a flat correction whereas Wave 4 is sharp correction and Wave 4 finds support around 50% retracement level of Wave 3 i.e. at 49 levels for Dollar during February 2012.
 - The best method to confirm that Wave 4 has found support is to look for first higher top-higher bottom formation near Wave 4 support area. Here first higher top-higher bottom is formed at 49.85 levels on 2nd March 2012 and thereafter Wave 5 made new high around 57 levels.



(Figure 26)

(ii) Selling at the end of Wave 4 when prices are declining.

- Before selling at end of Wave 4, make sure that Wave 4 is not more than 61.8% retracement level of Wave 3, otherwise odds for Wave 5 failure increases.
- Stop Loss for selling at end of Wave 4 is placed above the 61.8 % retracement level of Wave 3.
- Use Fibonacci relationship to predict Wave 5 target. Then observe risk reward ratio as both stop loss and target is known. If reward is less than 1.5 times the risk, then one should strictly avoid taking sell side position.
- (Figure 27) illustrates sell setup in Bank Nifty Index when Wave 4 ends. Here Wave 4 finds resistance at 50% retracement level of Wave 3 i.e. at 10080 levels during October 2011.
- The best method to confirm that Wave 4 has found resistance is to look for first lower bottom-lower top formation near Wave 4 resistance area. Here first lower bottom-lower top is formed at 9300 levels on 11th November 2011 and thereafter Wave 5 made new low around 7770 levels on 20th December 2011.



(Figure 27)

4. Fourth recommendation is to take position in the market when Wave 5 ends. This is subdivided into two parts-
 - (i) Selling at the end of Wave 5 when prices are advancing.
 - Before selling at end of Wave 5, make sure that prices are near to Wave 5 target as suggested by Fibonacci Relationship. One should preferable sell when immediate bottom is taken off after Wave 5 is completed.
 - Stop Loss for selling at end of Wave 5 is placed above previous highs.
 - Use Fibonacci relationship to predict Wave C target. Then observe risk reward ratio as both stop loss and target is known. If reward is less than 1.5 times the risk, then one should strictly avoid taking sell side position.
 - (Figure 28) illustrates sell setup in Nifty Index when Wave 5 ends. Here one sells when immediate bottom is taken off after Wave 5 is formed i.e. at 5675 levels on 21st January 2008 and thereafter Nifty vertically crashed with a lower circuit freeze within two days of selling level being taken off.



(Figure 28)

(ii) Buying at the end of Wave 5 when prices are declining.

- Before buying at end of Wave 5, make sure that prices are near to Wave 5 target as suggested by Fibonacci Relationship. One should preferable buy when immediate top is taken off after Wave 5 is completed.
- Stop Loss for buying at end of Wave 5 is placed below previous lows.
- Use Fibonacci relationship to predict Wave C target. Then observe risk reward ratio as both stop loss and target is known. If reward is less than 1.5 times the risk, then one should strictly avoid taking buy side position.
- (Figure 29) illustrates buy setup in Nifty Index when Wave 5 ends. Here one buys when immediate top is taken off after Wave 5 is formed i.e. at 4800 levels on 10th January 2012 and thereafter Nifty rallied with a momentum to 5600 levels within 30 trading days.



(Figure 29)

5. Fifth recommendation is to take position in the market when Wave 3 emerges. This is subdivided in two parts-
 - (i) Buying when Wave 3 emerges in the advancing market.
 - Here one buys when high of Wave 1 is taken off.
 - Stop loss is placed below the bottom of Wave 2.
 - Use Fibonacci relationship to predict Wave 3 target. Then observe risk reward ratio as both stop loss and target is known. If reward is less than 1.5 times the risk, then one should strictly avoid taking buy side position.
 - (Figure 30) illustrates buy setup in Jindal Steel and Power as Wave 3 emerges. Here buying is recommended when top of wave 1 is taken off and Wave 3 is confirmed i.e. at 180 levels during March 2009 and thereafter stock rallied to 500 levels in a straight line without any significant correction.



(Figure 30)

(ii) Selling when Wave 3 emerges in the declining market.

- Here one sells when low of Wave 1 is taken off
- Stop loss is placed above the top of Wave 2.
- Use Fibonacci relationship to predict Wave 3 target. Then observe risk reward ratio as both stop loss and target is known. If reward is less than 1.5 times the risk, then one should strictly avoid taking sell side position.
- (Figure 31) illustrates sell setup in Reliance Infrastructure as Wave 3 emerges. Here selling is recommended when bottom of wave 1 is taken off and Wave 3 is confirmed i.e. at 1025 levels during November 2010 and thereafter stock declined to 500 levels by February 2011



(Figure 31)

Model Questions

- Q1. Dow Theory is named after Charles H Dow who is considered as the father of Technical Analysis.
- A. True
 - B. False
- Q2. Charles Dow never wrote a book nor published his complete theory on the markets.
- A. True
 - B. False
- Q3. Samuel A. Nelson is the first person to use the term Dow Theory.
- A. True
 - B. False
- Q4. The Dow Theory is made up of Principles.
- A. Four
 - B. Six
 - C. Eight
 - D. Five
- Q5. Which of the following statement is true
- A. Stock prices discount all information that is known about stock.
 - B. Stock market discounts all information related to interest rate movement, macroeconomic data, RBI decision and future earnings announcement by the company.
 - C. Stock price represents sum total of hopes, fear and expectation of all participants.
 - D. All the above
- Q6. is the main trend and trader should trade in direction of this trend.
- A. Minor Trend
 - B. Secondary Trend
 - C. Primary Trend
 - D. Corrective Trend
- Q7. As long as each successive top is higher than previous top and each successive bottom is higher than previous bottom trend is considered down.
- A. True
 - B. False

- Q8. As long as each successive top is lower than previous top and each successive bottom is lower than previous bottom trend is considered down.
- A. True
B. False
- Q9. Secondary Trend is found within
- A. Corrective Trend
B. Minor Trend
C. Primary Trend
D. Tertiary Trend
- Q10. The is corrective move within secondary trend.
- A. Primary Trend
B. Main Trend
C. Secondary Trend
D. Minor Trend
- Q11. Participation phase is the longest phase of the primary trend during which largest price movement takes place.
- A. True
B. False
- Q12. Under Dow Theory, reversal from bull market to bear market or vice versa is not signaled until and unless both indexes i.e. Industrial Index and Transportation Index. Confirm the same.
- A. True
B. False
- Q13. Dow Theory says trend should not be confirmed by volume.
- A. True
B. False
- Q14. Dow Theory has no significance in today's world as it's more than 100 year old.
- A. True
B. False
- Q15. Which of the following statement is true
- A. One should never assume reversal of the trend until and unless clear reversal signal are there.
B. If primary trend is down then volume should increase with the market decline.
C. Both A and B
D. Only A

CHAPTER 7 TRADING PSYCHOLOGY AND RISK MANAGEMENT

Learning objectives

After studying this chapter the student should be able to understand:

- Why to put stop loss and use optimal trade size
- Qualities of successful traders
- Do's and Don'ts in trading
- Trading along with trend
- Choosing the Right Markets to Trade
- Importance of Discipline in trading

7.1 Introduction

It is generally noticed that when we invest or trade our focus is on potential gains rather than dwelling on possible losses. Traders are often so confident about their trades that they push back their minds and don't think that something could go wrong. But in order to be successful trader, we must keep our mind open to the potential losses and we should know how to manage and control those losses.

If you are making huge profits in the market on a very small or average trading account, it is most likely that you are not implementing sound money management. May be you are lucky for one or two days that has earned you windfall profits. But you have exposed yourself to obscene risk because of an abnormally high "Trade Size." If you continue trading in this manner, probabilities indicate that very soon you would land up with series of losses and you may loose your entire capital.

Trading, like every other business, needs to start with a certain amount of equity or "seed capital". Traders remain in business so long as they have this seed capital with them. Many traders start and end their trading capital in just one month! By not controlling risk and by using improper "Trade Size" a trader can go broke in no time. It usually happens like this; they begin trading, get 5 to 8 losses in a row, don't use proper position size and don't cut their losses soon enough. After 5 to 8 devastating losses in a row, their funds become too small to continue trading.

Novice traders tend to focus on the trade outcome as only winning and therefore do not think about risk. They don't ask themselves, how much can they afford to lose on this trade

and hence they fall prey to the “risk-of-ruin” outcome. Failure to implement good money management program will leave you subject to the deadly “risk of ruin” exposure leading eventually to a probable equity bust.

Professional traders focus on the risk and take the trade based on a favorable outcome. Thus, the psychology behind ‘Trade Size’ begins when you believe and acknowledge that each trade’s outcome is unknown when entering the trade. You either adjust your “Trade Size” or tighten your stop-loss before entering the trade. In most situations, the best method it to adjust your “Trade Size” and set your stop-loss based on market dynamics.

During “draw-down” periods, risk control becomes very important and since good traders test their trading systems, they have a good idea of the probabilities of how many consecutive losses in a row can occur. Taking this information into account, allows the trader to further determine the appropriate risk percentage to take on each trade.

Let’s talk about implementing sound money management in your trading formula so as to improve your trading and help control risk. The idea behind money management is that given enough time, even the best trading systems will only be right about 60% to 65% of the time. That means 40% of the time we will be wrong and have losing trades. For every 10 trades, we will lose an average of 4 times. Even certain trading set ups with higher rates of returns nearing 80% usually fall back to a realistic 60% to 65% return when actually traded. The reason for this is that human beings trade trading systems. And when human beings get involved, the rates of returns on most trading systems are lowered. Why? Because humans make trading mistakes, and are subject from time to time to emotional trading errors.

If we are losing 40% of the time then we need to control risk! This is done through implementing stops and controlling position size. We never really know which trades will be profitable. As a result, we have to control risk on every trade regardless of how sure we think the trade will be. If our winning trades are higher than our losing trades, we can do very well with a 60% trading system win to loss ratio. In fact with risk control, we can sustain multiple losses in a row without it devastating our trading account and our emotions.

7.2 Risk Management

Risk is there in every business and proper risk management is road to success for any business. Equity trading is a lucrative business which is very rewarding but this reward is not risk free, as theoretically and practically risk free trade does not exist. Because risk is associated with the reward, it becomes essential to manage risk in order to protect one’s capital.

Risk management is very essential for trading as markets have potential to take back all life time profits in just few bad trades. Risk managements help in preserving initial capital and

accumulated profits so that one can stay alive long enough in financial markets for wealth creation, thus it provides biggest edge in trading.

7.2.1 Components of risk management

7.2.1.1 Stop loss

Stop loss is an integral part of risk management. Stop loss is an order placed to buy or sell security once certain price is reached. It is basically designed to limit the amount of loss on buy/sell position. In fact by placing the stop loss one is just closing the losing position and limiting the amount of loss which can increase beyond imagination.

7.2.1.2 *Analyze reward risk ratio*

Before initiating a trade, the trade should analyze reward risk ratio. On a conservative basis if the said ratio is less than 1.5 then one should not initiate the trade.

7.2.1.3 *Trail stop loss*

Initially stop loss is placed to protect one's capital on a losing trade, but once the trade is in profit stop loss should be so moved that trade is at zero risk even if trailed stop loss gets triggered.

7.2.1.4. *Booking profit*

Profit is the only goal for which we all trade. But at the same time profit is profit only when it is realized otherwise its notional profit. Hence one should book profit at predefined target levels and one should not be carried away by one's emotions specially greed when prices are near to predefined target levels.

7.2.1.5 *Use of stop loss*

A trader should always put Stop Loss and trade a fraction of his capital. It is very important for the trader to have sound knowledge in the area concerned and should be comfortable with the trading system. He should be aware that it is possible and inevitable to have a losing streak of five losses in a row. This is called drawdown. This awareness will help the traders prepare as to how to control risk and choose their trading system.

What we are striving for is a balanced growth in the trader's equity curve over time.

7.2.1.6 *Qualities of successful traders:*

1. Always use stops

2. Trade size should be determined on the basis of trading account equity, and stop loss price for every trade.
3. Never trade more than 10% on any given sector
4. Never exceed a loss of 2 to 5% on any given trade
5. Always trade with risk capital, money you can afford to lose.
6. Never trade with borrowed money and don't overtrade based on the time frame you have chosen to trade

7.2.1.7 *Golden rules for traders*

Want to trade successfully?

It is very important to choose good positions over the bad ones. Poor trading sense leads to a heavy loss of both the confidence and money. Without a system of discipline for your decision-making, impulse and emotion will undermine skills as you chase the wrong stocks at the worst times.

Many short-term players view trading as a form of gambling.

Many short-term players without planning or discipline jump in the market. The occasional big score reinforces this easy money attitude but sets them up for ultimate failure. Without defensive rules, insiders easily feed off these losers and send them off to other hobbies.

Technical Analysis teaches traders to execute positions based on numbers, time and volume.

This discipline forces traders to distance themselves from reckless gambling behavior. Through detached execution and solid risk management, short-term trading finally "works".

7.2.1.8 *Do's and Don'ts in trading:*

The science of trend allows you to build systematic rules to play these repeating formations and avoid the chase:

1. **Forget the news, remember the chart.** You're not smart enough to know how news will affect price. The chart already knows the news is coming.
2. **Buy at support, sell at resistance.** Everyone sees the same thing and they're all just waiting to jump in the pool.
3. **Don't chase momentum if you can't find the exit.** Assume the market will reverse the minute you get in. If it's a long way to the door, you're in big trouble.
4. **Trends test the point of last support/resistance.** Enter here even if it hurts.

- 5. Trade with the TICK not against it.** Don't be a hero. Go with the money flow.
- 6. If you have to look, it isn't there.** Forget your college degree and trust your instincts.
- 7. The trend is your friend in the last hour.** As volume cranks up at 3:00pm don't expect anyone to change the channel.
- 8. Avoid the open.** They see YOU coming sucker
- 9. Bulls live above the 200 day, bears live below.** Sellers eat up rallies below this key moving average line and buyers to come to the rescue above it.
- 10. Price has memory.** What did price do the last time it hit a certain level? Chances are it will do it again.
- 11. Big volume kills moves.** Climax blow-offs take both buyers and sellers out of the market and lead to sideways action.
- 12. Trends never turn on a dime.** Reversals build slowly. The first sharp dip always finds buyers and the first sharp rise always finds sellers.
- 13. Bottoms take longer to form than tops.** Greed acts more quickly than fear and causes stocks to drop from their own weight.
- 14. Beat the crowd in and out the door.** You have to take their money before they take yours, period.

7.3 Rules to Stop Losing Money

- 1. Don't trust others opinions** - It's your money at stake, not theirs. Do your own analysis, regardless of the information source.
- 2. Don't break your rules** - You made them for tough situations, just like the one you're probably in right now.
- 3. Don't try to get even** - Trading is never a game of catch-up. Every position must stand on its merits. Take your loss with composure, and take the next trade with absolute discipline.
- 4. Don't believe in a company** - Trading is not investment. Remember the charts and forget the press releases.
- 5. Don't seek the Holy Grail** - There is no secret trading formula, other than solid risk management. So stop looking for it.
- 6. Don't forget your discipline** - Learning the basics is easy. Most traders fail due to a lack of discipline, not a lack of knowledge.

7. **Don't trade over your head** - Concentrate on playing the game well, and don't worry about making money.
8. **Don't chase the crowd** - Listen to the beat of your own drummer. By the time the crowd acts, you're probably too late...or too early.
9. **Don't trade the obvious** - The prettiest patterns set up the most painful losses. If it looks too good to be true, it probably is.
10. **Don't ignore the warning signs** - Big losses rarely come without warning. Don't wait for a lifeboat to abandon a sinking ship.
11. **Don't count your chickens** - Profits aren't booked until the trade is closed. The market gives and the market takes away with great fury.
12. **Don't forget the plan** - Remember the reasons you took the trade in the first place, and don't get blinded by volatility.
13. **Don't join a group** - Trading is not a team sport. Avoid acting on messages, flashes and financial TV. Your judgment may be more correct than all of them put together
14. **Don't have a paycheck mentality** - You don't deserve anything for all of your hard work. The market only pays off when you're right, and when your timing is really, really good.
15. **Don't ignore your intuition** - Respect the little voice that tells you what to do, and what to avoid. That's the voice of the winner trying to get into your thick head.
16. **Don't hate losing** - Expect to win and lose with great regularity. Expect the losing to teach you more about winning, than the winning itself.
17. **Don't fall into the complexity trap** - A well-trained eye is more effective than a stack of indicators. Some time Common sense is more valuable than a complex set of indications.
18. **Don't confuse execution with opportunity** - Overpriced software won't help you trade like a pro. Pretty colors and flashing lights make you a faster trader, not a better one.
19. **Don't project your personal life** - The outcome of your trade is definitely likely to get affected by the situation at your home. Get your own house in order before playing the markets.
20. **Don't think its entertainment** - Trading should be boring most of the time, just like the real job you have right now.

If one could sum up the single most important aspect of successful trading it would be to stick with the trend as much as possible.

"The Trend is your friend until the end when it bends." Anonymous

If you have been around trading for any time at all you've probably encountered that quotation a thousand times by now. But in all those times have you ever really tried to understand what this well worn expression is saying to you?

Whoever was the first to say, it knew the secret to making money in the markets. Trading with trend is not just another axiom that rolls off the lips of traders, but it is the very core of successful trading. As almost any successful trader will tell you, there are infinitely better opportunities to trade with the trend than against it.

So, if it is such a commonly accepted truism among traders that the best way to make money in the markets is by trading with the trend, why is it that so many traders chose to take positions against the predominant market direction?

I suppose one reason is that within each of us is a rebel. It is part of human nature to go against the *crowd*. Our society embraces individualism and as a result everyone strives to be an individual. Sometimes this is interpreted as doing the opposite as everyone else.

There is something romantic about being the underdog. Everyone roots for the underdog. Traders have even coined the term *contrarian* to describe the strategy of trading against the trend.

Now does that mean that you will never lose money by trading with the trend? Of course not! Every trend ends and reverses eventually which will stop you out. Furthermore markets make regular pullbacks as a part of an ongoing trend which could stop you out prematurely.

You should always trade with the trend until it hurts. You should follow the trend until you can not possibly conceive how the market could go any higher/lower. And then you should trade with the trend some more. One must Paper trade it. I think you'll be pleased with the results. One of the things that the majority of folks find most challenging about trading is determining which is more important: a good entry or a good exit?

As has been pointed out so many times before, the three components of good trading are market analysis, money management and mental attitude.

As every experienced trader knows, market analysis is the easiest part to learn. However, that by itself only turns you into a good PAPER trader!

There is a world of difference between paper trading and real trading. And the difference is the emotional impact trading has on us, when we trade with real money.

Emotions make a trader hang on to a losing trade, because he has the hope that the market will turn around and get him back to break-even, causing him to ride a bad trade into oblivion.

Emotions will keep a trader out of entering a perfectly good trade, because he is afraid of this being a losing trade.

Emotions make a trader exit a good trade, right after he entered, because the normal jiggles in price make him doubtful of his analysis and afraid of losing on this trade, thus making him miss out on what could be a long ride.

Trades are rarely entered at the low point of a V-shaped bottom. The great majority of our trade entries are followed by some form of 'chop', right after entry.

This applies to both position trades and day trades. The time frames may be different (days, in case of a position trade, and minutes, in case of a day-trade), but the principle is the same: What looked like a perfectly well thought-out trade before the order was placed can turn into a struggle with fear and doubt.

Once these emotions surface, it becomes difficult to stick with the original plan. Many traders then take the easy way out, by escaping to the safety of being on the side lines. And there goes another good trade without them!

A carelessly placed entry almost always results in such misery.

On the other hand, take those incidences when a buy was made right at the low. What a nice and relaxed feeling, when the market goes in the right direction immediately after entry!

So what, if there are some wiggles! There is a profit, even if it's only a small profit. Now it is so much easier to keep a cool head and make the right decision.

Therefore, it is my belief that a trader should strive to perfect his entry techniques first, and worry about the exit later on.

Here are some tips for the newcomer, aimed at relieving trading-stress:

Use stops! Many traders trade without stops. They argue that they don't need to place stop loss orders because they are closely monitoring the market.

This may be so, but the intense monitoring required, and the ever present possibility of a quick adverse price move, create unnecessary additional stress. A well placed stop can do a lot to relieve the tension associated with a new position.

Keep your positions small! Many newcomers try to make a quick killing by using positions that are too large for their account, or trading a stock that's too volatile for them. A sure way to increase the stress level!

Accept yourself for what you are! There are many ways to trade the markets. But we all have different personalities, and many trading styles simply don't fit our personality and emotional set-up.

Some people are natural long-term investors; some people are natural day-traders. Find out what suits you best, and then throw away those books that try to turn you into a person you can never be.

7.4 Choosing the Right Markets to Trade

An often overlooked part of trading is choosing the right markets to trade. Most traders do not pay too much attention to the mix of markets they follow. New traders are sometimes at a loss as to how many markets or sectors to trade and which ones to follow. It is a common misconception that you need to follow a lot of stocks to be a successful trader. This is not true. For most traders, choosing six to eight stocks to follow should be adequate. It is important to allow some diversification among the markets you follow however, so as to allow for the maximum number of trading opportunities.

You would not want to choose all power stocks to follow, or all grains if trading in commodities. By taking one or two picks from each category you should have enough of a cross section to catch most of the opportunities within that category.

7.4.1 *Importance of discipline in trading*

Overtrading is the biggest reason for failure of people in trading. While there is no definitive rule for how many times you can (or should) trade, new traders should be especially cautious not to overtrade. Industry statistics show that 90% of new traders will not make it to their first anniversary. Why? Overtrading is one factor that has been identified as a definite 'no-no'.

So why do traders overtrade?

- Traders overtrade because of the reason that they are hooked on the rush that comes from being in the markets
- Some overtrade because they feel they will miss a golden opportunity if they don't trade.
- Some traders overtrade because their system does not have specific enough entry criteria to keep them out of bad trades.
- Many traders in a hurry to start trading don't wait for a good opportunity but start trading with a first trade that looks good.
- Some traders overtrade because they feel that the more they trade, the more the money they will be able to make.

This is the real secret in making more money with your trades: **learning to identify the best market opportunities.**

There are three positions that a trade can have in the market namely: long, short or flat. But the trader's don't realize this. Many of them feel that they have to be constantly in the market for which they need to acquire either a long position or a short position. It is equally important to recognize that the third option, being flat, is as legitimate a position as the first two.

Being flat allows you to watch the market set up so that you can best take advantage of the market when it is ready. This is what traders mean when they tell you *not to chase the markets.*

It is important to learn to wait for the markets and let them come to you. Then your job as a trader is to be ready for them.

Buy, sell, or stand aside. Just make sure it's the right decision at the time.

There are many methods to build superior trading habits. Good trading habits will make trading a part of routine, rather than a task. Getting in the habit of doing everything exactly to plan will boost trading profits, marking one more step in the path to financial freedom.

1. **Trading discipline** – One's own trading plan is very important to success. It should be followed strictly. Emotions have no place in trading and it could easily lead to losing of money. Proven techniques and strategies should not be edited for any reason; follow the plan and let it work for you.
2. **Understanding risk** - Difference between gambling and investing is what is called as managing risk. Profitable traders can quickly calculate how much of a drawdown they are willing to incur before cutting a position. It is important to have a plan for pruning losses and minimizing the damage of drawdown.
3. **Stick to your niche** - Niche trading is considered to be the best strategy to remain profitable. Sticking to an area in which one specializes is the best way to minimize losses. If one is best in high volume trading, then only trade during periods of high volume. Finding your trading niche will help you to become more a more efficient trader.
4. **Look at every time frame** - Even when trading short 5 minute ticks, it is important to evaluate all timeframes for market data. It just might happen that a 100 day moving average is acting to support your position. You'll never know this unless you take the time to study all timeframes rather than just a few. Long term trends can and do impact short term trading positions. Day traders are more susceptible to trading in only one timeframe because of how time-sensitive their investments are. Swing traders are probably used to checking multiple timeframes for entry points.

5. **Trading is affected by emotion** – It is difficult to get away with the trading. Holding open positions can increase the amount of stress. Day traders should try and limit the exposure and keep the stress at lower level.
6. **Trade as your capital allows** – High levels of margins can be easily exceeded by the day traders that greatly exceeds their trading capital. Exceeding the credit limit can be very dangerous and it can accumulate losses as fast as gains. Momentum trading with many different entry points can end up in costly mistakes if your account becomes overextended.

Even the best traders in the market have trading sessions that are less than optimal. Human nature dictates that we make mistakes, and trading the stock market is no exception. Subsequently, there is always room for improvement, whether you are a novice trader or a seasoned veteran.

1. **Stick to your Guns** – Running from the market is no solution. One should try to stay in the game and earn profits. Sticking to the trading plan and enacting trading discipline are the best ways to produce profits.
2. **Set stop losses and take profits** – The most profitable trading is one in which we “Set and forget”. Once should remember to place exit along with placement of trade. Technical analysis will tell you the best price or selling (near resistance) and the best place for buying (near support). Support and resistance points are the best places to put limit orders.
3. **Don't watch minute to minute** – The minute to minute movements should be avoided by the traders. It is difficult to have a potentially profitable trade after having minute to minute movements. There is no reason to get out of a trade for quick profits if you're in for the long haul. Small ups and downs create temporary stress and can reduce swing traders to day traders. Niche trading works because you're specialized in your own area.
1. **Eliminate high probability trading** - You wouldn't expect to make consistent profits at the roulette wheel, and you shouldn't do the same with your investments. The active, professional trader only takes quality trades opposed to quantity of trades.
2. **Accept that full-time day trading is rough** – It is very difficult to trade on a full time daily basis. The ups and downs of full-time day trading are very stressful. Stress will make you think differently and trade differently. A professional trader will need to find ways to vent their frustrations as bad days do happen to the best of traders.
3. **Don't get attached** –one should not be too attached with the stock. Investor should be ready to dump it off when the price is right.

4. **Pick swing traders or day traders** - Know exactly what kind of trader you want to be. It is difficult to be very good at swing trading while following short term movements of day trading. Define what kind of strategy you want to follow and stick with it.
5. **Talk to other traders** – Communicate with other traders and share their experiences. Aim should be to get trading down to a point where it comes naturally to you.

New terms

Drawdown: A Drawdown is the peak-to-trough decline during a specific record period of an investment, fund or commodity. A drawdown is usually quoted as the percentage between the peak and the trough.

Test: In technical analysis, it is when a stock price approaches a support or resistance level set by the market. If the stock stays within the support and resistance levels, the test is passed. However, if the stock price reaches new lows and/or new highs, the test has failed.

Trend: The general direction of a market or of the price of an asset is known as a Trend. Trends can vary in length from short, to intermediate, to long term. If you can identify a trend, it can be highly profitable, because you will be able to trade with the trend.

Holy grail: As the community of traders has evolved, the "Grail buy" has been nicknamed "the dip", implying a place where a buy may be set up. The "Grail sale" has been nicknamed "the ding", implying a place where a short sale may be set up. This refers to the Holy Grail technique. The key is to buy pullbacks in an established uptrend, or sell bounces in an established downtrend and avoid trading ranges.

Stop loss: A stop loss is an order to buy (or sell) a security once the price of the security climbed above (or dropped below) a specified stop price. When the specified stop price is reached, the stop order is entered as a market order (no limit) or a limit order (fixed or pre-determined price).

Contrarian: One who takes a contrary view or action, especially an investor who makes decisions that contradict prevailing wisdom, as in buying securities that are unpopular at the time.

Model Questions

Q1 Which of the following is important for an investor, before entering into a trade?

- a) Adjust the trade size
- b) Tighten the stop loss
- c) Both a) and b) above
- d) Use maximum exposure from broker

Q2 Small ups and downs create temporary stress and can reduce swing traders to ____

- a) Day traders
- b) investors
- c) gamblers
- d) arbitrageurs

Q3 Efficient risk management system involves:

- a) putting stop loss
- b) controlling position size
- c) controlling losses
- d) all of the above

Q4 Which of the following should an investor follow?

- a) Long term Trader
- b) Short term Trader
- c) Find out What best suits him
- d) Follow the Trend

Q5 Trends never turn on a dime because:

- a) Reversals build slowly
- b) The first sharp dip always finds buyers and the first sharp rise always finds sellers
- c) Both a) and b) above
- d) The first sharp dip always finds more sellers and the first sharp rise always finds more buyers

MODEL ANSWERS

Ques.	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7
1	a	c	d	a	a	c
2	d	b	b	a	a	a
3	a	c	c	a	a	d
4	c	b	c	c	b	c
5	d	a	d	b	d	C
6	b	b	a		c	
7	b	d	c		b	
8	b	a	a		a	
9	b	c	a		c	
10	c	b	b		d	
11					a	
12					a	
13					b	
14					b	
15					c	