Chapter 5
Equity Shares—An Analysis: A Neuro Knowledge Engineers Perspective

In this chapter we do an incisive analysis of equity shares. The objective of this analysis is to incorporate this knowledge in our framework. This would help us in developing our rule-base and would give us a deep insight into the realm of equity shares and related decision making.

5.1 Equity Shares

Equity investment is a variable-income investment option, whereas small saving schemes, bank deposits, company deposits and debentures, etc. are fixed-income investments. Whether a company does well or not, it has to pay interest on deposits. There is no such obligation to pay dividend on equity shares; it may be declared in certain years, be skipped in certain others. It could go up, come down, or remain steady. Since equity capital is risk capital. If a company does well, the investors are benefited, otherwise not.

To make money from deposits and debentures one need not be as well-informed, knowledgeable as an investor in equity shares.
5.2 Analysis of Equity Investment

Basically there are two methods of equity investment analysis for taking decisions like buying, selling and holding: fundamental analysis and technical analysis. Fundamental analysis is a value-based approach. Technical analysis is a market-based approach. [Yasaswy 1990]

Fundamental analysis is a value-based approach. This is a conservative and non-speculative approach to evaluate equity shares. Fundamental analysis consists of a three phase analysis: Economic analysis, industry analysis and company analysis. The perspective of a fundamental analysis is long-term. Various financial ratios are used as aids to decision making.

Technical analysis is a market based approach. It gives more importance to the technical aspects of the market, such as prices, price changes and trading volumes. The time perspective of it is short-term.

5.2.1 Fundamental Analysis

Fundamental analysis is time-honored and value-based approach, based on a careful assessment of the "fundamentals" of an economy, an industry and a company. A fundamental analyst is not unduly influenced by what is currently happening on a particular day in the stock exchange. He looks at the general economic situation, makes an evaluation of the particular industry and finally does an in-depth analysis - financial and non-financial of the specific company. Thus it is a 3-phase analysis - of economy, industry, and company as shown in Table 1.
5.2.1.1 Economic analysis

The stock market does not operate in a vacuum. It is an integral part of the total economy of a country.

To get an insight into the complexities of the stock market, an investor should develop a good sense of economic understanding and interpreting important economic indicators, with reference to their impact on stock markets.

Examples:

a) A favorable monsoon will have a positive impact on stock market. During years when the monsoon is good, Indian economy performs well with good growth rates in Gross National Product. As the purchasing power of the people goes up the aggregate demand goes up, and companies do well. Hence their profits go up and the investors are benefited.

Table 1. The Three Phase Fundamental Analysis.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Nature of analysis</th>
<th>Purpose</th>
<th>Tools &amp; Techniques</th>
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<tbody>
<tr>
<td>First</td>
<td>Economic analysis</td>
<td>To assess the general economic situation in the country, its major trading partners, neighbors, etc.</td>
<td>Economic indicators-lead, lag and coincidental.</td>
</tr>
<tr>
<td>Second</td>
<td>Industry analysis</td>
<td>To review the prospects and problems of a specific industry and its segments.</td>
<td>Performance indicators, aggregate demand and supply position, internal and external competition, government policies.</td>
</tr>
<tr>
<td>Third</td>
<td>Company analysis</td>
<td>To analyse the financial and non-financial aspects of a company and determine whether to buy/sell/hold shares of that company.</td>
<td>Non-financial aspects like promoter, management, product quality, corporate image, location, etc. Financial aspects like earnings per share, sales, profitability, dividend record, asset growth, etc.</td>
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b) Productivity of public sector enterprises like railways, coal, power, etc. play a crucial role in deciding the fate of our economy.

There are certain economic indicators which can be studied to assess the national economy as a whole. Some are known as leading indicators which foretell, in their own language, what is going to happen. Good examples of leading indicators are employment position, rainfall and agricultural production, fixed capital investment, corporate profits, money supply, credit position and index of equity share prices.

There are some coincidental indicators. Some examples of coincidental indicators are GNP (Gross National Product), Index of Industrial Production, money market, interest rates and reserve funds with the commercial banks.

Then there are some lagging indicators, which reveal what has already happened. Some examples of lagging indicators are large-scale unemployment, piled-up inventories, outstanding debt, interest rates of commercial loans, etc. While these indicators are useful, they are by no means infallible. One must use them with caution. These indicators can be helpful in understanding the economic trends and may enable you to adjust your investment strategy suitably.

Table 2 summarises the impact of some economic indicators on the stock market.

5.2.1.2 Industry analysis

The second phase of fundamental analysis consists of a detailed analysis of a specific industry; its characteristics, its past record, its present state and future prospects. The purpose of industry analysis is to identify those industries
which are likely to grow in future, and to invest in the equity shares of companies selected from such industries.

Every industry (and every company in a given industry) usually goes through a life-cycle with four distinct phases: (a) pioneering stage, (b) expansion stage, (c) stagnation stage, and (d) declining stage. An investor would be benefited by investing in an industry only in its pioneering expansion stages. One should quickly get out of industries which have reached the stagnation stage, and before they lapse into decline. The particular phase of an industry can be understood in terms of its sales (volume and value) and profitability. [Aggarwal 1985]
Industries which my be doing well today may in future, face stagnation and decline as a result of changes in social habits (e.g., the cigarette industry is bound to suffer with increasing emphasis on the health hazards of smoking), or from changes in statutory controls (e.g., the prohibition), or from the emergence of excess capacity and consequent cut-throat competition (e.g., polyester), or as a result of rising prices (e.g., the Indian refrigerator and air-conditioning industries are out-priced for vast segments of the domestic market largely from heavy excise imports). For an investor, these analytical insights into the various industries are necessary.

The method of evaluation of the Industry should encompass four critical areas:

(i) What are the strength of the industry ?
(ii) What are its vulnerabilities ?
(iii) What are the opportunities available to it?
(iv) What are the threats faced by it ?

Such a comprehensive analysis is not going to be a simple exercise. The investor should evaluate the industry with the help of financial and non-financial data he may have access to.

5.2.1.3 Company analysis

Many investors find that though a particular industry may be doing very well, certain companies in that industry may not be in good shape. Hence selecting the individual companies for investment in a given industry is equally important.

There are two major components of company analysis Financial and non-financial. A good analyst tries to give
balanced weightage to both these aspects. Overemphasis on either may lead to a distorted analysis.

**Non-financial aspects:** Many non-financial aspects of the company should be evaluated by an investor. The non-financial factors are listed in Table 3.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Review Questions</th>
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<tbody>
<tr>
<td>History, promoters and management</td>
<td>How old is the company?</td>
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<td></td>
<td>Who are the promoters?</td>
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<td></td>
<td>Is it family managed or professionally managed?</td>
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<td></td>
<td>What is the public image and reputation of the company, its promoters and its products?</td>
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<td>Technology, facilities and production</td>
<td>Does the company use relevant technology?</td>
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<td>Is there any foreign collaboration?</td>
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<td></td>
<td>Where is the Unit located?</td>
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<td></td>
<td>Are the production facilities well balanced?</td>
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<td></td>
<td>Is the size the right economic size?</td>
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<td></td>
<td>What are the production trends?</td>
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<td></td>
<td>What is the raw material position?</td>
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<td></td>
<td>Is the process power-intensive?</td>
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<td></td>
<td>Are there adequate arrangements?</td>
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<tr>
<td>Product range, marketing selling and distribution</td>
<td>What is the company's product range?</td>
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<td></td>
<td>Are there any cash cows among the products?</td>
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<td>How effective is the market network?</td>
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<td>What is the brand image of the products?</td>
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<td></td>
<td>What is the market share enjoyed by the products in the relevant segments?</td>
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<tr>
<td></td>
<td>What are the effects and costs of sales promotion and distribution?</td>
</tr>
</tbody>
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Industrial relations, How important is the labor productivity and personnel? What is the worker productivity? How is the labor situation in general?

Environment Are there any statutory controls on production, price, distribution, raw materials etc.? Are there any major legal constraints?

History of the company, Promoters and Managements, Technology, Production, Marketing, Environment (statutory controls), Industrial Relations and Sales, Personnel etc.

Equity analyst attaches great importance to the following ratios in financial analysis:

**Earning per share (EPS):** This indicates the post-tax profits earned per share. The higher the better.

\[
EPS = \frac{\text{profit after tax}}{\text{No. of equity shares}}
\]

Price-earning ratio (P/E ratio): This ratio indicates the relationship between the market price of the share and the earnings per share. Whether a particular company's P/E ratio is high or low may be understood with reference to the All-Industry average, and also with reference to the specific average.

\[
\text{Price-Earning Ratio} = \frac{\text{Market Price of the share}}{\text{Earnings per share}}
\]

**Book value per share:** This ratio indicates the asset-backing available of each share. The higher, the better.
Book value per share = Shareholders' funds + reserves / No. of Equity Shares

Return on net worth = this indicates the post-tax return on the shareholder's funds. The higher the better.

Return on net worth = Profit after tax / Shareholders' funds X 100

Dividend cover: This indicates the extent to which the equity dividends are protected by the earnings. The higher the better.

Earnings per share / Dividend per share

Profitability of sales: This indicates the profitability or otherwise of the sales. The higher this ratio, the better the profitability.

Profitability of sales = Profit before tax / sales X 100

Debt-equity ratio: Debt (i.e., loans) is measured as a percentage of equity (i.e., the shareholders' funds). The lower the ratio, the better.

Debt-Equity ratio = Loans / Shareholders' funds X 100

5.3 Technical Analysis

Technical analysis deals with the factors of supply of, and demand for shares. Technical analysis is market oriented. A true technical analyst is not worried about the company's
assets, turnover, dividends, reserves, product, or even its name. He looks only at the market situation for the company to decide about investing in it.

According to the technical analyst all such relevant factors, which affect the market, get reflected in the volume of stock exchange transaction, and the level of share prices.

The basic assumptions underlying technical analysis are:

a) Market value is determined solely by the interaction of supply of, and demand for shares.

b) Supply and demand are governed by many rational and irrational factors.

A technical analyst game plans are simple:

• If the market price is raising, BUY.
• If the market price is going down, SELL.
• If the market price is steady, WAIT.

Some technical indicators:

There are many tools and indicators used to understand and interpret the market position as a whole, and also individual scripts. Some of them are:

Market averages: The patterns of the market averages like BSE (Bombay Stock Exchange) sensitive index, BSE National index, etc, are studied to obtain clues for future action.

Trading volume: The figure relating to trading volumes are studied to assess the price pressure created by high trading
volume or low trading volume. If price rise is accompanied by a trading volume, it is sure sign of upsurge in demand.

c) Short interest: This indicates the total number of shares sold short. Short selling takes place when prices are expected to decline in a later period. When the market booms, short selling diminishes.

d) Irregular prediction tools: There are some other methods which are used for predicting the market. They are understood as irregular prediction tools. These include the following:

- Fricas go up on Friday because all leading open-ended mutual funds calculate Net Asset Value as on Friday.
- Prices usually go down in February every year from budget fears.
- Prices are pulled down on March 31 every year as that being the valuation date for Wealth tax purpose.
- Prices are depressed before general elections.

Cra has to go through a great deal of trial and error before he can develop reasonable interpretative skills.

To arrive at accurate results one has to do the fundamental as well the technical analysis.

5.4 Advantages of Equity Investment

There are many advantages of investing in equity shares of well managed and successful companies. The most important of these are:
5.4.1 Capital Appreciation

Equity shares of good companies appreciate in value and act as a partial hedge against inflation. Consequently the purchasing power of your investment in such shares is generally protected to a great extent.

Bonus shares: Successful companies frequently issue bonus shares, subject to guidelines issued by the Controller of Capital Issues from time to time. After bonus shares are issued, shareholders are entitled to dividends not only on the original shares but on the bonus shares as well.

Annual dividends: All reasonably profitable companies try to maintain a steady rate of dividends. In fact, many of them declare interim dividends as well.

Rights shares: When a company wants to issue new equity shares, these must be first offered to the existing shareholders on a pro-rata basis, unless the existing shareholders agree to give up this right. Such shares are known as "Rights Shares". This right to further shares can be sold in the market. So shareholders who do not wish to subscribe for further shares can sell their rights at a profit, if there is a good demand for them.

Voting rights: As an owner of the company, an equity shareholder, enjoys voting rights in the general meeting of the company.

As a pledge: Equity shares of the selected companies can be pledged as security to raise loans from banks and other financial institutions.
Tax benefits: Under section SOL of the Income Tax Act, dividends on shares of Indian companies are exempt from income tax up to Rs. 10,000 per year. Also tax relief is available for investments in certain new company shares under Section 80CC/83A of the Income Tax Act.

Marketability: Listed equity shares which are actively traded and quoted on stock exchanges can be sold without difficulty. Whenever you want money, you can ring up your broker and dispose of the shares at or around the prevailing market prices. There are now 19 stock exchanges in India: Ahmedabad, Bangalore, Baroda, Bhubaneshwar, Bombay, Calcutta, Cochin, Delhi, Gauhati, Hyderabad, Indore, Jaipur, Kanpur, Ludhiana, Madras, Mangalore, Patna, Pune and Rajkot. However not all the shares which are listed are actively traded.

While all these advantages are tempting, there are some attendant problems as well.

5.4.2 Problems of Investing in Equity Shares

Changing market values: The market values of actively traded equity shares seldom remain constant. They keep fluctuating; some moderately, but other violently. These fluctuations in the market prices are likely to cause anxiety and discomfort for the amateur investor.

Need for constant watch: Equity investment is not a one-shot affair, it demands your continuing involvement. You have to keep constant: watch on the environmental factors such as the industry's prospects, the company's performance, etc. Some times it can be more preoccupying than a fulltime job.

Criticability of timing: Since timing is critical both while buying or selling shares you have always to be alert. If you
miss a good right opportunity once, you may have to wait for a long time for the next one.

Uncertainty of government policies: Consistency has never been a strong point with our government. Uncertain changing policies of the policies of companies, which in turn, affects the shareholders. A change in the government of course leads to considerable changes in policies.

5.5 A Framework for Analysis and Decisions

![Diagram of Investment Analysis and Decisions - A Framework](image-url)
Let us understand the type of decisions you have to make in equity investments.

5.5.1 Macro Decisions

a) Whether it is an opportune time for equity investment. There are booms and slumps in the market. Ideally one should invest at the end of a slump and quit before the end of a boom, as shown in the Figure 2.

To understand these stock market cycles, which are interlinked with the business cycles, an appreciation of important macro-economic factors which have a bearing on the stock market is necessary.

b) Whether a particular industry (or industries) is right for investment or not at a given point of time. There are certain sunrise industries (e.g., electronics) and
some sunset industries (e.g., Jute). There are high-tech industries (e.g., instrumentation) and low-tech industries (e.g., solvent extraction). There are capital intensive industries (e.g., petrochemicals) and labour intensive industries (e.g., textiles). Thus industries can be classified into several types. Each industry goes through a certain life cycle from a small beginning to massive growth to stagnation to eventual decline.

A good insight into these broad industry aspects, will help choose the right type of industry for investment at an opportune time.

5.5.2 Micro Decisions

The micro decisions relating to equity investments deal with three issues whether one is talking about existing companies or new ones.

a) Selection of a specific company: All companies—in any particular industry you choose for investment—are obviously not equally good. You have to choose the right company or companies based both on financial criteria (based on balance sheet analysis and also non-financial reasons, such as management reputation, past track record, future plans, etc.

b) Deciding on the right price: Having chosen a company, you then need to decide whether its share is attractive at the prevailing price. Is it overpriced, Is it underpriced, or Is the price just right? Whether a price is right or not essentially depends not so much on a company's asset base but upon its earning power. If the earnings are good, and growing, a high price may be justified; otherwise not.
c) **Deciding on the right time:** The next aspect is the timing of your investment; i.e., Is it the right time to buy a particular share: In a way, the time and price issues are interlinked and may be examined together. A good understanding of charts of share price movement may help in timing your purchase. Obviously, one should not buy if the price is likely to go down in the near future; similarly, one should not sell if the price is likely to go up.

5.5.3 Disinvestment Decisions

Stock market profits are illusory until you sell your shares and book the gains. You must disinvest periodically. The disinvestment process is the mirror-image of an investment decision. All you have to do is to apply all the investment principles in reverse.

5.5.4 Portfolio Decisions

Prudent investors never put all their money in just one or two shares, because the risk of such a concentration is too high. On the other hand, if you diversify too much, the average performance of your portfolio will be mediocre. Hence you have to strike a proper balance between non-diversification and excessive diversification. Also, the portfolio should be reviewed periodically, shuffled whenever necessary, and otherwise properly managed.

We will now apply the investment analysis and decision paradigm (Figure 1) on equity analysis of cement industry.
5.6 An Example

It is amply clear from the discussion presented above that decision making in this activity is a very complicated process. To aid the decision maker help of computers is necessary. Over present system that draws from the latest advances in AI such as NN is expected to make the decision making process more effective.

To illustrate the performance of our system, cement industry has been chosen. We have analyzed different aspects of cement industry based on various methods enumerated earlier. We have derived rules. Information about six leading cement companies, ACC Cement, Ramco Cement, Rayalseema Cement, Panyam Cement, Kakatiya Cement and Coramandal Cement has been fed into the system. Figures 3 and 4 illustrate in a capsulated form different types of analysis used in formulating the rules.

![Diagram](image)

Figure 3. Selecting the industry segment.

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The following parameters were considered for the analysis of the above cement companies.

**Stock market parameters:**

a) P.E. ratio  
b) Market price  
c) Earning per share  
d) Profit after taxes
Balance sheet:

a) Reserves  
b) Assets  
c) Net asset value (NAV)  
d) Liabilities  
e) Promoter's contribution

Expenditure for production:

a) Raw material cost  
b) Labour cost  
c) Power cost

Production problems:

a) Technology related problems  
b) Labour problems  
c) Power problems  
d) Raw material problems

Demand for the product:

a) Brand image  
b) Price  
c) Transport Cost

Company's image:

a) Management  
b) Brand Image

Based on the analysis a Knowledge Base was built. Some sample rules are given below:
Rules to Grade Production

rulep1:

if company has labor problems
    and raw_material problems are intense or they exist or do not exist
    and power problem are intense or exist or do not exist
    and company's technology advances are high
then
    company's production is high

rulep2:

if company has labor problems
    and raw_material problems are intense or they exist or do not exist
    and power problem are intense or exist or do not exist
    and company's technology advances are normal
then
    company's production is low

rulep3:

if company has no labor problems
    and has no raw_material problems
    and has no power problems
    and company's technology advances are normal
then
    company's production is high
rulep4:  
if company has no labor problems  
and has no raw_material problems  
and has no power problems  
and company's technology advances are high  
then  

cOMPANY'S production is very high

rulep5:  
if company has no labor problems  
and has no raw_material problems  
and power problems are intense  
and company's technology advances are high  
then  

cOMPANY'S production is high

rulep6:  
if company has no labor problems  
and has ok raw_material problems  
and power problem are intense or exist or do not exist  
and company's technology advances are either high or normal  
then  

cOMPANY'S production is ok

rulep7:  
if company has intense or normal labor problems or does not have labor problems  
and intense raw_material problems  
and power problem are intense or exist or do not exist  
and company's technology advances are high or normal  
then  

cOMPANY'S production is low
rulep8:
if company has labor problems
    and has normal raw_material problems
    and power problem are intense or exist or do not exist
    and company's technology advances are high
then
    company's production is ok

rulep9:
if company has labor problems
    and has normal raw_material problems
    and power problem are intense or exist or do not exist
    and company's technology advances are normal
then
    company's production is low

rulep10:
if company has no labor problems
    and has normal raw_material problems
    and has intense or normal power problems
    and company's technology advances are high or normal
then
    company's production is low