

Mentored-Research

Equity Research Module

Handbook

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Investment Research and the Equity Research Initiative

Sophisticated investors (individual people as well as institutions such as pension funds) account for but a fraction of the world's human population, but represent trillions of dollars in investable funds that they park in the various **asset classes** – cash and cash equivalents, fixed interest securities such as bonds, stocks, real estate, commodities, currencies, and derivatives, among others.

Assets are anything that expose the buyer to a potential future pay-off (typically cash inflows) in exchange for a present day pay-out (typically a cash outflow)

An asset class is a group of assets that exhibit similar characteristics, behave similarly in the marketplace, and are subject to the same laws and regulations

The purpose of investment research is to help these investors decide which asset class, and which particular asset within that class, would make a 'good' investment. Now, the definition of a 'good' investment varies based on the risk appetite and financial goals of the investor. A typical pension fund, for example, has capital appreciation goals that are far more modest than a speculative hedge fund; it is more desirous of ensuring that its capital is preserved. This means that a complex and volatile derivative security which routinely experiences large swings in value may be perfect for the hedge fund, but a terrible investment for the pension fund. Client-focused investment research always takes this into account when recommending investments to the concerned client.

In equity research, which is basically a sub-set of investment research, the universe of assets is limited to stocks, which represent ownership in a company. There are two types of professionals in this field – buy-side analysts, who work for money management firms and present stock pitches to portfolio managers, and sell-side analysts, who work at brokerages and independent equity research firms, and whose mandate it is to churn out coverage initiation and update reports on the various stocks they follow. The buy-side analyst's research is available only to employees within their firm, and the analysts themselves are typically compensated based on the performance of their recommendations. The sell-side analyst's recommendations and reports, on the other hand, are meant for their firm's clients; the outlines of their reports are also often disseminated to the general investing public by the financial press.

A much debated topic in the domain of high finance is the conflict of interest that sell-side analysts who work at brokerage firms are exposed to. A lot of sell-side research divisions are cost centers, i.e., they cost their firm more (in terms of wages paid etc.) than the revenues they earn for their firm on the sale of research reports. Why then would a brokerage firm continue to support its research division? The reason is that research analysts known to be experts in the sector(s) they cover influence the trading volumes of stocks in that sector

If a highly respected oil & gas analyst were to change ONGC's rating from 'buy' to 'sell', there would be a mad rush among institutional and retail investors to dump ONGC stock, driving the market price down. It is easy to see how this frenzy would result in increased brokerage business for the

analyst's firm, since brokers are paid commissions on every trade they participate in. Now, all that is left is for the brokerage firm to promise its analyst a bonus based on the brokerage fees he/she generates (indirectly) for it, and behold! The analyst's research is neither 'independent' nor 'objective' any longer

The goal of the equity research program is to expose you, the student, to the work of a sell-side analyst. You will be assigned a company shortly, if you have not already been assigned one, and, over the next six-eight weeks, you will understand its business model, read its financial statements, use ratio analysis techniques to compare its financial performance with those of its closest comparable peers (which you must select), value it using both intrinsic and relative valuation approaches, and finally, prepare a complete equity research report on it with a recommendation to 'BUY', 'SELL', or 'HOLD' its stock at the current share price. Our student mentors, all of who have successfully completed this program in the past, will be your guides through this undertaking.

We are sure you can't wait to begin!

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What is a Company?

A **Company** is a voluntary association formed and organized to carry on a business. It is a legal entity that has its own property; the members (shareholders) cannot claim the property of the company as their own property. The liability of the members (shareholders) of the company is limited to the amount of shares they hold.

A company is primarily of two types:

Public Limited Company:

- a. A company that is permitted to sell its **shares** to the general public. It is also referred to as a "publicly-traded company." A public company is a company with securities (equity and debt) owned and traded by the general public through the public capital markets. "**Shares**" of a public company are openly traded and widely distributed.
- b. A "**Share**" is a unit of ownership that represents an equal proportion of a company's capital. It entitles its holder (the shareholder) to an equal claim on the company's profits and an equal obligation for the company's debts and losses. In the past, shareholders received a physical paper stock certificate that indicated that they owned "x" shares in a company. Today, brokerages have electronic records that show ownership details. Owning a "paperless" share makes conducting trades a simpler and more streamlined process. Shares of a company are easily transferable.

- c. In a public company, the ownership is shared between the shareholders, including the board, management and public shareholders. A *public company* is able to raise substantial amounts of capital in the public capital markets, trading ownership shares as well as control of the company. At the same time, public companies are subject to higher levels of costly reporting, regulations, and public scrutiny. For example, publicly traded companies must publish annual reports and disclose detailed information about its finances and business activities, including proprietary information that may help competitors. In addition, changes within the company, such as the capital structure of the company, need to be approved by the shareholders.
- d. The art of determining the true value (intrinsic value) of the share of a publicly listed company is called **Equity research**. These shares trade on various stock markets such as the New York Stock Exchange, National Stock Exchange, Bombay Stock Exchange, NASDAQ, etc. Equity research analysts are usually employed by financial firms that have equity research departments made up of numerous analysts, each of which focuses on being an "expert" on a particular industry.
- e. **On a daily basis, equity research analysts closely "follow"**, or monitor the shares that fall under their purview. Throughout the duration of the program, the ERI participant is expected to follow his/her company so as to be able to make correct assumption while valuing the share of his/her company. In addition to just monitoring current events with companies, equity research analysts typically write equity research reports, which explain and analyze what a company's business is. As part of that analysis, the analyst will "model" the company's financial statements. To create the model, the participants will use Microsoft Excel, which is a

spreadsheet program that allows for easy calculation of numerous equations, some of which could be very complex.

Private Company:

- a. Shares of private companies are offered, owned and traded privately among interested investors. The ownership of private companies is limited to a relatively small number of investors. Though private companies come in all sizes, a vast majority of private companies are small businesses. Investors in private companies tend to be those who are closest to the founders: family, friends, colleagues, employees and angel investors. If a small private company needs to raise outside money to grow, the next round of financing often comes from venture capital (VC) firms who specialize in providing capital for high-risk, high-reward opportunities. If a private company is able to grow large enough, it may eventually decide to "go public," meaning it issues shares via an initial public offering (IPO) and shares are then traded on public stock exchanges.
- b. The reverse process can happen if an investor wants to "take a company private." In that scenario, a large investor, usually a private equity (PE) firm buys a large portion of the outstanding shares of stock and then tells the stock exchange on which the company's shares are listed that the shares will be delisted at some future point in time.
- c. Owners of *private companies* are entitled to profits and dividends, just like the owners of public companies, but there are some major differences between being a shareholder in a private company versus being a shareholder in a public company. First, shares of private

companies are often **illiquid**, meaning it may take a lot of effort to find buyers or sellers of a private company's stock. This becomes extremely important if an owner wants to exit and cash out his or her shares. Often times, figuring out the price of the shares becomes a one-on-one bargaining exercise with the person who wants to buy the stock. For this reason, coming up with a correct valuation of a private company is much more challenging than for a public company. Because shares don't trade very often, it's difficult to determine how much a private company is worth at any given point in time.

- d. Finally, because its shares are not available to the public, a private company's financial position and operation is less transparent, with the trade-off being that the private company is not exposed to as much government or regulatory interference.
- e. Certain companies stay private as a matter of choice. They tend to be more entrepreneurial because their management has greater leeway to make decisions without the public or regulators looking over their shoulders. However, this freedom also means that private companies can be riskier operations than their publicly traded counterparts because they're subject to less oversight.

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Broad Approaches of Analyzing Share Price Movement

The methods used to analyze securities and make investment decisions fall into two very broad categories: fundamental analysis and technical analysis.

Technical Analysis and Fundamental Analysis

Technical Analysis is a method of evaluating shares 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.

Fundamental analysis on the other hand, is a technique that attempts to determine a share's value by focusing on underlying factors that affect a company's *actual* business and its future prospects. On a broader scope, you can perform fundamental analysis on industries or the economy as a whole. The term simply refers to the analysis of the economic well-being of a financial entity as opposed to only its price movements.

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Differences between the two approaches¹

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.

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

¹ Article borrowed from Investopedia

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 fundamental analyst 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 than 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.

Understanding Financial Statements

Every company listed on a major stock exchange must prepare financial statements in accordance with some standard, examples of which include US Generally Accepted Accounting Principles, or GAAP, and the International Financial Reporting Standard, or IFRS. To someone who knows how to read them, these financial statements are a treasure trove of information about the company's financial position. The technique most popularly used to analyze the information extracted from financial statements is **ratio analysis**, which we shall cover shortly. You can take a look at the spreadsheet accompanying the handbook to understand the structure of the three most important financial statements- the income statement, the balance sheet, and the cash flow statement - but first, we run through the line items you are likely to see in each.

The Income Statement

Also called the 'profit and loss account', this financial statement reports the financial performance of the firm over a period of time, usually a year. It typically contains the following line items:

Revenues

"Revenues" is just a fancy term for "Total Sales". It is the aggregate of all the sales of the company's products or services that have been achieved through the year. For example, Apple's revenue for the year 2010 would basically be the sum of the retail prices of all the iPods, iPhones, iPads, MacBooks, etc. that Apple sold over that year.

Cost of Goods Sold (COGS)

This line item aggregates the manufacturing costs of the products sold during the period under consideration. The key components of COGS include cost of raw materials and supplies used, wages of employees involved in manufacturing, and overhead costs allocable specifically to production. For a service-based company, such as a management consultancy, COGS would be the salaries of all the consultants that performed services for clients during the year.

It is worthwhile to remember that while there are occasions when the cost of goods sold may be identified with the exact item sold, it is not always, or even often possible. In cases where exact identification is not unfeasible, a convention is used to make assumptions about which items were sold, and this practice is referred to as making a cost flow assumption. Examples of conventions are First-In-First-Out, or FIFO, which assumes that the first products to be manufactured were also the first to be sold, and Last-In-First-Out, or LIFO, which assumes that the last products to be manufactured were the first to be sold. The effects of different cost flow assumptions on a company's financial statements will be discussed in more detail later.

Gross Profits

This is simply revenues less COGS. Dividing this line item by revenues gives you the Gross Profit Margin, which is a measure of the premium the company is selling its products at. Companies selling differentiated products are likely to have a higher gross profit margin than companies competing on the basis of cost leadership.

Selling, General, and Administrative Expenses (SG&A)

Selling expenses represent the costs of selling the product – salaries of salespeople, commissions and travel expenses, advertising costs, shipping costs, etc.

General & Administrative expenses represent costs of managing the business, and include the salaries of company executives, legal & professional fees, cost of office supplies, etc.

Earnings before Interest, Tax, Depreciation, and Amortization (EBITDA)

EBITDA is gross profits less SG&A. As with gross profit, dividing EBITDA by revenues gives the EBITDA margin, which is a good proxy for the general profitability of a company.

Depreciation & Amortization

When a company buys an asset, either tangible, like manufacturing plants and equipment, or intangible, like patents, it pays the seller the current market price of the asset. Over the years, however, the asset loses value – the company can no longer sell the asset after a few years at the same price it bought it for. Depreciation (for tangible assets) and Amortization (for intangible ones) are the line items that account for this decrease in asset value with time. A depreciation/amortization schedule is assigned to it, and the drop in value of the asset each year is determined by that schedule.

For example, if a just-established manufacturing company buys a brand new lathe machine for \$1,000 today, and decides to depreciate it using the straight-line method over the next 5 years, and also decides that the salvage value of the lathe machine, which is what the company thinks the machine will sell for at the end of the depreciation period, is \$0, then the asset depreciates in value by \$200 each year for the depreciation period of 5 years. The D&A account on the company's income statement will thus be \$200 for the next five years, assuming no other depreciable assets are bought.

If some other depreciable asset is indeed bought before the first one is fully depreciated, then the D&A line item for any year will reflect the sum of the individual assets' D&A for that year.

Earnings before Interest & Tax (EBIT)

EBIT is EBITDA less D&A. You're probably getting used to this by now...

Net Interest Expense

Most companies have debt outstanding, which means they must pay the holders of their debt interest every year. They also have cash sitting in the bank and earning interest. These interest payments are netted against each other, and the net interest expense for the year is arrived at.

In the usual case, interest rate to be paid on debt is higher than interest being earned on cash, and net interest expense is positive (it is an expense, and so must be subtracted from EBIT to arrive at PBT).

Profit before Tax (PBT)

PBT, which equals EBIT less net interest expense, is a generally useless line item. It might just come in useful if you're looking at an already prepared income statement – you can then calculate the company's effective tax rate quickly and easily as income tax expense divided by profit before tax.

Income Tax Expense

The income tax expense for companies is calculated in a manner similar to that for individuals – according to income tax slabs.

Reported Profit after Tax (PAT)

The last item on the income statement that is related to the company's continuing business operations. It is equal to PBT less income tax expense. Dividing it by the number of shares outstanding gives the Earnings per Share (EPS), which represents the fraction of the company's profits for the year that belong to a shareholder with one share.

Dividends

Unlike debt holders, shareholders are not legally entitled to fixed payments every year. Their returns are through share price appreciation, and the issue of dividends. Normally, a company pays out a certain amount of its yearly profits as dividends to keep shareholders happy, and stops paying those dividends if it is need of that extra cash. Companies cannot antagonize shareholders too much, however, since that much lead to the dumping of the company's shares in the market, causing the company's stock price to take a dive. In some (unusual) cases, companies have taken on additional debt just in order to keep paying dividendsand prevent that from happening.

Retained Earnings

Profits not distributed as dividends are termed 'retained earnings' for the year, and represent the money that the company is plowing back into itself to fuel future growth.

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Balance sheet

A balance sheet, or statement of financial position, is a summary listing of the assets, liabilities, and shareholders' equity of a company as of a specific date. The most important line items in the balance sheet are presented here:

Current assets

As defined earlier in this handbook, assets are a firm's economic resources, and represent probable future economic benefits (such as cash inflows) to the firm. If all of these future benefits are expected to accrue within a year, the asset is termed a current asset

Cash & cash equivalents

These are the most liquid assets found within the asset portion of a company's balance sheet. Cash equivalents are assets that are readily convertible into cash, such as money market instruments, treasury bills, and commercial paper. Cash equivalents typically have maturity period of less than 3 months, as opposed to short term investments, which have maturity periods ranging from 3 to 12 months, and long term investments, which have maturity periods of over a year

Inventory

'Inventory' refers to unsold goods that represent a probable future economic benefit since they can be sold at any time, i.e., they are ready to be sold immediately. Inventory can arise either as a result of production from raw materials, or direct acquisition from suppliers. In the financial statements, inventory is tied to COGS and purchases from suppliers through the following formula:

$$\text{Beginning inventory} + \text{purchases from suppliers} - \text{COGS} = \text{Ending inventory}$$

While finding the amount of purchases from suppliers is straightforward, the COGS, beginning-, & ending-inventory line items all depend on the cost flow assumptions of the company as mentioned previously in this handbook.

An example will make this clearer:

Let's say I have just set up a new retail outlet to sell bicycles, and bicycles alone. At the beginning of the year, I have nothing with me, so my beginning inventory is \$0. I then purchase 1 bicycle from a supplier for \$100, and, two months later, another for \$200. Let's also assume that, through the year, I only manage to sell one bicycle for \$150. This \$150 becomes my revenue for the year.

Now, had I been using the FIFO cost flow assumption, I would assume that the bicycle I sold was the first one I bought, and therefore, COGS would be \$100. This would leave me with a profit of gross profit of \$50, and ending inventory of \$200, at year-end. But, if I had been using LIFO, my books would show a gross profit of (-) \$50, and ending inventory of \$100.

Accounts Receivable (A/R)

In business, an established way for companies to increase sales is to extend credit to their customers/clients. The accounts receivable line item in companies' balance sheets represents the aggregate of the money owed them by their customers. So, when a sale is made, but the customer does not pay the cash up front, the company's accounts receivable increases by the price of the product just sold, rather than the company's cash balance. When, eventually, the customer does

cough up the cash, accounts receivable is converted to cash – the former decreases while the latter increases by the same amount.

Prepaid expenses

Some costs, such as rent, electricity bills, etc. can be estimated to a reasonable degree of certainty. Some companies choose to pay large advances that cover multiple periods of cost. For example, if I pay a year of office rent in advance, I can enjoy the present and future benefits (11 months' office space) without the costs (which have already been incurred in the past). This makes prepaid expenses an asset. Since very few companies would pre-pay for periods exceeding a year in duration, this line-item is almost always a current asset.

Non-current assets

Also referred to as “fixed assets”, this set of line items describes assets that cannot easily be converted into cash, that cannot usually be sold directly to the firm's end-customers, and that give probable economic benefits which extend beyond a year from the date of purchase.

Gross Fixed Assets (Property, Plant, & Equipment)

Property, Plant, & Equipment (PP&E) refer to items of value - such as land and buildings, motor vehicles, furniture, office equipment, computers, and plant and machinery - that will be used over an extended period of time. This line item represents the value of these items at the time of purchase of each. If a company were to buy a lathe machine for \$100 at the beginning of one year, and another for \$200 exactly two years later, its gross fixed assets line item immediately after the purchase (end of year 2 – beginning of year 3) would read \$300

Accumulated Depreciation

The sum of the depreciated amounts of all the company's assets is equal to accumulated depreciation

Net Fixed Assets

Net fixed assets is gross fixed assets less accumulated depreciation

Investments

This line item represents the company's investments in other companies, where a non-controlling stake of less than 50% is held

Intangible assets

These are defined as identifiable non-monetary assets that cannot be seen, touched, or physically measured, but which are created through time and effort. There are two primary forms of intangibles – legal (trade secrets, copyrights, patents, trademarks) and competitive (know-how, goodwill). Legal intangibles are also known under the generic term 'intellectual property'

Current Liabilities

Liabilities have already been defined previously as obligations arising from past transactions that resulted in a cash inflow or other economic benefit. Current liabilities, like current assets, have obligations coming due within 12 months of the originating transaction

Accounts Payable (A/P)

A/P is the exact opposite of A/R – it is the amount owed by the company to its suppliers due to the purchase of raw materials etc. on credit

Unearned revenues

These are accrued by a company when a customer pays for a product or service in advance of the product being delivered or the service being rendered. Only when the product is finally delivered (or service rendered), can the company reduce its unearned revenue account and increase its revenues

Net Current Assets

Some balance sheet formats net current assets against current liabilities to obtain net current assets, which is placed in the asset section of the balance sheet

Shareholders' Equity

Equal to the firm's total assets less total liabilities, the shareholders' equity line item represents the combined net worth of all the owners (shareholders) of the firm

Share Capital

These are the funds raised by issuing shares in the company in exchange for cash. The amount of share capital a company reports on its balance sheet only accounts for the initial amount for which the original shareholders purchased the shares during its IPO. Subsequent changes in stock price as a result of transactions in the secondary market are not included.

Preferred Stock

This is the dollar value of the preferred stock issued by the firm over its lifetime

Accumulated Retained Earnings

Like accumulated D&A, this line item is self-explanatory

The fundamental balance sheet equation: “assets = liabilities + equity” always holds. Here’s an easier way to understand this equation: think of liabilities and owner’s equity as **sources of funds**, and assets as the **application of funds**. For a firm to start generating money, it must own some assets. At the very initial stage, the capital needed to buy these assets comes from the owner’s personal savings, and becomes the owner’s equity in the company. Later, the company may choose to issue debt (a liability) in order to finance the purchase of more assets. The debt capital thus raised goes to the liabilities part of the balance sheet.

Note: There are 2 distinct ways that a company can present its Balance Sheet.

- 1) The term current liabilities are mentioned under liabilities, of the liabilities and equity half of the balance sheet.
- 2) The current liabilities are not mentioned under the liabilities and equity half of the balance sheet. Instead, the current liabilities are mentioned long with the current assets, in the assets half of the Balance sheet. Here, the term “net current assets” is defined, where net current assets = total current assets – total current liabilities. Hence, in this case, total assets are calculated using the net current assets, and not the current assets, as in the previous case.

Special attention has to be paid to the format that has been used to present the balance sheet. For example, consider the term “total assets” in Method 2. Here, though the term in the balance sheet is represented as “Total Assets”, the actual value of total assets is obtained by adding back current

liabilities to this term. Similarly, “current liabilities” should not be neglected while calculating the value of “Total Liabilities”.

Cash flow statement²

The cash flow statement, also called the **funds flow statement**, provides aggregate data regarding all cash inflows a company receives from both its ongoing operations and external investment sources, as well as all cash outflows that pay for business activities and investments during a given period. It basically is a record of the cash and cash equivalents entering and leaving the company. A detailed cash flow statement allows investors to understand where exactly the money is coming from, and how it is being spent. Like the income statement, the cash flow statement is more descriptive of financial performance than of financial position.

There are three kinds of cash flows that companies normally deal with:

- *Operating cash flows*, which include the cash effects of transactions that involve the normal business of the firm (operating activities)

Examples of operating activities

Inflows	Outflows
Cash collected from customers	Cash paid to employees and suppliers
Interest and dividends received	Cash paid for other expenses
Sale proceeds from trading securities	Acquisition of trading securities
	Interest and taxes paid

² Optional Reading Section

- *Investing cash flows*, which result from the acquisition or sale of fixed assets, subsidiaries or segments, securities, and significant investments in other firms (investing activities)

Examples of investing activities

Inflows	Outflows
Proceeds from sale of fixed assets	Acquisition of fixed assets
Proceeds from sale of debt and stock	Purchase of other companies' debt and stock
Principal repayment of loans made to others	Loans made to others

- *Financing cash flows*, which arise from the issuance or retirement of debt and equity securities and the payment of dividends to stockholders (financing activities)

Examples of financing activities

Inflows	Outflows
Principal amounts of debt issued	Principal paid on debt
Proceeds from sale of stock	Payments to re-acquire own stock
	Dividends paid to shareholders

All cash inflows and outflows for the same kind of activity are netted to arrive at **Net Cash Flow from that activity** (over the period under consideration). The three net cash flow figures thus obtained are summed to arrive at **Net Cash Flow from all activities**(over the period under consideration).

If you look at successive years' balance sheets, the difference between the cash and cash equivalents line items of the two balance sheets is equal to the Net Cash Flow from all activities over that period.

Economy, Industry & Company Analysis

Equity research and analysis begins with an attempt to understand the business and financial characteristics of a given company – the target.

There are a number of information sources that the analyst can take advantage of to begin: the ‘about’ page on the target’s website, its **quarterly & annual reports**, press releases, earnings call transcripts, corporate presentations to analysts, other analysts’ research reports, Google and Yahoo! Finance, articles on websites like [Moneycontrol](#), and subscription-based financial information services like **Capitaline**. The most important source of information, as you may have guessed, is the target’s annual report, the **MD&A**, **financial statements**, and **notes to financial statements** sections of which are required reading for every research analyst.

A simple framework for understanding the target is given below:

Business profile	Financial profile
Sector	Size
Products/Services	Profitability
Customers and End Markets	Growth Profile
Distribution Channels	Return on Investment
Geography	Credit Profile

*This framework is a starting point at best, and is by no means exhaustive

Business Profile

Sector

Sector refers to the industry or markets in which the company operates (energy, consumer products, healthcare, technology, etc.) A company's sector can further be divided into sub-sectors to facilitate business comparison. The energy sector, for example, can be divided into the oil & gas, coal, and renewable energy sub-sectors, among others.

Products/Services

Products are the commodities (crude oil, gold, wheat...) or value added goods (computers, prescription drugs, furniture...) that a company creates, produces, or refines; services (banking, logistics, transportation...) are acts or functions performed by one entity for the benefit of another.

Customers and End Markets

The term 'customers' refers to the purchasers of a company's products and services. Companies with a similar customer base tend to share similar opportunities and risks. The quantity and diversity of the customer base are also important; some companies may target a broad customer base while others target niche markets.

A company's end market is the broad underlying market into which it sells its products/services. For example, a steel manufacturer may sell into several end-markets such as automotive, construction, medical devices, etc. End markets need to be differentiated from customers – a company selling

prescription drugs may be selling to retailers or other suppliers such as hospitals as opposed to individuals.

Distribution Channels

Distribution channels are the avenues through which a company sells its products and services to the end-user. Companies selling their products to a retailer (superstore) or directly to a customer will have different distribution channel needs than those involved in wholesale distribution.

Geography

Companies' growth rates, organizational costs and structure, and potential opportunities and risks are greatly influenced by their geography as a result of variance from country to country in economic drivers, regulation, consumer buying patterns, cultural norms, etc. There are often valuation disparities in companies doing business in different countries, although not so much in truly global industries such as oil& gas and coal.

To create the business profile of a company, the following tools are utilized in the industry:

PEST Analysis – Economy Analysis

Originally known as PEST Analysis, this is a macro environmental framework used to understand the impact of the external factors on the organization and is used as strategic analytical technique. PEST stands for "**Political, Economic, Social, and Technological**" factors.

Let us examine these factors in a bit more detail.

Political Factors affects the organizations in terms of government regulations and legal issues and define both formal and informal rules under which the firm must operate. Examples are:

- Political stability
- Tax policy
- Employment and labor law
- Environmental regulations
- Trade restrictions
- Tariffs etc.

Economic factors affect the business operations and decision making of the organization. For example the predicted recession is preventing the organizations from increasing the workforce . Other examples are:

- Economic growth
- Interest rates
- Inflation rate

Social factors refer to the cultural and demographic aspects of the environment. For example increase in the health consciousness may affect the demand of the company's product. Other factor includes:

- Age distribution
- Population growth rate
- Emphasis on safety
- Career attitudes

Technological factors affect the cost and quality of the outputs. These also determine the barriers to entry and minimum efficient production level. Factors include:

- Automation
- Technology incentives
- Rate of technological change
- R&D activity

Porter's 5 Forces Analysis – Industry Analysis

This model identifies and analyzes 5 competitive forces that shape every industry, and helps determine an industry's weaknesses and strengths.

1. Competition in the industry

2. Threat of new entrants into industry

3. Power of suppliers

4. Power of buyers

5. Threat of substitute products

Five Forces Analysis assumes that there are five important forces that determine competitive power in a business situation. These are:

1. **Supplier Power:** Here you assess how easy it is for suppliers to drive up prices. This is driven by the number of suppliers of each key input, the uniqueness of their product or service, their strength and control over you, the cost of switching from one to another, and so on. The fewer the supplier choices you have, and the more you need suppliers' help, the more powerful your suppliers are.
2. **Buyer Power:** Here you ask yourself how easy it is for buyers to drive prices down. Again, this is driven by the number of buyers, the importance of each individual buyer to your business, the cost to them of switching from your products and services to those of someone else, and so on. If you deal with few, powerful buyers, then they are often able to dictate terms to you.
3. **Competitive Rivalry:** What is important here is the number and capability of your competitors. If you have many competitors, and they offer equally attractive products and services, then you'll most likely have little power in the situation, because suppliers and buyers will go elsewhere if they don't get a good deal from you. On the other hand, if no-one else can do what you do, then you can often have tremendous strength.
4. **Threat of Substitution:** This is affected by the ability of your customers to find a different way of doing what you do – for example, if you supply a unique software product that automates an

important process, people may substitute by doing the process manually or by outsourcing it. If substitution is easy and substitution is viable, then this weakens your power.

5. **Threat of New Entry:** Power is also affected by the ability of people to enter your market. If it costs little in time or money to enter your market and compete effectively, if there are few economies of scale in place, or if you have little protection for your key technologies, then new competitors can quickly enter your market and weaken your position. If you have strong and durable barriers to entry, then you can preserve a favorable position and take fair advantage of it.

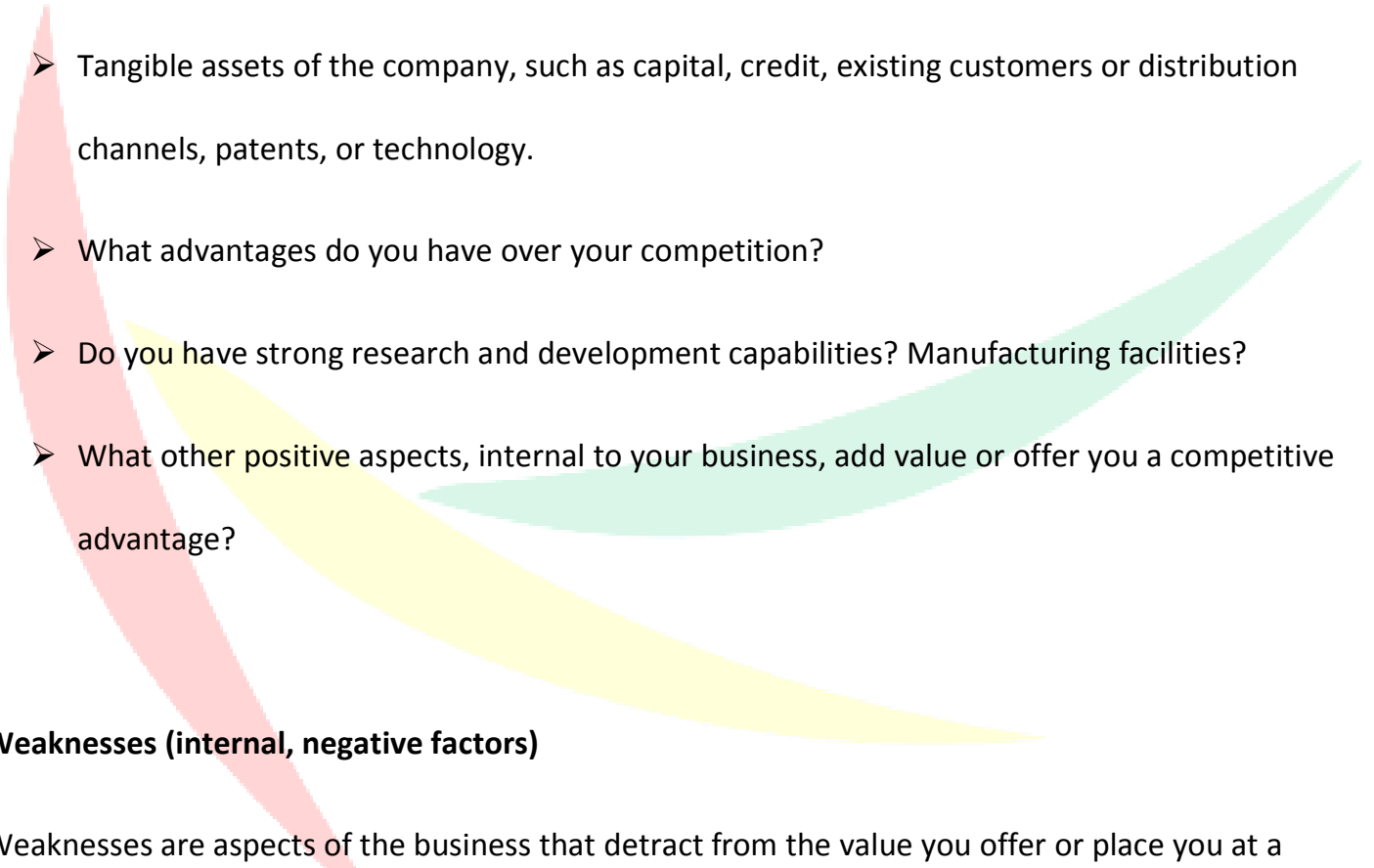
SWOT ANALYSIS – Company Analysis

S.W.O.T. is an acronym that stands for **Strengths, Weaknesses, Opportunities, and Threats**. A SWOT analysis is an organized list of a business's greatest strengths, weaknesses, opportunities, and threats.

Strengths and weaknesses are internal to the company (think: reputation, patents, location). You can change them over time but not without some work. Opportunities and threats are external (think: suppliers, competitors, prices)—they are out there in the market, happening whether you like it or not. You can't change them.

Strengths (*internal, positive factors*)

Strengths describe the positive attributes, tangible and intangible, internal to the organization. They are within your control.

- 
- What do you do well?
 - What internal resources do you have? Think about the following:
 - Positive attributes of people, such as knowledge, background, education, credentials, network, reputation, or skills.
 - Tangible assets of the company, such as capital, credit, existing customers or distribution channels, patents, or technology.
 - What advantages do you have over your competition?
 - Do you have strong research and development capabilities? Manufacturing facilities?
 - What other positive aspects, internal to your business, add value or offer you a competitive advantage?

Weaknesses (internal, negative factors)

Weaknesses are aspects of the business that detract from the value you offer or place you at a competitive disadvantage. You need to enhance these areas in order to compete with your best competitor.

- What factors that are within your control detract from your ability to obtain or maintain a competitive edge?
- What areas need improvement to accomplish your objectives or compete with your strongest competitor?

- What does your business lack (for example, expertise or access to skills or technology)?
- Does your business have limited resources?
- Is your business in a poor location?

Opportunities (external, positive factors)

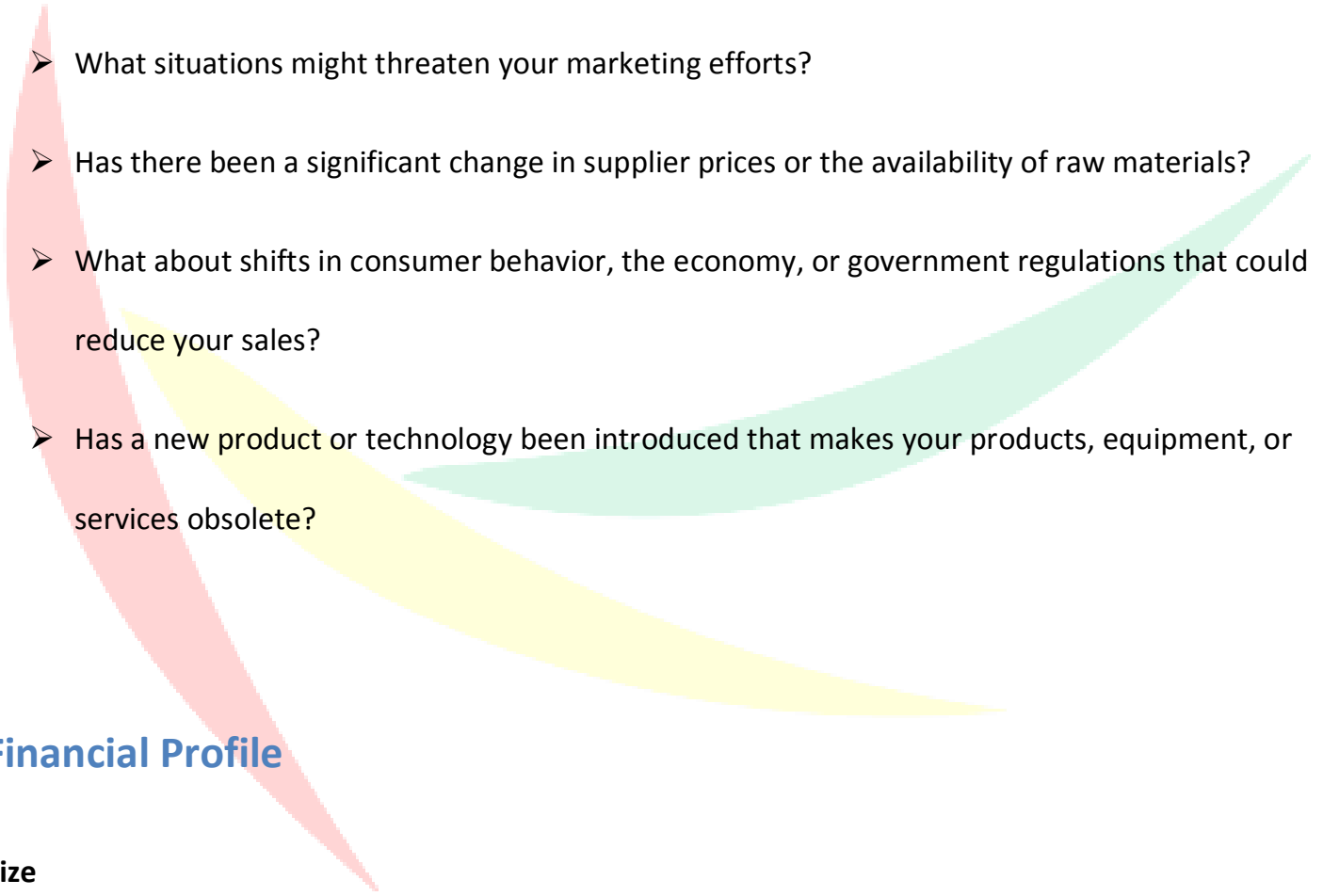
Opportunities are external attractive factors that represent reasons your business is likely to prosper.

- What opportunities exist in your market or the environment that you can benefit from?
- Is the perception of your business positive?
- Has there been recent market growth or have there been other changes in the market the create an opportunity?
- Is the opportunity ongoing, or is there just a window for it? In other words, how critical is your timing?

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Threats (external, negative factors)

Threats include external factors beyond your control that could place your strategy, or the business itself, at risk. You have no control over these, but you may benefit by having contingency plans to address them if they should occur.

- 
- Who are your existing or potential competitors?
 - What factors beyond your control could place your business at risk?
 - Are there challenges created by an unfavorable trend or development that may lead to deteriorating revenues or profits?
 - What situations might threaten your marketing efforts?
 - Has there been a significant change in supplier prices or the availability of raw materials?
 - What about shifts in consumer behavior, the economy, or government regulations that could reduce your sales?
 - Has a new product or technology been introduced that makes your products, equipment, or services obsolete?

Financial Profile

Size

A company's size is typically measured in terms of market valuation (market cap, enterprise value...) or key financial statistics (sales, EBITDA, EBIT, net income...). Companies of vastly different size tend to have different economies of scale, purchasing power, etc. and so are usually not directly compared.

Profitability

This is a measure of a company's ability to convert sales into profit. Profitability ratios generally have a measure of profitability (EBIT or operating income, net income...) in the numerator and sales in the denominator. In some sectors, profitability may be measured on a per unit basis (e.g., per ton or pound)

Growth Profile

A company's growth profile is determined by its historical and estimated future financial performance. Equity investors typically value high-growth companies higher than low-growth ones. They also discriminate in favor of organic growth and against acquisition-driven (inorganic) growth.

Return on Investment

RoI measures a company's ability to provide returns (earnings) to its capital providers (shareholders and debt holders). RoI ratios typically have a measure of profitability (EBITDA, EBIT, net income...) in the numerator and a measure of capital (invested capital, shareholders' equity, total assets...) in the denominator.

Credit Profile

This refers to a company's creditworthiness as a borrower, and is measured by metrics relating to a company's overall debt level (leverage ratios) as well as its ability to pay interest (coverage ratios). S&P, Moody's, and Fitch are the three primary credit rating agencies that provide independent assessments of a company's credit profile.

Selecting Comparable Companies

Identifying companies with similar business and financial characteristics is the foundation of comparable company analysis. This step requires a sound understanding of the business and financial profiles of the target company. At the initial stage, the analyst focuses on selecting companies with similar business profiles. An examination of the target's public competitors is the best place to begin. Google and Yahoo! Finance, Moneycontrol.com, and Capitaline all have ready lists of comparable public companies that can be used as a starting point. Companies are then added to or removed from these lists in accordance with the analyst's insight into the target's business and financial characteristics.

Generally, companies in the same sub-sector as the target, and of similar size, can be easily found and tend to serve very well as comparables. But for a target with no clear comparable, the analyst must look for businesses outside the target's core sub-sector. For example, a manufacturer of residential windows may have few or no publicly traded competitors. The analyst can then use similar-sized companies that manufacture other building products such as doors and cabinets, or companies that serve homebuilders by providing services such as roofing and decking.

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Ratio Analysis

The numbers in a company's financial statements carry very little meaning by themselves – knowing a company made \$100,000 in profits last year does not tell us how good the business is at converting resources to earnings. This is where ratios come in – they provide meaningful relationships between individual line items in the financial statements. We will restrict our use of ratio analysis to the finding of ratios that will help us evaluate five aspects of a company – its operating performance, activity levels, liquidity position, leverage, and stock valuation multiples. The most important ratios affiliated to each of these are discussed next.

A caveat: even though these select ratios can give us a great deal of info about any given company, they will not help answer the burning question of whether (or not) the company's stock is a good investment at its current share price unless they are viewed relative to two things: the historical ratios of the same company (this would be time-series ratio analysis), and the present ratios of the company's competitors (and this would be cross-sectional ratio analysis)

Operating performance

- EBITDA margin = (EBITDA/Net sales)
 - The difference between sales and operating expenses (COGS and SG&A) is EBITDA. The EBITDA margin is a measure of how much a company's revenues exceed the costs of its operations; normally, higher is better

- Net profit margin = (Net profit/Net sales)
 - The net profit margin takes all costs associated with the firm's continuing operations into account, and so tells us how much it is able to keep as profit for each dollar of sales it makes; again, higher is usually better
- Total Asset turnover = (Net sales/Total assets)
 - The asset turnover ratio tells us how many dollars of sales a company is able to generate for each dollar of assets
 - A high asset turnover is an indicator of good performance provided the company's assets are not in a state of advanced depreciation
- Return on assets = (Net profit/Total assets)
 - This ratio tells us how much profit a company is able to generate for each dollar of assets invested
 - A higher ROA is better than a lower one except in cases where the higher ROA is caused by the assets of the company being in a completely depreciated state rather than higher profit levels
- Return on equity = (Net profit/Shareholders' equity)

- ROE is a comprehensive indicator of the firm's performance because it provides an indication of how well managers are employing the funds invested by the firm's shareholders to generate returns
- Sometimes, high ROEs can be caused by the firm taking on excessive leverage, which can prove disastrous for the firm's shareholders in the long run. As with ROA, higher is not always better where ROE is concerned

Liquidity position

- Current ratio = CA/CL
 - The current ratio how well prepared the company is for an emergency in which in current liabilities become due; a current ratio of 2 or above is usually considered safe.

Leverage

- Debt to equity = $(Debt/Shareholders' \text{ equity})$
 - The most widely used measure of a company's leverage; debt to equity ratios greater than 1 indicate the company may be overleveraged, and stretching itself financially

Stock valuation multiples

- $P/E = (Share \text{ price}/Earnings \text{ per share})$

- The price-to-earnings ratio is possibly the most widely used ratio in all of finance. It tells us how many years a company will need to earn back what investors are currently paying for the stock
- It is generally high for companies considered to have huge growth potential, and low for mature ('unexciting') companies

- $P/S = \text{Share price} / (\text{Sales} / \text{No. of shares outstanding})$

- The price-to-sales (per share) ratio is more stable than the price-to-earnings ratio, and is preferred for the relative valuation of companies which are still growing and do not have positive earnings

Once these ratios have been calculated for the target company, they can be compared against those of its peers to determine the target's competitive standing within its industry

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Valuation

This section deals with what is essentially the ultimate objective behind the equity research analysis. Here, we will try to grasp the methodology that goes into finding the intrinsic value of a company's share. The intrinsic value contributes greatly to whether we give a BUY or a SELL or a HOLD call for that share.

For simplicity, assume that you own a firm called ABC Corp. All analyses carried out here on will be with reference to this company ABC Corp.

In order to estimate the intrinsic value of any share of ABC Corp. with reasonable accuracy, we have a variety of valuation models available with us. Some finance firms even devise their own customized share valuation methods. However, within the scope of this program, we are going to look at a few models and techniques that are the most widely used by equity research professionals.

These models are not artifacts of complex mathematical or empirical derivations, but are in fact, quite intuitive. In the course of this section, we will dissect these valuation models one-by-one, and then we'll attempt to address the very natural question of "When to use what?"

Before we get into the intricacies of actual Valuation, we understand the concept of Time Value of Money.

Time Value of Money

The concept of time value of money is the basics of finance, and recognition of this concept is critical

in financial decision-making. Money has time value – money available at the present time has a different worth as compared to the same amount in the past and future.

There are many factors that come into play while discussing the concept of time value of money.

Some of these include

- Risk and uncertainty – if an individual is unsure of receiving cash in the future, he would prefer to receive cash right now
- Inflation – in case of positive inflation, you can buy more with a USD 100 today than with the same note 1 year later

There are many more factors that are to important to consider to understand this concept.

In this context, we define 2 relevant mathematical terms – future value and present value.

- **Future Value:** Assume that we have some asset in hand today. The future value of this cash is the value that this asset holds sometime in the future. Presuming the asset grows at a fixed annual compound interest rate 'r':

$$FV = PV \cdot (1+r)^n$$

- **Present Value:** Similarly, say we hope to have an asset worth a certain amount 4 years from now. The present value of this asset is the value that it will hold today, growing at the annual compound interest rate 'r' so that it attains that value.

$$PV = FV / (1+r)^n$$

Types of Values

We now consider the different types of values that an asset can hold. For simplification, we consider the asset to be a share of the company ABC Corp. we discuss 2 different types of values

- **Market Value:** It is the current quoted price at which investors buy or sell the share, in the stock market. This is the price of the stock listed on the stock exchange, at a specific point in time.
- **Intrinsic Value:** This is the actual value of the share, based on its true value, including all aspects of the company – tangible and intangible.

It is not necessary for these 2 values to always be equal, i.e. the market value of a stock need not be equal to its intrinsic value. In fact, it is the difference in these 2 values that determine the investment decisions made.

Objective of Valuation

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As previously discussed, the intrinsic value and market value of the stock need not be the same.

However, an important assumption that is made is that the market value of a stock moves towards its intrinsic value, achieving it in a specific but undefined time duration.

Based on this, an analyst gives his recommendation of BUY/SELL/HOLD, by comparing the values of the intrinsic value and the market value of the stock.

- If Market Value > Intrinsic Value, then the stock is overvalued, i.e. the stock of the company should be sold
- If Market Value < Intrinsic Value, then the stock is undervalued, i.e. the stock of the company should be bought.

Valuation Methods

There are 2 different methods of valuation:

- **Discounted Cash Flow (DCF) Valuation:** This method is based on discounting, i.e. finding the present values of, the overall cash flows to either the firm or shareholder, respectively. These 2 models are:
 - Free Cash Flow to Firm (FCFF)
 - Free Cash Flow to Equity (FCFE)
- **Relative Valuation:** This involves valuing the company “relative” to industry benchmarks and peer performances

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Capital Asset Pricing Model

The Capital asset Pricing Model (CAPM) is a very important model in finance. It explains the variations in the rate of return on equity as a function of the market rate of return. It describes a linear relationship between the variables. The mathematical expression for CAPM model is:

$$R_e = R_f + \beta(R_m - R_f)$$

where

R_f : *risk free rate of return*. This is the minimum rate of return that an investor expects from any investment. For practical purposes, the yield to maturity of Government bonds, which are considered to be risk-free because of low likelihood of defaulting, is used. Hence, we use the 10-year average returns on government bonds

R_m : *market rate of return on current investments*. This is estimated by measuring the geometrical average of the historical returns of a market portfolio. For practical purposes, the value of R_m can be found on financial news websites, like www.reuters.com, etc.

$(R_m - R_f)$: *the risk premium of the investor*. This is the least return an investor should get on investing in a risky asset.

β : *volatility factor of the company's stock with respect to the market*. "Volatility factor" means that if the market goes up by 5%, and ABC's stock price goes up by 20%, the β value will be $(20/5) = 4$. Stocks with $\beta < 1$ are said to be less volatile, and the ones with $\beta > 1$ are said to be highly volatile and dynamic with respect to market changes. Mathematically, the value of beta is expressed in the following manner:

$$\beta = \text{Covariance between company return and index return} / \text{Variance in return in index}$$

From the CAPM model, we observe that the values of R_f and R_m are the same for different companies in the same country and in the market. The only company-dependent variable is β . The value of β can

be found from several data sources – yahoo finance, reuters, etc. Please ensure that the value so found is the latest data.

Relative Valuation

Relative Valuation deals with certain standard multiples and ratios, based on which we compare our company to the industry benchmarks and peers' performances. The results of analyzing the company in the light of these multiples vis-à-vis the industry helps to value the company's share. Several commonly used multiples include P/E multiple, PEG ratio, EV/Sales, EV/EBITDA, etc. Of these, the most important multiple is the P/E multiple.

P/E multiple

The P/E multiple stands for Price/Earnings multiple. Among all other ratios, it is considered the best ratio for carrying out Relative Valuation. This is because the earnings of the company is the most direct driving force of any investor's investment in the shares of the respective company.

An important assumption made to make it viable to use the P/E multiple is that the required rate of return and the growth rates of the firms are comparable.

The implication of this ratio is that if the calculated multiple is greater than the current market multiple of comparable firms, then the firm is considered to be over-valued. Similarly, if the calculated multiple is lesser than the current market multiple of comparable firms, then the firm is considered to be under-valued.

We observe that:

- Higher growth firms will have a higher PE ratio than lower growth firms
- Low-risk firms will have a higher PE ratio than high risk firms
- Firms with lower reinvestment needs will have a higher PE ratio than firms with higher reinvestment needs

Estimating the Target Price

The following steps are followed to estimate the target price of a stock:

- 1) Obtain the income statement of the company.
- 2) Forecast the sales of the company for the next 3 years.

The step of forecasting company performance can be viewed from two perspectives: the economic environment in which the company operates, and the company's own financial characteristics.

Economic forecasting

Industry analysis and competitive analysis take place within the larger context of macroeconomic analysis. As an approach to forecasting, moving from the international and national macroeconomic forecasts to industry forecasts and then to individual company and asset forecasts is known as a **top-down forecasting approach**. For example, starting with forecasts of the level of macroeconomic activity, an analyst might project overall industry sales and the market share of a company within the industry to arrive at revenue forecasts for that company.

It is also possible to aggregate individual company forecasts of analysts (possibly arrived at using various methodologies) into industry forecasts, and finally into macroeconomic forecasts; doing so is called a **bottom-up forecasting approach**. The problem with bottom-up forecasting is that there may be glaring inconsistencies in different analysts' assumptions. For example, different analysts may assume different inflationary environments, and this may make resulting individual stock valuations incomparable.

Financial forecasting

The analyst integrates his analysis of industry prospects, competitive strategy, and corporate strategy with ratio analysis to formulate specific numerical forecasts of the important line items such as sales and earnings. Techniques of financial forecasting will be presented shortly. Analysts may consider qualitative as well as quantitative factors in financial forecasting and valuation. For example, some analysts may include their viewpoint on the business acumen and integrity of management as well as the transparency and quality of a company's accounting practices in their forecasts. Obviously, adjustments to forecasts that are based on qualitative factors are always subjective.

Companies earn revenues and profits in various ways –through normal business activities, through the sale of physical assets, through trading activities etc. *Earnings quality* is a measure that captures how much of a firm's earnings have come from its normal business activities, as opposed to from the one-time sale of machinery or other fixed assets. If a large chunk of a firm's current year earnings are known to have come from an unusual or non-recurring transaction (sale of land, building, etc.), the firm is said to have poor earnings quality. This is because profits from normal business activities are

more sustainable and more indicative of the cash flow generating potential of the firm than profits that accrue in any other way.

An analyst who can skillfully analyze a company's financial statements, especially from the perspective of earnings quality, can more accurately value a security than peer analysts with only a superficial understanding of the numbers by adjusting his forecasts for non-recurring transactions that may have affected reported income in the past. Skill in quality of earnings analysis, however, comes only with experience in reading financial statements. For this reason, it is advisable to peruse the financial statements and financial statement footnotes of companies on a regular basis.

- 3) Forecast the remaining items of the income statement. To forecast the expenditure items, make use of the concept of fixed costs and variable costs.

The costs incurred by a company that are constant over the years, i.e. that are independent of the sales of the company, are called fixed costs. On the other hand, variable costs are costs that vary with the sales of the company.

Take the income statement of the company that you are analyzing and find its Common Size income statement. This is obtained by dividing each value in the income statement by the total sales/revenues of the company of that specific year. Then consider one specific expenditure item, observe the trend in its values over the past 3 years and the trend in its common size values.

- If its money value is approximately constant over the past 3 years, then it is a fixed cost. Hence, we forecast the value of this specific expenditure item by averaging its value over the past 3 years.

- If the percentage in the common size sheet is approximately constant over the past 3 years, then it is a variable cost. Hence, we first average the common size value over the past 3 years and then multiply this average value with the Total Forecasted Revenues of a specific year to get the estimated value of that expenditure item for that specific year.

We employ this technique for each expenditure item.

- 4) To account for earnings of the company post 3rd forecasted year, we estimate the Terminal value of Net Income. For this we first estimate the terminal growth rate (g) - the constant growth rate the company is expected to show in the years beyond the 3rd forecasted year, and then compute the terminal value by using the following mathematical expression:

$$\text{Terminal Value} = \text{Forecasted Earnings} \div (R_e - g)$$

- 5) Next, assume that the number of shares outstanding over the forecasted years remains unchanged vis-à-vis the number of shares outstanding of the most recent year for which data is available. Using these values, calculate the Forecasted Earnings per Share (EPS), and EPS_{terminal}.

- 6) Apply the concept of time value of money and find the present value of the forecasted EPS. We find this out by discounting forecasted EPS to the present by using R_e (from CAPM model) as the discount rate.

- 7) The Target price of the stock is hence calculated by making use of the following mathematical formula:

$$\text{Target value of stock} = \sum \text{Discounted Forecasted EPS}$$

8) On obtaining the target price of the stock, the final step is to make a call. This is done by comparing the target price of the stock to the present market value of the stock. We make use of the following 2 results:

- If Market price > Target price; Sell the share of the company
- If Market Value < Target Price; Buy the share of the company

Discounted Cash Flow Valuation³

Free Cash Flow model:

As the name suggests, this model is based on an estimation of cash flows. Two terms are very crucial here: Free cash flow to firm (FCFF) and Free cash flow to equity (FCFE). Let's try to understand what they mean and their significance in valuation.

Free cash Flow to firm (FCFF):

Valuation, any model of valuation is predicated upon the fact that we have the financials of the firm whose intrinsic value we wish to calculate, i.e. we need to have the income statement, the balance sheet, and the cash flow statement for the last few years at our disposal.

Now, in the FCFF method, we will calculate the **total cash flows** to the firm with the help of these financial statements.

³ Optional Reading Section

The first key word here is “cash”. We are not concerned with the overall net income or operating profits here. We are only interested in the overall cash flows to the firm. Hence, all non-cash accounts and transactions have to be deducted and only those involving cash inflow/outflow will contribute.

The second keyword is “firm”. Our target is to estimate the cash flow for the entire firm, as opposed to only the equity, or only the debtors/creditors etc. We are interested in the cash flow to the company as a whole. This is very vital to understand, since this very fact differentiates this measure (FCFF) from FCFE. FCFE is only concerned with the cash flow to the company’s equity and does not take the complete firm into account.

To calculate the free cash flows for our company, ABC Corp. we make use of the formula:

$$\text{FCFF} = \text{Net income} + \text{Depreciation} - \text{Capital Expenditure} - \text{Increase in non-cash working capital} + \text{Interest paid} * (1 - \text{tax rate})$$

Let us go term-by-term and attempt to justify the presence of each term in the given formula.

Clearly, the starting point here is the **net income/net profit** which is readily available from the income statement.

Now if we recall how net income is calculated this in the first place, we realize that we subtract the **depreciation** as an operating expense from our operating profit. Now depreciation of capital obviously does not include actual cash outflow, but is more of a qualitative operating expense. But we, as previously stated, are only interested in the actual cash flows to the firm. Hence, this term must be added back to the net income as compensation for subtracting it earlier. Thus, we nullify the impact of a non-cash expense here.

Capital Expenditure (CAPEX) on long term fixed assets like land and PPE (plant, power, equipment) require real cash outflow from the firm and hence should be subtracted from this account.

Quantitatively, CAPEX is calculated from the balance sheet as:

$$\text{CAPEX} = \text{Gross Block}_2 - \text{Gross Block}_1$$

by subtracting the previous year *Gross Block* from the present *Gross Block*. For example, if the 2013 *Gross Block* of ABC Corp. is INR 100 Crore and that in 2012 is INR 40 Crore, then the CAPEX for 2013 = $(100-40) = \text{INR } 60 \text{ Crore}$.

Note on CAPEX: As observed, we use the balance sheet for CAPEX calculations as opposed to the income (profit & loss) statement. This is explained by the fact that CAPEX is a compulsory (fixed) cost that the firm has to incur irrespective of the business volume. The company has to spend on land, plant, buildings and equipment in order to set up operations. Since these fixed costs do not depend on the firm's revenues (or profits), they do not feature in the firm's profit & loss statement. .

Increase in non-cash working capital will also be deducted here since these changes are non-cash in nature and we are only concerned with the cash flows. We know that

$$\text{Working Capital} = \text{Current assets} - \text{Current liabilities}$$

Non-cash working capital would be the aforementioned working capital minus the cash and cash balances, all of which can be deduced from the balance sheet of the company. Hence, increase in non-cash working capital for 2013 will be the non-cash working capital of 2013 minus that in 2012.

Now comes the most crucial term of the expression: **Interest paid*(1-Tax)**. As highlighted repeatedly before, we are interested in the cash flows to the entire firm here, and not only to the firm's equity/shareholders. Now ABC Corp. might have raised some cash for its operations by issuing long term and short term bonds. Since these bondholders directly contribute towards improving the cash scenario of the firm, they have a kind of a fractional ownership in the firm. Hence, when we are calculating the cash flows to the entire firm, we add the cash paid to these bondholders (after tax interest rate) since these bondholders are considered part of the overall firm owing to their contribution in the firm's cash position. In a nutshell, we can again conclude that FCFF is not only the money available to stakeholders (equity), but also includes the money available to bondholders who are assumed to be part of the total firm. This money to bondholders is quantified as the after tax interest rate.

Thus, we can intuitively see how by starting with the net income, we can eliminate the impact of non-cash measures like depreciation and the noncash working capital. Of course, CAPEX, which is a cash out-flow, has to be subtracted from the account and the after-tax interest cash to bondholders (part of the overall firm) has to be added to the account to get the final cash flow to the firm as a whole.

*Alternative FCFF calculation: Starting off with the net income for FCFF calculation means we're using the income statement to estimate the firm's total cash flow. Alternatively, we can use the firm's cash flow statement in order to calculate the FCFF. This is done by the following formula, which can be readily justified by the explanation given for the previous formula:

FCFF= Cash flow from Operating Activities + Interest*(1-Tax Rate) – CAPEX

While discussing FCFF, we also need to define an important quantity called “**Weighted Average Cost of Capital**”. As the name suggests, this is the weighted average of the money that the firm expends to build its capital. This money comes either from debt or equity. Using the leverage (debt/equity) ratio of ABC Corp. from the ratio analysis statement, we can find the respective weights. WACC is given by:

$$WACC = W_e R_e + W_d R_d (1 - \text{Tax rate})$$

Where W_d = weight of debt

W_e = weight of equity.

R_d = cost of debt

R_e = cost of equity

Cost of debt (R_d) is the price that you pay for taking debt (interest), relative to the debt taken. So suppose ABC Corp. incurs a total long-term debt (secured and unsecured) of INR 20 Crore and has to pay INR 4 Crore as interest on it. Then, **$R_d = \text{Interest/Debt} = 4/20 = 1/5 = 20\%$** . Hence, cost of debt for ABC Corp. is 20%.

Cost of equity (R_e) is obtained from the Capital Asset Pricing Model (CAPM), discussed earlier.

So, for practical purposes, on appropriately forecasting the financials of the company, we calculate the FCFF for each year, beginning from the present year. After doing so, we find out the present value of this cash flow using WACC as a discounting factor.

Hence, Value of firm = $FCFF_0 + \sum_{i=1} FCFF_i / (1+WACC)^i$

$$i=1$$

where $FCFF_0$ is the value of cash flow in the present year

The above formula has given us the overall value of the firm, as derived from its present and forecasted cash flows. Just a word of caution, forecasting is very integral to the process of valuation and should be carried out cautiously for accurate results on intrinsic values.

Note that there is no limitation to the value of FCFF; it may be a negative value as well. All that this depicts is that the firm's overall cash flow is negative. It says nothing about the cash flow to equity, and hence FCFE should be calculated and worked upon in these cases.

	2010	2011	2012	2013	2014	2015
Net Income	₹ 4,061.00	₹ 4,566.51	₹ 6,081.11	₹ 6,993.28	₹ 7,133.14	₹ 7,275.80
Depreciation (Add)	₹ 608.71	₹ 721.41	₹ -	₹ -	₹ -	₹ -
Interest * (1- tax) (Add)	₹ 30.24	₹ 14.02	₹ 16.13	₹ 18.55	₹ 18.92	₹ 19.30
Change in WC excl. cash (Subtract)	₹ -1,047.44	₹ -268.34	₹ 188.63	₹ 715.60	₹ 935.33	₹ 1,179.99
Cap Ex (Subtract)	₹ 1,479.20	₹ 1,500.00	₹ 1,500.00	₹ 1,500.00	₹ 1,500.00	₹ 1,500.00
FCFF	₹ 4,268.19	₹ 4,070.28	₹ 4,408.61	₹ 4,796.23	₹ 4,716.73	₹ 4,615.11
Terminal Value						₹ 34,111.51
CF of FCFF	₹ 4,268.19	₹ 4,070.28	₹ 4,408.61	₹ 4,796.23	₹ 4,716.73	₹ 38,726.62
Period		1.00	2.00	3.00	4.00	5.00
Discount Factor for FCFF		0.87	0.75	0.65	0.56	0.49
PV CF for FCFF	₹ 4,268.19	₹ 3,523.16	₹ 3,303.06	₹ 3,110.44	₹ 2,647.71	₹ 18,816.79
Value of Firm	₹ 35,669.33					

In the above illustration, FCFF for each projected year has been calculated with the formula we earlier discussed. Keeping in mind that the 'current year' in the analysis is 2010, the sum of all the discounted values gives the total present value of the firm.

Self read: Current Capital Structure (Current WACC) v/s Target Capital Structure (Target WACC) and which one is to be employed for a particular case.

Free Cash Flow to Equity (FCFE):

We have already mentioned in the previous section that FCFE is the cash flow to the company's equity and does not take the complete firm into account. Thus, the major difference between FCFF and FCFE calculations is accounting for the debt when calculating FCFE. Clearly, for a company with zero debt, FCFF= FCFE.

Mathematically,

FCFE = Net income + Depreciation – CAPEX – Increase in non-cash working capital + (New Debt issued - Debt paid)

The term(New debt issued – debt paid) is also known as Net Borrowings of the company.

The expression for FCFE can also be given as:

$$\text{FCFE} = \text{FCFF} - \text{Interest paid} \times (1 - \text{tax rate}) + \text{Net Borrowings}$$

So, FCFE differs from FCFF, except for 2 important differences:

Firstly, the $\text{Interest} \times (1 - \text{Tax rate})$ term, is absent from the FCFE expression. As earlier stated, this is the cash flow to the bondholders who are considered part of the overall firm. But this is a mandatory payment and has nothing to do with the cash belonging to equity or shareholders. This after-tax interest payment is cash flow affecting the firm as a whole, not the equity in particular. Hence, this will be accounted for only in FCFF.

Secondly, we see a new term - Net borrowings. This is because once the company ABC Corp. borrows money from a source, this cash now belongs to me you, as the owner, and you can use it for any purpose in the company. Interest would need to be paid on it on it but as of right now, the borrowed amount of cash can be used for any purpose, like for purchasing capital, asset investments, shareholder's payments, etc. Thus, the net borrowings available can potentially be used to flow towards equity in form of shareholders' payment.

As was the case with the calculations for the value of the firm, the FCFE for each year – the present year and the forecasted year, are calculated, using the FCFF for that specific year. Then we discount these terms to the present, and get the NPV of all cash flows to equity. However, this time, the future FCFE values will be discounted at the cost of equity R_e , instead of WACC.

Hence, Value of equity = $\text{FCFE}_0 + \sum_{i=1} \text{FCFF}_i / (1 + R_e)^i$

$i=1$

where $FCFE_0$ is the value of cash flow in the present year

To get the intrinsic value of the stock, we divide this value of the firm by the number of outstanding shares, i.e. mathematically

$$\text{Intrinsic Value of Stock} = \text{Value of equity} / \text{Number of outstanding shares}$$

Now, a problem arises in case of a negative value of value of equity. Dividing a negative value by the number of shares gives a negative intrinsic value of the stock, which does not make any sense. We will later discuss 2 different methods to tackle such a situation, i.e. to find the intrinsic value of the shares of a company whose value of equity is negative.

FCFF v/s FCFE:

Our discussion till now has not given any observable use of the term FCFF. However, the term FCFF can be used as an indirect way of finding out the intrinsic value of the stock, under some special circumstances. These circumstances are as follows:

- **A levered company with negative FCFE:** In this case, working with FCFF to value the company's equity might be easiest. We would discount FCFF to find the present value of operating assets and then subtract the market value of debt to obtain an estimate of the value of equity. This is done as debtors are paid back before the shareholders from the firm's profits. Whatever's left after paying off the debtors will then be available to shareholders (equity). On dividing this value by the number of outstanding shares, we get an approximate value of the intrinsic value of the stock.

- **A levered company with a changing capital structure:** In such a scenario, if historical data are used in forecasting the financials, FCFF growth might reflect fundamentals more clearly than FCFE growth would do, which will reflect a fluctuating amount of net borrowing. Second, in a forward-looking context, the required return on equity might be expected to be more sensitive to changes in financial leverage than changes in the WACC, making the use of a constant discount rate difficult to justify. So, in such a scenario, we avoid making use of FCFE in valuations.

Negative FCFE:

In cases of negative FCFE, to find out the intrinsic value of the stock, we have 2 alternate methods:

- 1) As already discussed, we calculate the value of the firm, using FCFF, and subtract the value of debt to obtain an approximate value of the value of equity. On dividing this by the number of outstanding shares, we obtain the intrinsic value of the stock.
- 2) Using the **EV/EBITDA multiple**: EBITDA(a term from the income statement of the company) is a very common proxy for cash flow available to the firm, and Enterprise Value (EV) is given by:

$$EV = \text{Equity Value of the company} + \text{Net debt}$$

So, in this method, we find the average value of this multiple from among the peers of the respective company. We assume that this average value calculated is the approximate value of EV/EBITDA for our company. We forecast the EBITDA value for our company, and using the estimated EV/EBITDA value, we find out the approximate EV value of the firm. We then subtract net debt from this estimated EV value to get the equity value of the firm. We divide

this value by the number of outstanding shares to obtain an approximate value of the intrinsic value of the share.

Making a Call:

So, we now have the intrinsic value of the stock (that we have calculated), and the current stock price of the respective stock. We make use of the following relations:

- if the intrinsic value is greater than the market stock price, then it means that the ABC Corp. is undervalued and a **“Long-term BUY”** of the stock can be recommended based on intrinsic value, but as always the final call should be based on all available factors including Fundamental Analysis of the company, industry, Macro-economic view, industry peer analysis etc.
- if the intrinsic value is lesser than the market stock price, then it means that the ABC Corp. is overvalued and a **“Long-term SELL”** of the stock can be recommended based on intrinsic value, but as always the final call should be based on all available factors including Fundamental Analysis of the company, industry, Macro-economic view, industry peer analysis etc.

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Dividend Discount Model (DDM):

Along with the Free Cash Flow models, we also discuss the Dividend Discount Model. This method, as the name suggests, depends on the dividend payouts of the company and is generally less reliable and

accurate than the free cash flow models. The basis of this method is the fact that a company's dividends to its shareholders increase/decrease year after year, and this growth rate is the major variable in the application of the model.

We forecast the dividends to get future dividends, and then discount them to the present to get the final intrinsic value of the stock. The discounting rate used is the rate of equity return (R_e). Thus, the intrinsic value is simply the present value of all future dividends, starting with the dividend of the next year.

Now, mathematically, the growth rate could display any pattern – it could be constant forever, it could be constant initially and then take on another constant value after n_1 years, etc. The pattern of growth rate can be used to define a different model of growth. Some of the common models are:

Gordon's Growth Model:

According to the Gordon Growth Model, the company has a constant growth rate of dividends g . Such constant growth scenarios are rare and are observed only in select industries like the consumer goods (FMCG) sector, where the demand growth is relatively stable irrespective of market situations owing to the daily necessity of these goods. For such industries, if the present dividend given out is D_0 , then, by using simple mathematics, the future dividends can be forecasted to be:

$$D_1 = D_0(1+g),$$

$$D_2 = D_0(1+g)(1+g),$$

$$D_3 = D_0(1+g)(1+g)(1+g) \dots \text{and so on.}$$

Thus, adding the present values of these dividends and using formula for an infinite geometric progression, we get the

$$\text{Intrinsic Value} = P = D_1 / (R_e - g)$$

where

D_1 = dividend for the next year = present dividend * (1+g)

R_e = return on equity as derived from CAPM

g = constant growth rate in dividends year after year

It is now important to find out what the growth rate to be used is. As the growth rate is constant, we can analyze the growth rate over the past few years.

Mathematically, growth rate in dividends is given by:

$$g = ROE \times (1 - \text{dividend payout ratio})$$

Where ROE = return on equity

Dividend payout ratio = Dividend per share / Earnings per share

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This model is too simplistic for practical scenarios and hence does not have too many practical

applications. Another major disadvantage evident from the above formula is that it fails if $g > R_e$

(dividend growth rate > return on equity) and yields a negative intrinsic value, which is impossible.

Also, the method discussed above is valid for a single stage model of dividends i.e. they take into

calculations a single constant growth rate for all coming years. Though such an assumption makes the

model very simplistic, the practical feasibility of this to happen in the real world scenario is too low. We would generally expect firms to give dividends with varying growth rates from year to year, more so when we realize that the amount belted out as dividends to shareholders depends upon what's left of the firm's profits after catering to debt payments and the company's own capital investment needs. Any change in the firm's net income, debt structure or capital requirements will hence, directly affect the capability of the firm to pay out dividends. Also, it is not compulsory for a firm to yield dividends. So the moral is, both questions of "whether to pay dividend" and "how much to pay" are completely at the firm's discretion; and the firm's current financial position dictates both answers. With so many variables affecting a firm's dividend policy, it is quite natural to anticipate that no firm follows a constant growth pattern in dividends over the years. This explains why analysts don't usually resort to the Gordon's model for DDM valuations.

To account for variable dividend growth rates, we have "n-stage" DDM models where we assume n different values of dividend growth rates for different time periods. The simplest of these is the **2-stage model**.

2-stage model: EXPLORE|REFINE|INSPIRE

This model allows for 2 stages of growth - an initial phase of stable growth rate for a certain period of time, and a subsequent steady state where the growth rate is stable and different to the previous growth rate. Clearly, this model permits for a more dynamic growth pattern as compared to the constant growth model. A fairly good example of such a growth pattern is the IT sector in India.

In this case, the intrinsic value of the stock is given by:

$$\text{Intrinsic Value} = \sum \text{Div}_t / (1 + r_e)^t + P_n / (1 + r_e)^n$$

where,

Div_t = Dividend paid in the 't'th year

r_e = cost of equity (found from CAPM calculations)

g = growth rate for first n years (stage 1 short run growth rate)

g_n = steady rate forever after year n (stage 2 long run growth rate)

P_n = Price at the end of year $n = \text{Div}_{n+1} / (r_e - g_n)$

Though the 2-stage method is widely used as a robust substitute of the Gordon's model, this model also suffers from certain inadequacies:

- It is difficult to define an initial period of time for the constant growth period
- Our assumption in this model is that a particular growth rate is suddenly transformed to a different stable rate at the end of the period, which may be inconceivable

To address these issues, a typical modification of the 2-stage model known as the "H-model" is often used.

H-Model:

This is a variation of the 2-stage growth model. In this, the growth rate in the initial growth phase is not constant but declines linearly over time to reach the stable growth rate in steady stage. This model assumes that the dividend pay-out and cost of equity are constant over time.

The earnings growth rate starts at a high initial rate (g_a) and declines linearly over the extraordinary growth period (which is assumed to last $2H$ periods) to a stable growth rate (g_n).

$$\text{Intrinsic Value} = \text{Div}_0 * (1+g_n)/(r_e-g_n) + \text{Div}_0 * H*(g_a-g_n)/(r_e-g_n)$$

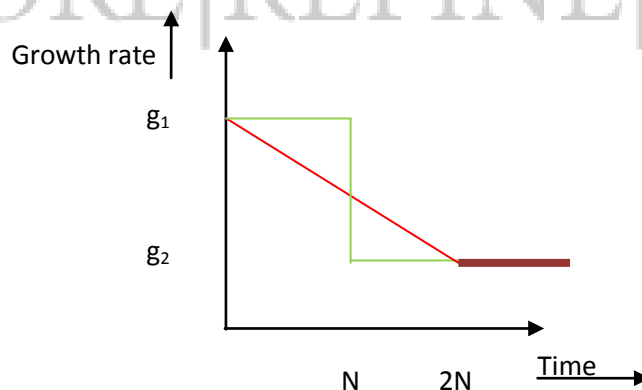
where

r_e = Cost of equity

g_a = initial growth rate

g_n = growth rate at end of $2H$ years

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$$NPV = NPV_{\text{nextN}} + NPV_{\text{afterN}}$$

$$= D_0 * \left(\frac{(1+r)}{(r-g_1)} \right) * \left(1 - \frac{(1+g_1)^N}{(1+r)^N} \right) + D_0 * \left(\frac{(1+r)}{(r-g_2)} \right) * \left(\frac{(1+g_1)^N}{(1+r)^N} \right)$$

Here, D_0 is the present dividend and g_1, g_2 are the two growth rates involved. The total NPV gives the overall value of the firm.

Though the H-model is usually more effective than the previous two models discussed, this method too has its share of limitations:

- To apply this model, the decline in the firm's growth rate should follow the strict structure laid out in the model. This may not always happen in the real world.
- The assumption that the pay-out ratio is constant through both phases of growth is sometimes inconsistent – since generally as growth rates decline, the pay-out ratio increases.

Choice of Growth Pattern:

Having discussed a few of the various models, it is important to address the important query as to “when to use what”. There are certain guidelines that have to be followed when selecting a certain growth model. These are as follows:

- Use a **stable growth model** if the company:

- is large and growing at a rate close to or less than growth rate of the economy
- constrained by regulation from growing at rate faster than the economy
- has the characteristics of a stable firm (average risk & reinvestment rates)

- Use a **2 stage growth model** if the company:

- is large & growing at a moderate rate (\leq Overall growth rate + 10%)
- has a single product & barriers to entry with a finite life (e.g. patents)

- Use an **n-stage model** if the company:

- is small and growing at a very high rate ($>$ Overall growth rate + 10%)
- has significant barriers to entry into the business
- has firm characteristics that are very different from the norm.

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Now that we have discussed the various possible models in the dividend discount method, it is

important to realize that DDM isn't a very popular valuation technique, when compared to the free cash flow models. As mentioned before, return on equity $>$ dividend growth rate is a mathematical necessity for the DDM formula application. Also, since a firm's dividends are completely subject to its financial position at a certain point in time, a long term forecasting of dividends is difficult; future

dividends cannot be anticipated with much certainty. Furthermore, since paying off dividends is not compulsory on the firm's part, the model will obviously not work for companies that do not pay dividends.

Owing to the above listed flaws, analysts generally prefer the more robust and reliable free cash flow models. DDM is seldom used in real time valuations.



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Conclusion

The final stage in the research of a target company has the analyst answering the question “What is this company worth?” To do this, the analyst makes use of any of a range of valuation concepts.

Firstly, we turn our consideration to some basic questions: “What is equity valuation?” “Who performs equity valuation?” “How important is industry knowledge for valuation?” and “How can the analyst effectively communicate his analysis?”

Valuation is the estimation of an asset’s value based either on variables perceived to be related to future investment returns (usually cash flows) or on comparisons with similar assets. Skill in valuation is one very important element of success in investing, and is an essential component of the arsenals of equity research analysts, portfolio managers, investment bankers. These professionals usually find themselves applying the tools of equity valuation to address a range of practical problems including:

- Judging whether securities are fairly valued, overvalued, or undervalued
- Inferring market expectations – since the intrinsic value (inherent or true worth) of a company is found based on assumptions about its future cash flows, an equity research analyst can, from a company’s current share price, work backwards through an intrinsic valuation model to deduce the market’s expectations of its future cash flows; if he deems the market’s expectations unreasonable, he may take a view on the company’s share price
- Evaluating corporate events – Investment bankers and corporate analysts use valuation tools to assess the impact of corporate events like mergers and acquisitions, divestitures, spin-offs,

management buy-outs (MBOs), leveraged recapitalizations etc.; each of these events may affect a company's future cash flows, and thus, the intrinsic value of the company

Each individual valuation that an analyst undertakes can be viewed as a process with the following five steps:

- Understanding the business – this involves evaluating industry prospects, competitive position, and corporate strategies. Analysts use this information together with financial statement analysis to forecast performance
- Forecasting company performance – forecasts of sales and earnings are the immediate inputs to any intrinsic valuation model
- Selecting appropriate valuation model – analysts must choose a particular valuation approach (intrinsic vs. relative) and particular valuation model (dividend discount models vs. free cash flow models) when using intrinsic valuation; when using relative valuation techniques, the analyst must make a judgment call regarding the appropriate stock valuation ratio (P/E vs. P/S vs. EV/EBITDA)
- Use the chosen model to convert forecasts into a valuation
- Make investment recommendation based on valuation

An in-depth understanding of the business and an ability to forecast the performance of a company improve the quality of an analyst's valuation efforts.