1.1 BRIEF HISTORY OF DERIVATIVES

The history of derivatives is quite colourful and surprisingly a lot longer than most people think. Forward delivery contracts, stating what is to be delivered for a fixed price at a specified place on a specified date, existed in ancient Greece and Rome. Roman emperors entered forward contracts to provide the masses with their supply of Egyptian grain. These contracts were also undertaken between farmers and merchants to eliminate risk arising out of uncertain future prices of grains. Thus, forward contracts have existed for centuries for hedging price risk.

The first organized commodity exchange came into existence in the early 1700's in Japan. The first formal commodities exchange, the Chicago Board of Trade (CBOT), was formed in 1848 in the US to deal with the problem of 'credit risk' and to provide centralised location to negotiate forward contracts. From 'forward' trading in commodities emerged the commodity 'futures'. The first type of futures contract was called 'to arrive at'. Trading in futures began on the CBOT in the 1860's. In 1865, CBOT listed the first 'exchange traded' derivatives contract, known as the futures contracts. Futures trading grew out of the need for hedging the price risk involved in many commercial operations. The Chicago Mercantile Exchange (CME), a spin-off of CBOT, was formed in 1919, though it did exist before in 1874 under the names of 'Chicago Produce Exchange' (CPE) and 'Chicago Egg and Butter Board' (CEBB). The first financial futures to emerge were the currency in 1972 in the US. The first foreign currency futures were traded on May 16, 1972, on International Monetary Market (IMM), a division of CME. The currency futures traded on the IMM are the British Pound, the Canadian Dollar, the Japanese Yen, the Swiss Franc, the German Mark, the Australian Dollar, and the Euro dollar. Currency futures were followed soon by interest rate futures. Interest rate futures contracts were traded for the first time on the CBOT on October 20, 1975. Stock index futures and options emerged in 1982. The first stock index futures contracts were traded on Kansas City Board of Trade on February 24, 1982.The first of the several networks, which offered a trading link between two exchanges, was formed between the Singapore International Monetary Exchange (SIMEX) and the CME on September 7, 1984.

Options are as old as futures. Their history also dates back to ancient Greece and Rome. Options are very popular with speculators in the tulip craze of seventeenth century Holland. Tulips, the brightly coloured flowers, were a symbol of affluence; owing to a high demand, tulip bulb prices shot up. Dutch growers and dealers traded in tulip bulb options. There was so much speculation that people even mortgaged their homes and businesses. These speculators were wiped out when the tulip craze collapsed in 1637 as there was no mechanism to guarantee the performance of the option terms.

The first call and put options were invented by an American financier, Russell Sage, in 1872. These options were traded over the counter. Agricultural commodities options were traded in the nineteenth century in England and the US. Options on shares were available in the US on the over the counter (OTC) market only until 1973 without much knowledge of valuation. A group of firms known as Put and Call brokers and Dealer's Association was set up in early 1900's to provide a mechanism for bringing buyers and sellers together.

On April 26, 1973, the Chicago Board options Exchange (CBOE) was set up at CBOT for the purpose of trading stock options. It was in 1973 again that black, Merton, and Scholes invented the famous Black-Scholes Option Formula. This model helped in assessing the fair price of an option which led to an increased interest in trading of options. With the options markets becoming increasingly popular, the American Stock Exchange (AMEX) and the Philadelphia Stock Exchange (PHLX) began trading in options in 1975.

The market for futures and options grew at a rapid pace in the eighties and nineties.
The CBOT and the CME are two largest financial exchanges in the world on which futures contracts are traded. The CBOT now offers 48 futures and option contracts (with the annual volume at more than 211 million in 2001).The CBOE is the largest exchange for trading stock options. The CBOE trades options on the S&P 100 and the S&P 500 stock indices. The Philadelphia Stock Exchange is the premier exchange for trading foreign options.

1.2 INDIAN DERIVATIVE MARKET

Starting from a controlled economy, India has moved towards a world where prices fluctuate every day. The introduction of risk management instruments in India gained momentum in the last few years due to liberalisation process and Reserve Bank of India's (RBI) efforts in creating currency forward market. Derivatives are an integral part of liberalisation process to manage risk. NSE gauging the market requirements initiated the process of setting up derivative markets in India. In July 1999, derivatives trading commenced in India

Table 2. Chronology of instruments

December 14, 1995	NSE asked SEBI for permission to trade index futures.
November 18, 1996	L.C. Gupta Committee set up to draft a policy framework for introducing derivatives
May 11, 1998	L.C. Gupta committee submits its report on the policy framework
May 25 2000	SEBI allows exchanges to trade in index futures
June 12, 2000	Trading on Nifty futures commences on the NSE
June 4, 2001	Trading on Nifty Options commences on the NSE
July 2, 2001	Trading on Stock Options commences on the NSE
November 9, 2001	Trading on Stock Futures commences on the NSE
August 29, 2008	Currency Derivatives trading commences on the NSE
August 31, 2009	Interest rate derivatives trading commences on the NSE

Need for derivatives in India today

In less than three decades of their coming into vogue, derivatives markets have become the most important markets in the world. Today, derivatives have become part and parcel of the day-to-day life for ordinary people in major part of theworld. Until the advent of NSE, the Indian capital market had no access to the latest trading methods and was using traditional out-dated methods of trading. There was a huge gap between the investors' aspirations of the markets and the available means of trading. The opening of Indian economy has precipitated the process of integration of India's financial markets with the international financial markets. Introduction of risk management instruments in India has gained momentum in last few years thanks to Reserve Bank of India's efforts in allowing forward contracts, cross currency options etc. which have developed into a very large market

Myths and realities about derivatives

In less than three decades of their coming into vogue, derivatives markets have become the most important markets in the world. Financial derivatives came into the spotlight along with the rise in uncertainty of post-1970, when US announced an end to the Bretton Woods System of fixed exchange rates leading to introduction of currency derivatives followed by other innovations including stock index futures. Today, derivatives have become part and parcel of the day-to-day life for ordinary people in major parts of the world. While this is true for many countries, there are still apprehensions about the introduction of derivatives. There are many myths about derivatives but the realities that are different especially for Exchange traded derivatives, which are well regulated with all the safety mechanisms in place.

What are these myths behind derivatives?

- Derivatives increase speculation and do not serve any economic purpose
- Indian Market is not ready for derivative trading
- Disasters prove that derivatives are very risky and highly leveraged instruments.
- Derivatives are complex and exotic instruments that Indian investors will find difficulty in understanding
- Is the existing capital market safer than Derivatives?

(i) Derivatives increase speculation and do not serve any economicpurpose: Numerous studies of derivatives activity have led to a broad consensus, both in the private and public sectors that derivatives provide numerous and substantial benefits to the users. Derivatives are a low-cost, effective method for users to hedge and manage their exposures to interest rates, commodity prices or exchange rates. The need for derivatives as hedging tool was felt first in the commodities market. Agricultural futures and options helped farmers and processors hedge against commodity price risk. After the fallout of Bretton wood agreement, the financial markets in the world started undergoing radical changes. This period is marked by remarkable innovations in the financial markets such as introduction of floating rates for the currencies, increased trading in variety of derivatives instruments, on-line trading in the capital markets, etc. As the complexity of instruments increased many folds, the accompanying risk factors grew in

gigantic proportions. This situation led to development derivatives as effective risk management tools for the market participants.

By providing investors and issuers with a wider array of tools for managing risks and raising capital, derivatives improve the allocation of credit and the sharing of risk in the global economy, lowering the cost of capital formation and stimulating economic growth. Now that world markets for trade and finance have become more integrated, derivatives have strengthened these important linkages between global markets, increasing market liquidity and efficiency and facilitating the flow of trade and finance

DEVELOPMENT OF DERIVATIVES MARKET IN INDIA

The first step towards introduction of derivatives trading in India was the promulgation of the Securities Laws (Amendment) Ordinance, 1995, which withdrew the prohibition on options in securities. The market for derivatives, however, did not take off, as there was no regulatory framework to govern trading of derivatives. SEBI set up a 24–member committee under the Chairmanship of Dr.L.C.Gupta on November 18, 1996 to develop appropriate regulatory framework for derivatives trading in India. The committee submitted its report on March 17, 1998 prescribing necessary pre–conditions for introduction of derivatives trading in India. The committee recommended that derivatives should be declared as 'securities' so that regulatory framework applicable to trading of 'securities' could also govern trading of securities. SEBI also set up a group in June 1998 under the Chairmanship of Prof.J.R.Varma, to recommend measures for risk containment in derivatives market in India. The report, which was submitted in October 1998, worked out the operational details of margining system, methodology for charging initial margins, broker net worth, deposit requirement and real–time monitoring requirements. The Securities Contract Regulation Act (SCRA) was amended in December 1999 to include derivatives within the ambit of 'securities' and the regulatory framework were developed for governing derivatives trading. The act also made it clear that derivatives shall be legal and valid only if such contracts are traded on a recognized stock exchange, thus precluding OTC derivatives. The government also rescinded in March 2000, the three decade old notification, which prohibited forward trading in securities. Derivatives trading commenced in India in June 2000 after SEBI granted the final approval to this effect in May 2001. SEBI permitted the derivative segments of two stock exchanges, NSE and BSE, and their clearing house/corporation to commence trading and settlement in approved derivatives contracts. To begin with, SEBI approved trading in index futures contracts based on S&P CNX Nifty and BSE–30 (Sense) index. This was followed by approval for trading in options based on these two indexes and options on individual securities.

The trading in BSE Sensex options commenced on June 4, 2001 and the trading in options on individual securities commenced in July 2001. Futures contracts on individual stocks were launched in November 2001. The derivatives trading on NSE commenced with S&P CNX Nifty Index futures on June 12, 2000. The trading in index options commenced on June 4, 2001 and trading in options on individual securities commenced on July 2, 2001. Single stock futures were launched on November 9, 2001. The index futures and options contract on NSE are based on S&P CNX Trading and settlement in derivative contracts is done in accordance with the rules, byelaws, and regulations of the respective exchanges and their clearing house/corporation duly approved by SEBI and notified in the official gazette. Foreign Institutional Investors (FIIs) are permitted to trade in all Exchange traded derivative products.

The following are some observations based on the trading statistics provided in the NSE report on the futures and options (F&O):

- Single-stock futures continue to account for a sizable proportion of the F&O segment. It constituted 70 per cent of the total turnover during June 2002. A primary reason attributed to this phenomenon is that traders are comfortable with single-stock futures than equity options, as the former closely resembles the erstwhile badla system.

- On relative terms, volumes in the index options segment continue to remain poor. This may be due to the low volatility of the spot index. Typically, options are considered more valuable when the volatility of the underlying (in this case, the index) is high. A related issue is that brokers do not earn high commissions by recommending index options to their clients, because low volatility leads to higher waiting time for round-trips.

- Put volumes in the index options and equity options segment have increased since January 2002. The call-put volumes in index options have decreased from 2.86 in January 2002 to 1.32 in June. The fall in call-put volumes ratio suggests that the traders are increasingly becoming pessimistic on the market.

• Farther month futures contracts are still not actively traded. Trading in equity options on most stocks for even the next month was non-existent.

• Daily option price variations suggest that traders use the F&O segment as a less risky alternative (read substitute) to generate profits from the stock price movements. The fact that the option premiums tail intra-day stock prices is evidence to this. If calls and puts are not looked as just substitutes for spot trading, the intra-day stock price variations should not have a one-to-one impact on the option premiums.

- The spot foreign exchange market remains the most important segment but the derivative segment has also grown. In the derivative market foreign exchange swaps account for the largest share of the total turnover of derivatives in India followed by forwards and options. Significant milestones in the development of derivatives market have been (i) permission to banks to undertake cross currency derivative transactions subject to certain conditions (1996) (ii) allowing corporates to undertake long term foreign currency swaps that contributed to the development of the term currency swap market (1997) (iii) allowing dollar rupee options (2003) and (iv) introduction of currency futures (2008). I would like to emphasise that currency swaps allowed companies with ECBs to swap their foreign currency liabilities into rupees. However, since banks could not carry open positions the risk was allowed to be transferred to any other resident corporate. Normally such risks should be taken by corporates who have natural hedge or have potential foreign exchange earnings. But often corporate assume these risks due to interest rate differentials and views on currencies.

1.3 WHAT IS DERIVATIVE?

A derivative is a product whose value is derived from the value of one or more underlying variables or assets in a contractual manner. The underlying asset can be equity, forex, commodity or any other asset. In our earlier discussion, we saw that wheat farmers may wish to sell their harvest at a future date to eliminate the risk of change in price by that date. Such a transaction is an example of a derivative. The price of this derivative is driven by the spot price of wheat which is the "underlying" in this case.

The Forwards Contracts (Regulation) Act, 1952, regulates the forward/futures contracts in commodities all over India. As per this the Forward Markets Commission (FMC) continues to have jurisdiction over commodity futures contracts. However when derivatives trading in securities was introduced in 2001, the term "security" in the Securities Contracts (Regulation) Act, 1956 (SCRA), was amended to include derivative contracts in securities. Consequently, regulation of derivatives came under the purview of Securities Exchange Board of India (SEBI). We thus have separate regulatory authorities for securities and commodity derivative markets.

Derivatives are securities under the SCRA and hence the trading of derivatives is governed by the regulatory framework under the SCRA. The Securities Contracts (Regulation) Act, 1956 defines "derivative" to include-

A security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract differences or any other form of security.

A contract which derives its value from the prices, or index of prices, of underlying securities.

1.4 TYPES OF DERIVATIVESMARKET

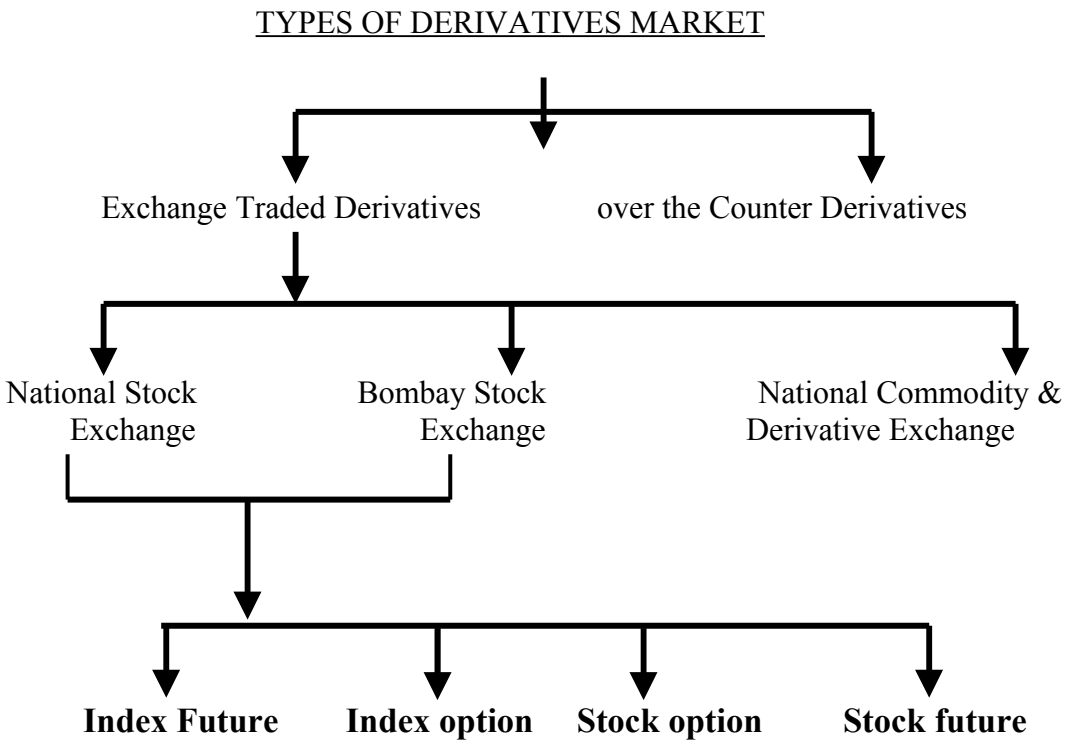


Figure.1 Types of Derivatives market

1.5 TYPES OF DERIVATIVES

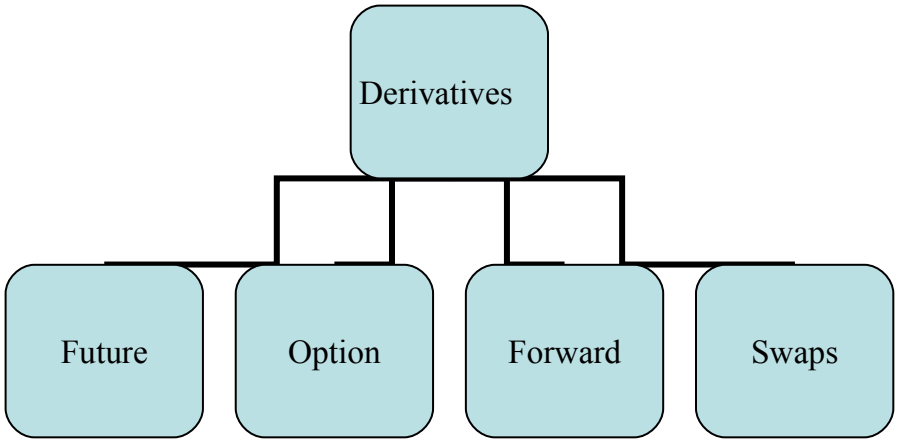


Figure.2 Types of Derivatives market

There are various types of derivatives traded on exchanges across the world. They range from the very simple to the most complex products. The following are the three basic

forms of derivatives, which are the building blocks for many complex derivatives instruments

- Forwards
- Futures
- Options

Knowledge of these instruments is necessary in order to understand the basics of derivatives. We shall now discuss each of them in detail.

(i) FORWARD CONTRACTS

A forward contract or simply a forward is a contract between two parties to buy or sell an asset at a certain future date for a certain price that is pre-decided on the date of the contract. The future date is referred to as expiry date and the pre-decided price is referred to as Forward Price. It may be noted that Forwards are private contracts and their terms are determined by the parties involved.

A forward is thus an agreement between two parties in which one party, the buyer, enters into an agreement with the other party, the seller that he would buy from the seller an underlying asset on the expiry date at the forward price. Therefore, it is a commitment by both the parties to engage in a transaction at a later date with the price set in advance. This is different from a spot market contract, which involves immediate payment and immediate transfer of asset.

The party that agrees to buy the asset on a future date is referred to as a long investor and is said to have a long position. Similarly the party that agrees to sell the asset in a future date is referred to as a short investor and is said to have a short position. The price agreed upon is called the delivery price or the Forward Price.

Forward contracts are traded only in Over the Counter (OTC) market and not in stock exchanges.

Settlement of forward contracts:

When a forward contract expires, there are two alternate arrangements possible to settle the obligation of the parties: physical settlement and cash settlement. Both types of settlements happen on the expiry date and a re given below.

Physical Settlement

A forward contract can be settled by the physical delivery of the underlying asset by a short investor (i.e. the seller) to the long investor (i.e. the buyer) and the payment of the agreed forward price by the buyer to the seller on the agreed settlement date. The following example will help us understand the physical settlement process.

Illustration

Consider two parties (A and B) enter into a forward contract on 1 August, 2009 where, A agrees to deliver 1000 stocks of Unitech to B, at a price of Rs. 100 per share, on 29 th August, 2009 (the expiry date). In this contract, A, who has committed to sell 1000 stocks of Unitech at Rs. 100 per share on 29 th August, 2009 has a short position and B, who has committed to buy 1000 stocks at Rs. 100 per share is said to have a long position.

In case of physical settlement, on 29th August, 2009 (expiry date), A has to actually deliver 1000 Unitech shares to B and B has to pay the price (1000 * Rs. 100 = Rs. 10,000) to A. In case A does not have 1000 shares to deliver on 29th August, 2009, he has to purchase it from the spot market and then deliver the stocks to B.

On the expiry date the profit/loss for each party depends on the settlement price, that is, the closing price in the spot market on 29th August, 2009. The closing price on any given day is the weighted average price of the underlying during the last half an hour of trading in that day. Depending on the closing price, three different scenarios of profit/loss are possible for each party. They are as follows:

Scenario I. Closing spot price on 29 August, 2009 (S T) is greater than the Forward price (FT) Assume that the closing price of Unitech on the settlement date 29 August, 2009 is Rs. 105. Since the short investor has sold Unitech at Rs. 100 in the Forward market on 1 August, 2009, he can buy 1000 Unitech shares at Rs. 105 from the market and deliver them to the long investor. Therefore the person who has a short position

makes a loss of (100 – 105) X 1000 = Rs. 5000. If the long investor sells the shares in the spot market immediately after receiving them, he would make an equivalent profit of (105 – 100) X 1000 = Rs. 5000.

Scenario II. Closing Spot price on 29 August (S T), 2009 is the same as the Forward price (F T)

The short seller will buy the stock from the market at Rs. 100 and give it to the long investor. As the settlement price is same as the Forward price, neither party will gain or lose anything.

Scenario III. Closing Spot price (S T) on 29 August is less than t he futures price (F T)

Assume that the closing price of Unitech on 29 August, 2009 is Rs. 95. The short investor, who has sold Unitech at Rs. 100 in the Forward market on 1 August, 2009, will buy the stock from the market at Rs. 95 and deliver it to the long investor. Therefore the person who has a short position would make a profit of (100 – 95) X 1000 = Rs. 5000 and the person who has long position in the contract will lose an equivalent amount (Rs. 5000), if he sells the shares in the spot market immediately after receiving them.

The main disadvantage of physical settlement is that it results in huge transaction costs in terms of actual purchase of securities by the party holding a short position (in this case A) and transfer of the security to the party in the long position (in this case B). Further, if the party in the long position is actually not interested in holding the security, then she will have to incur further transaction cost in disposing off the security. An alternative way of settlement, which helps in minimizing this cost, is through cash settlement.

Cash Settlement

Cash settlement does not involve actual delivery or receipt of the security. Each party either pays (receives) cash equal to the net loss (profit) arising out of their respective position in the contract. So, in case of Scenario I mentioned above, where the spot price at the expiry date (ST) was greater than the forward price (F T), the party with the short position will have to pay an amount equivalent to the net loss to the part y at the long position. In our example, A will simply pay Rs. 5000 to B on the expiry date. The

opposite is the case in Scenario (III), when ST < FT. The long party will be at a loss and have to pay an amount equivalent to the net loss to the short party. In our example, B will have to pay Rs. 5000 to A on the expiry date. In case of Scenario (II) where S T = FT , there is no need for any party to pay anything to the other party.

Please note that the profit and loss position in case of physical settlement and cash settlement is the same except for the transaction costs which is involved in the physical settlement.

2.1.2 **Default risk in forward contracts**

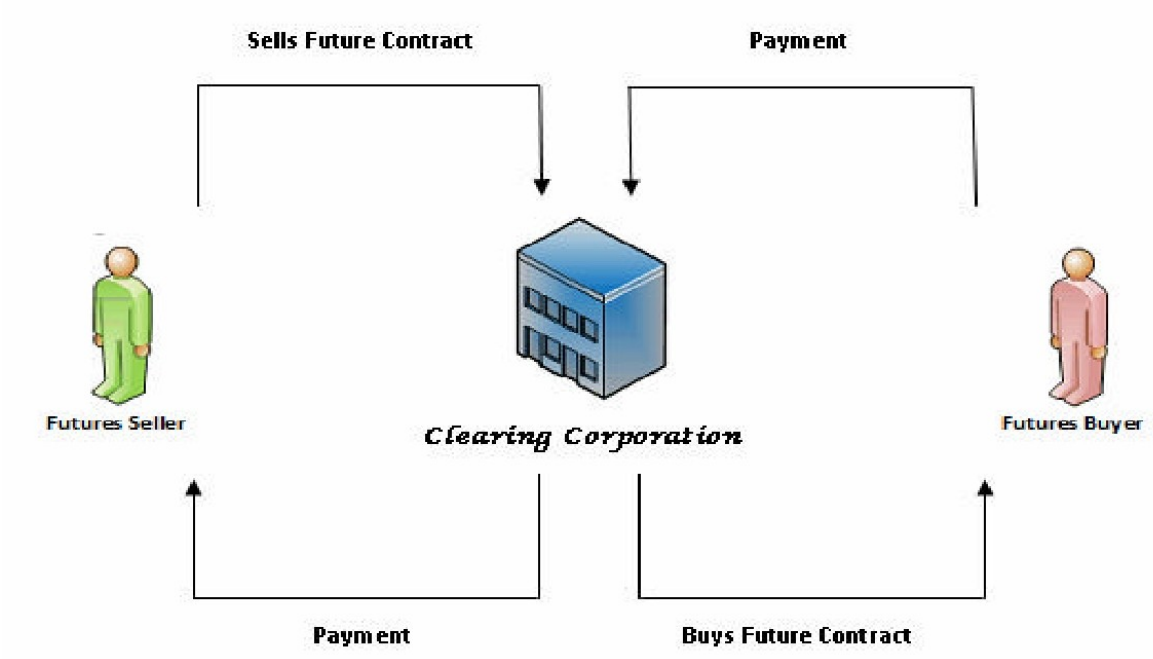
A drawback of forward contracts is that they are subject to default risk. Regardless of whether the contract is for physical or cash settlement, there exists a potential for one party to default, i.e. not honor the contract. It could be either the buyer or the seller. This results in the other party suffering a loss. This risk of making losses due to any of the two parties defaulting is known as counter party risk. The main reason behind such risk is the absence of any mediator between the parties, who could have undertaken the task of ensuring that both the parties fulfill their obligations arising out of the contract. Default risk is also referred to as counter party risk or credit risk.

(ii) FUTURE CONTRACT

Like a forward contract, a futures contract is an agreement between two parties in which the buyer agrees to buy an underlying asset from the seller, at a future date at a price that is agreed upon today. However, unlike a forward contract, a futures contract is not a private transaction but gets traded on a recognized stock exchange. In addition, a futures contract is standardized by the exchange. All the terms, other than the price, are set by the stock exchange (rather than by individual parties as in the case of a forward contract). Also, both buyer and seller of the futures contracts are protected against the counter party risk by an entity called the Clearing Corporation. The Clearing Corporation provides this guarantee to ensure that the buyer or the seller of a futures contract does not suffer as a result of the counter party defaulting on its obligation. In case one of the parties defaults, the Clearing Corporation steps in to fulfill the obligation of this party, so that the other party does not suffer due to non-fulfillment of the contract. To be able to guarantee the

fulfillment of the obligations under the contract, the Clearing Corporation holds an amount as a security from both the parties. This amount is called the Margin money and can be in the form of cash or other financial assets. Also, since the futures contracts are traded on the stock exchanges, the parties have the flexibility of closing out the contract prior to the maturity by squaring off the transactions in the market.

The basic flow of a transaction between three parties, namely Buyer, Seller and Clearing Corporation is depicted in the diagram below:



BASIC FEATURES OF FUTURE CONTRACT

1. Standardization:

Futures contracts ensure their liquidity by being highly standardized, usually by specifying:

- The underlying. This can be anything from a barrel of sweet crude oil to a short term interest rate.

- The type of settlement, either cash settlement or physical settlement.
- The amount and units of the underlying asset per contract. This can be the notional amount of bonds, a fixed number of barrels of oil, units of foreign currency, the notional amount of the deposit over which the short term interest rate is traded, etc.
- The currency in which the futures contract is quoted.
- The grade of the deliverable. In case of bonds, this specifies which bonds can be delivered. In case of physical commodities, this specifies not only the quality of the underlying goods but also the manner and location of delivery. The delivery month.
- The last trading date.
- Other details such as the tick, the minimum permissible price fluctuation.

2. Margin:

Although the value of a contract at time of trading should be zero, its price constantly fluctuates. This renders the owner liable to adverse changes in value, and creates a credit risk to the exchange, who always acts as counterparty. To minimize this risk, the exchange demands that contract owners post a form of collateral, commonly known as Margin requirements are waived or reduced in some cases for hedgers who have physical ownership of the covered commodity or spread traders who have offsetting contracts balancing the position.

Initial Margin: is paid by both buyer and seller. It represents the loss on that contract, as determined by historical price changes, which is not likely to be exceeded on a usual day's trading. It may be 5% or 10% of total contract price.

Mark to market Margin: Because a series of adverse price changes may exhaust the initial margin, a further margin, usually called variation or maintenance margin, is required by the exchange. This is calculated by the futures contract, i.e. agreeing on a price at the end of each day, called the "settlement" or mark-to-market price of the contract.

To understand the original practice, consider that a futures trader, when taking a position, deposits money with the exchange, called a "margin". This is intended to protect the

exchange against loss. At the end of every trading day, the contract is marked to its present market value. If the trader is on the winning side of a deal, his contract has increased in value that day, and the exchange pays this profit into his account. On the other hand, if he is on the losing side, the exchange will debit his account. If he cannot pay, then the margin is used as the collateral from which the loss is paid.

3. Settlement

Settlement is the act of consummating the contract, and can be done in one of two ways, as specified per type of futures contract:

- **Physical delivery** - the amount specified of the underlying asset of the contract is delivered by the seller of the contract to the exchange, and by the exchange to the buyers of the contract. In practice, it occurs only on a minority of contracts. Most are cancelled out by purchasing a covering position - that is, buying a contract to cancel out an earlier sale (covering a short), or selling a contract to liquidate an earlier purchase (covering a long).
- **Cash settlement** - a cash payment is made based on the underlying reference rate, such as a short term interest rate index such as Euribor, or the closing value of a stock market index. A futures contract might also opt to settle against an index based on trade in a related spot market.

Expiry is the time when the final prices of the future are determined. For many equity index and interest rate futures contracts, this happens on the Last Thursday of certain trading month. On this day the t+2 futures contract becomes the t forward contract.

PRICING OF FUTURE CONTRACT

In a futures contract, for no arbitrage to be possible, the price paid on delivery (the forward price) must be the same as the cost (including interest) of buying and storing the asset. In other words, the rational forward price represents the expected future value of the underlying discounted at the risk free rate. Thus, for a simple, non-dividend paying asset, the value of the future/forward, $F(t)$, will be found by discounting the present value $S(t)$at time $t$to maturity $T$by the rate of risk-free return r.

$$F(t) = S(t) \times (1 + r)^{(T-t)}$$

This relationship may be modified for storage costs, dividends, dividend yields, and convenience yields. Any deviation from this equality allows for arbitrage as follows.

In the case where the forward price is higher:

1. The arbitrageur sells the futures contract and buys the underlying today (on the spot market) with borrowed money.
2. On the delivery date, the arbitrageur hands over the underlying, and receives the agreed forward price.
3. He then repays the lender the borrowed amount plus interest.
4. The difference between the two amounts is the arbitrage profit.

In the case where the forward price is lower:

1. The arbitrageur buys the futures contract and sells the underlying today (on the spot market); he invests the proceeds.
2. On the delivery date, he cashes in the matured investment, which has appreciated at the risk free rate.
3. He then receives the underlying and pays the agreed forward price using the matured investment. [If he was short the underlying, he returns it now.]
4. The difference between the two amounts is the arbitrage profit.

OPTIONS -

Like forwards and futures, options are derivative instruments that provide the opportunity to buy or sell an underlying asset on a future date.

An option is a derivative contract between a buyer and a seller, where one party (say First Party) gives to the other (say Second Party) the right, but not the obligation, to buy from (or sell to) the First Party the underlying asset on or before a specific day at an agreed -upon price. In return for granting the option, the party granting the option collects a payment from the other party. This payment collected is called the “premium” or price of the option.

The right to buy or sell is held by the “option buyer” (also called the option holder); the party granting the right is t he “option seller” or “option writer”. Unlike forwards and futures contracts, options require a cash payment (called the premium) upfront from the option buyer to the option seller. This payment is called option premium or option price. Options can be traded either on the stock exchange or in over the counter (OTC)

markets. Options traded on the exchanges are backed by the Clearing Corporation thereby minimizing the risk arising due to default by the counter parties involved. Options traded in the OTC market however are not backed by the Clearing Corporation.

There are two types of options —call options and put options —which are explained below.

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CALL OPTION:

A call option is an option granting the right to the buyer of the option to buy the underlying asset on a specific day at an agreed upon price, but not the obligation to do so. It is the seller who grants this right to the buyer of the option. It may be noted that the person who has the right to buy the underlying asset is known as the "buyer of the call option". The price at which the buyer has the right to buy the asset is agreed upon at the time of entering the contract. This price is known as the strike price of the contract (call option strike price in this case). Since the buyer of the call option has the right (but no obligation) to buy the underlying asset, he will exercise his right to buy the underlying asset if and only if the price of the underlying asset in the market is more than the strike price on or before the expiry date of the contract. The buyer of the call option does not have an obligation to buy if he does not want to.

PUT OPTION:

A put option is a contract granting the right to the buyer of the option to sell the underlying asset on or before a specific day at an agreed upon price, but not the obligation to do so. It is the seller who grants this right to the buyer of the option. The person who has the right to sell the underlying asset is known as the "buyer of the put option". The price at which the buyer has the right to sell the asset is agreed upon at the time of entering the contract. This price is known as the strike price of the contract (put option strike price in this case). Since the buyer of the put option has the right (but not the obligation) to sell the underlying asset, he will exercise his right to sell the underlying asset if and only if the price of the underlying asset in the market is less than the strike price on or before the expiry date of the contract. The buyer of the put option does not have the obligation to sell if he does not want to.

ILLUSTRATION:

Suppose A has "bought a call option" of 2000 shares of Hindustan Unilever Limited (HLL) at a strike price of Rs 260 per share at a premium of Rs 10. This option gives A, the buyer of the option, the right to buy 2000 shares of HLL from the seller of the option, on or before August 27, 2009 (expiry date of the option). The seller of the option has the obligation to sell 2000 shares of HLL at Rs 260 per share on or before August 27, 2009 (i.e. whenever asked by the buyer of the option).

Suppose instead of buying a call, A has "sold a put option" on 100 Reliance Industries (RIL) shares at a strike price of Rs 2000 at a premium of Rs 8. This option is an obligation to A to buy 100 shares of Reliance Industries (RIL) at a price of Rs 2000 per share on or before August 27 (expiry date of the option) i.e., as and when asked by the buyer of the put option. It depends on the option buyer as to when he exercises the option. As stated earlier, the buyer does not have the obligation to exercise the option.

1.6 TERMINOLOGIES IN DERIVATIVE MARKET

In this section we explain the general terms and concepts related to derivatives

- **SPOT PRICE (ST)**

Spot price of an underlying asset is the price that is quoted for immediate delivery of the asset. For example, at the NSE, the spot price of Reliance Ltd. at any given time is the price at which Reliance Ltd. shares are being traded at that time in the Cash Market Segment of the NSE. Spot price is also referred to as cash price sometimes.

- **Forward price or futures price (F)**

Forward price or futures price is the price that is agreed upon at the date of the contract for the delivery of an asset at a specific future date. These prices are dependent on the spot price, the prevailing interest rate and the expiry date of the contract.

- **STRIKE PRICE (K)**

The price at which the buyer of an option can buy the stock (in the case of a call option) or sell the stock (in the case of a put option) on or before the expiry date of option contracts is called strike price. It is the price at which the stock will be bought or sold when the option is exercised. Strike price is used in the case of options only; it is not used for futures or forwards.

- **Expiration date (T)**

In the case of Futures, Forwards and Index Options, Expiration Date is the only date on which settlement takes place. In case of stock options, on the other hand, Expiration date (or simply expiry), is the last date on which the option can be exercised. It is also called the final settlement date.

- **Types of Options**

Options can be divided into two different categories depending upon the primary exercise styles associated with options. These categories are:

European Options: European options are options that can be exercised only on the expiration date. All options based on indices such as Nifty, Mini Nifty, Bank Nifty, CNX IT traded at the NSE are European options which can be exercised by the buyer (of the option) only on the final settlement date or the expiry date.

American options: American options are options that can be exercised on any day on or before the expiry date. All options on individual stocks like Reliance, SBI, and Infosys traded at the NSE are American options. They can be exercised by the buyer on any day on or before the final settlement date or the expiry date.

- **Contract Size**

As futures and options are standardized contracts traded on an exchange, they have a fixed contract size. One contract of a derivatives instrument represents a certain number

of shares of the underlying asset. For example, if one contract of BHEL consists of 300 shares of BHEL, then if one buys one futures contract of BHEL, then for every Re 1 increase in BHEL's futures price, the buyer will make a profit of 300 X 1 = Rs 300 and for every Re 1 fall in BHEL's futures price, he will lose Rs 300.

- **Contract value**

Contract value is notional value of the transaction in case one contract is bought or sold. It is the contract size multiplied but the price of the futures. Contract value is used to calculate margins etc. for contracts. In the example above if BHEL futures are trading at Rs. 2000 the contract value would be Rs. 2000 x 300 = Rs. 6 lacs.

- **Margins**

In the spot market, the buyer of a stock has to pay the entire transaction amount (for purchasing the stock) to the seller. For example, if Infosys is trading at Rs. 2000 a share and an investor wants to buy 100 Infosys shares, then he has to pay Rs. 2000 X 100 = Rs. 2,00,000 to the seller. The settlement will take place on T+2 basis; that is, two days after the transaction date.

In a derivatives contract, a person enters into a trade today (buy or sell) but the settlement happens on a future date. Because of this, there is a high possibility of default by any of the parties. Futures and option contracts are traded through exchanges and the counter party risk is taken care of by the clearing corporation. In order to prevent any of the parties from defaulting on his trade commitment, the clearing corporation levies a margin on the buyer as well as seller of the futures and option contracts. This margin is a percentage (approximately 20%) of the total contract value. Thus, for the aforementioned example, if a person wants to buy 100 Infosys futures, then he will have to pay 20% of the contract value of Rs 2,00,000 = Rs 40,000 as a margin to the clearing corporation. This margin is applicable to both, the buyer and the seller of a futures contract.

- **Moneyness of an option:**

"Moneyness" of an option indicates whether an option is worth exercising or not i.e. if the option is exercised by the buyer of the option whether he will receive money or not. "Moneyness" of an option at any given time depends on where the spot price of the underlying is at that point of time relative to the strike price. The premium paid is not taken into consideration while calculating moneyness of an Option, since the premium once paid is a sunk cost and the profitability from exercising the option does not depend on the size of the premium. Therefore, the decision (of the buyer of the option) whether to exercise the option or not is not affected by the size of the premium. The following three terms are used to define the moneyness of an option.

In the Money Option:

An option is said to be in-the-money if on exercising the option, it would produce a cash inflow for the buyer. Thus, Call Options are in-the-money when the value of spot price of the underlying exceeds the strike price. On the other hand, Put Opt ions are in-the-money when the spot price of the underlying is lower than the strike price. Moneyness of an option should not be confused with the profit and loss arising from holding an option contract. It should be noted that while moneyness of an option does not depend on the premium paid, profit/loss do. Thus a holder of an in-the-money option need not always make profit as the profitability also depends on the premium paid.

Out of the money option

An out-of-the-money option is an opposite of an in-the-money option. An option-holder will not exercise the option when it is out-of-the-money. A Call option is out-of-the-money when its strike price is greater than the spot price of the underlying and a Put option is out-of-the-money when the spot price of the underlying is greater than the option's strike price.

At the money option

An at-the-money-option is one in which the spot price of the underlying is equal to the strike price. It is at the stage where with any movement in the spot price of the underlying, the option will either become in-the-money or out-of-the-money.

Illustration:

Consider some Call and Put options on stock XYZ. As on 13 August, 2009, XYZ is trading at Rs 116.25. The table below gives the information on closing prices of four options, expiring in September and December, and with strike prices of Rs. 115 and Rs. 117.50.

Table 2.3: Moneyness of call and put options

Strike Price	Sep Call option	Dec Call Option	Sep Put Option	Dec Put Option
Rs 115.00	Rs. 8.35	Rs. 12.30	Rs. 4.00	Rs. 8.00
Rs 117.50	Rs. 4.00	Rs. 8.15	Rs. 8.00	Rs. 12.00

Suppose the spot price of the underlying (closing share price) as at end of September is Rs. 116 and at end of December is Rs. 118. On the basis of the rules stated above, which options are in-the-money and which ones are out-of-the-money are given in the following table.

Table 2.4: Moneyness of call and put options

In-the-money Options		**Out -of-money Options**	
Option	**Justification**	**Option**	**Justification**
September 115 Call	Rs. 115 < Rs. 116	September 115 Put	Rs. 115 < Rs. 116
September 117.50 Put	Rs. 117.50 > Rs. 116	September 117.50 Call	Rs. 117.50 > Rs. 116
December 115 Call	Rs 115 < Rs 118	December 115 Put	Rs 115 < Rs 118
December 117.50 Call	Rs 117.50 < Rs 118	December 117.50 Put	Rs 115 < Rs 118

It may be noted that an option which is in-the-money at a particular instance may turn into out-of-the– money (and vice versa) at another instance due to change in the price of the underlying asset.

1.7 OTHER KINDS OF DERIVATIVES

The other kind of derivatives, which are not, much popular are as follows**:**

BASKETS -

Baskets options are option on portfolio of underlying asset. Equity Index Options are most popular form of baskets.

LEAPS -

Normally option contracts are for a period of 1 to 12 months. However, exchange may introduce option contracts with a maturity period of 2-3 years. These long-term option contracts are popularly known as Leaps or Long term Equity Anticipation Securities.

WARRANTS -

Options generally have lives of up to one year, the majority of options traded on options exchanges having a maximum maturity of nine months. Longer-dated options are called warrants and are generally traded over-the-counter.

SWAPTIONS -

Swaptions are options to buy or sell a swap that will become operative at the expiry of the options. Thus a swaption is an option on a forward swap. Rather than have calls and puts, the swaptions market has receiver swaptions and payer swaptions. A receiver swaption is an option to receive fixed and pay floating. A payer swaption is an option to pay fixed and receive floating

2.1 DERIVATIVE RISK

Any business is open to risks from movements in competitors' prices, raw material prices, competitors' cost of capital, foreign exchange rates and interest rates, all of which need to be (ideally) managed.

This section addresses the task of managing exposure to Derivatives contracts movements. These Risk Management Guidelines are primarily an enunciation of some good and prudent practices in exposure management. They have to be understood, and slowly internalised and customised so that they yield positive benefits to the company over time.

It is imperative and advisable for the Apex Management to both be aware of these practices and approve them as a policy. Once that is done, it becomes easier for the Exposure Managers to get along efficiently with their task.

DERIVATIVE Risk Statements

The risk of loss in trading derivatives can be substantial. You should therefore carefully consider whether such trading is suitable in light of your financial condition. You may sustain a total loss of funds and any additional funds that you deposit with your broker to maintain a position in the derivative market. Actual past performance is no guarantee of future results. There are numerous other factors related to the markets in general or to the implementation of any specific trading program which cannot be fully accounted for in the preparation of hypothetical performance results and all of which can adversely affect actual trading results.

The risk of loss in trading Derivative Contracts can be substantial. You should therefore carefully consider whether such trading is suitable for you in light of your financial condition. In considering whether to trade or authorize someone else to trade for you, you should be aware of the following:

If you purchase or sell a Derivative option you may sustain a total loss of the initial margin funds and additional funds that you deposit with your broker to establish or

maintain your position. If the market moves against your position, you could be called upon by your broker to deposit additional margin funds, on short notice, in order to maintain your position. If you do not provide the additional required funds within the prescribed time, your position may be liquidated at a loss, and you would be liable for any resulting deficit in you account.

The placement of contingent orders by you or your trading advisor, such as a "stop-loss" or "stop-limit" orders, will not necessarily limit your losses to the intended amounts, since market conditions may make it impossible to execute such orders.

A "spread" position may not be less risky than a simple "long" or "short" position.

The high degree of leverage that is often obtainable in derivatives trading can work against you as well as for you. The use of leverage can lead to large losses as well as gains.

In some cases, managed accounts are subject to substantial charges for management and advisory fees. It may be necessary for those accounts that are subject to these charges to make substantial trading profits to avoid depletion or exhaustion of their assets.

Derivative trading is speculative and volatile Currency prices are highly volatile. Price movements for different contracts are influenced by, among other things: changing supply-demand relationships; trade, fiscal, monetary, exchange control programs and policies of governments; United States and foreign political and economic events and policies; changes in national and international interest rates and inflation; currency devaluation; and sentiment of the market place. None of these factors can be controlled by any individual advisor and no assurance can be given that an advisor's advice will result in profitable trades for a participating customer or that a customer will not incur losses from such events.

2.2 Derivative risk management strategies

The Derivative market behaves differently from other markets! The speed, volatility, and enormous size of the derivative market are unlike anything else in the financial world. Beware: the Derivative market is uncontrollable – no single event, individual, or factor rules it. Enjoy trading in the perfect market! Just like any other speculative business, increased risk entails chances for a higher profit/loss.

Derivative markets are highly speculative and volatile in nature. Any scrip/stock/contract can become very expensive or very cheap in relation to any or all other scrip/stock/contract in a matter of days, hours, or sometimes, in minutes. This unpredictable nature of the scrip/stock/contract is what attracts an investor to trade and invest in the currency market.

But ask yourself, "How much am I ready to lose?" When you terminated, closed or exited your position, had you had understood the risks and taken steps to avoid them? Let's look at some derivative risk management issues that may come up in your day-to-day transactions.

- Unexpected corrections in Contracts/Stock rates
- Wild variations in Contracts rates
- Volatile markets offering profit opportunities
- Lost payments
- Delayed confirmation of payments and receivables
- Buy or Sell

There are areas that every trader should cover both BEFORE and DURING a trade.

✯ *EXIT THE DERIVATIVE MARKET AT PROFIT TARGETS*

Limit orders, also known as profit take orders, allow traders to exit the market at pre-determined profit targets. Limit orders help create a disciplined trading methodology and make it possible for traders to walk away from the computer without continuously monitoring the market.

Control risk by capping losses

Stop/loss orders allow traders to set an exit point for a losing trade. Stop/loss orders help traders control risk by capping losses. Stop/loss orders are counter-intuitive because you do not want them to be hit; however, you will be happy that you placed them! When logic dictates, you can control greed.

Where should I place my stop and limit orders?

As a general rule of thumb, traders should set stop/loss orders closer to the opening price than limit orders. If this rule is followed, a trader needs to be right less than 50% of the time to be profitable. Where the trader places the stop and limit will depend on how risk-adverse he is. Stop/loss orders should not be so tight that normal market volatility triggers the order. Similarly, limit orders should reflect a realistic expectation of gains based on the market's trading activity and the length of time one wants to hold the position. In initially setting up and establishing the trade, the trader should look to change the stop loss and set it at a rate in the 'middle ground' where they are not overexposed to the trade, and at the same time, not too close to the market.

Trading Derivatives is a demanding and potentially profitable opportunity for trained and experienced investors. However, before deciding to participate in the Derivative market, you should soberly reflect on the desired result of your investment and your level of experience. Warning! Do not invest money you cannot afford to lose.

RISK MANAGEMENT- AN INTRODUCTION

3.1 What is Risk Management?

Risk is anything that threatens the ability of a nonprofit to accomplish its mission.

Risk management is a discipline that enables people and organizations to cope with uncertainty by taking steps to protect its vital assets and resources.

But not all risks are created equal. Risk management is not just about identifying risks; it is about learning to weigh various risks and making decisions about which risks deserve immediate attention.

Risk management is not a task to be completed and shelved. It is a process that, once understood, should be integrated into all aspects of your organization's management.

Risk management is an essential component in the successful management of any project, whatever its size. It is a process that must start from the inception of the project, and continue until the project is completed and its expected benefits realised. Risk management is a process that is used throughout a project and its products' life cycles. It is useable by all activities in a project. Risk management must be focussed on the areas of highest risk within the project, with continual monitoring of other areas of the project to identify any new or changing risks.

Definition of Risk?

- **What is Risk?**

"What is risk?" And what is a pragmatic definition of risk? Risk means different things to different people. For some it is "financial (exchange rate, interest-call money rates), mergers of competitors globally to form more powerful entities and not leveraging IT optimally" and for someone else "an event

or commitment which has the potential to generate commercial liability or damage to the brand image". Since risk is accepted in business as a trade off between reward and threat, it does mean that taking risk bring forth benefits as well. In other words it is necessary to accept risks, if the desire is to reap the anticipated benefits.

Risk in its pragmatic definition, therefore, includes both threats that can materialize and opportunities, which can be exploited. This definition of risk is very pertinent today as the current business environment offers both challenges and opportunities to organizations, and it is up to an organization to manage these to their competitive advantage.

3.2 What is Risk Management - Does it eliminate risk?

Risk management is a discipline for dealing with the possibility that some future event will cause harm. It provides strategies, techniques, and an approach to recognizing and confronting any threat faced by an organization in fulfilling its mission. Risk management may be as uncomplicated as asking and answering three basic questions:

1. What can go wrong?
2. What will we do (both to prevent the harm from occurring and in the aftermath of an "incident")?
3. If something happens, how will we pay for it?

Risk management does not aim at risk elimination, but enables the organization to bring their risks to manageable proportions while not severely affecting their income. This balancing act between the risk levels and profits needs to be well-planned. Apart from bringing the risks to manageable proportions, they should also ensure that one risk does not get transformed into any other undesirable risk. This transformation takes place due to the inter-linkage present among the various risks. The focal point in managing any risk will be to understand the nature of the transaction in a way to unbundle the risks it is exposed to.

Risk Management is a more mature subject in the western world. This is largely a result of lessons from major corporate failures, most telling and visible being the Barings collapse. In addition, regulatory requirements have been introduced, which expect

organizations to have effective risk management practices. In India, whilst risk management is still in its infancy, there has been considerable debate on the need to introduce comprehensive risk management practices.

3.3 Objectives of Risk Management Function

Two distinct viewpoints emerge –

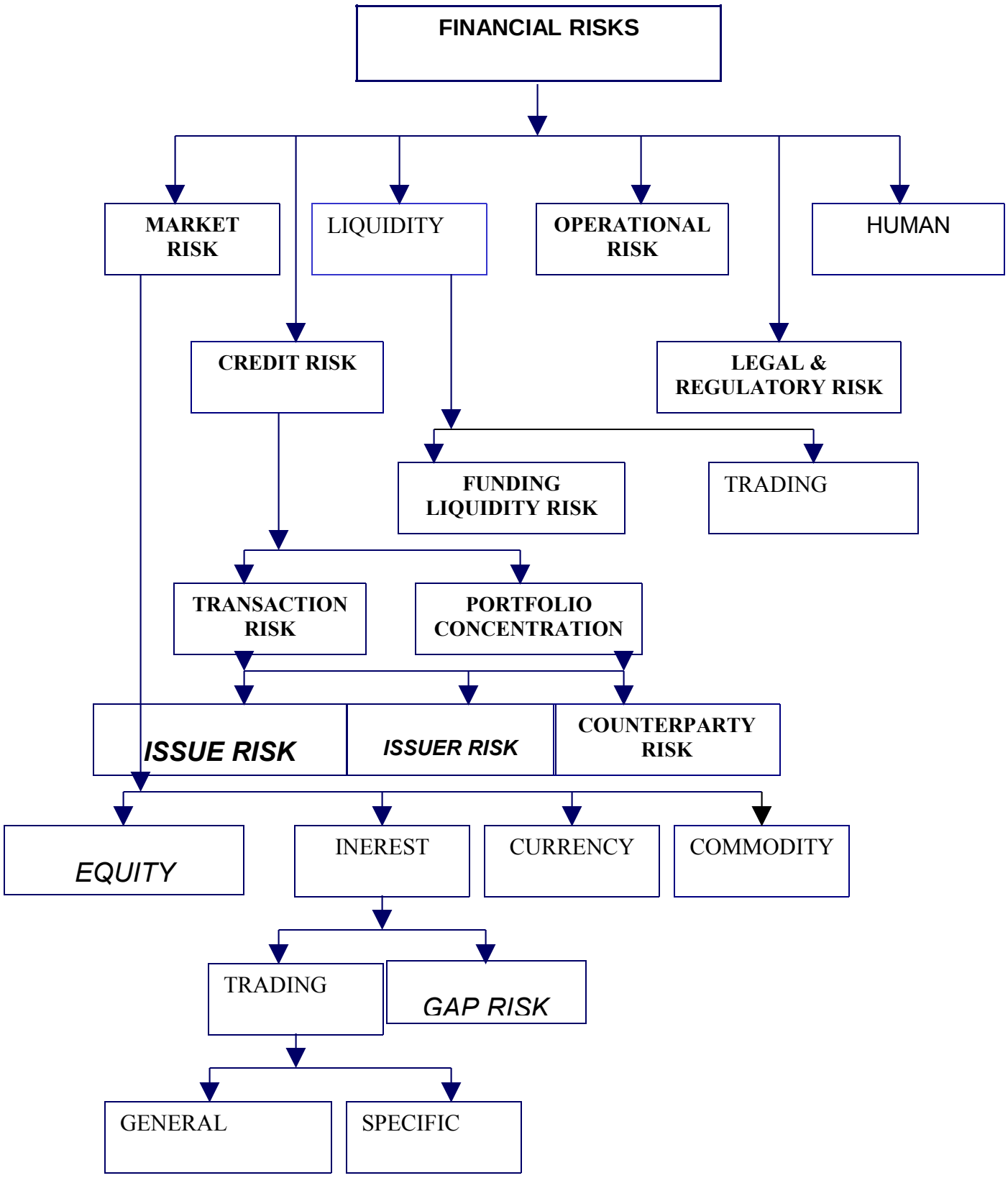
- One which is about managing risks, maximizing profitability and creating opportunity out of risks
- And the other which is about minimising risks/loss and protecting corporate assets.

The management of an organization needs to consciously decide on whether they want their risk management function to 'manage' or 'mitigate' Risks.

- Managing risks essentially is about striking the right balance between risks and controls and taking informed management decisions on opportunities and threats facing an organization. Both situations, i.e. over or under controlling risks are highly undesirable as the former means higher costs and the latter means possible exposure to risk.
- Mitigating or minimising risks, on the other hand, means mitigating all risks even if the cost of minimising a risk may be excessive and outweighs the cost-benefit analysis. Further, it may mean that the opportunities are not adequately exploited.

In the context of the risk management function, identification and management of Risk is more prominent for the financial services sector and less so for consumer products industry. What are the primary objectives of your risk management function? When specifically asked in a survey conducted, 33% of respondents stated that their risk management function is indeed expressly mandated to optimise risk.

3.4 TYPES OF RISK


FINANCIAL RISKS
MARKET RISK
LIQUIDITY
OPERATIONAL RISK
HUMAN
CREDIT RISK
LEGAL & REGULATORY RISK
FUNDING LIQUIDITY RISK
TRADING
TRANSACTION RISK
PORTFOLIO CONCENTRATION
ISSUE RISK
ISSUER RISK
COUNTERPARTY RISK
EQUITY
INEREST
CURRENCY
COMMODITY
TRADING
GAP RISK
GENERAL
SPECIFIC

1. MARKET RISK

Market risk is that risk that changes in financial market prices and rates will reduce the value of the bank's positions. Market risk for a fund is often measured relative to a benchmark index or portfolio, is referred to as a "risk of tracking error" market risk also includes "basis risk," a term used in risk management industry to describe the chance of a breakdown in the relationship between price of a product, on the one hand, and the price of the instrument used to hedge that price exposure on the other. The market-Var methodology attempts to capture multiple component of market such as directional risk, convexity risk, volatility risk, basis risk, etc.

2. CREDIT RISK

Credit risk is that risk that a change in the credit quality of a counterparty will affect the value of a bank's position. Default, whereby counterparty is unwilling or unable to fulfill its contractual obligations, is the extreme case; however banks are also exposed to the risk that the counterparty might downgraded by a rating agency.

Credit risk is only an issue when the position is an asset, i.e., when it exhibits a positive replacement value. In that instance if the counterparty defaults, the bank either loses all of the market value of the position or, more commonly, the part of the value that it cannot recover following the credit event. However, the credit exposure induced by the replacement values of derivative instruments are dynamic: they can be negative at one point of time, and yet become positive at a later point in time after market conditions have changed. Therefore the banks must examine not only the current exposure, measured by the current replacement value, but also the profile of future exposures up to the termination of the deal.

3. LIQUIDITY RISK

Liquidity risk comprises both

- Funding liquidity risk
- Trading-related liquidity risk.

Funding liquidity risk relates to a financial institution's ability to raise the necessary cash to roll over its debt, to meet the cash, margin, and collateral requirements of

counterparties, and (in the case of funds) to satisfy capital withdrawals. Funding liquidity risk is affected by various factors such as the maturities of the liabilities, the extent of reliance of secured sources of funding, the terms of financing, and the breadth of funding sources, including the ability to access public market such as commercial paper market. Funding can also be achieved through cash or cash equivalents, "buying power," and available credit lines.

Trading-related liquidity risk, often simply called as liquidity risk, is the risk that an institution will not be able to execute a transaction at the prevailing market price because there is, temporarily, no appetite for the deal on the other side of the market. If the transaction cannot be postponed its execution my lead to substantial losses on position. This risk is generally very hard to quantify. It may reduce an institution's ability to manage and hedge market risk as well as its capacity to satisfy any shortfall on the funding side through asset liquidation.

4. OPERATIONAL RISK

It refers to potential losses resulting from inadequate systems, management failure, faulty control, fraud and human error. Many of the recent large losses related to derivatives are the direct consequences of operational failure. Derivative trading is more prone to operational risk than cash transactions because derivatives are, by heir nature, leveraged transactions. This means that a trader can make very large commitment on behalf of the bank, and generate huge exposure in to the future, using only small amount of cash. Very tight controls are an absolute necessary if the bank is to avoid huge losses.

Operational risk includes" fraud," for example when a trader or other employee intentionally falsifies and misrepresents the risk incurred in a transaction. Technology risk and principally computer system risk also fall into the operational risk category.

5. LEGAL RISK

Legal risk arises for a whole of variety of reasons. For example, counterparty might lack the legal or regulatory authority to engage in a transaction. Legal risks usually only become apparent when counterparty, or an investor, lose money on a transaction and

decided to sue the bank to avoid meeting its obligations. Another aspect of regulatory risk is the potential impact of a change in tax law on the market value of a position.

6. HUMAN FACTOR RISK

Human factor risk is really a special form of operational risk. It relates to the losses that may result from human errors such as pushing the wrong button on a computer, inadvertently destroying files, or entering wrong value for the parameter input of a model.

❖ Types of market risk

- **Interest rate risk:**

Interest rate risk is the risk where changes in market interest rates might adversely affect a bank's financial condition. The immediate impact of changes in interest rates is on the Net Interest Income (NII). A long term impact of changing interest rates is on the bank's net worth since the economic value of a bank's assets, liabilities and off-balance sheet positions get affected due to variation in market interest rates. The interest rate risk when viewed from these two perspectives is known as 'earnings perspective' and 'economic value' perspective, respectively.

Management of interest rate risk aims at capturing the risks arising from the maturity and reprising mismatches and is measured both from the earnings and economic value perspective.

Earnings perspective involves analyzing the impact of changes in interest rates on accrual or reported earnings in the near term. This is measured by measuring the changes in the Net Interest Income (NII) or Net Interest Margin (NIM) i.e. the difference between the total interest income and the total interest expense.

Economic Value perspective involves analyzing the changes of impact on interest on the expected cash flows on assets minus the expected cash flows on liabilities plus the net cash flows on off-balance sheet items. It focuses on the risk to net worth arising from all reprising mismatches and other interest rate sensitive positions. The economic value perspective identifies risk arising from long-term interest rate gaps.

The management of Interest Rate Risk should be one of the critical components of market risk management in banks. The regulatory restrictions in the past had greatly reduced many of the risks in the banking system. Deregulation of interest rates has, however, exposed them to the adverse impacts of interest rate risk. The Net Interest Income (NII) or Net Interest Margin (NIM) of banks is dependent on the movements of interest rates. Any mismatches in the cash flows (fixed assets or liabilities) or reprising dates (floating assets or liabilities), expose bank's NII or NIM to variations. The earning of assets and the cost of liabilities are now closely related to market interest rate volatility Generally, the approach towards measurement and hedging of IRR varies with the segmentation of the balance sheet. In a well functioning risk management system, banks broadly position their balance sheet into **Trading** and **Banking** Books. While the assets in the trading book are held primarily for generating profit on short-term differences in prices/yields, the banking book comprises assets and liabilities, which are contracted basically on account of relationship or for steady income and statutory obligations and are generally held till maturity. Thus, while the price risk is the prime concern of banks in trading book, the earnings or economic value changes are the main focus of banking book.

- **Equity price risk:**

The price risk associated with equities also has two components" General market risk" refers to the sensitivity of an instrument / portfolio value to the change in the level of broad stock market indices." Specific / Idiosyncratic" risk refers to that portion of the stock's price volatility that is determined by characteristics specific to the firm, such as its line of business, the quality of its management, or a breakdown in its production process. The general market risk cannot be eliminated through portfolio diversification while specific risk can be diversified away.

- **Commodity price risk:**

The price of the commodities differs considerably from its interest rate risk and foreign exchange risk, since most commodities are traded in the market in which the concentration of supply can magnify price volatility. Moreover, fluctuations in the depth of trading in the market (i.e., market liquidity) often accompany and exacerbate high

levels of price volatility. Therefore, commodity prices generally have higher volatilities and larger price discontinuities. Risk can be explained as uncertainty and is usually associated with the unpredictability of an investment performance. All investments are subject to risk, but some have a greater degree of risk than others. Risk is often viewed as the potential for an investment to decrease in value.

Though quantitative analysis plays a significant role, experience, market knowledge and judgment play a key role in proper risk management. As complexity of financial products increase, so do the sophistication of the risk manager's tools.

We understand risk as a potential future loss. When we take an insurance cover, what we are hedging is the uncertainty associated with the future events. Financial risk can be easily stated as the potential for future cash flows (returns) to deviate from expected cash flows (returns).

There are various factors that give raise to this risk. Return is measured as Wealth at T+1- Wealth at T divided by Wealth at T. Mathematically it can be denoted as $(W_{T+1}-W_T)/W_T$. Every aspect of management impacting profitability and therefore cash flow or return, is a source of risk. We can say the return is the function of:

Prices, Productivity, Market Share, Technology and Competition etc

Financial risk management Risk management is the process of measuring risk and then developing and implementing strategies to manage that risk. Financial risk management focuses on risks that can be managed ("hedged") using traded financial instruments (typically changes in commodity prices, interest rates, foreign exchange rates and stock prices). Financial risk management will also play an important role in cash management. This area is related to corporate finance in two ways. Firstly, firm exposure to business risk is a direct result of previous Investment and Financing decisions. Secondly, both disciplines share the goal of creating, or enhancing, firm value. All large corporations have risk management teams, and small firms practice informal, if not formal, risk management.

Derivatives are the instruments most commonly used in Financial risk management. Because unique derivative contracts tend to be costly to create and monitor, the most cost-effective financial risk management methods usually involve derivatives that trade on well-established financial markets. These standard derivative instruments include options, futures contracts, forward contracts, and swaps.

The most important element of managing risk is keeping losses small, which is already part of your trading plan. Never give in to fear or hope when it comes to keeping losses small.

Risk can be explained as uncertainty and is usually associated with the unpredictability of an investment performance. All investments are subject to risk, but some have a greater degree of risk than others. Risk is often viewed as the potential for an investment to decrease in value.

3.5 Managing risk - How to manage risks

There are four ways of dealing with, or managing, each risk that you have identified. You can:

- **Accept it**
- **Transfer it**
- **Reduce it**
- **Eliminate it**

For example, you may decide to accept a risk because the **cost** of eliminating it completely is too high. You might decide to transfer the risk, which is typically done with insurance. Or you may be able to reduce the risk by introducing new safety measures or eliminate it completely by changing the way you produce your product.

When you have evaluated and agreed on the actions and procedures to reduce the risk, these measures need to be put in place.

Risk management is not a one-off exercise. Continuous monitoring and reviewing is crucial for the success of your risk management approach. Such monitoring ensures that risks have been correctly identified and assessed, and appropriate controls put in place. It is also a way to learn from experience and make improvements to your risk management approach.

All of this can be formalised in a risk management policy, setting out your business' approach to and appetite for risk and its approach to risk management. Risk management will be even more effective if you clearly assign responsibility for it to chosen employees. It is also a good idea to get commitment to risk management at the board level.

Contrary to conventional wisdom, risk management is not just a matter of running through numbers. Though quantitative analysis plays a significant role, experience, market knowledge and judgment play a key role in proper risk management. As complexity of financial products increase, so do the sophistication of the risk manager's tools.

"Good risk management can improve the quality and returns of your business."

TECHNICAL ANALSIS

4.1 WHAT DOES TECHNICAL ANALYSIS MEAN?

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.

General Description

Technical analysts seek to identify price patterns and trends in financial markets and attempt to exploit those patterns. While technicians use various methods and tools, the study of price charts is primary.

Technicians especially search for archetypal patterns, such as the well-known head and shoulders or double top reversal patterns, study indicators such as moving averages, and look for forms such as lines of support, resistance, channels, and more obscure formations such as flags, pennants or balance days.

Technical analysts also extensively use indicators, which are typically mathematical transformations of price or volume. These indicators are used to help determine whether an asset is trending, and if it is, its price direction. Technicians also look for relationships between price, volume and, in the case of futures, open interest. Examples include the relative strength index, and MACD. Other avenues of study include correlations between changes in options (implied volatility) and put/call ratios with price. Other technicians include sentiment indicators, such as Put/Call ratios and Implied Volatility in their analysis.

Technicians seek to forecast price movements such that large gains from successful trades exceed more numerous but smaller losing trades, producing positive returns in the long run through proper risk control and money management.

There are several schools of technical analysis. Adherents of different schools (for example, candlestick charting, Dow Theory, and Elliott wave theory) may ignore the other approaches, yet many traders combine elements from more than one school. Technical analysts use judgment gained from experience to decide which pattern a

particular instrument reflects at a given time, and what the interpretation of that pattern should be.

Technical analysis is frequently contrasted with *fundamental analysis*, the study of economic factors that influence prices in financial markets. Technical analysis holds that prices already reflect all such influences before investors are aware of them, hence the study of price action alone. Some traders use technical or fundamental analysis exclusively, while others use both types to make trading decisions.

4.2 THE BASIC ASSUMPTIONS

Technicians say that a market's price reflects all relevant information, so their analysis looks more at "internals" than at "externals" such as news events. Price action also tends to repeat itself because investors collectively tend toward patterned behavior – hence technicians' focus on identifiable trends and conditions.

Market Action Discounts Everything

Based on the premise that all relevant information is already reflected by prices, pure technical analysts believe it is redundant to do fundamental analysis – they say news and news events do not significantly influence price, and cite supporting research such as the study by Cutler, Pot erba, and Summers t itled "What Moves Stock Prices?" On most of the sizable return days large market

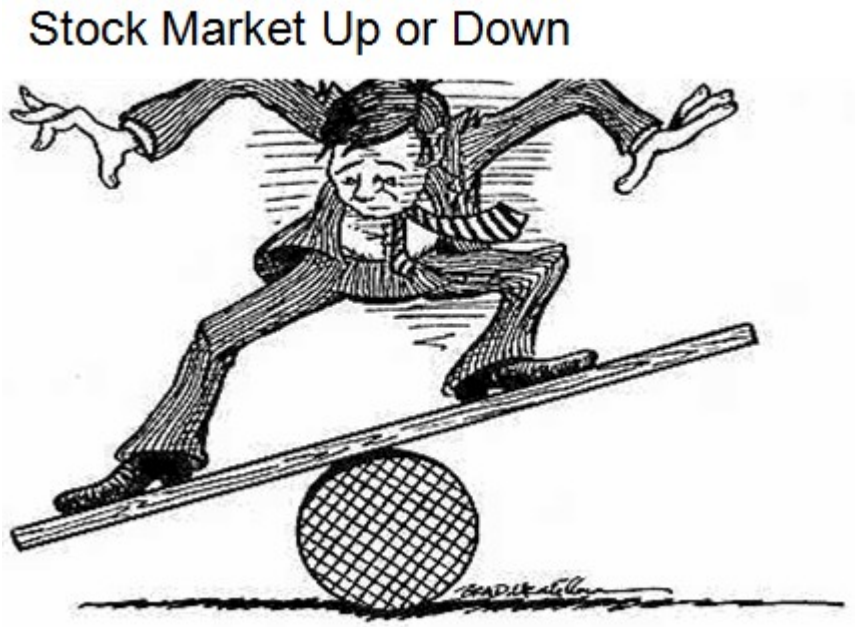
moves...the information that the press cites as the cause of the market move is not particularly important. Press reports on adjacent days also fail to reveal any convincing accounts of why future profits or discount rates might have changed. Our inability to identify the fundamental shocks that accounted for these significant market moves is

difficult to reconcile with the view that such shocks account for most of the variation in stock returns.

Prices Move In Trends

Technical analysts believe that prices trend. Technicians say that markets trend up, down, or sideways (flat). This basic definition of price trends is the one put forward by Dow Theory.

An example of a security that had an apparent trend is AOL from November 2001 through August 2002. A technical analyst or trend follower recognizing this trend would look for opportunities to sell this security. AOL consistently moves downward in price. Each time the stock rose, sellers would enter the market and sell the stock; hence the "zig-zag" movement in the price. The series of "lower highs" and "lower lows" is a tell tale sign of a stock in a down trend. In other words, each time the stock edged lower, it fell below its previous relative low price. Each time the stock moved higher, it could not reach the level of its previous relative high price.



Note that the sequence of lower lows and lower highs did not begin until August. Then AOL makes a low price that doesn't pierce the relative low set earlier in the month. Later in the same month, the stock makes a relative high equal to the most recent relative high. In this a technician sees strong indications that the down trend is at least pausing and possibly ending, and would likely stop actively selling the stock at that point.

History tends to repeat itself

Technical analysts believe that investors collectively repeat the behavior of the investors that preceded them. "Everyone wants in on the next Microsoft," "If this stock ever gets to $50 again, I will buy it," "This company's technology will revolutionize its industry, therefore this stock will skyrocket" – these are all examples of investor sentiment repeating itself. To a technician, the emotions in the market may be irrational, but they exist. Because investor behavior repeats itself so often, technicians believe that recognizable (and predictable) price patterns will develop on a chart.

Technical analysis is not limited to charting, but it always considers price trends. For example, many technicians monitor surveys of investor sentiment. These surveys gauge the attitude of market participants, specifically whether they are bearish or bullish. Technicians use these surveys to help determine whether a trend will continue or if a reversal could develop; they are most likely to anticipate a change when the surveys report extreme investor sentiment. Surveys that show overwhelming bullishness, for example, are evidence that an uptrend may reverse – the premise being that if most investors are bullish they have already bought the market (anticipating higher prices). And because most investors *are* bullish and invested, one assumes that few buyers remain. This leaves more potential sellers than buyers, despite the bullish sentiment. This suggests that prices will trend down, and is an example of contrarian trading.

SYSTEMATIC TRADING

Neural Networks

Since the early 1990s when the first practically usable types emerged, artificial neural networks (ANNs) have rapidly grown in popularity. They are artificial intelligence adaptive software systems that have been inspired by how biological neural networks work. They are used because they can learn to detect complex patterns in data. In mathematical terms, they are universal function approximators, meaning that given the right data and configured correctly, they can capture and model any input-output relationships. This not only removes the need for human interpretation of charts or the series of rules for generating entry/exit signals, but also provides a bridge to fundamental analysis, as the variables used in fundamental analysis can be used as input.

As ANNs are essentially non-linear statistical models, their accuracy and prediction capabilities can be both mathematically and empirically tested. In various studies, authors have claimed that neural networks used for generating trading signals given various technical and fundamental inputs have significantly outperformed buy-hold strategies as well as traditional linear technical analysis methods when combined with rule-based expert systems.

While the advanced mathematical nature of such adaptive systems has kept neural networks for financial analysis mostly within academic research circles, in recent years more user friendly neural network software has made the technology more accessible to traders. However, large-scale application is problematic because of the problem of matching the correct neural topology to the market being studied.

Rule-Based Trading

Rule-based trading is an approach intended to create trading plans using strict and clear-cut rules. Unlike some other technical methods and the approach of fundamental analysis, it defines a set of rules that determine all trades, leaving minimal discretion. The theory behind this approach is that by following a distinct set of trading rules you will reduce the number of poor decisions, which are often emotion based.

For instance, a trader might make a set of rules stating that he will take a long position whenever the price of a particular instrument closes above its 50-day moving average, and shorting it whenever it drops below.

Combination With Other Market Forecast Methods

John Murphy says that the principal sources of information available to technicians are price, volume and open interest. Other data, such as indicators and sentiment analysis, are considered secondary.

However, many technical analysts reach outside pure technical analysis, combining other market forecast methods with their technical work. One advocate for this approach is John Bollinger, who coined the term *rational analysis* in the middle 1980s for the intersection of technical analysis and fundamental analysis. Another such approach, fusion analysis, overlays fundamental analysis with technical, in an attempt to improve portfolio manager performance.

Technical analysis is also often combined with quantitative analysis and economics. For example, neural networks may be used to help identify intermarket relationships. A few market forecasters combine financial astrology with technical analysis. Chris Carolan's article "Autumn Panics and Calendar Phenomenon", which won the Market Technicians Association Dow Award for best technical analysis paper in 1998, demonstrates how technical analysis and lunar cycles can be combined. It is worth noting, however, that some of the calendar related phenomena, such as the January effect in the stock market, have been associated with tax and accounting related reasons.

Investor and newsletter polls, and magazine cover sentiment indicators, are also used by technical analysts.

4.3 FUNDAMENTAL V/S TECHNICAL ANALYSIS

Technical analysis and fundamental analysis are the two main schools of thought in the financial markets. As we've mentioned, technical analysis looks at the price movement of a security and uses this data to predict its future price movements. Fundamental analysis, on the other hand, looks at economic factors, known as fundamentals. Let's get into the details of how these two approaches differ, the criticisms against technical analysis and how technical and fundamental analysis can be used together to analyze securities.

The Differences

Charts vs. Financial Statements

At the most basic level, a technical analyst approaches a security from the charts, while a fundamental analyst starts with the financial statements.

By looking at the balance sheet, cash flow statement and income statement, a fundamental analyst tries to determine a company's value. In financial terms, an analyst attempts to measure a company's intrinsic value. In this approach, investment decisions

are fairly easy to make - if the price of a stock trades below its intrinsic value, it's a good investment. Although this is an oversimplification (fundamental analysis goes beyond just the financial statements) for the purposes of this tutorial, this simple tenet holds true.
Technical traders, on the other hand, believe there is no reason to analyze a company's fundamentals because these are all accounted for in the stock's price. Technicians believe that all the information they need about a stock can be found in its charts.

Time Horizon

Fundamental analysis takes a relatively long-term approach to analyzing the market compared to technical analysis. While technical analysis can be used on a timeframe of weeks, days or even minutes, fundamental analysis often looks at data over a number of years.

The different timeframes that these two approaches use is a result of the nature of the investing style to which they each adhere. It can take a long time for a company's value to be reflected in the market, so when a fundamental analyst estimates intrinsic value, a gain is not realized until the stock's market price rises to its "correct" value. This type of investing is called value investing and assumes that the short-term market is wrong, but that the price of a particular stock will correct itself over the long run. This "long run" can represent a timeframe of as long as several years, in some cases.
Furthermore, the numbers that a fundamentalist analyzes are only released over long periods of time. Financial statements are filed quarterly and changes in earnings per share don't emerge on a daily basis like price and volume information. Also remember that fundamentals are the actual characteristics of a business. New management can't implement sweeping changes overnight and it takes time to create new products, marketing campaigns, supply chains, etc. Part of the reason that fundamental analysts use a long-term timeframe, therefore, is because the data they use to analyze a stock is generated much more slowly than the price and volume data used by technical analysts.

Trading Versus Investing

Not only is technical analysis more short term in nature that fundamental analysis, but the goals of a purchase (or sale) of a stock are usually different for each approach. In general,

technical analysis is used for a trade, whereas fundamental analysis is used to make an investment. Investors buy assets they believe can increase in value, while traders buy assets they believe they can sell to somebody else at a greater price. The line between a trade and an investment can be blurry, but it does characterize a difference between the two schools.

The Critics

Some critics see technical analysis as a form of black magic. Don't be surprised to see them question the validity of the discipline to the point where they mock its supporters. In fact, technical analysis has only recently begun to enjoy some mainstream credibility. While most analysts on Wall Street focus on the fundamental side, just about any major brokerage now employs technical analysts as well.

Much of the criticism of technical analysis has its roots in academic theory - specifically the efficient market hypothesis (EMH). This theory says that the market's price is always the correct one - any past trading information is already reflected in the price of the stock and, therefore, any analysis to find undervalued securities is useless.

There are three versions of EMH. In the first, called weak form efficiency, all past price information is already included in the current price. According to weak form efficiency, technical analysis can't predict future movements because all past information has already been accounted for and, therefore, analyzing the stock's past price movements will provide no insight into its future movements. In the second, semi-strong form efficiency, fundamental analysis is also claimed to be of little use in finding investment opportunities. The third is strong form efficiency, which states that all information in the market is accounted for in a stock's price and neither technical nor fundamental analysis can provide investors with an edge. The vast majority of academics believe in at least the weak version of EMH, therefore, from their point of view, if technical analysis works, market efficiency will be called into question. (For more insight, read What Is Market Efficiency? and Working through the Efficient Market Hypothesis.)

There is no right answer as to who is correct. There are arguments to be made on both sides and, therefore, it's up to you to do the homework and determine your own

philosophy.

Can They Co-Exist?

Although technical analysis and fundamental analysis are seen by many as polar opposites - the oil and water of investing - many market participants have experienced great success by combining the two. For example, some fundamental analysts use technical analysis techniques to figure out the best time to enter into an undervalued security. Oftentimes, this situation occurs when the security is severely oversold. By timing entry into a security, the gains on the investment can be greatly improved.

Alternatively, some technical traders might look at fundamentals to add strength to a technical signal. For example, if a sell signal is given through technical patterns and indicators, a technical trader might look to reaffirm his or her decision by looking at some key fundamental data. Oftentimes, having both the fundamentals and technicals on your side can provide the best-case scenario for a trade.

While mixing some of the components of technical and fundamental analysis is not well received by the most devoted groups in each school, there are certainly benefits to at least understanding both schools of thought.

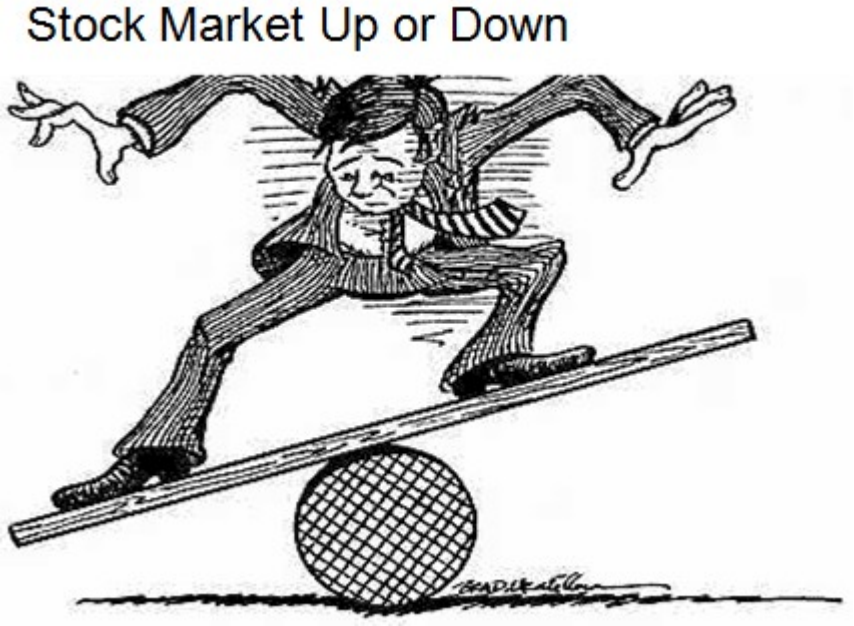
4.4 The Dow Theory and some other basic concepts

As already stated Most of the later developments in technical analysis occurred as a follow up study of the tenets included in the Dow Theory. So it becomes important to examine these six tenets that are as follows,

1. ***The Averages Discount Everything*:** The first of these tenets, the Averages discount everything, is deeply woven into the philosophy of technical analysis. Dow's research was based on the Dow Jones Industrial, Transport and Utility Averages. If the phrase 'market price' were to be substituted for 'averages' we are left with the observation "market price discounts everything." This premise needs to be fully understood before we can move on. By focusing on price action, technical analysts are simply cutting to the chase, believing that anything that can

affect the market price of a financial instrument already reflected in its price because it is the only way in which every kind of player is able to express himself in the stock market.

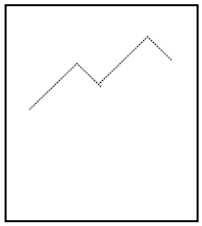
2. ***Prices move in Trends:*** Dow suggested that prices have a tendency to move consistently in the same direction for long lengths of time. These he expressed as Trends. There is a general awareness of what trends are – often referred to as being either bullish or bearish trends. What it really refers to is the consistent movement of prices. When markets are moving about aimlessly, they can be said to be random but if there is a certain consistency in the direction of price movements, then they are said to be trended.



Trends were classified by way of Direction – Up, Down or Sideways or by Time – Long, Medium and Short. While the classification by direction was more generic, the classification by time was taken to be more specific. They were given specific names and extent. Hence the long-term was called Primary Trend and was expected to last more than one year. The medium-term was called the Intermediate Trend and was expected last from between 3 weeks and up to 3 months while the short-term was called the Minor Trend and was expected to last up to 3 weeks.

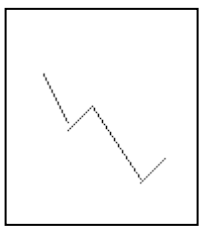
However, under present market conditions, these definitions of trend times have become way off. With the fast technological and trading changes in market long-term trend can be stated as being the same as defined by minor trend in original Dow Theory.

Dow defined an **Uptrend** as a sequence of Higher Tops and Higher bottoms. In other words, prices have to move in such a fashion that every rises will exceed the previous peak while subsequent declines will hold above the previous declines. Pictorially, it will look like this:



Uptrend

The logic of this is very sound. Unless people are willing to pay a greater premium the prices cannot rise further. And people will pay a higher premium only when they perceive that there are even higher prices down the line. This can happen only when the underlying fundamentals are sound. Hence a sequence of higher tops will indicate that the perception of the underlying set of numbers is deemed to be positive. A higher bottom would form when the people are in a hurry to buy thereby preventing the stock prices to trade down to where they had been earlier. This also suggests that there is a change in the perception about what the stock is worth.



Downtrend

The exact reverse happens when the stock is showing a sequence of lower tops and bottoms. People are seen to be in a hurry to discard their holdings. This can only happen when there is something adverse in the perception about the stock. Therefore a clear sequence of lower tops and bottoms would be a bearish signal. This can be pictorially depicted in a Downtrend.

3. ***Trends have phases***: This is a further delineation of how the price trends are to be studied. By giving a greater emphasis on the different aspects of a trend, Dow chose to draw a clearer picture of what is happening within the markets. Essentially, any trend has three phases:

Phase of accumulation, where the insiders buy up the stock and begin sponsoring a new rise. Quieter price movements often characterize accumulation but a closer look would reveal that higher tops and bottoms would be recorded at a minor level as insiders begin to absorb all the stocks on offer.

The phase of accumulation is then followed by a **phase of Rapid Advance**. This happens when the broader market becomes aware that there is something new happening in the stock and begins to participate. Maximum price moves occur in this phase.

This is then followed by a **phase of Distribution**. Once the price targets are achieved, the stocks are then sold off to the maximum number of people, thereby exiting the positions built up earlier during accumulation. Many times distribution occurs over a period of time and may be part of the last rise as well as the first fall.

On the downside, the sequence begins with distribution, is then followed up with a phase of rapid decline and then terminates with a phase of accumulation.

4. ***Volume must expand in the direction of the main trend:*** Addressing the second variable within the market, Dow stated what to most would seem obvious – that every directional move in the market must be accompanied by volumes. By

making it a rule Dow ensured that we would have a definitive way of checking for true and false up and down moves. One would have to make comparative studies between two legs of advances (or declines) on the volume patterns that they exhibit. Depending upon what is seen, one can then draw a conclusion that either the market is moving ahead with volumes accompanying advances or not. A rising market trend can only persist if there are more and more people willing to invest in that direction. So a rise, which does not have volumes, is suspect and liable for reversal.

5. ***Averages must confirm:*** Dow made this as a safety tenet. By stating that the sequence of higher tops and bottoms should be seen in more than one average (industrials as well as rails) he was just ensuring that the uptrend that one is supposing has a stronger foundation. The basis of conclusion was that what was evident across a wider canvas has a lesser probability of becoming wrong.
6. ***Reversal Signals***: Dow stated that a trend is in existence until there is an evidence of its reversal. This may seem a bit circular but in reality, it is very clear what Dow is attempting here. He is giving us a clear rule, which prevents us from becoming subjective about the markets. This tenet says to us that until there is a new sequence of lower tops and bottoms, the earlier sequence of higher tops and bottoms should be deemed to be in existence. This way we will be prevented from taking an improper trend consideration.

Plotting Charts

As defined, Technical Analysis is the study of market action principally through charts; therefore charts are used as the means for depicting the market's movement through time. Charts are therefore the medium, through which one can read, hear and understand the language that the market speaks. Since the market speaks only one language – that of price – an understanding of how this chart is plotted along with volume (which is also another important factor) is necessary.

Every exchange-traded instrument would contain the following data:

Open: This is the price at which the first trade of a security is executed on that particular day.

High: This is the maximum price attained by the security on a particular day.

Low: This is the minimum price attained by the security on the particular day.

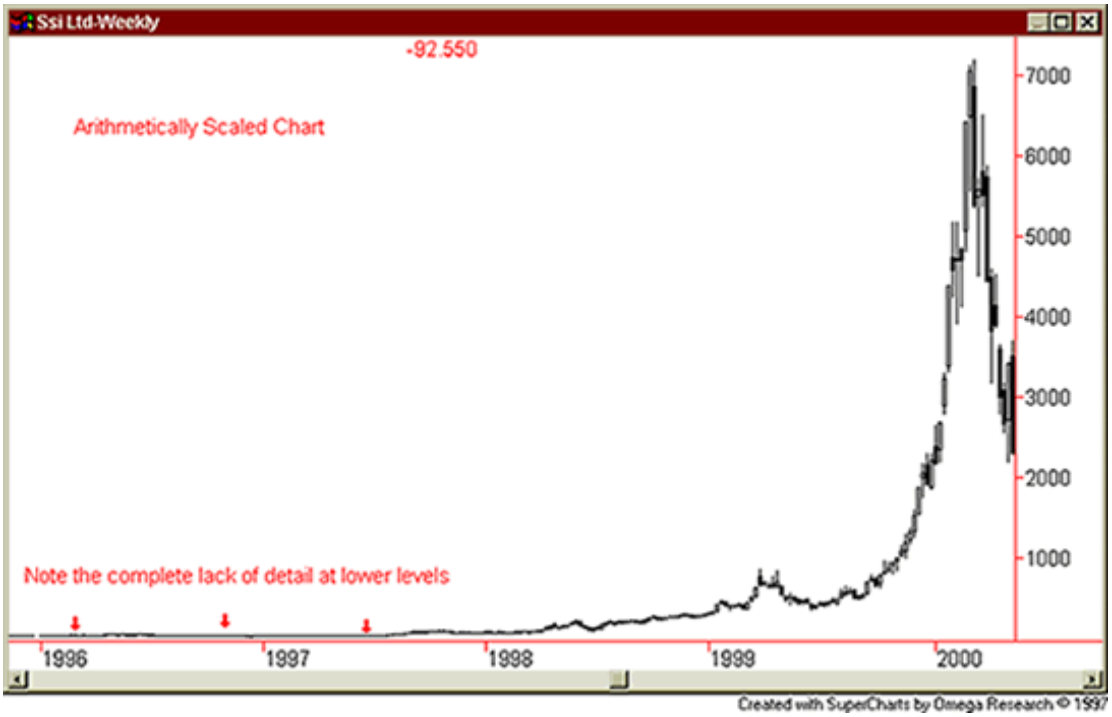
Close: This is the price at which the last trade of a security is executed on that particular day.

Charts are plotted on a daily basis using a Price vs. Time scale. The Price goes on the Y-axis while the Time goes on the X-axis. One can also plot the chart on a weekly or monthly or yearly basis. In such cases, the data points would be the Open, High, Low or Close for the week, month or the year respectively.

Usually, the charts are referred to by the time period of the plot such as Daily chart, Weekly chart, Monthly chart etc. Whatever the time period principle remains the same – the frequency of the data points that are plotted are what would differentiate the chart.

Another important factor to be considered while plotting of chart is the type of scale used, two of the scales used are arithmetic scale & percentage or logarithmic scale,

The Arithmetic Scale: In this scale, the chart scale is split between the highest and lowest values on the scale and each of the divisions move up the exact same amount at every step.



The Problem with this scale is that if the price movements have been substantial then the chart would lack detail, i.e. one would find it difficult to decipher the moves at the low price levels, note the above chart.

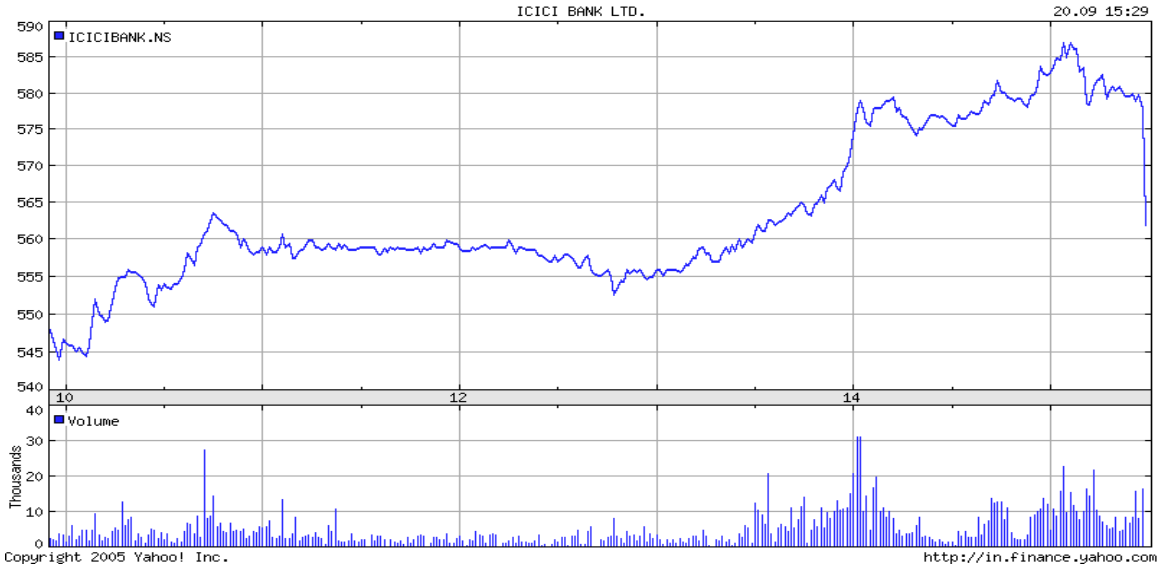
Percentage Scale: The above limitation of arithmetic scale gets removed by resorting to a percentage based scaling on the Price axis while maintaining the Time axis the same (i.e. one division per day/week/month). In these charts, the steps of price rise are percentages of the ones below it. This way a greater amount of prices are covered. Comparing this chart with earlier chart might help clear the picture:

Note that the left side stock has almost no details of the lower prices while the same is clearly depicted on the logarithmic chart, sometimes also called as semi-logarithmic chart. It is because of the difference in scaling.

Normally, one looks at Arithmetic scaled charts over the short-term period (such as intra day and daily charts) while Percentage scaled charts should be used while looking at longer term charts (such as the weekly and monthly charts).

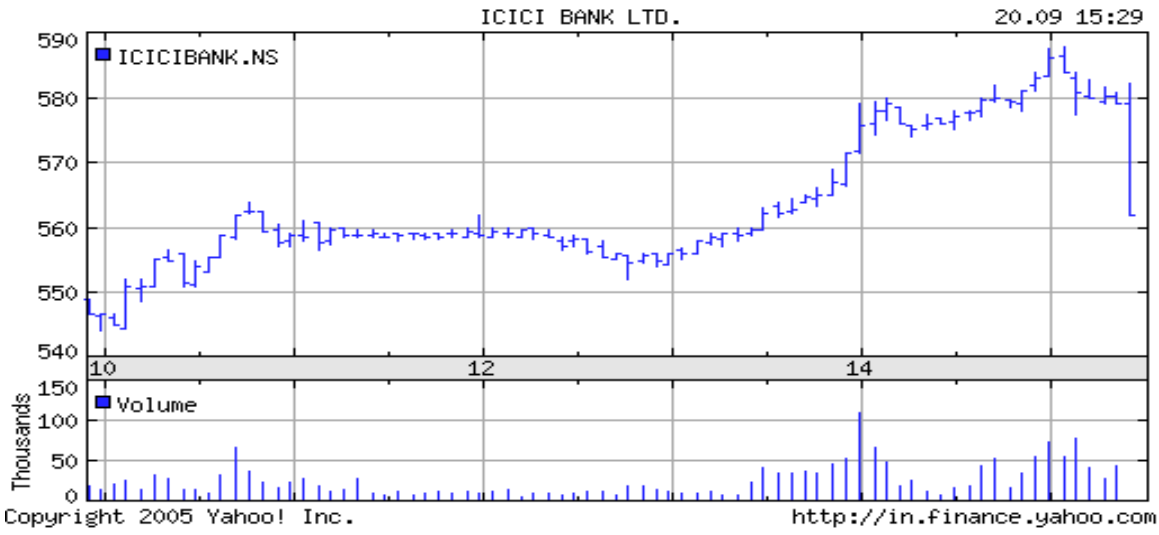
Types Of Charts

a. Line Chart: The line chart is one of the simplest charts. It is formed by plotting one price point, usually the close, of a security over a period of time. Connecting the dots, or price points, over a period of time, creates the line. Some investors and traders consider the closing level to be more important than the open, high or low. By paying attention to only the close, intraday swings can be ignored. Line charts are also used when open, high and low data points are not available. Sometimes only closing data are available for certain indices, thinly traded stocks and intraday prices.



This is the most frequently chart type that is used. It is, by default, the chart of the *closing* prices only. One plots the closing price from day to day and joins the prices using a line. Hence the name Line chart. Also known as the closing chart.

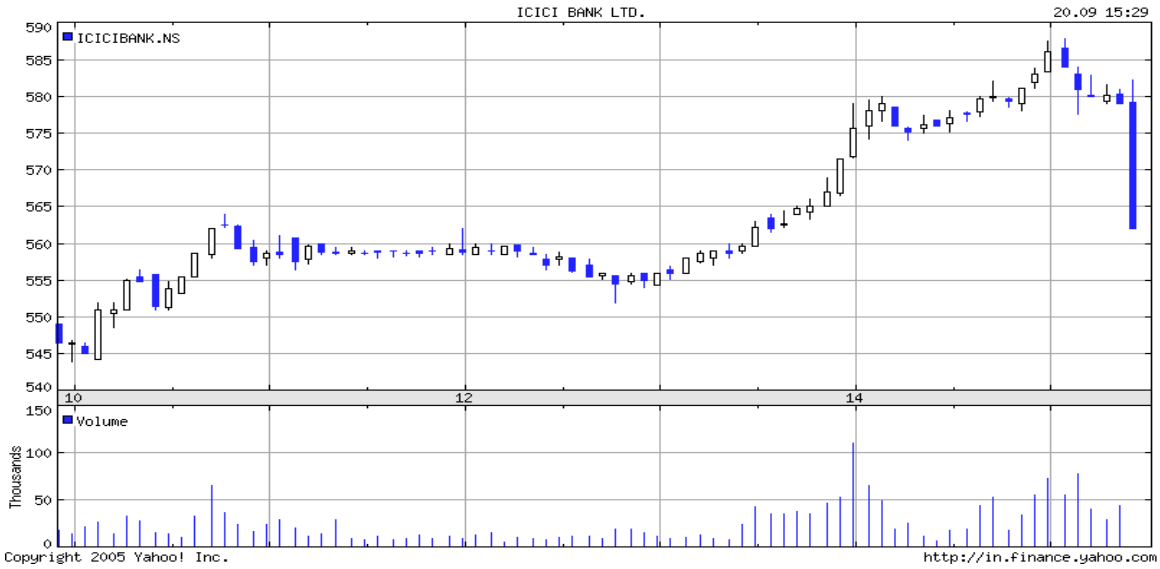
b. Bar Chart:



This type of chart uses all the four data points – Open (O) High (H) Low (L) and Close (C). It is also known as the Hilo bar chart or the OHLC chart. The High and Low points

are plotted and joined by a vertical line. The open is then placed as a small horizontal line to the left of the bar while the close is placed as a small horizontal line to the right of the bar.

c. Candlesticks:



The same four data points are used (OHLC) but in a slightly different manner. The open and close are plotted and joined together by a vertical box while the high and low are placed as small extensions above and below the box. The width of the box is kept uniform. Depending on whether the open is greater than the close or lesser, the box is suitably colored. If the close is lower, then the box is colored while if the close is higher, the box is white. This kind of charting is more visual as it can tell in a flash where the open and close were in relation to one another.

Other less frequently used charts

Point and Figure, Renko and Three Line Break charts: These are time independent charts where price plots are made when the stock moves a certain number of points or a certain percentage move occurs.

Kagi: This is a type of charting where the thickness of the line plotted changes with the crossing of previous highs and lows.

Equivolume: A particular type of charting method, which seeks to combine volumes and prices into one bar. The bars are made thin or thick based on the extent of volumes, which are seen on that particular time period. A high volume day will have a thick bar while a low volume day will have a thin bar.

4.5 LINE STUDIES

The concept of Trend has already been elaborated in earlier section on Tenets of Dow Theory (2nd tenet). This Concept of trend is fundamental to the making of the simplest of set of tools in Technical Analysis – the Trendline.

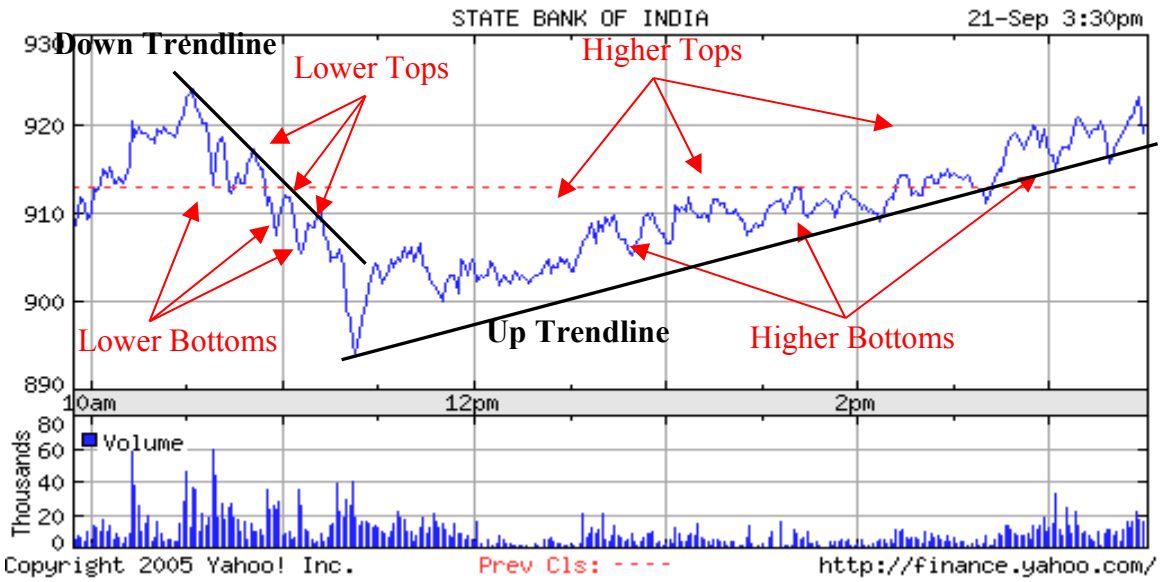
Trend is the basic direction of the market (or security) price movement. Trend can either be upwards, downwards or sideways. Once a trend identified, then trend lines are drawn to define the lower limits of an up trend or the upper limits of a downtrend. At its most basic level, we form trendlines by joining two lows in a rising trend (support trendline) or by joining two highs in a declining trend (resistance trendline).

Up Trendline: This is drawn when prices are making higher tops and higher bottoms i.e. in an up trend. A straight line is drawn from the lowest low of the period to the lowest low prior to the highest high so that the line does not pass through prices between these two. (see figure on next page)

Down Trendline: When prices are making lower tops and lower bottoms a straight line is drawn from the highest high of the period to the highest high prior to the lowest low so that the line does not pass through prices between these two points. (see figure on next page)

Since prices hardly ever rise or fall at a constant rate. At such times it should be realized that the second point (i.e. the last minor low or the last minor high) is the fixed one and we can move the first point (i.e. the point at the lowest low or the highest high) to a level where all the trading bars lie above or below, (as the case may be), the trendline.

It is essential that trend lines be drawn correctly as it is the recognition of the trend line and the violation of this trend line that is your key to successful trading by using technical analysis.



Role of Trendlines

Trendlines function mainly to define supports (in a rising market) and to define resistance (in a falling market). Stocks in a trend are expected to persist with the same trend until the trendline is penetrated or broken. Depending upon which time frame chart is used to plot prices, the trendlines are labeled as short-term trendline or medium term or long term trendlines. The break of a long-term trendline is to be treated as much more significant development as compared to a break of a short-term trendline.

Dynamics of a Trend

During development of a trend the growth of the trend proceeds at different rates at different times. A frequent sequence is the following - a short initial explosive breakout and advance from a previous prolonged period of trading in a limited price range, a much longer period of steady progression at a lower rate of change and, finally, a shorter period of noticeably slower rate of progression.

Each phase of trend advancement is followed by a period of retracement (price falling after creating a top in uptrend and rising after creating a bottom) and consolidation. The initial growth phase is too rapid to be sustained and the ensuing correction is often quite deep. The second phase of advancement is one of steady sustainable growth and often persists for some time. Inevitably this too ends and a period of retracement follows but usually not as deep as the initial correction. This second correction often takes more time than the first to complete the corrective process. When the correction is complete the final phase of trend advancement occurs usually at the slowest rate of change for the whole progression of the trend and then this too corrects.

One can see that on the chart on the previous page, by observing the volumes and line chart the; explosive breakout, sustainable growth and the advancement can be seen with the ensuing corrections.

Retracement Lines

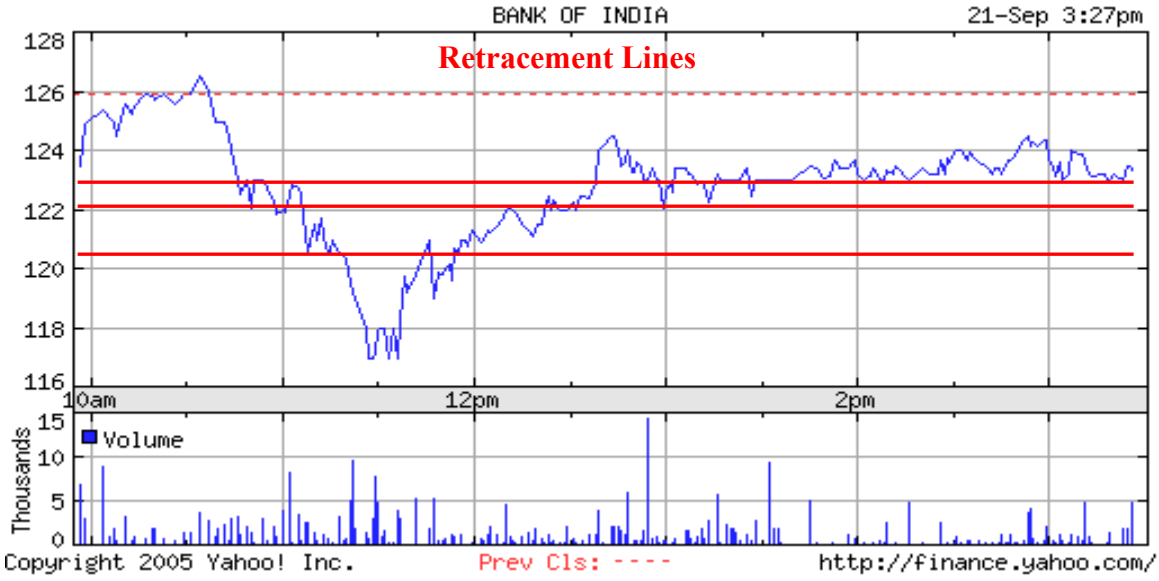
The various patterns of correction are seen to involve some relative retracement of prices in a trend. These can be analogically understood as three steps forward one back, before further advance, so as to prepare for taking a fresh position and being on a safe side as one moves in new areas of the chart. The amount of retracement tend to fall into predictable percentage amounts in any given trend be it short or long term. These predictable amounts tend to be Fibonacci fractions of the price distance covered in the last move of the trend.

Fibonacci was a thirteenth century customs officer in Pisa. He was a mathematical genius and introduced Arabic numerals to Europe. Of his three major mathematical publications his masterpiece was Liber Abaci - the Book of Calculations. In this opus he solved the conundrum of the mathematical progression, the sequence of progression being the following: 1 + 1 = 2; 1 + 2 = 3; 2 + 3 = 5; 3 + 5 = 8... etc.

The sequence has interesting relationships:

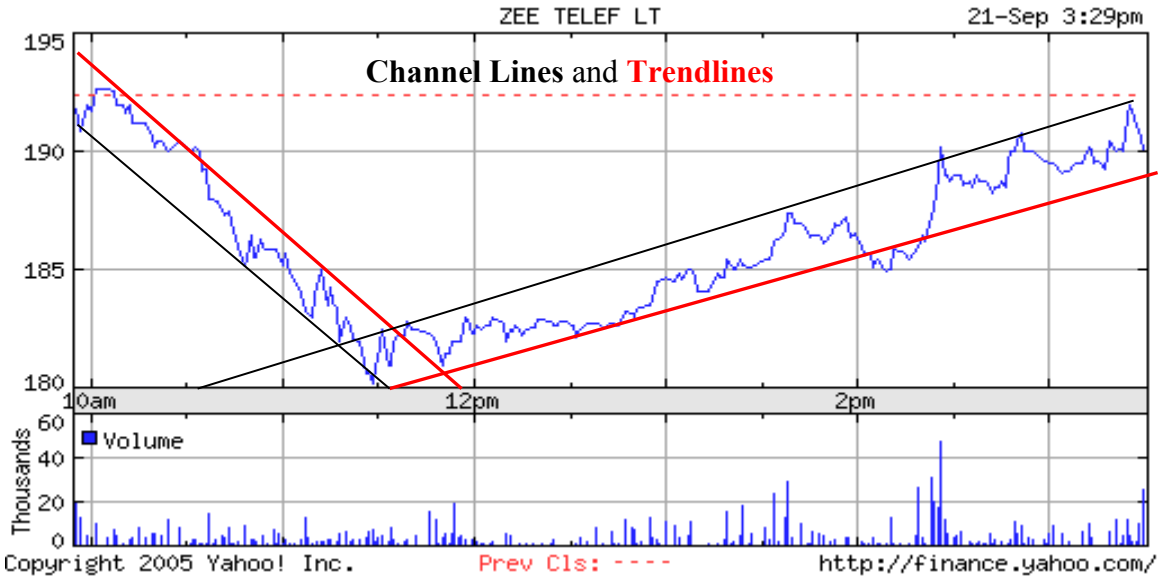
1. The sum of consecutive numbers in the sequence gives the next higher number.
2. The ratio of any number to its next higher number approximates 0.618.
3. The ratio of any number to its next lower number approximates 1.618.

The ratios of alternate numbers are 0.382 and 2.618 respectively. These ratios form the basis of universal symmetry and in context of technical Analysis they are equally important as the Fibonacci fraction or ratios are 0.38 (38%), 0.5 (50%) and 0.62 (62%) in whole numbers of the length of the trend. These are very close to the common perception that stocks tend to correct by one third, one half or two thirds of their recent trend. When prices seem to be correcting a significant move one can quickly calculate and identify these possible Fibonacci points of retracement. If prices retrace to one of these levels and find support then this could prove to be a good, low risk area to enter the market or add to your previous stock holdings. If correction exceeds the 62-66% it is then very probable that the previous trend has failed and a reversal is truly in effect.



Channels of the Trend

The Trendline acts as underlying support to up trends and overhead resistance to down trends. Also the prices once finding support (resistance) will move ahead and away from the trend line then return to the trend line. Over time this meandering course of price movements to and from the trend line form a channel of variance from the trend line and in the direction of the trend.



There are buyers who are committed in varying degree to prices going up, sellers who are similarly convinced that prices are headed down and that that large undefined mass of the uncommitted, observing the buyer/seller dynamic turmoil and joining the fray when they are convinced that one or the other is in ascendancy.

Channel Lines allows the buyers and sellers to adjust their respective positions with the prices moving to and fro between Trendlines and Channel lines, the exact happenings can be understood by gaining an insight on the prevailing human dynamics associated with Trends. Trading can be done on retracement i.e. when the price just moves away from Channel Line or people who want to be on relatively safer side can trade using the Trendline; when Trendline gets significantly penetrated short sell (sell first buy later when price depreciates) in a down trend or take long position (buy first and sell when price appreciates) in an up trend.

Inferences from Line Studies

- Line studies help in establish the concepts of supports and resistances on a more dynamic basis and therefore one can follow the price movements as they unfold either up or down.
- Correctly drawing Trendlines and studying the penetration based on the type (up trend/downtrend) and nature (long, medium, short term) of trend allows us to anticipate price movements.
- With Help of Retracement Lines we can understand the corrections that will take place and profit from it.
- Identification of precise points for entry and exit and are established as well as stop loss levels that will help us manage the trade from a risk and reward perspective can be determined with help of Trend channel Lines.
- Line studies are therefore an invaluable but extremely simple way of looking at markets.

4.6 PRICE PATTERNS

After the basic concepts of Support and Resistances and the simple but very much important Straight Line Studies (Trendlines), the next set of tools in the realm of technical analysis. This is the area of Price patterns.

- What are Price Patterns?
- What causes Price Patterns to be formed?
- What are the basic Characteristics of Price Patterns?

Price patterns have the following characteristics

1. They are expressions of market symmetry and hence would be part of the support-resistance mechanisms
2. They appear to be often in geometric or some easily identifiable form

- How are Price Patterns classified?

Patterns are classified into two categories:

1. **Reversal Patterns**: These are often seen as a Major variety of pattern as they are seen at the end of long moves i.e. they signal end of one trend and start of opposite trend.

The following are the most commonly found Reversal patterns:

Head Shoulder (and its mirror the Inverted Head and Shoulder)
Triple Tops (and its mirror the Triple Bottom)
Double Tops (and its mirror the Double Bottom)
Rounding Bottoms

2. **Continuation Patterns**: Continuation patterns, on the other hand, will only interrupt the trend for a while and the trend is expected to resume once the interruption is over.

   The following are the most commonly formed continuation patterns:

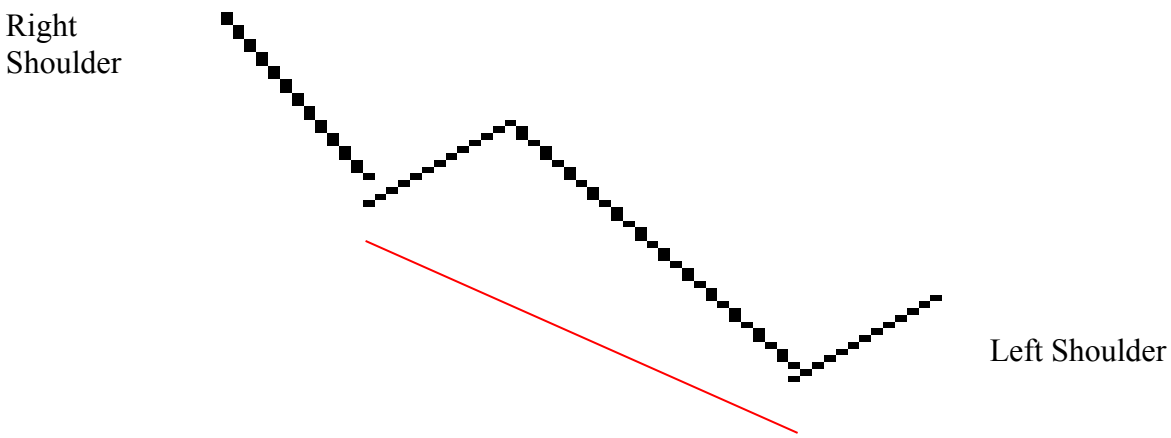
   Triangles

   Flags and Pennants

   Wedges

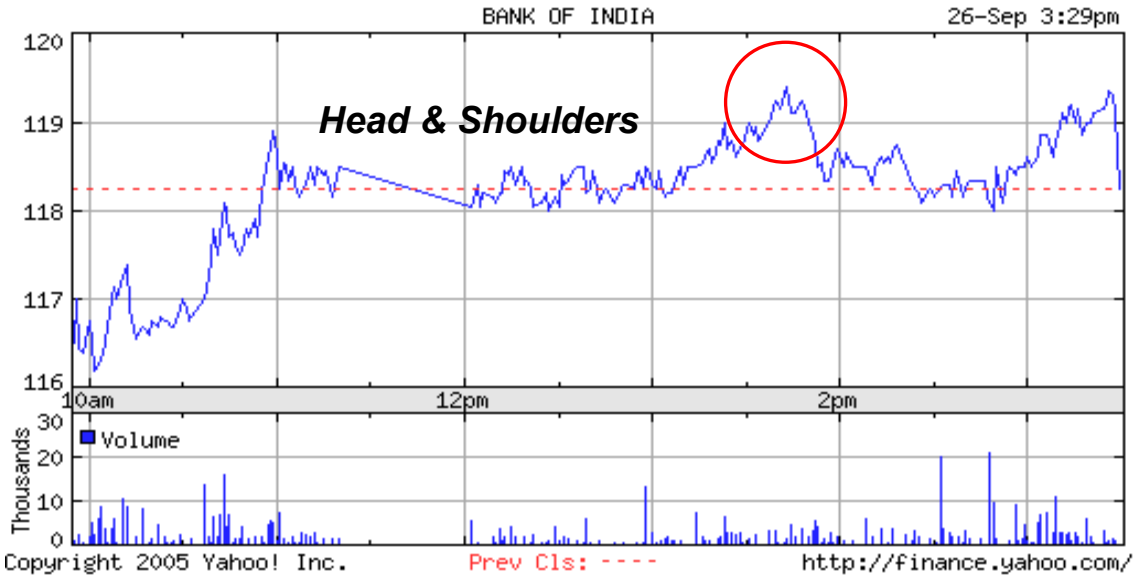
   Gaps

   a. **Head & Shoulders:** This is so named because it appears in the shape of a "head", which is bordered on two sides by two "shoulders". Pictorially, it would look like this:

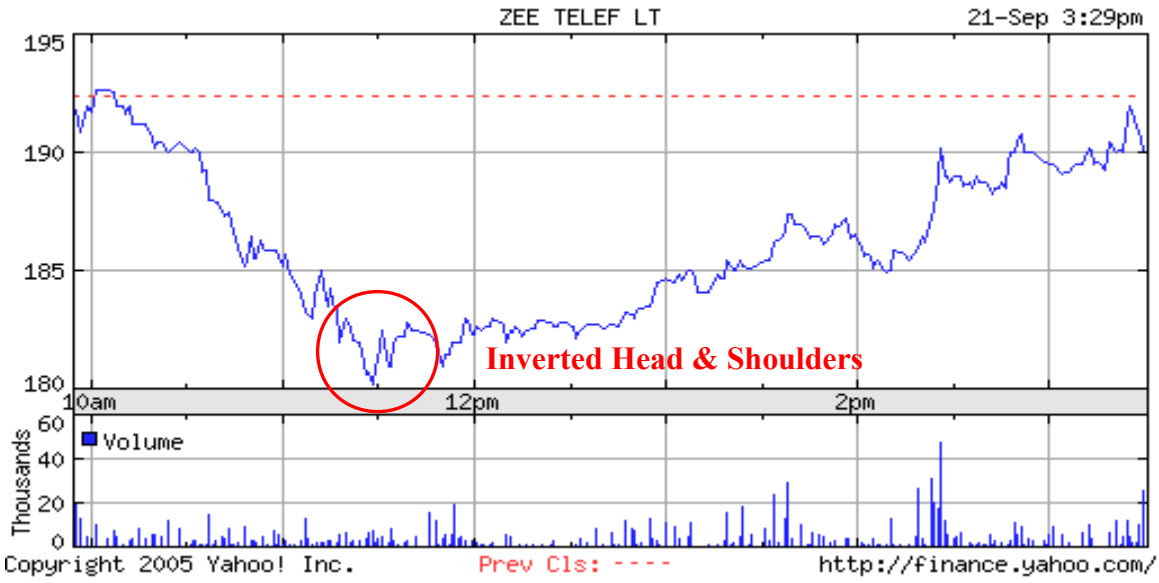


Head

Since the "head" is joined to the "shoulders" at the Neck (in our body), the line joining the two shoulders and the head is referred to as the Neckline. The pattern is said to be completed (or resolved, as the jargon goes) only when prices penetrate the neckline (or achieve a breakout below the neckline).

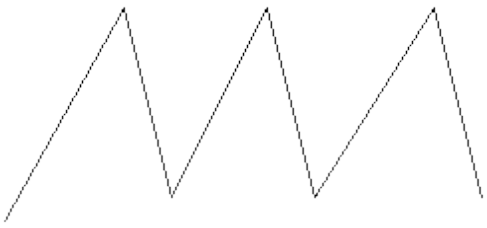


This is normally observed when up trend is changing over to downtrend.

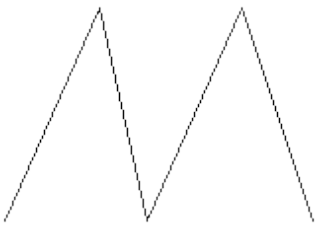


The inverted Head and Shoulder is nothing but a mirror image of the picture given above. It is observed when downtrend changes to an up trend.

b. Triple Tops and Double Tops and the respective bottoms: These are different varieties of the head and shoulder pattern. In the pattern above, the two shoulders are minor tops, which are below the final top (which is the head). If the two shoulders were to rise to the level of the head, then we would have a pattern, which has three highs around the same level - the Triple top. If there were to be only two drives to the top and the levels are the same, then the pattern would be a Double top. Pictorially, it would seem thus:



Double Top



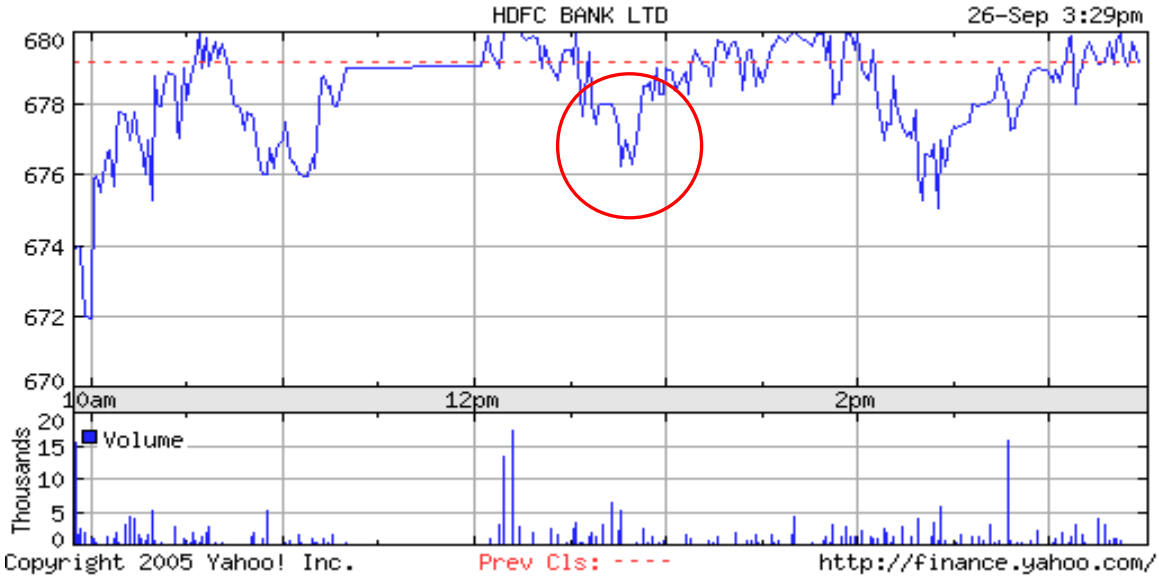
Triple Top

The Triple and Double bottoms are exact mirror images of the two patterns shown above. The price area between two tops is known as the Valley. The pattern is said to have completed when the prices break below the valley.

The following can be noticed: The Head and shoulder pattern is a higher-top and higher bottom formation succeeded by a lower top and lower bottom (once the neckline breaks) The double (or triple) top is similarly a same top followed by a lower bottom (once the valley level breaks). Hence the rules relating to the support-resistance concept as well as the Dow theory discussed earlier, remains consistent. The following charts examples of a head and shoulder double and triple tops as well as bottoms.

Double Top

Double Bottom



Triple Tops

Triple Bottom

The Rounding Pattern

This pattern resembles a large U shaped structure and hence the name "rounding" pattern. It is characterized by a long drawn out, slow development where the prices become less and less volatile, dropping down to an almost quiet level. Slowly, they flatten out and start a slow climb upward. This gradual process takes on a rounded shape and gives the pattern the name. The slow nature of the pattern means that this pattern develops over weeks and months and is usually a signal of slow and quiet accumulation. Since this is found at the bottom of bear markets, it is classified as a major reversal pattern. It is suggestive of action by insiders. Every accumulation phase is characterized by the appearance of this pattern. The Rounding top is an exact replica (but reverse) of the same pattern at the top. However, since our markets have not begun witnessing any major distribution as yet, there isn't a single good example of a stock with rounding pattern. The pattern is said to be resolved when the top of the U pattern is exceeded by the prices.

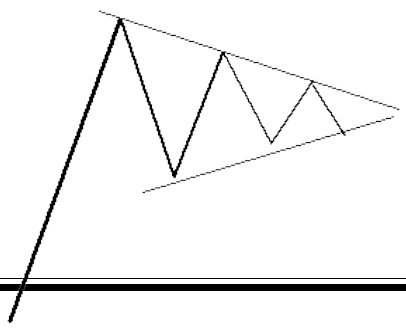
Continuation Patterns

These patterns normally occur whenever the market receives some new informational inputs, the source of which is not immediately known. For example, if there is an up trend in progress in a Indian company and there is some news about a merger internationally between this company and another MNC group which is also present in India, one does not readily know if such a merger would affect the Indian operations and that too in what way. There will of course be no immediate statements from the company circles about the issue and therefore the market, at such times, chooses to halt and consolidate. The word consolidate means strengthen one's position while holding the ground. Hence continuation patterns are often of the consolidation variety.

When markets undergo a period of consolidation, they naturally stop gaining new territory. Since further moves in the same direction are halted, the market (or the stock) begins to retrace the same ground that it had covered earlier. Since the fresh information is being digested and no clear views have yet formed, the prices tend to move back and forth rapidly within a narrow confine. Some times these moves remain quite clearly divided between two fixed levels – a high price where there are enough convinced that the news is bearish for the market or the stock – and a low price where the opposing view is held. The prices oscillate between these two areas several times and thus, a zone of consolidation is formed. This keeps the market in fixed zone.

Some Of the Continuation patterns are:

a. Triangles: There will be occasions when the consolidation patterns can be boundaried by converging trendlines. These would then look like a cone and hence the geometric shape is the name given to the pattern – a Triangle. There is a degree of uncertainty associated with the triangle pattern. When the prices can be confined between converging trendlines, one finds that the tops are getting lower while the bottoms are getting higher. Pictorially it can be seen to be like this:



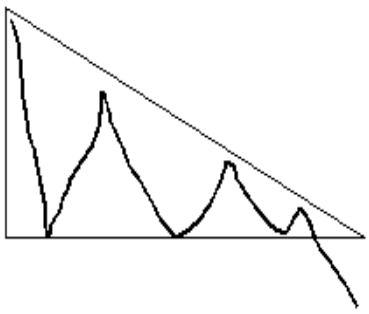
The pattern shown above has rising bottoms and falling tops. According to Dow theory; higher bottoms are a

sign of strength while lower tops are a sign of weakness. So, here we have a situation, where the market is showing both. This situation arises when the confusion is extreme and people are moving back and forth between pessimism and optimism.

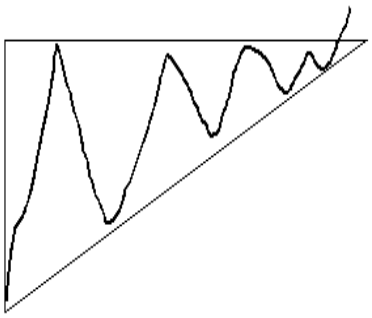
After hesitating for a while after a decline, the prices continued with their decline as sharply as ever.

The ideal triangle is called a symmetrical triangle.

When the triangle is formed such that there is either a fixed band of accumulation or a fixed band of distribution so that one of the lines of the triangle pattern is horizontal, it forms what is known as a right angle triangle. It also goes under the names of ascending or rising or descending or falling triangles. Pictorially, they would look like this:



Descending Triangle

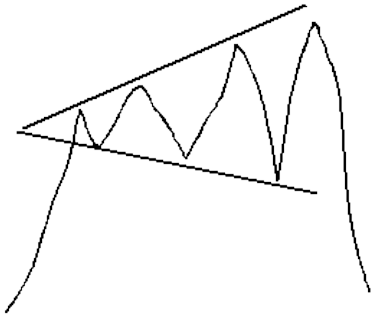


Ascending Triangle

These form when there is one or two large buyers (in descending triangle) or sellers (in ascending triangle) at a fixed price for some reasons particular to them. However, the market as a whole reacts differently and therefore the participants come in at lower and lower highs (descending triangle) or higher and higher bottoms (ascending variety). Once the main buyer or seller is exhausted of his quantity, the stock breaks out in the main direction and proceeds ahead.

Descending Triangle Ascending Triangle

Another one of triangle pattern is the Expanding Triangle. Two divergent lines from a common focus point characterize the expanding triangle. It is the reverse of the normal triangle and it also goes by the name of reverse triangle sometimes. Pictorially it would look like this:



It is a pattern with higher tops and lower bottoms. This signifies confusion in the market. It is only seen at market tops as the pattern keeps enlarging as it progresses (market bottoms are quiet affairs and prices contract). This is normally seen during rumors about company or clear news is not reaching the market participants. After 3-4 forays to the top boundary of the pattern, the stock prices reverse with a massive sell off.

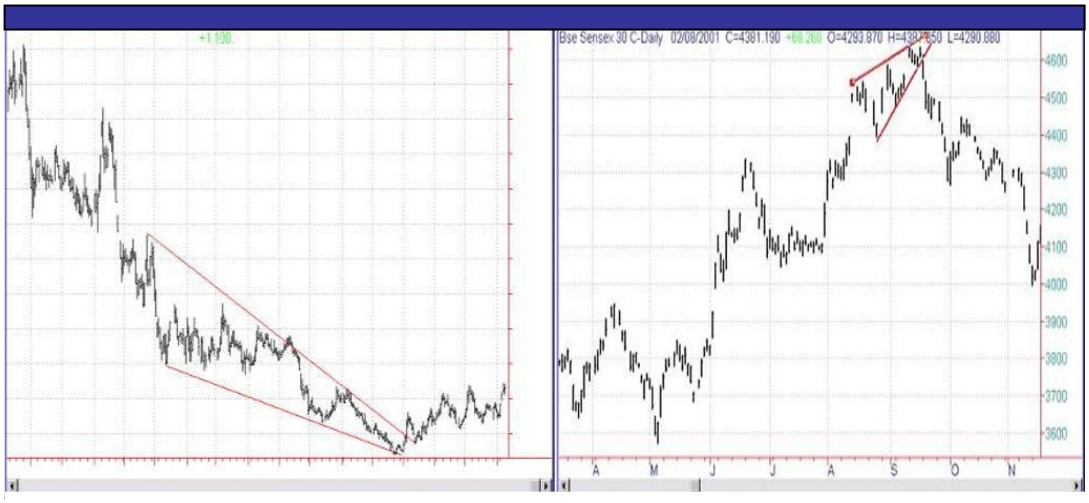
b. Wedges

Wedges are slightly rarer patterns that come at the end of long moves. They are triangular patterns which symmetrical triangles which are completely sloped upward or downward. They are also thinner patterns and the rising or falling line would be characterized by a sharp angle. Pictorially, they would look like this:

Rising wedge

Falling wedge

Finding good examples of this pattern is difficult.



Rising wedge

Falling wedge

Volume patterns in Triangles

Since these are consolidations where there is no clear-cut view about the market, the volumes during such patterns shrink as the pattern progresses. This is true of all the patterns shown above except the expanding variety. Here the volumes will be higher in every leg – whether rising or falling, creating more confusion.

Breakout from the pattern is also normally on high volumes as in the case of the Reversal patterns.

The pattern is deemed to have been resolved when the prices move past one of the trendline confines of the pattern. Usually, there are two touch points on either trendlines confining the pattern i.e. two excursions to the resistance trendline and similarly two down to the support trendline.

C. Gaps

Price gaps occur when there is some extra emotion generated about a stock overnight or intra day, which rush to buy or sell at certain price levels, which are beyond the price levels last seen. Traders are in such a hurry to execute that they willingly let go of several points from the last close. This creates a pocket of price area where no trading occurs.

For example, if a stock closes at 360 today and there is some fresh development overnight, which makes everyone bullish, and then there will be a rush of buy orders tomorrow. But there may be no sellers at 360 and the bunched up buy orders will prevent any trade below this level. A seller may emerge only around say, 365 and the first trade will take place there. This will leave an untraded price area between 360 and 365 that will appear as a gap on the price charts.

As explained above gaps occur when some sudden new development occurs which is deemed to affect the trend either positively or negatively. The appearance of a gap on the charts is therefore a sign of warning of a possible change in the trend status. It will either accelerate or reverse.

Gaps are classified as follows:

Normal gap: These are gaps caused by non-emotional factors such as dividends and other benefits that companies dole out. They have no significance.

Breakaway gap: This is gapped move past a zone of congestion or a price pattern, which leads to the end of that phase of the trend. The gap will start a new trend in the direction of the trend.

Run-away gap: This leads to strengthening of the trend that is launched by the earlier gap and therefore this would be the second gap in the sequence. Sometimes there are more than one run away gaps when the trend strength is very high.

Exhaustion gap: This is the last gap in the sequence and ends the rapid acceleration in the trend. Many times it is difficult to find the exhaustion gap on the charts as the prices form the gap and reverse the same day. So the only way to spot is to check the previous high and the current open and this is where the gap will be. The reversal will carry the prices below the opening gap up and therefore the price bar may look like a normal one. It requires some training to be able to catch the exhaustion gap.

In the chart above a few break away or common gaps are shown. Note the marking EG signifying an exhaustion gap. Note that the prices open above the previous day high and then moved slightly higher before selling emerged to close the gap the same day. There

are no run away gaps in this chart example. If there were more than one gap in succession, the second one would be called the run away gap.

Gaps are generally seen around price patterns and most of these show a resolution with an upside or downside gap.

Gaps act as future support (during reactions in an up trend) and resistance (during rallies in downtrends). If the gap area is wide, then the mid point of the gap too acts as a support or resistance.

A gap that is immediately closed i.e. prices trade back into the gap area loses its trend signaling significance.

d. Flags and Pennants

These are small rectangles (flags) or triangles (pennants) that form on daily charts (mostly) and weekly charts (occasionally). They are part of a fast moving market and therefore signify – as the larger patterns convey – a temporary halt in the trend that will be resumed. The flag or pennant is seen only in the fast paced area of the trend. Therefore, the formation of a short term rectangle or triangle, has to be preceded by a rapid, almost vertical rise which is called the "flag" of the pole and following this rapid rise, the prices consolidate for a few days in a narrow range. If the consolidation occurs in the form of a rectangle, then it is known as a flag, if in the form of a triangle, then it is known as a pennant.

Pennant Flag

Volume patterns within flags and pennant remains the same as in triangles. They should be high during the formation of the pole of the flag and then dry off while the flag is being formed. Usually, the number of days taken to form the flag or pennant consolidation should not take more than twice the time taken to form the pole. If it extends beyond that, the pattern is more likely to fail.

Point Of Resolution

The signal of ending of pattern in combination patterns is the same i.e. a breakout on either side from converging lines confining the pattern. This breakout is backed by high volume, with volume continuing in the next move of price. Breakouts without support of volume are most likely to be the cases of failed patterns.

4.7 TYPES OF CHARTS

There are four main types of charts that are used by investors and traders depending on the information that they are seeking and their individual skill levels. The chart types are: the line chart, the bar chart, the candlestick chart and the point and figure chart. In the following sections, we will focus on the S&P 500 Index during the period of January 2006 through May 2006. Notice how the data used to create the charts is the same, but the way the data is plotted and shown in the charts is different.

Line Chart

The most basic of the four charts is the line chart because it represents only the closing prices over a set period of time. The line is formed by connecting the closing prices over the time frame. Line charts do not provide visual information of the trading range for the individual points such as the high, low and opening prices. However, the closing price is often considered to be the most important price in stock data compared to the high and low for the day and this is why it is the only value used in line charts.

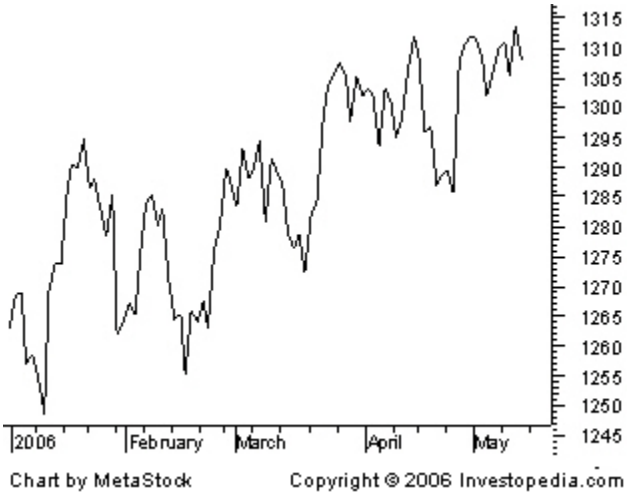


Fig 14: A line chart

Bar Charts

The bar chart expands on the line chart by adding several more key pieces of information to each data point. The chart is made up of a series of vertical lines that represent each data point. This vertical line represents the high and low for the trading period, along with the closing price. The close and open are represented on the vertical line by a horizontal dash. The opening price on a bar chart is illustrated by the dash that is located on the left side of the vertical bar. Conversely, the close is represented by the dash on the right. Generally, if the left dash (open) is lower than the right dash (close) then the bar will be shaded black, representing an up period for the stock, which means it has gained value. A bar that is colored red signals that the stock has gone down in value over that

period. When this is the case, the dash on the right (close) is lower than the dash on the left (open).

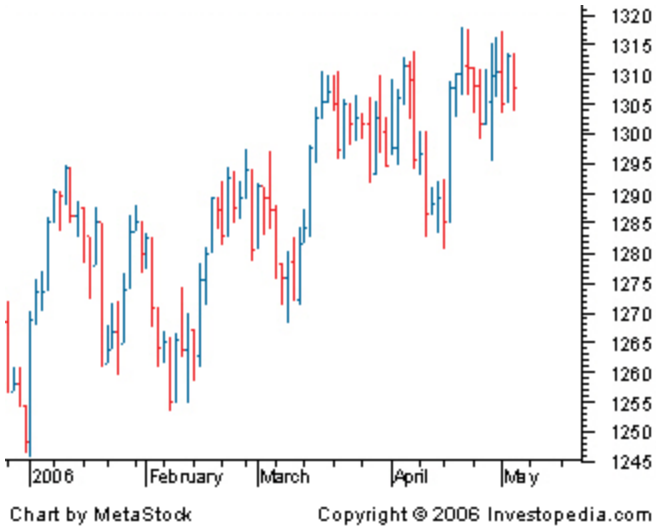


Fig 15: A bar chart

Candlestick Charts

The candlestick chart is similar to a bar chart, but it differs in the way that it is visually constructed. Similar to the bar chart, the candlestick also has a thin vertical line showing the period's trading range. The difference comes in the formation of a wide bar on the vertical line, which illustrates the difference between the open and close. And, like bar charts, candlesticks also rely heavily on the use of colors to explain what has happened during the trading period. A major problem with the candlestick color configuration, however, is that different sites use different standards; therefore, it is important to understand the candlestick configuration used at the chart site you are working with. There are two color constructs for days up and one for days that the price falls. When the price of the stock is up and closes above the opening trade, the candlestick will usually be white or clear. If the stock has traded down for the period, then the candlestick will usually be red or black, depending on the site. If the stock's price has closed above the previous day's close but below the day's open, the candlestick will be black or filled with the color that is used to indicate an up day.

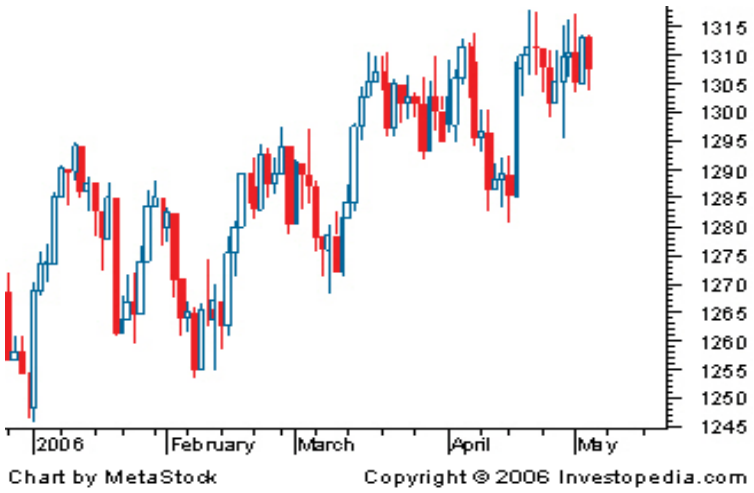


Fig 16: A candlestick chart

Point and Figure Charts

The point and figure chart is not well known or used by the average investor but it has had a long history of use dating back to the first technical traders. This type of chart reflects price movements and is not as concerned about time and volume in the formulation of the points. The point and figure chart removes the noise, or insignificant price movements, in the stock, which can distort traders' views of the price trends. These types of charts also try to neutralize the skewing effect that time has on chart analysis.

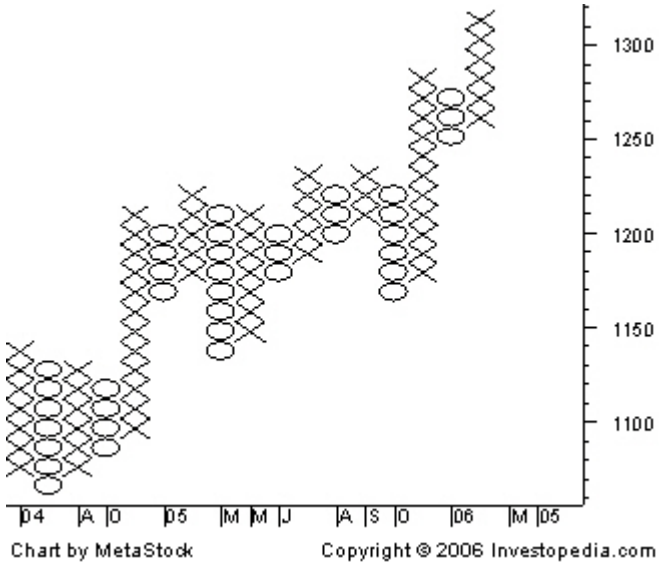


Fig 17: A point and figure chart

When first looking at a point and figure chart, you will notice a series of Xs and Os. The Xs represent upward price trends and the Os represent downward price trends. There are also numbers and letters in the chart; these represent months, and give investors an idea

of the date. Each box on the chart represents the price scale, which adjusts depending on the price of the stock: the higher the stock's price the more each box represents. On most charts where the price is between $20 and $100, a box represents $1, or 1 point for the stock. The other critical point of a point and figure chart is the reversal criteria. This is usually set at three but it can also be set according to the chartist's discretion. The reversal criteria set how much the price has to move away from the high or low in the price trend to create a new trend or, in other words, how much the price has to move in order for a column of Xs to become a column of Os, or vice versa. When the price trend has moved from one trend to another, it shifts to the right, signaling a trend change.

Types of Trends

Up trend- The graph shows Up trend in which if the closing points are connected they give rising trend line.

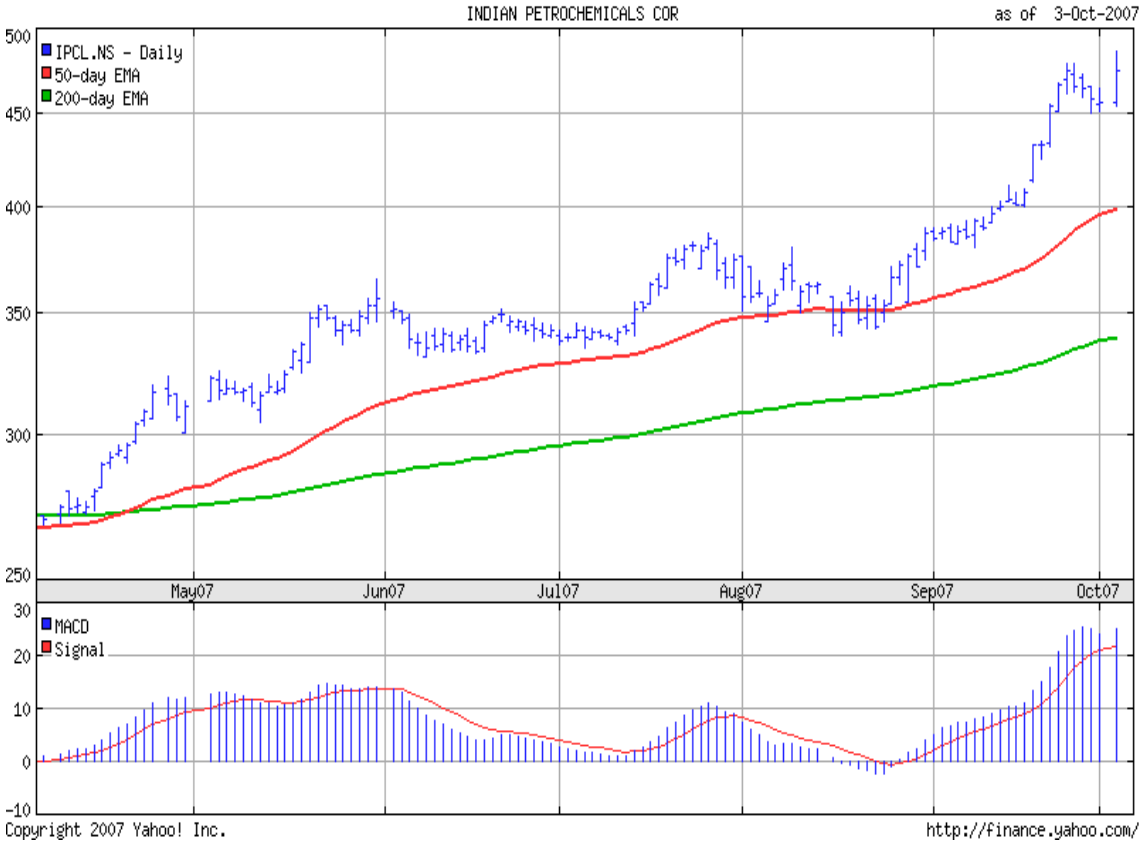


Fig 18: Uptrend

Down Trend- The down trend is when the line connecting all closing points shows falling trend line. As shown in following graph.

Fig 19: Down trend

Sideways Trend- when there is no up or down movement in the market it is said to be in the Sideways Trend. As shown in following graph.


PHILLIP MORRIS
Breakout
Resistance at 51.5
Trader's
Remorse
Support at 45.5
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
50000
93
May
June
July
August
Sep
October
November

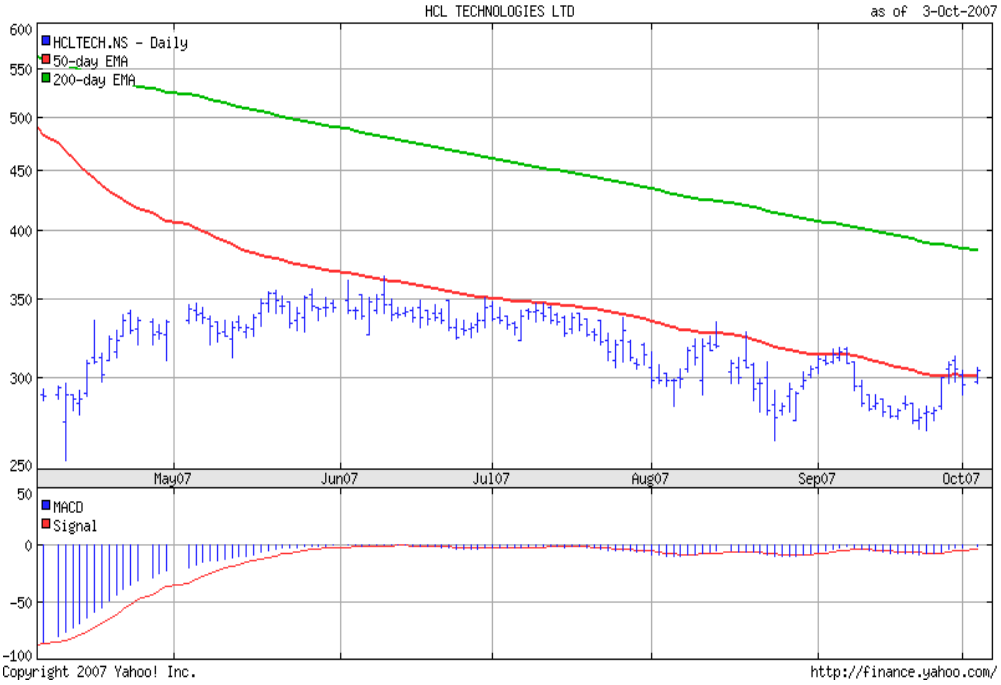

HCL TECHNOLOGIES LTD
as of 3-Oct-2007
HCLTECH.NS - Daily
50-day EMA
200-day EMA
600
550
500
450
400
350
300
250
May07
Jun07
Jul07
Aug07
Sep07
Oct07
MACD
Signal
50
0
-50
-100
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Fig 20 : Sideway trend

Trend Lines-

Support and Resistance Lines-

Think of prices for financial instruments as a result of a head-to-head battle between a bull (the buyer) and a bear (the seller). Bulls push prices higher, and bears lower them. The direction prices actually move shows who wins the battle.

Fig 21: Support and Resistance Line

Support is a level at which bulls (i.e., buyers) take control over the prices and prevent them from falling lower.

Resistance, on the other hand, is the point at which sellers (bears) take control of prices and prevent them from rising higher. The price at which a trade takes place is the price at which a bull and bear agree to do business. It represents the consensus of their expectations.

Support levels indicate the price where the most of investors believe that prices will move higher. Resistance levels indicate the price at which the most of investors feel prices will move lower.

But investor expectations change with the time, and they often do so abruptly. The development of support and resistance levels is probably the most noticeable and reoccurring event on price charts. The breaking through support/resistance levels can be triggered by fundamental changes that are above or below investor's expectations (e.g., changes in earnings, management, competition, etc.) or by self-fulfilling prophecy (investors buy as they see prices rise). The cause is not so significant as the effect: new expectations lead to new price levels. There are support/resistance levels, which are more emotional.

Supply And Demand

There is nothing mysterious about support and resistance: it is classic supply and demand. Remembering 'Econ 101' class, supply/demand lines show what the supply and demand will be at a given price.

The supply line shows the quantity (i.e., the number of shares) that sellers are willing to supply at a given price. When prices increase, the quantity of sellers also increases as more investors are willing to sell at these higher prices. The demand line shows the number of shares that buyers are willing to buy at a given price. When prices increase, the quantity of buyers decreases as fewer investors are willing to buy at higher prices.

At any given price, a supply/demand chart shows how many buyers and sellers there are. In a free market, these lines are continually changing. Investor's expectations change, and so do the prices buyers and sellers feel are acceptable. A breakout above a resistance level is evidence of an upward shift in the demand line as more buyers become willing to buy at higher prices. Similarly, the failure of a support level shows that the supply line has shifted downward.

The foundation of most technical analysis tools is rooted in the concept of supply and demand. Charts of prices for financial instruments give us a superb view of these forces in action.

Traders' Remorse

After a support/resistance level has been broken through, it is common for traders to ask themselves about to what extent new prices represent the facts. For example, after a breakout above a resistance level, buyers and sellers may both question the validity of the new price and may decide to sell. This creates a phenomenon that is referred to as "traders' remorse": prices return to a support/resistance level following a price breakout.

The price action following this remorseful period is crucial. One of two things can happen: either the consensus of expectations will be that the new price is not warranted, in which case prices will move back to their previous level; or investors will accept the new price, in which case prices will continue to move in the direction of the breaking through.

In case number one, following traders' remorse, the consensus of expectations is that a new higher price is not warranted, a classic "bull trap" (or false breakout) is created. For example, the prices broke through a certain resistance level (luring in a herd of bulls who expected prices to move higher), and then prices dropped back to below the resistance level leaving the bulls holding overpriced stock. Similar sentiment creates a bear trap. Prices drop below a support level long enough to get the bears to sell (or sell short) and then bounce back above the support level leaving the bears out of the market.

The other thing that can happen following traders' remorse is that investors expectations may change causing the new price to be accepted. In this case, prices will continue to move in the direction of the penetration.

A good way to quantify expectations following a breakout is with the volume associated with the price breakout. If prices break through the support/resistance level with a large increase in volume and the traders' remorse period is on relatively low volume, it implies that the new expectations will rule (a minority of investors are remorseful). Conversely, if the breakout is on moderate volume and the "remorseful" period is on increased volume, it implies that very few investor expectations have changed and a return to the original expectations (i.e., original prices) is warranted.

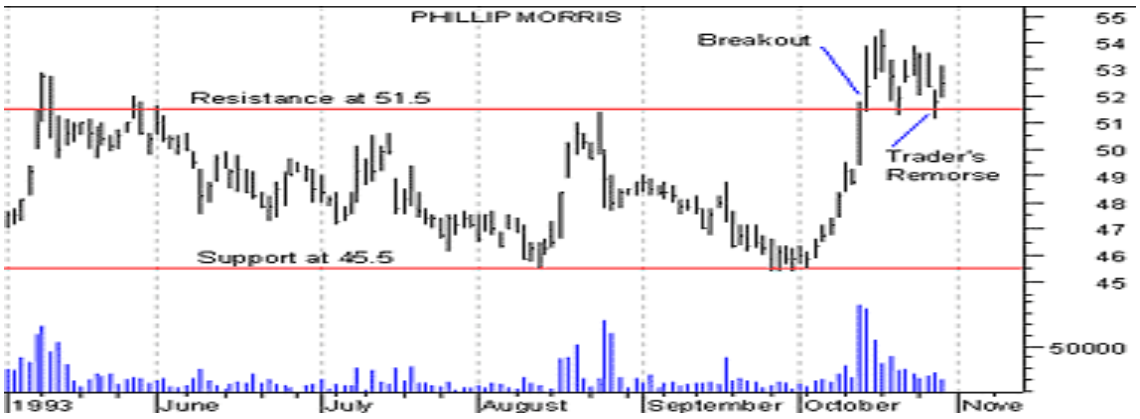


Fig 22: Trader's Remorse

Resistance becomes support

When a resistance level is successfully broken through, that level becomes a support level. Similarly, when a support level is successfully broken through, that level becomes a resistance level.

The reason for it is that a new "generation" of bulls appears, who refused to buy when prices were low. Now they are anxious to buy at any time the prices return to the previous level. Similarly, when prices drop below a support level, that level often becomes a resistance level that prices have a difficult time breaking through. When prices approach the previous support level, investors seek to limit their losses by selling.

Fig 23: Resistance Becomes Support

VOLUMES-

Volume is simply the number of shares or contracts that trade over a given period of time, usually a day. The higher the volume, the more active the security. To determine the movement of the volume (up or down), chartists look at the volume bars that can usually be found at the bottom of any chart. Volume bars illustrate how many shares have traded per period and show trends in the same way that prices do.

Fig 24: Volumes

Why Volume is Important

Volume is an important aspect of technical analysis because it is used to confirm trends and chart patterns. Any price movement up or down with relatively high volume is seen as a stronger, more relevant move than a similar move with weak volume. Therefore, if you are looking at a large price movement, you should also examine the volume to see whether it tells the same story.

Say, for example, that a stock jumps 5% in one trading day after being in a long downtrend. Is this a sign of a trend reversal? This is where volume helps traders. If volume is high during the day relative to the average daily volume, it is a sign that the reversal is probably for real. On the other hand, if the volume is below average, there may not be enough conviction to support a true trend reversal.

Volume should move with the trend. If prices are moving in an upward trend, volume should increase (and vice versa). If the previous relationship between volume and price movements starts to deteriorate, it is usually a sign of weakness in the trend. For

example, if the stock is in an uptrend but the up trading days are marked with lower volume, it is a sign that the trend is starting to lose its legs and may soon end. When volume tells a different story, it is a case of divergence, which refers to a contradiction between two different indicators. The simplest example of divergence is a clear upward trend on declining volume.

Volume and Chart Patterns

The other use of volume is to confirm chart patterns. Patterns such as head and shoulders, triangles, flags and other price patterns can be confirmed with volume, a process which we'll describe in more detail later in this tutorial. In most chart patterns, there are several pivotal points that are vital to what the chart is able to convey to chartists. Basically, if the volume is not there to confirm the pivotal moments of a chart pattern, the quality of the signal formed by the pattern is weakened.

Volume Precedes Price

Another important idea in technical analysis is that price is preceded by volume. Volume is closely monitored by technicians and chartists to form ideas on upcoming trend reversals. If volume is starting to decrease in an uptrend, it is usually a sign that the upward run is about to end.

4.8 Moving Averages

After understanding trends and trendlines another important tool in Technical analysis is Moving Average. This is similar in principle and application to trendlines but has a curvilinear nature and bends and twists with the prices rather than following a straight unbending path and hence also called as ‘Curved Trendline’.

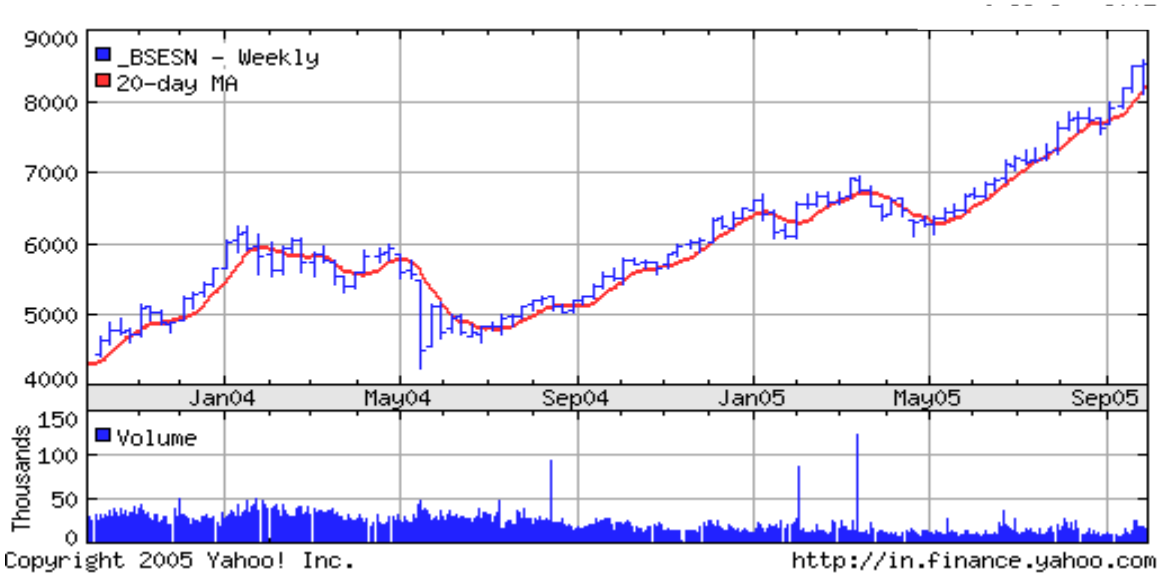
The constant fluctuation of Prices makes it difficult to understand all the patterns on charts while trading and in this situation moving average becomes very useful. A moving average (MA) is a calculated effort to eliminate or minimize the fluctuations of the numerical value of the phenomenon being observed so that an underlying trend may be recognized when a sequential series of that phenomenon is reviewed.

Moving averages of stock prices are usually calculated using the closing price. The moving Average eliminates the fluctuation of price in all time periods below the number that is chosen for the average i.e. a 5 day or 5 week moving average eliminates the presence of price fluctuations for periods up to 5 days or 5 weeks respectively, a 200 day moving average eliminates the presence of daily price fluctuations for periods below 200 days. This smoothing effect of price change increases as you use longer and longer periods as the average.

There are four commonly used moving averages: - simple, smoothed, weighted and exponential. Simple moving averages give equal weighting to each day's price of the number of days chosen for the study. The other three types of averages have been developed to incorporate recent price changes of stocks and give them more importance than historical prices. These three averages are statistically derived by use of complex formulas, but overall the simple moving average is the most widely used tool and reliable of the other three.

Simple Moving Average

This is the most widely used and is simply calculated by adding up a set of values and dividing the total by the number in the set. This is the average. The closing price of each day for the requisite period (i.e. 5 day, 20 day etc) is taken and average is calculated, for the next day; the closing price of first day is subtracted while the particular day’s closing price is added and average is calculated. This arithmetic is repeated with each new day. Since each new day prices are considered for calculation it is known as Moving Average.



The chart denotes a 20 days moving average. In a Moving Average chart stock price strength is associated with a rising moving average and that weakness is denoted by a declining moving average. Peaks and troughs occur in the moving average after the peaks and troughs of actual stock prices. This lag occurs because the average is calculated and plotted at the end of the time period chosen when in actuality the average occurred at the half way point (i.e. on the 10th day of a 20 day M.A.). Therefore, in graphically representing moving averages they are not plotted after the time of study but at its midpoint, i.e. the moving average should be centered. However, custom and tradition still plot the average to the latest addition of data. Any number of time periods can be calculated, i.e. any numerical number, e.g. 5, 10, 20, etc. for any constant time span, e.g. days, weeks, months, years. However, the shorter the time period calculated the more volatile the average and the shorter the lag period but the more frequent will be costly whipsaws (A whipsaw occurs when a buy or sell signal is reversed in a short time. Volatile markets and sensitive indicators can cause whipsaws.) . Longer time periods will be less volatile with fewer whipsaws but the lag period will be greatly increased substantially eroding profits.

Choosing An Appropriate Time Span For Your Moving Average

Any time span can be considered from minutes to years. An appropriate choice relevant to one's requirements is mandatory.

Different markets, different market cycles and different investor goals will determine the most appropriate time period for which to calculate the moving average. Experience has shown most helpful studies include:

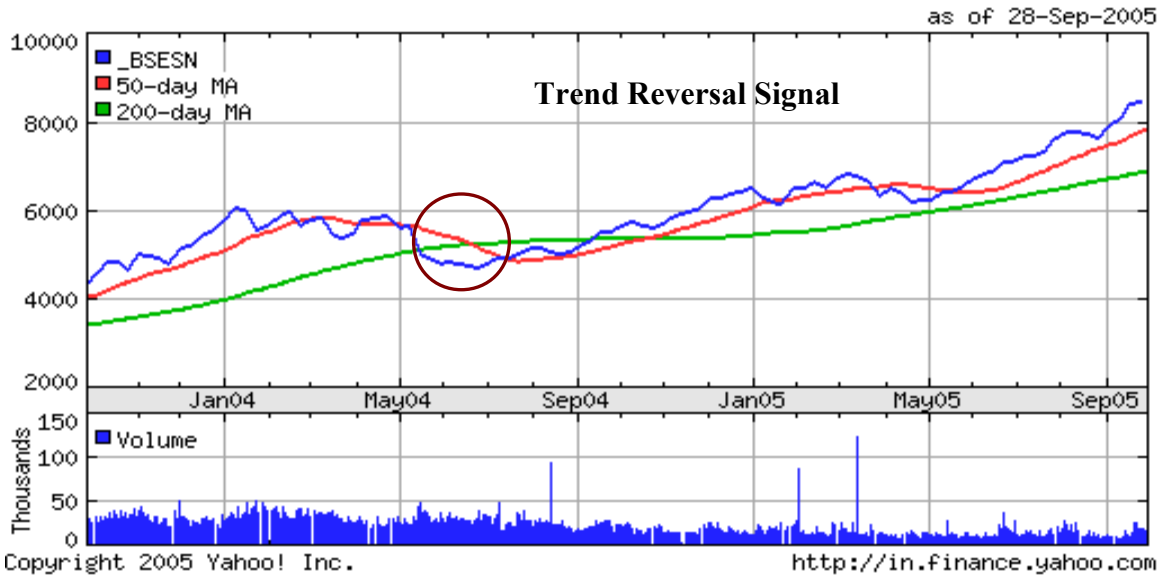
- Major primary trend monitored by a 40 week (200 day) moving average.
- Intermediate term trend by a 40 day moving average.
- Short-term trend by a 20 day moving average.

Multiple Moving Averages.

By using two or even three moving averages the fluctuations of the data under study are smoothed twice or thrice thereby minimizing misleading whipsaws yet indicating trend reversal shortly after having taken place.

The trend reversal signal is given when the short term moving average crosses over the longer term moving average, both averages having already at least flattened out or better yet reversed direction.

For e.g., refer the chart on next page,



Interpretation Of Moving Averages

1. The moving average is a smoothed trend and as such often acts as an area of support or resistance. Retracements of stock prices often reverse when they reach the moving average level, i.e. in a rising trend a falling stock price often finds support and in a falling market rising stock prices often find resistance when they reach the level of the moving average.
2. The penetration or cross over of a moving average (and therefore of a smoothed line of support or resistance) by the stock price is frequently the signal of a major trend reversal.
3. If the moving average has flattened out or has already reversed direction then its violation increases the likelihood of a reversal of the recent trend.
4. The longer the time span used to calculate the moving average the greater the significance of its violation by price, i.e. A forty week moving average violation by price is of more significance than that of a four week moving average which is of more significance than that of a four day moving average. In the chart below note that the long-term average is quite a distance away from the price action while the short-term average hugs the prices rather closely.

4.9 Market and Momentum

Market momentum is defined as the velocity of stocks and market price movement i.e. the rate at which the prices are changing. A better way of understanding Market momentum would be to take up an analogy of car, As the accelerator is pushed, the car picks up speed. As long as the pedal remains pressed, the speedometer is going to register higher and higher readings. The car is going to advance faster and faster through this acceleration. Once the feet are lifted off the pedal, the speedometer begins to drop. In other words, the momentum begins to decrease. But the car continues to move forward. Only, it does so at lesser and lesser speed. If the pedal is not reapplied at all, the car will come to a halt after some distance. The extent to which the car will travel ahead on falling momentum would largely depend upon the extent of built up momentum.

All of the technical analysis tools discussed up to this point were calculated using a security's price (e.g., high, low, close, volume, etc). There is another group of technical

analysis tools designed to help gauge the changes in all securities within a specific market. These indicators are usually referred to as "momentum indicators," because what prices are actually doing, but do so by looking deeper than price.

So indicators can basically be defined as a series of data points that are derived by applying a formula to the price data (or volume) of a security. Price data includes any combination of the open, high, low or close over a period of time. The price data is entered into the formula and a data point is produced. Indicators are divided into two groups: trend following or lagging and momentum or leading. Lagging indicators tell you what prices are doing now, or in the recent past, so they are useful when stocks are trending. A moving average is an example of a lagging indicator. Leading indicators are designed to anticipate future price action and many come in the form of oscillators.

Oscillators

As markets and securities, and fluctuates, prices tend to over compensate, either by moving too high or too low. Oscillators are derived from these price movements. They are particularly handy in determining trading ranges or trend reversals. Thus Oscillator is an indicator that determines when a market is in an overbought or oversold condition. When the oscillator reaches an upper extreme, the market is overbought. When the oscillator line reaches a lower extreme, the market is oversold.

Oscillators have been around since the early sixties but gathered popularity with the advent of the calculator and then the computer. The seventies saw a quantum jump in the usage and the work done in this field and most of the advancement in recent times has been in the area of oscillators. Their popularity has grown very much and since they are mathematically derived, many research houses have come up with an oscillator of their own, so their numbers have increased over the period. Few of the oscillators and indicators that are popular would be discussed in following pages.

One of the concepts to understand before moving on to looking at various indicators is the concept of convergence and divergence, when the price and the momentum are moving in same direction they are said to be in gear or converging, this does not indicate

anything but just that trend is healthy. When the price and momentum are in conflict then at such times it is known as divergence, when this occurs the chances of trend reversing are high.

The indicators and oscillators to be discussed in brief are:

- Rate of Change (ROC)
- MACD-Moving Average Convergence – Divergence.
- Relative Strength Index (RSI)
- Stochastic

1. **Rate of Change (ROC)**: ROC is a momentum indicator that measures velocity and also leads the price action. Rate of Change, ROC, can be very useful, because it is a leading indicator (ROC changes direction before the underlying price). ROC is sometimes also referred to as Price Rate of Change (PROC).

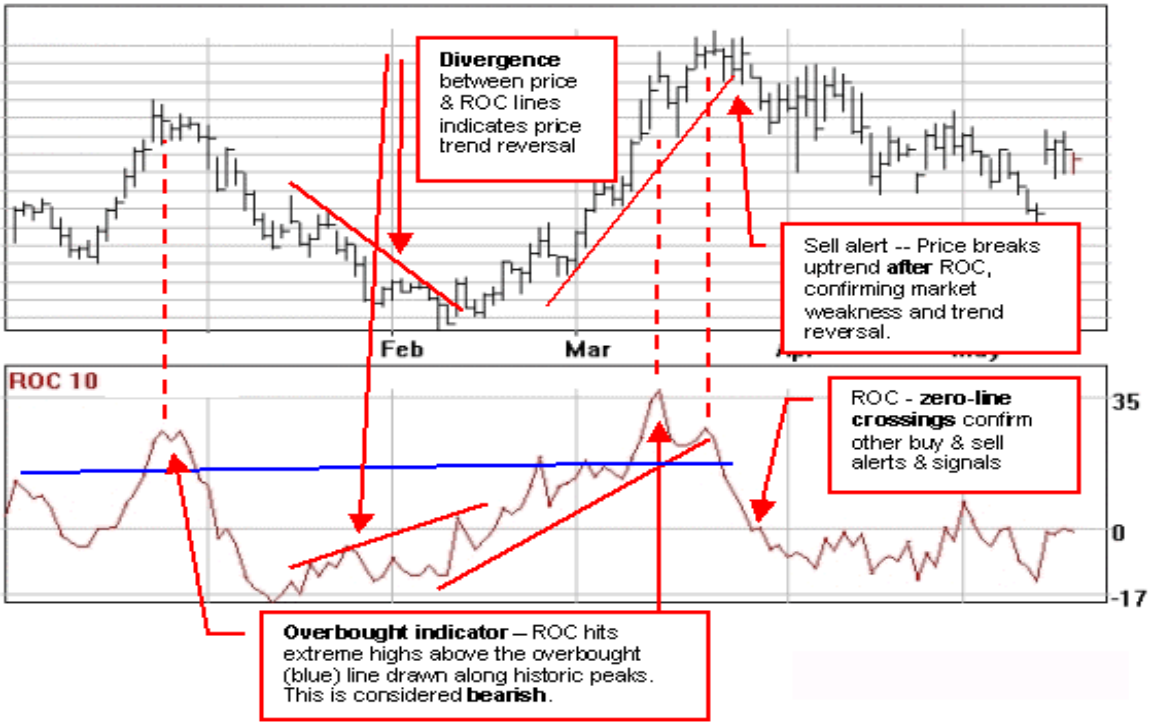
- ROC is a price momentum or velocity indicator.
- A rising ROC indicates a bullish increasing momentum
- A falling ROC indicates a bearish decreasing momentum
- ROC should always be used in conjunction with reversal signals on the price chart.

Interpretation

The ROC displays the amount prices have changed over the given time period as an oscillator. When the wave is above the equilibrium line, the market price is higher than it was at the start of the ROC time period. The higher the wave, the greater the change. When the wave sinks below the equilibrium line into a trough, the lower it goes, the lower the market is in comparison to the previous price. As the wave starts coming up from the bottom of a trough, in a rising ROC, this indicates expanding momentum (considered bullish). Conversely, a falling ROC is considered bearish.

Comparing the ROC's of different time spans improves the accuracy of the analysis. A 12-month period is usually the most reliable for long-term trends and 3 or 6-month period works well for intermediate trends. As mentioned previously, a 10 or 12-day ROC is a good short-term indicator, oscillating in a fairly regular cycle.

The lower the ROC, the more undersold the market and the more likely a recovery. Although the opposite may hold true in that the higher the ROC, the more overbought the market; both extremes can indicate the formation of a sideways channel.



Signals

Overbought/ Oversold Levels

Overbought and oversold lines can be drawn on the ROC chart, generally along previous highs and lows. There are no hard and fast rules about where these lines should be drawn. Like trend lines they should be drawn in response to the previous actions of the price and

ROC indicator itself. Overbought levels can only be relied on to indicate a coming market reversal when a bull market has matured, or during bearish phases.

Filtering of many premature buy and sell signals can be done by waiting for:

- The ROC to come back through the overbought or oversold line the second time, and
- a confirmation of a trend reversal from the price itself.

Divergences

Divergences can provide warnings or alerts of weaknesses in market trends, but do not represent actual buy or sell signals. It is essential to wait for a confirmation from the price itself that the overall trend has reversed.

Zero-line crossings

Although the long-term price trend is still the overriding consideration, a crossing upward through the zero line can confirm a buy signal and a crossing downward through the zero line, a sell signal.

Trendline Violations

The trendlines on the ROC chart are broken sooner than those on the price chart. The value of the momentum indicators is that it turns sooner than the market itself, making it a leading indicator.

2. **MACD-Moving Average Convergence – Divergence**: MACD is a useful indicator for spotting major changes in trend. MACD is a trend following momentum indicator used to signal trend changes and to indicate trend direction wherein Crossovers and divergence from price generate signals.

The MACD method, developed by Gerald Appel, is a trending indicator, telling us whether a stock is in an up trend or a downtrend. The direction of the long-term trend is the first assessment made of any market. If it is trending up, one should long (buying). If it is trending down, one should be short (selling).

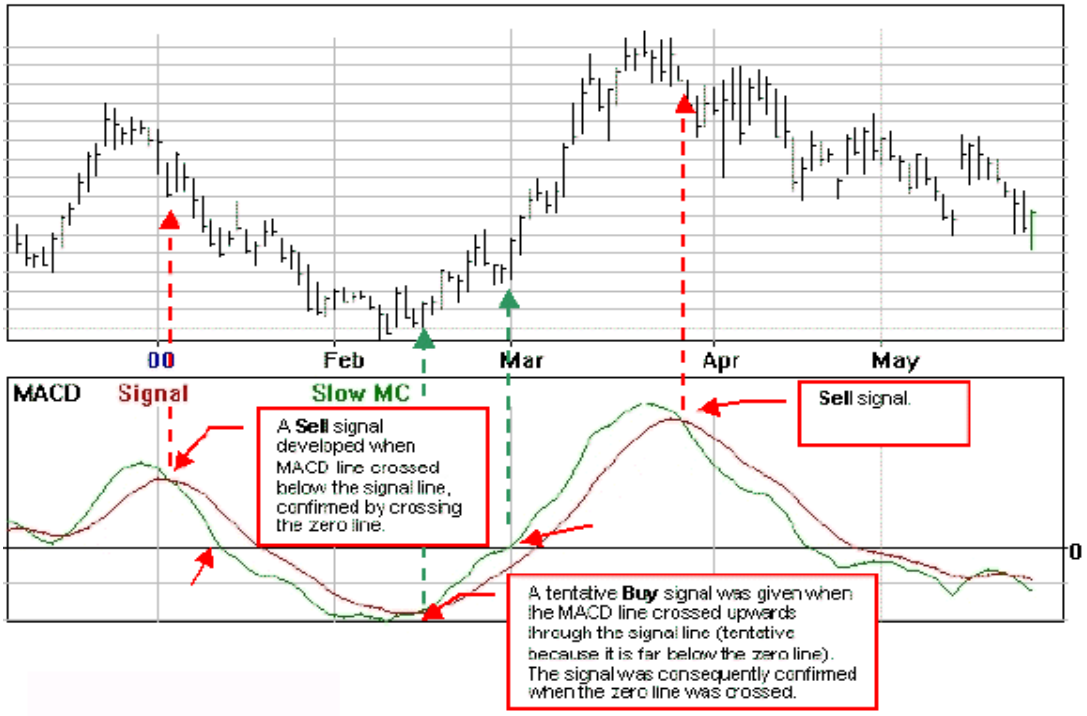
The simplest version of this indicator is composed of two lines: the MACD line, which is the difference between two exponential moving averages (EMAs) and a signal line, which is an EMA of the MACD line itself. The signal or trigger line is plotted on top of the MACD to show buy/sell opportunities. Gerald Appel's MACD method uses a 26-day and 12-day EMA, based on the daily close, and a 9-day EMA for the signal line.

Interpretation

The MACD proves most effective in trending markets rather than choppy, sideways markets. There are two main sets of signals generated by the MACD: crossovers and divergences.

There are two main MACD crossover signals:

1. Signal Line Crossovers: MACD crosses above or below the signal line
2. Zero Line Crossovers: MACD crosses above or below the zero line.



Signal Line Crossovers

The basic MACD trading rule is to buy when the MACD rises above its signal line. Similarly, a sell signal occurs when the MACD crosses below its signal line. The crossing of the MACD line above the signal line can denote the beginning of a trend. An up trend typically pauses or stops when the MACD line crosses and falls below the signal line.

The location relative to the zero line is also important in indicating how strong a trend might be. A crossover above the zero line is considered more bullish than one below the zero line. The higher above the zero line it crosses, the stronger the up trend. If the crossover occurs below the zero line, the up trend is likely not very strong.

When the bullish crossover occurs above the zero line, the up trend gains more momentum, and the price rises with more intensity.

Bullish MACD crossovers are probably the most common signals and as such can be less reliable. If not used in conjunction with other technical analysis tools, these crossovers can lead to whipsaws and many false signals.

One way to try and counteract false signals is to apply a price filter to the crossover to see if a trend will hold. An example of a price filter would be to buy if the MACD breaks above the signal line and remains above for three days. The buy signal would then commence at the end of the third day.

Zero Line Crossovers

The zero line can also be used to produce a signal. It is popular to buy/sell when the MACD crosses above/below the zero line.

A bullish zero line crossovers occur 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 MACD crossover, the zero line crossovers can act as a confirmation signal.

Divergence

MACD can provide forewarning of important market turns through divergence. When the MACD trend diverges from the price trend, it can provide a signal that a trending market may slow or reverse. A negative, or bearish, divergence occurs when the MACD is making new lows while prices fail to reach new lows. A positive, or bullish, divergence occurs when the MACD is making new highs while prices fail to reach new highs. Both of these divergences are most significant when they occur at relatively high/low levels. A positive divergence is shown when MACD begins to advance and the market is still in a downtrend and makes a new 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 not very common, but are usually reliable and can lead to good moves.

Combinations

Probably the best way to use the basic MACD is to use a combination of signals to confirm one another. In addition, a fast MACD line can be added to enhance the signals generated and to often provide early warning of changes in trends. An example of a three line MACD is shown below, with the signal line, the fast MACD line and the slow MACD line. The MACD Histogram is also commonly used to clarify the relationship between the two MACD lines.

Weaknesses of MACD

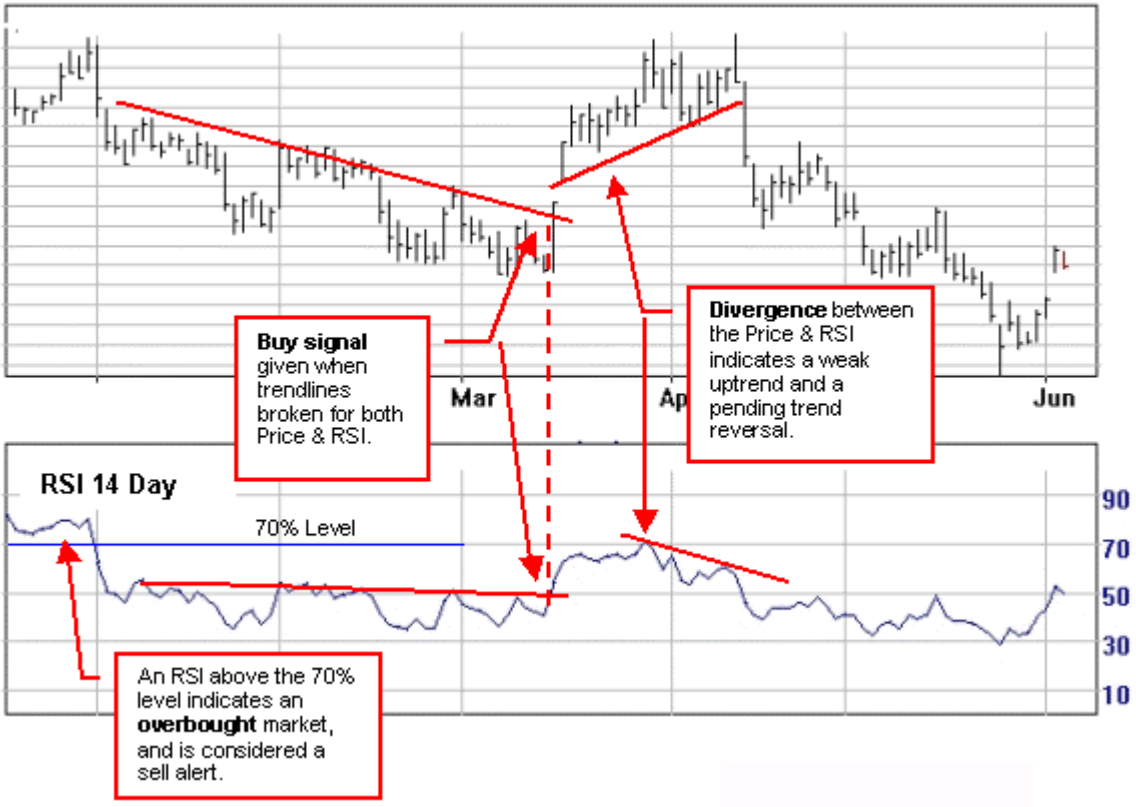
MACD is a trend following indicator, and as such, sacrifices early signals in exchange for keeping you in line with the trend. When a significant trend develops, MACD is often able to capture the majority of the move. When the trend is short lived, however, MACD often proves unreliable.

This is because moving averages themselves are lagging indicators. Even though MACD represents the difference between two moving averages, there is still some lag in the indicator itself. This is more likely to be the case with weekly

charts than daily charts. One solution to this problem is the use of the MACD-Histogram

3. The Relative Strength Index (RSI): can provide an early warning of an opportunity to buy or sell. The RSI is a momentum indicator, or oscillator, that measures the relative internal strength of a market (not against another market or index). As with all oscillators, RSI can provide early warning signals but should be used in conjunction with other indicators. Divergences are the most important signal provided by RSI.

   The Relative Strength Index (RSI) is an oscillator developed by Welles Wilder. Jr). RSI measures the relative changes between higher and lower closing prices, and provides an indication of overbought and oversold conditions. The term "Relative Strength" is slightly misleading and often causes some confusion. Relative strength generally means a comparison between two different markets or indices. RSI, on the other hand, looks at the internal strength of a single market.



Interpretation

RSI is plotted on a vertical scale of 0 to 100. The 70% and 30% levels are used as warning signals. An RSI above 70% is considered overbought and below 30% is considered oversold. The 80% and 20% levels are preferred sometimes. The significance depends upon the time frame being considered. An overbought reading in a 9-day RSI is not nearly as significant as an RSI for a 12-month period.

An overbought or oversold condition merely indicates that there is a high probability of a counter reaction. It is an indication that there may be an opportunity to buy or sell, but does not provide the final signal. RSI signals should always be used in conjunction with trend-reversal signals offered by the price itself.

RSI can be plotted for any time span. Wilder originally recommended using a 14-day RSI. Since then, the 9, 10 and 25-day RSIs have also become popular. The shorter the time period, the more sensitive the oscillator becomes. If the user is trading short-term moves, the time period can be shortened. Lengthening the time period makes the oscillator smoother and narrower in amplitude.

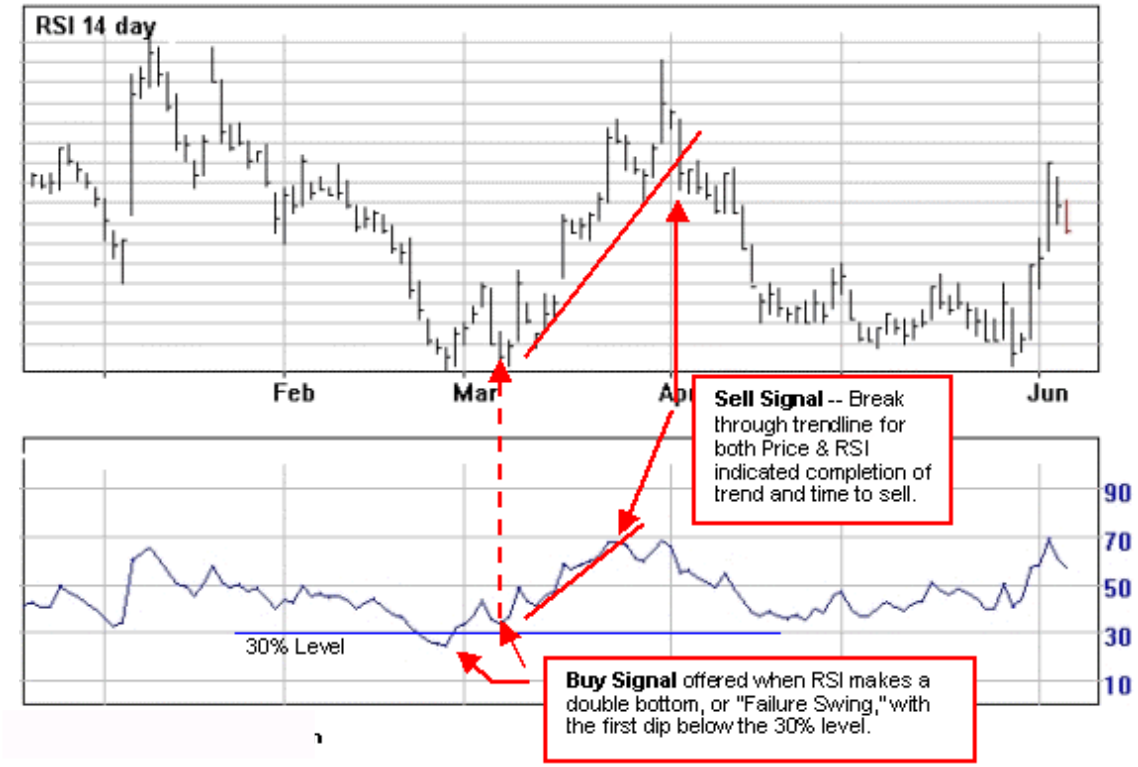
In using RSI, a crossover above the 70% level is a warning signal to prepare to sell and, conversely, when the RSI falls below 30% you have a notice to prepare to buy. The actual buy and sell signals are given when the RSI reverses (see below).

Tops & Bottoms, Failure Swings, Divergence

Traders watch for double tops or what Wilder referred to as "failure swings." If the RSI makes a double top formation, with the first top above 70% and the second top below the first, you get a sell signal when the RSI falls below the level of the dip. Conversely, a double bottom at or below 30% (with the first low below

30% and the second at or above the same level) gives you a buy signal when the RSI breaks above the previous peak.

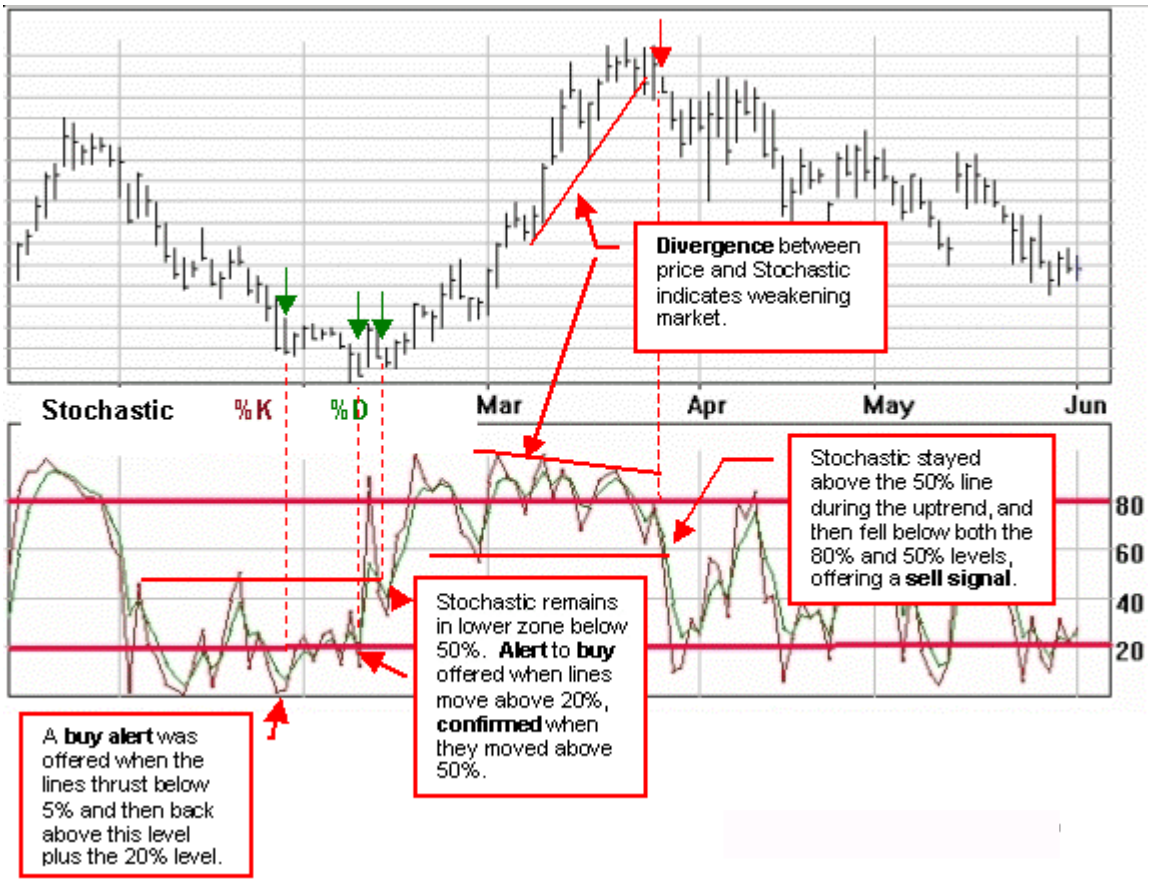
These failure swings can lead to divergences between the price action and the RSI. For example, a divergence occurs when a market makes a new high or low, but the RSI fails to set a matching new high or low. A divergence can be an indication of an impending reversal. In Wilder's opinion, divergences are the most important signal provided by RSI.



Trendlines

RSI trendlines can provide good signals, particularly when used in conjunction with price patterns. When both price and RSI trendlines are violated within a short period you could have an important buy or sell signal.

4. **Stochastic Oscillator**: The stochastic indicator can help determine when a market is overbought or oversold. The stochastic indicator is a momentum oscillator that can warn of strength or weakness in the market, often well ahead of the final turning point based on the assumption that when a stock is rising it tends to close near the high and when a stock is falling it tends to close near its lows.



The original stochastic oscillator, developed by Dr. George Lane, is plotted as two lines called %K, a fast line and %D, a slow line.

- %K line is more sensitive than %D
- %D line is a moving average of %K.
- %D line triggers the trading signals.

Although this sounds complex, it is similar to the plotting of moving averages. Think of %K as a fast moving average and %D as a slow moving average. The lines are plotted on a 1 to 100-scale. "Trigger" lines are normally drawn on stochastic charts at the 80% and 20% levels. A signal is generated when these lines are crossed. The zones above and below these two lines can be referred to as the stochastic bands.

Slow Stochastics

The original stochastic is sometimes referred to as the "fast" stochastic to differentiate it from the "slow" stochastic. Some traders feel the fast stochastic %K line is too sensitive and, to improve their analysis, they replace the original %D line with a new slow %K line. The new slow %D line formula is then calculated from the new %K line. The result is a pair of smoothed oscillators that some traders believe provide more accurate signals.

Interpretation

The 80% value is used as an overbought warning signal, and the 20% is used as an oversold warning signal. The signals are most reliable if you wait until the %K and %D lines turn upward below 5% before buying, and the lines turn downward above 95% before selling.

An overbought or oversold level indicates that a market may be vulnerable to a retracement these signals are particularly important with monthly charts. Buying into a market with an overbought %K or selling into one that is oversold may involve above-average risk, particularly if the market is pressing against previous levels of support or resistance.

Signals

The Stochastic Oscillator generates signals in three main ways:

1. Extreme values when the 20% and 80% trigger lines are crossed. Buy when the stochastic falls below 20% and then rises above that level. Sell when the stochastic rises above 80% and then falls below that level. The pattern of the stochastic is also important; when it stays below 40-50% for a period and then swings above, the market is shifting from overbought and offering a buy signal. And vice versa when it stays above 50-60% for a period of time.

2. Crossovers between the %D and %K lines. Buy when the %K line rises above the %D line and sell when the %K line falls below the %D line. Beware of short-term crossovers. The preferred crossover is when the %K line intersects after the peak of the %D line (right-hand crossover). Crossovers often provide choppy signals that need to be filtered through the use of other indicators.

Divergences between the stochastic and the underlying price i.e., if prices are making a series of new highs and the stochastic is trending lower, you may have a warning signal of weakness in the market.

Tips for Using Indicators

- Indicators filter price action with formulas. As such, they are derivatives and not direct reflections of the price action. This should be taken into consideration when applying analysis. Any analysis of an indicator should be taken with the price action in mind.
- When choosing an indicator to use for analysis, choice has to be made carefully and moderately. One should not cover more than five indicators, two to three indicators are enough for good analysis.
- Indicators that complement each other, instead of those that move in unison and generate the same signals should be chosen.

4.10 HOW IS TECHNICAL ANALYSIS DONE?

Technical Analysis is done by identifying the trend from past movements and then using it as a tool to predict future price movements of the stock. It can be done by using any of the following methods:

a) Moving Averages—This method is used to predict the trend and specify various support and resistance levels in the short and long term period. Most commonly used moving averages are 30 DMAs and 200 DMAs. Where DMA means Days Moving Average.

b) Charts & Patterns—Some analysts' uses charts and patterns to decide on the trend and then judge the future movement. The tool used by such analyst is converting the chart
in one of the many form of many shapes commonly formed by stocks. Some of such patterns are:

Reversal Patterns: -

1. Bump and Run
2. Double Top
3. Double Top
4. Double Bottom
5. Head And Shoulders Top
6. Head And Shoulders Bottom
7. Falling Wedge
8. Rising Wedge
9. Rounding Bottom
10. Triple Top
11. Triple Bottom

Continuation Patterns: -

1.Cup with Handle
2. Flag Pennant
3. Symmetric Triangle
4.Ascending Triangle
5. Descending Triangle
6. Price Channel
7. Rectangle
8. Measured {Bear} Move

Types of trends: Trends can be classified broadly in 3 types. They are:

a) Uptrend: - Generally a stock moves in any direction with phases of consolidation or moving against the trend for a short period. But still it creates a higher Highs and Lows in case of an uptrend. In short each short rally will create new High for the stock.
b) Downward: - In this case as against Uptrend the stock creates lower Highs and Lows. Furthermore in case of Downtrend the fall is much more steeper than the rise in case of Uptrend.
c) Range-bound: - In case of such a trend the price moves in a small range for the long period. There is no apparent direction as far as trend is concerned in this case.

Role of Volume: Volume plays a key role in deciding about the kind of future movement in stock. Whenever there is a sudden rise in the volume of the stock and if it is not followed by a price fall, it is a sign of consolidation and that the price may rise in near future. Generally if any stock breaks any trend it is accompanied by huge rise in volume.

In case of range bound trend the volume tends to die down to a great extent. Smart investors uses technical analysis to judge the rise in volume and take early positions in the stock during breakthroughs.

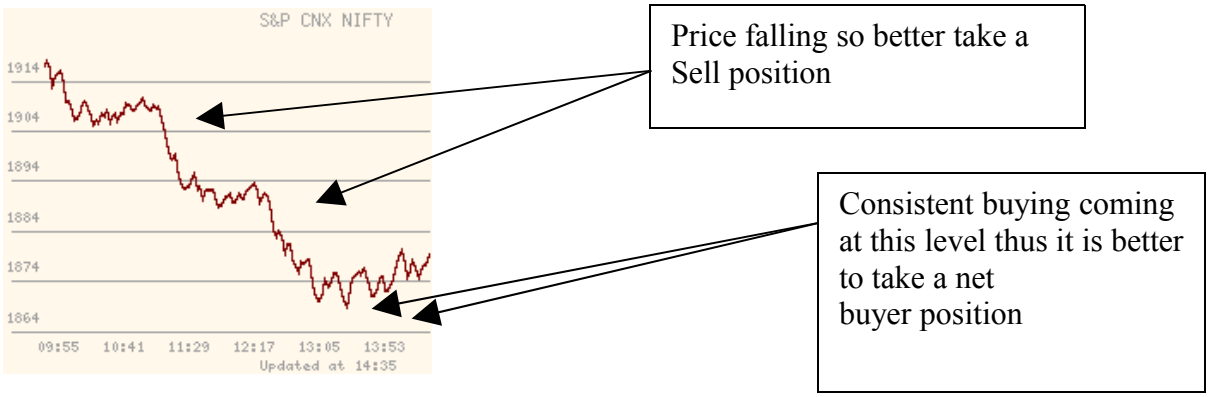
4.11 WHO USES TECHNICAL ANALYSIS?

Investors for their short-term trading decisions use Technical Analysis. This short-term may be further divided in day trading, short-term investment and for hedging purposes. The role played by Technical Analysis in each case is as follows:

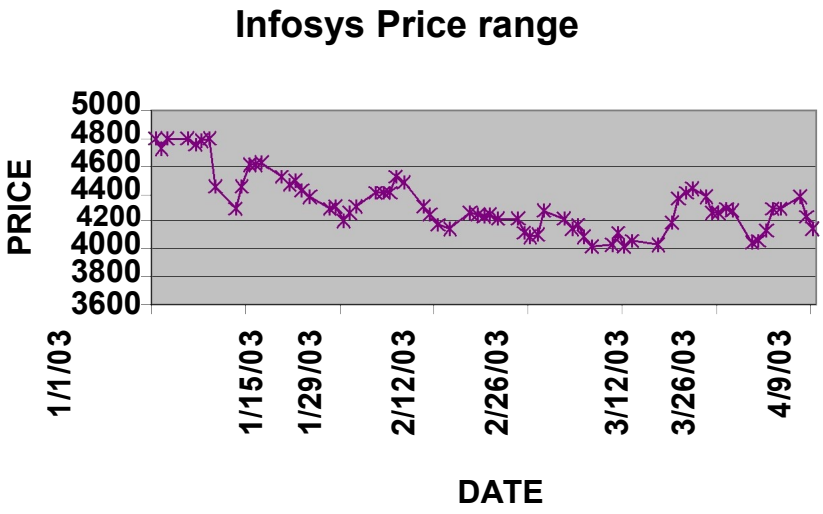
1) *Day Traders*: A day trader is one who takes and squares off his position both on the same day. Mostly a day trader counts on turnover rather than margin. A day trader will interpret the market movement in the manner stated below.

.

Suppose Mr. X is a day trader who deals in S&P CNX Nifty. The movement of Nifty during a particular day is stated below, if Mr. X follows the recommendations made by Technical Analysis he should sell the Nifty at 1904-1908 levels and again at 1890 level. It can be clearly seen that buying is coming at the level of 1870-1875; it is better He Squares off and can even become a net buyer at this range.

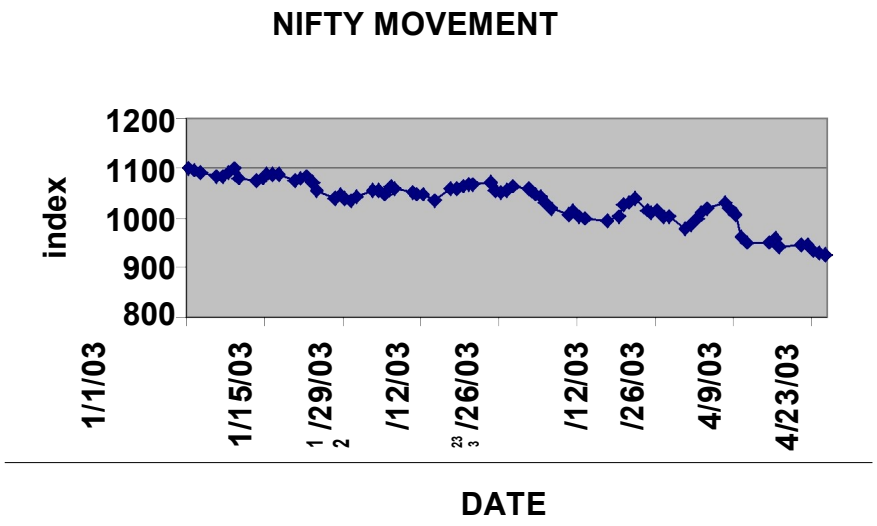


2) *Short term investors*: These people form the biggest clientele base of both the brokers and the Technical Analyst. To explain the working lets take the price movement curve of Infosys Technologies on NSE for the period 1st January 2003 to 9th April 2003. On closely analyzing the chart you will notice that a sustained buying is coming at the level of around Rs.4000. Another aspect, which should be noted, is the declining trend in terms of short term 'High' created by the stock. We can clearly deduce that each short-term rally is creating a lower high over the given term. In such a situation it is recommended by analyst to buy at the resistance level but sell it off immediately if it breaks the level by a margin of 2-3%. This is just an illustrative example and the level of analysis varies with each case.



***3.Hedgers*:** These are generally big investors, who have lot of money at stake and hence they look to have some hedging of their risk. The strategy followed by this section of investors is that they compare the stock in consideration with the index and on the basis of the result of this comparison they take their position in the stock. This can be explained by comparing the movement of nifty on the graph with Infosys movement as we have done in the figure given below.

If we look at both the charts of nifty movement with Infosys movement we find that although both have fallen over the period but Infosys has witnessed some rallies and **hence we can clearly say that a hedger will benefit by using technical Analysis and getting out at the periods when Infosys has given an upward rally.**



5.1 Five Ways that Technical Analysis Can Fail:

Technical Analysis is truly remarkable. At a glance, the trader can view an incredible amount of information on the price movement of any given currency. Moving average lines can show trending or range-bound currencies. Candlesticks report the relationship between the opening and closing prices. Bollinger Bands give price targets and show the currency pair's level of volatility.

Below are five ways in which technical analysis shows its imperfections. These unpredictable events can cause currencies to move in unpredictable ways for a few hours, an entire day, or even a month or longer. Sometimes, these events will cause currencies to move in your favor; sometimes not. The important point is that currencies can move contrary to what the indicators predicted -- and every trader has to be prepared for these events.

How Can Technical Analysis Fail?

Below are the five ways that technical analysis can fail.

- **Geopolitical events.**

Any geopolitical event can move stocks. News that Iran intensified its nuclear program fueled the fall of the USD last April, 2007. On October 9, 2006, North Korea tested its first nuclear weapon, which moved the yen to triple-pip gains for a day. Elections, OPEC decisions, and G7 statements can also move stocks.

- **Economic data**

Any economic news can cause stocks to move. Some of the most market-moving economic reports are the employment figures, Fed announcements (or even speeches made by central bank members), GDP report, and the manufacturing survey.

- **Natural disasters**

Earthquakes in Japan, drought in Australia (affecting wheat production), tsunamis in the Asia-Pacific region, or any natural occurrence that affects commodity supply can move

stocks contrary to the technical forecast. Commodity-linked currencies like the Australian Dollar (AUD) are particularly sensitive to natural disasters.

- **Acts of terrorism**

Any act of terrorism can affect stocks. The Sept 11, 2001 attacks pushed the USD quite dramatically downward. The terrorist attacks in London in July, 2005 also moved the European currencies, particularly the Pound (GBP).

- **Internal Conflict or war**

Any conflict can affect stocks, particularly in countries with commodities linked to oil or gold. Internal conflicts flaring up in oil-rich Nigeria can move currencies like the Canadian Dollar (CAD) and the US Dollar (USD).

5.2 IS TECHNICAL ANALYSIS USEFUL?

If we use only technical analysis in itself and do not consider other aspects it is very unlikely that we will have much success in the long run, particularly in case of short-term investments. But if we use Technical analysis along with fundamental analysis or discount the industry and company related news while considering the valuation, our chances of minimizing the risk brightens.

One thing that we must realize is that technical analysis provides us only with the trend and judge future on that basis, it can be far from actual in few cases, one of them was the day Infosys crashed by 30% on a single day. By no imagination and no analysis one could have guessed the same or rather have come closed to it. Therefore the best use of technical analysis is to realize the trend and levels at which it will break the trend so that one is prepared to take positions when such trend breaks. It is because of this disadvantage that Technical analysis more useful only for short-term investing…

6.1 QUESTIONNAIRE

1	**Name**		
2	**Qualification**		
3	**Age**		
4	**Profession**		
5	**Experience in Trading**		
6	**Amount Invested in last financial year**		
7	**% retuns in the last financial year**		
8	**Investment made in**	A. Mutual Funds	
		B. Equities	
		C. Derivatives	
		D. PPF	
		E. Commodities	
		F. Property	
9	**Investment On the basis Of**	A. Technical analysis	
		B. Fundamental Analysis	
		C. Tips given by broker	
		D.Tips given by friend	
		E.Tips given by News channel	
10	**Risk bearing capacity**	A. HIGH	
		B. MEDIUM	
		C. LOW	
11	**You use Fundamental & Technical Analysis for deciding**	A. Risk Involced in the Investment	
		B. To check the past performance of Security	
		C To do future prediction of the security	
		D. All of the above	
12	**Why you use fundamental and Technical analysis?**	A. You have a good past Expereince	
		B. You found it useful for others so want to check for yourself	
		C. Curiosity to check its usefulness	
		D. Somebody insisted you to do that	

6.2 DATASHEET

Sr. No.	Name	Qualification	Age	Proffession	Exp.in Trading	Amt Inv.	% Returns in last calender year	Invest on the basis of
1	Uttam Padhiar	Bcom	53	Buss.	More than 4	3 to 5 lacs	30 to 45%	Fund. & Tech. analysis
2	Saurabh Shinde	BE	36	Service	2 to 3	1 to 3 lacs	30 to 45%	Fund. & Tech. analysis
3	RamesMane	BSc	30	Service	1 to 2	50000 to 1 lac	0 to 15%	tips given by the broker
4	Shrikant Bagal	Bcom, MBA	46	Service	More than 4	1 to 3 lacs	30 to 45%	Fund. & Tech. analysis
5	Vijay Kumbhar	BA	45	Service	2 to 3	50000 to 1 lac	0 to 15%	tips given by the broker
6	Aniket Mahindre	BSc	58	Buss.	More than 4	1 to 3 lacs	15 to 30%	Fund. & Tech. analysis
7	Ashish Kore	12th	34	Service	2 to 3	1 to 3 lacs	0 to 15%	Past Perfomance
8	Vasudev Joshi	BE	38	Service	More than 4	50000 to 1 lac	30 to 45%	Fund. & Tech. analysis
9	Suhas Dahanukar	BSc	24	Service	1 to 2	Below 50000	0 to 15%	tips given by the broker
10	Sudhir Kulkarni	Bcom, MBA	37	Buss.	3 to 4	1 to 3 lacs	15 to 30%	Fund. & Tech. analysis
11	Vishwas Sutar	Bcom	40	Buss.	3 to 4	3 to 5 lacs	30 to 45%	Fund. & Tech. analysis
12	Lakshmikant Chavan	BSc	33	Service	More than 4	Below 50000	0 to 15%	Tips given by the Business News Channel
13	Umesh Jagtap	BE	30	Service	2 to 3	50000 to 1 lac	30 to 45%	Fund. & Tech. analysis
14	Mohd. Shaikh	BSc	55	Service	3 to 4	1 to 3 lacs	0 to 15%	tips given by the broker
15	Vinayak Thalange	BSc	60	Buss.	More than 4	above 5 lacs	15 to 30%	Tips given by the Business News Channel

16	Sagar Gawai	Bcom, MBA	41	Service	2 to 3	50000 to 1 lac	30 to 45%	Fund. & Tech. analysis
17	Manish Sawant	BE	57	Service	More than 4	above 5 lacs	30 to 45%	Fund. & Tech. analysis
18	Shardul Kulkarni	BSc	39	Service	3 to 4	50000 to 1 lac	15 to 30%	Fund. & Tech. analysis
19	Vaibhav Mane	BSc	66	Buss.	More than 4	above 5 lacs	15 to 30%	Fund. & Tech. analysis
20	Umakant Sahastrabudhe	12th	25	Service	3 to 4	50000 to 1 lac	0 to 15%	tips given by the broker
21	Rahul Farakate	BSc	32	Service	More than 4	3 to 5 lacs	15 to 30%	Fund. & Tech. analysis
22	Sushil Datar	Bcom	40	Service	2 to 3	1 to 3 lacs	0 to 15%	Fund. & Tech. analysis
23	Avinash Kunte	12th	38	Service	3 to 4	Below 50000	Negative Returns	Tips given by the friends
24	Jatin Patel	BSc	49	Buss.	More than 4	3 to 5 lacs	30 to 45%	Fund. & Tech. analysis
25	Suraj Sarada	Bcom	39	Buss.	More than 4	3 to 5 lacs	15 to 30%	Fund. & Tech. analysis
26	Murli Sarada	12th	28	Buss.	More than 4	50000 to 1 lac	15 to 30%	tips given by the broker
27	Nilesh Chavan	12th	37	Buss.	3 to 4	1 to 3 lacs	15 to 30%	tips given by the broker
28	Kapil Rene	BSc	48	Service	More than 4	3 to 5 lacs	15 to 30%	Fund. & Tech. analysis
29	Chetan Kotecha	Bcom	57	Buss.	2 to 3	50000 to 1 lac	15 to 30%	Fund. & Tech. analysis
30	Kunal Kapadia	12th	54	Buss.	3 to 4	3 to 5 lacs	30 to 45%	Fund. & Tech. analysis

6.3 DATA ANALYSIS

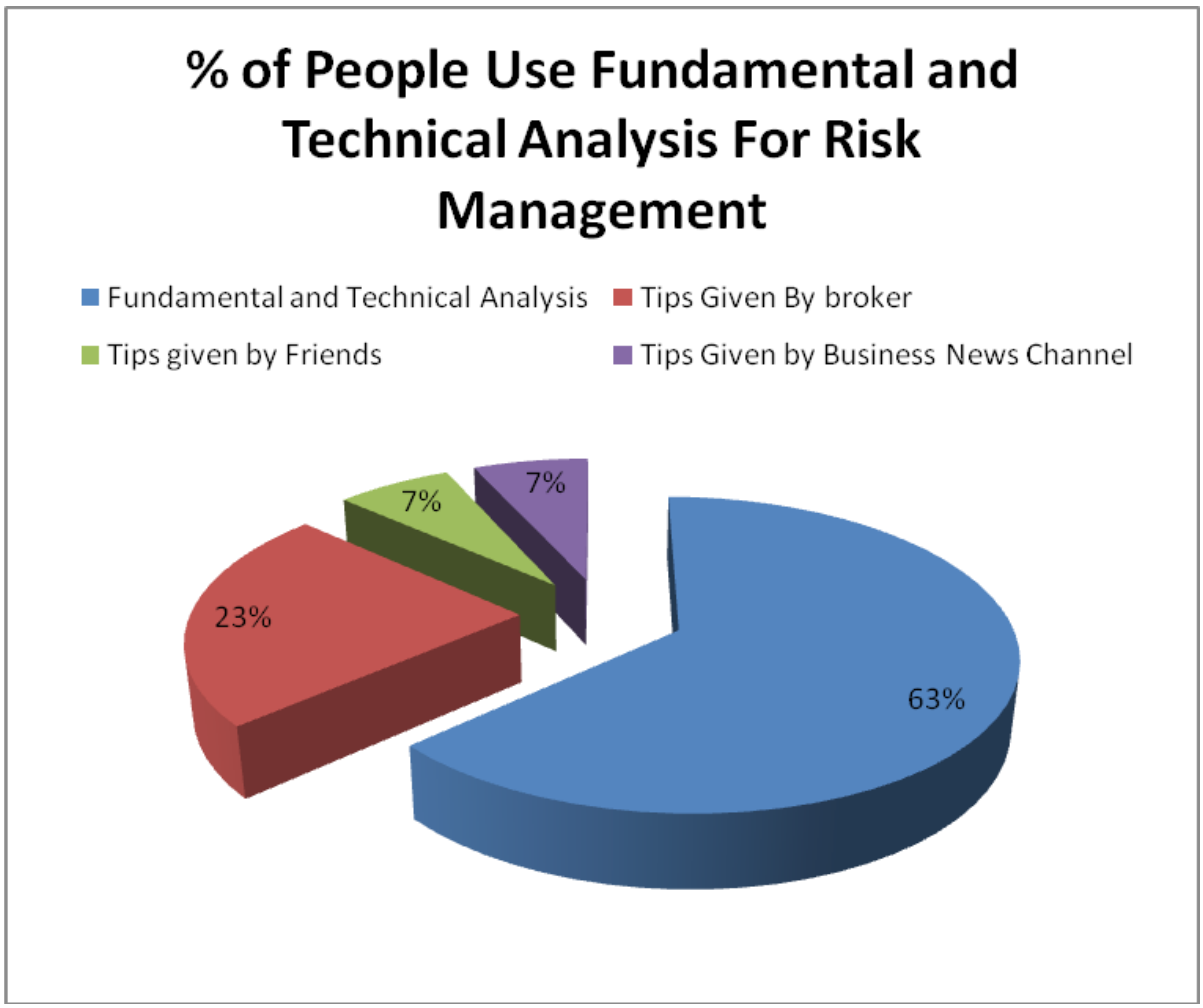


Fig 42: This Pie chart shows the % of people who use Fundamental and Technical Analysis to decide their Investment portfolio so as to keep the risk minimum and the returns maximum. In the Data sheet we can see that the candidates who use Technical Analysis has got higher returns as compared to the candidates who did not used this analysis so from this observation we can say that the Technical analysis has got positive effect on the returns of a particular investment.

Fig: 43 This pie chart shows the % of people who got different returns on their investment in lat calendar year. We can see that the total % of candidates who has got returns above 15% are 70% and the ones who get lesser returns are 30%. And also the candidates who use Technical Analysis are also 67%.

Limitation of Study: -

1. The Sample size selected is situated in same geographical area.
2. The Sample contains all the male candidates so the gender heterogeneity is not present.

6.4 CONCLUSION

In today's world people say that the Financial Markets are the easy way of earning money but actually it's not true. The volatility of any market is nothing but the potential that it has to earn from it, but at the same time the same volatility can be a serious problem to the investor for the investment.

The study shows that the Investment in Financial market can be safe only if the investor can have a fore look on the movement of the market. This needs a very keen observation of market. The technical analysis is the process of studying the trend of a market for similar situation in past and on that basis deciding the future movement. The indicators give a very fair picture of market. Technical Analysis allows an investor to study the market in the forms of trends and their effects on market and thus aids him in making decision about when and at what price to enter a market and at what price to get out of it. So one can easily say that it allows an investor to understand the Pulse of market in terms of Prices, volumes and the Speed with which the changes are occurring.

The Risk can be managed by using Hedging techniques, but to earn maximum returns the person has to take same risk the survey shows that the people who do Technical Analysis can take risk more confidently and can earn maximum profit.

So at the end can conclude that Investing in the share market is like walking on a dark road but Technical Analysis can become a cat eye to make the walking easy and fast.

RECOMMENDATIONS

1. The Fluctuation in any market makes it profitable but so as to earn profit one has to predict the market movement.
2. The Technical Analysis helps the user to get the future movement of the market on the basis of which the investment should be done.

The study also says that if the investment is done on the basis of Technical Analysis the chances of getting higher returns is more compared to others. So use of Technical Analysis is necessary.

BIBLIOGRAPHY

Books referred:

- Options Futures, and other Derivatives by John C Hull
- Derivatives FAQ by Ajay Shah
- NSE's Certification in Financial Markets: - Derivatives Core module
- Trend Forecasting with Technical Analysis by Louis B. Mendelsohn

Reports:

- Report of the RBI-SEBI standard technical committee on exchange traded Currency Futures
- Regulatory Framework for Financial Derivatives in India by Dr.L.C.GUPTA

Websites visited:

- www.nse-india.com
- www.bseindia.com
- www.sebi.gov.in
- www.ncdex.com
- www.google.com
- www.derivativesindia.com

ABBREVATIONS

A

AMEX- America Stock Exchange

B

BSE- Bombay Stock Exchange

BSI- British Standard Institute

C

CBOE - Chicago Board options Exchange

CBOT - Chicago Board of Trade

CEBB - Chicago Egg and Butter Board

CME - Chicago Mercantile Exchange

CNX- Crisil Nse 50 Index

CPE - Chicago Produce Exchange

CWC- Central Warehousing Corporation

D

DTSS- Derivative Trading Settlement System

F

FIIs- Foreign Institutional Investors

F & O – Future and Options

FMC- Forward Markets Commission

FRAs- Forward Rate Agreements

G

GAICL-Gujarat Agro Industries Corporation Limited

GSAMB- Gujarat State Agricultural Marketing Board

I

IMM - International Monetary Market

IPSTA- India Pepper & Spice Trade Association

M

MCX – Multi Commodity Exchange

N

NAFED-National Agricultural Co-Operative Marketing Federation Of India

NCDEX – National Commodities and Derivatives Exchange

NIAM- National Institute Of Agricultural Marketing

NMSE- National Multi Commodity Exchange

NOL- Neptune Overseas Limited

NSCCL- National Securities Clearing Corporation

NSDL- National Securities Depositories Limited

NSE - National Stock Exchange

O

OTC- Over The Counter

P

PHLX - Philadelphia Stock Exchange

PNB- Punjab National Bank

R

RBI- Reserve Bank Of India

S

SC(R) A - Securities Contracts (Regulation) Act, 1956

SEBI- Securities Exchange Board Of India

V

VPN- Virtual Private Network