

CHAPTER 6: SECURITY ANALYSIS

Buying, holding or selling of securities depends on several factors such as periodical returns, terminal returns, risk factors, macro and micro economic indicators, sentiments etc. A disciplined investor can fairly ascertain the value of a company from all its financial statements, reports etc. And make purchases when they are underpriced and sell when overpriced. In the process of analysing a security, the investor does a check on:

- Fundamental Analysis and
- Technical Analysis.

Of the security. In fundamental analysis risk return factors and in technical analysis demand supply factors are looked into.

Fundamental Analysis

This comprises study of Economic Analysis and Industry Analysis at macro level and company analysis at micro level.

Economic Analysis: In this the following areas are looked into:

- a. Growth rates of National Income and related measures, GDP;
- b. Growth rates of industrial sectors and indices;
- c. Inflation;
- d. Balance of Payments position;
- e. Monsoon etc.

Are considered.

Techniques of Economic Analysis: Some of the techniques that are employed are:

A. Anticipatory Surveys are conducted and results are analysed.

B. Barometer / Indicator Approach: In this:

- a. **Leading indicators:** These are the indicators which start showing positive signs before the economy starts improving. Eg. Capital Formation etc.
- b. **Coincidental indicators:** These are indicators which move in tandem with the performance of the economy.
- c. **Lagging indicators:** These are indicators which start improving after the economy is on growth path.

These are identified and analysed for drawing inferences.

C. Economic Model Building Approach: In this approach, a precise and clear relationship between dependent and independent variables is determined. GNP model building or sectoral analysis is used in practice through the use of national accounting framework.

Industry Analysis: In this Factors Affecting Industry Analysis like:

- a. Product Life-Cycle;
- b. Demand Supply Gap;
- c. Barriers to Entry;
- d. Government Attitude;
- e. State of Competition in the Industry;
- f. Cost Conditions and Profitability;
- g. Technology and Research; etc.

Are studied and inferences are drawn. Techniques such as Correlation and Regression analysis, input – output analysis etc. Are used.

Company Analysis: In this:

- a. Net Worth and Book Value;
- b. Sources and Uses of Funds;
- c. Cross Sectional and Time Series Analysis;
- d. Size and Ranking;
- e. Growth Record;
- f. Financial Analysis;
- g. Quality of Management;
- h. Location of the unit;
- i. Labour and Management relations;
- j. Pattern of Existing stockholding;
- k. Marketability of shares etc.

Are studied. Techniques used for study are, Correlation and Regression Analysis, Trend Analysis, Decision Tree Analysis, etc.

Technical Analysis:

Technical Analysis is a method of study of share price movements with the help of graphs and charts on the assumption that share price trends are repetitive, since investor psychology follows a certain pattern. It presupposes that price behaviour follows certain cyclic patterns that are repetitive. This analysis attempts to answer:

- a. Whether any trend exists? and if so,
- b. When will it reverse?

Charts like Bar chart, Line chart, Point figure chart etc. are used to ascertain the direction of movement of share prices. All said and done this does not

totally affirm that the past trend observed will continue in future and it could be a totally different scenario as well.

Bar Chart: This is drawn with days on X Axis and prices on Y axis. For each day, a small vertical line is drawn indicating the high and low prices. Closing price of the day is indicated by small horizontal line across the vertical line. Day volume is indicated below each vertical line.

Line Chart: Closing price of each day is plotted on the graph and joined by a line.

Point and Figure Chart: These charts are little complicated. Point and figure chart is unique. It does not plot price against time as all other techniques do. Instead it plots price against changes in direction by plotting a column of Xs as the price rises and a column of Os as the price falls. The correct way to draw a point and figure chart is to plot every price change but practicality has rendered this difficult to do for a large quantity of stocks so many point and figure chartists use the summary prices at the end of each day. Some prefer to use the day's closing price and some prefer to use the day's high or low depending on the direction of the last column.

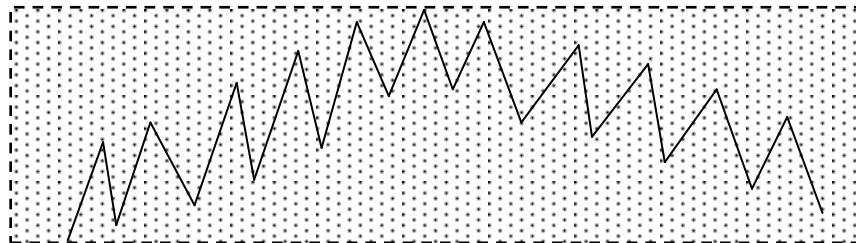


Dow Theory: This is the oldest theory explaining the behaviour of stock prices named after its propounder.

The Dow Theory is based upon the movements of two indices, constructed by Charles Dow, Dow Jones Industrial Average (DJIA) and Dow Jones Transportation Average (DJTA). These averages reflect the aggregate impact of all kinds of information on the market. The movements of the market are divided into three classifications, all going at the same time; the primary movement, the secondary movement, and the daily fluctuations. The primary movement is the main trend of the market, which lasts from one year to 36 months or longer. This trend is commonly called bear or bull market. The secondary movement of the market is shorter in duration than

the primary movement, and is opposite in direction. It lasts from two weeks to a month or more. The daily fluctuations are the narrow movements from day-to-day and are not considered by Dow.

The theory, in practice, states that if the cyclical swings of the stock market averages are successively higher and the successive lows are higher, then the market trend is up and a bullish market exists. Contrarily, if the successive highs and successive lows are lower, then the direction of the market is down and a bearish market exists.



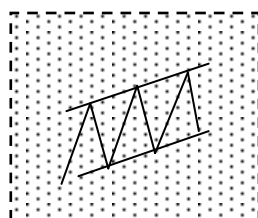
Breadth of Index: This is computed by calculating net advances or declines with total number of scrips traded. Higher the breadth, the direction of the market will be more assertive.

Confidence Index: This It is the ratio of high-grade bond yields to low-grade bond yields. A rising confidence index is expected to precede a rising stock market, and a fall in the index is expected to precede a drop in stock prices. This is used by market analysts as a method of trading or timing the purchase and sale of stock, and also, as a forecasting device to determine the turning points of the market.

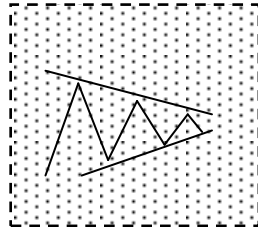
Odd - Lot Theory: This theory is a contrary - opinion theory. It assumes that the average person is usually wrong and that a wise course of action is to pursue strategies contrary to popular opinion. The odd-lot theory is used primarily to predict tops in bull markets, but also to predict reversals in individual securities.

Interpreting Price Patterns: There are several price patterns that are used by analysts to predict prices. Some of them are:

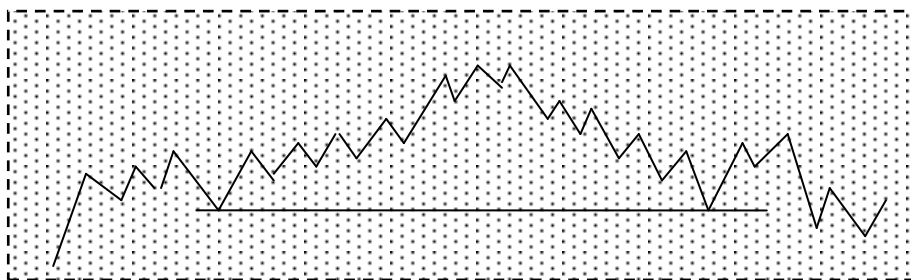
Channel: A series of uniformly changing tops and bottoms gives rise to a channel formation. A downward sloping channel would indicate declining prices and an upward sloping channel would imply rising prices. Dow theory explanation is based on channels formation.



Wedge: A wedge is formed when the tops (resistance levels) and bottoms (support levels) change in opposite direction (that is, if the tops, are decreasing then the bottoms are increasing and vice versa), or when they are changing in the same direction at different rates over time.



Head and Shoulders: This is a distorted drawing of a human form, with a large lump (for head) in the middle of two smaller humps (for shoulders). This is the most important pattern to indicate a reversal of price trend. The neckline of the pattern is formed by joining points where the head and the shoulders meet. The price movement after the formation of the second shoulder is crucial. If the price goes below the neckline, then a drop in price is indicated, with the drop expected to be equal to the distance between the top of the head and the neckline. This can be top head or bottom head mode (inverse head and shoulders). Inverse head and shoulders indicate as bullish trend. The following figure indicates the setting in of a bearish trend.



Gap: Gap is the difference between the preceding day's closing price and current day's opening price. The larger the gap, the stronger will be the continuation of the observed trend.

Decisions based on Data Analysis: This is based on statistical analysis of historical data.

Moving Averages: Moving averages are frequently plotted with prices to make buy and sell decisions. The two types of moving averages used by chartists are:

Arithmetic Moving Average (AMA), and
Exponential Moving Average (EMA).

An n-period AMA, at period t, is nothing but the simple average of the last n period prices. Analysts use long term (> 30 weeks) moving averages to ascertain long trends, medium term (30 – 60 days) moving averages for medium trends and short term (around 10 days) moving averages for short trends.

In the case of AMA, equal weightage is given to all results. But, in case of EMA, more weightage is given to latest result and the weight decreases for older results. The weights decrease exponentially, according to a scheme specified by the exponential smoothing constant, also known as the exponent, a. Formula for calculation is:

$$EMAT = aP_t + (1 - a) * EMA_{t-1} = EMA_{t-1} + a (P_t - EMA_{t-1})$$

Where, a = Exponent Constant; P_t = Price on respective day and EMA_{t-1} = Preceding day's EMA.

Bollinger Bands: Bollinger bands consist of a centreline and two price channels, one above the centreline and one below. The centreline is an exponential moving average, and the price channels are standard deviations of the stock that is being studied. The bands will expand and contract as the price of an issue becomes volatile (expansion) or becomes bound into a tight trading pattern (contraction).

When the stock price continually touches the upper bollinger band, the stock is thought to be overbought and conversely, when they continually touch the lower band, the stocks are thought to be oversold, and a buy signal would thus kick in.

In a rational, well ordered and efficient stock market, technical analysis may not work well as several people may follow same information.

Elliot Wave Theory: Elliot theory is based on analysis of 75 years stock price movements and charts. From his studies, he defined price movements in terms of waves. Accordingly, this theory was named Elliot Wave Theory. Elliot found that the markets exhibited certain repeated patterns or waves. As per this theory wave is a movement of the market price from one change in the direction to the next change in the same direction. Depending on the demand and supply pressures, waves are generated in the prices. As per Elliot theory, waves are classified into 2 categories, viz.

- a. **Impulsive Patterns also known as Basic Waves:** In this pattern there will be 3 or 5 waves in a given direction (going upward or

downward). These waves shall move in the direction of the basic movement. This movement can indicate bull phase or bear phase.

- b. **Corrective Patterns also known as Reaction Waves:** These 3 waves are against the basic direction of the basic movement. Correction involves correcting the earlier rise in case of bull market and fall in case of bear market.

These are similar to Primary and Secondary movements of Dow Jones theory with similar meaning.

Complete Cycle: One complete cycle consists of waves made up of both the distinct phases, bullish and bearish. On completion of full one cycle movement, the fresh cycle starts with similar impulses arising out of market trading.

Bond Valuation:

A bond or debenture is an instrument of debt issued by a business or government. Basics of bonds are:

Coupon Rate: Coupon rate is the interest payable on the bond. This is expressed as a percentage linked to the face value of the bond.

Maturity Period: Corporate bonds have a maturity period of 3-10 years and Government bonds maturity may extend upto 25 years. Face value of bond along with premium, if any is payable on maturity.

Value of a Bond: Value of a bond is sum of the discounted values of the series of interest payments and principal amount at maturity. Formula is:

$$V = \sum_{t=1}^n \frac{I}{(1+k_d)^t} + \frac{F}{(1+k_d)^n} \quad \text{where,}$$

V = Value of bond; I = series of interest payments; F = Face Value incl. Prem., if any; k_d = Reqd. Rate of return and n = maturity period;

In case interest is paid semi annually, formula is:

$$V = \sum_{t=1}^{2n} \left[\frac{\frac{I}{2}}{(1+\frac{k_d}{2})^t} \right] + \left[\frac{F}{(1+\frac{k_d}{2})^{2n}} \right] \quad \text{Where,}$$

V = Value of bond; $I/2$ = Semi Annual series of interest payments; F = Face Value incl. Prem., if any; k_d = Reqd. Rate of return and 2n = maturity period expressed in terms of half yearly periods;

Bond Value Theorems: Some basic rules relating to bonds are:

- a. When the required rate of return equals the coupon rate, the bond sells at par value.
- b. When the required rate of return exceeds the coupon rate, the bond sells at a discount. The discount declines as maturity approaches.
- c. When the required rate of return is less than the coupon rate, the bond sells at a premium. The premium declines as maturity approaches.
- d. The longer the maturity of a bond, the greater is its price change with a given change in the required rate of return.
- e. Price of a bond varies inversely with yield (Yield is the payment at maturity) because as the required yield increases, the present value of the cash flow decreases; hence the price decreases and vice versa. This is converse of return on bond and coupon rate.
- f. Value of the bond changes with duration. As the bond approaches its maturity date, the premium / discount will tend to be zero.

Yield to maturity: The rate of return one earns is called the Yield to Maturity (YTM). The YTM is defined as that value of the discount rate (" k_d ") for which the Intrinsic Value of the Bond equals its Market Price (Note the similarity between YTM of a Bond and IRR of a Project). If we ignore the issue related expenses, k_d equals the relevant cost of (debt) capital for the company.

Duration of Bond: Duration is nothing but the average time taken by an investor to collect his investment. If an investor receives a part of his investment over the time on specific intervals before maturity, the investment will offer him the duration which would be lesser than the maturity of the instrument. Higher the coupon rate, lesser would be the duration.

Duration of a financial asset that consists of fixed cash flows, like a bond, is the weighted average of the times until those fixed cash flows are received. When an asset is considered as a function of yield, duration also measures the price sensitivity to yield, the rate of change of price with respect to yield etc.

Macaulay duration is the weighted average time until cash flows are received, and is measured in years. **Modified duration** is the percentage change in price for a unit change in yield. When yields are continuously compounded Macaulay duration and modified duration will be numerically equal. When yields are periodically compounded Macaulay and modified duration will differ slightly, and there is a simple relation between the two.

For bonds with fixed cash flows a price change can come from two sources:

1. The passage of time (convergence towards par). This is of course totally predictable, and hence not a risk.
2. A change in the yield. This can be due to a change in the benchmark yield, and / or change in the yield spread.

The yield-price relationship is inverse, and we would like to have a measure of how sensitive the bond price is to yield changes. The modified duration is a measure of the price sensitivity to yields and provides a linear approximation.

Macaulay duration and modified duration are both termed "duration" and have the same (or close to the same) numerical value, but it is important to keep in mind the conceptual distinctions between them. Macaulay duration is a time measure with units in years. For a standard bond the Macaulay duration will be between 0 and the maturity of the bond. It is equal to the maturity if and only if the bond is a **zero-coupon bond**.

Modified duration, on the other hand, is a derivative (rate of change) or price sensitivity and measures the percentage rate of change of price with respect to yield. The concept of modified duration can be applied to interest-rate sensitive instruments with non-fixed cash flows, and can thus be applied to a wider range of instruments than can Macaulay duration.

The equality (or near-equality) of the values for Macaulay and modified duration can be a useful aid to intuition. For example a standard ten-year coupon bond will have Macaulay duration little less than 10 years and also implies that modified duration (price sensitivity) will also be somewhat but not dramatically less than 10%. Formula is:

$$\text{Macaulay Duration (in years)} = \left[\sum_{t=1}^n \frac{t \cdot C}{(1+i)^t} + \frac{n \cdot M}{(1+i)^n} \right] / P \quad \text{where,}$$

n = number of cash flows; t = time to maturity;

C = Cash flows; i = Req'd. Yield;

M = Maturity Value; P = Bond Price

Modified Duration: The modified duration of Macaulay considers interest rate changes and their affect on the duration of the bond.

$$\text{Modified Duration} = \text{Macaulay Duration} / (1 + \text{YTM} / n)$$

Where n = number of cash flows and YTM = Yield to Maturity.

Zero Coupon Bonds: These bonds do not pay interest during the life of the bonds. Instead, zero coupon bonds are issued at discounted price to their face value, which is the amount a bond will be worth when it matures. When a zero coupon bond matures, the investor will receive one lump sum (face

value) equal to the initial investment plus interest that has been accrued on the investment made. The maturity dates on zero coupon bonds are usually long term. These maturity dates allow an investor for a long range planning. Zero coupon bonds are issued by banks, government and private sector companies. However, bonds issued by corporate sector carry a potentially higher degree of risk, depending on the financial strength of the issuer and longer maturity period, but they also provide an opportunity to achieve a higher return. I C I C I, I D B I etc. have issued zero coupon bonds with the name as deep discount bonds.

Questions:

- a. Explain in detail the Dow Jones Theory.
- b. Explain the Elliot Wave Theory of technical analysis.
- c. Why should the duration of a coupon carrying bond always be less than the time to its maturity?
- d. Mention the various techniques used in economic analysis.
- e. Write short notes on Zero coupon bonds.