Fundamental Analysis - Part 2

The Financial Ratio Analysis (Part 1)

9.1 – A note on Financial Ratios

Over the last few chapters we have understood how to read the financial statements. We will now focus our attention on analyzing these financial statements. The best way to analyze the financial statements is by studying the 'Financial Ratios'. The theory of financial ratios was made popular by Benjamin Graham, who is popularly known as the father of fundamental analysis. Financial ratios help in interpreting the results, and allows comparison with previous years and other companies in the same industry.

A typical financial ratio utilizes data from the financial statement to compute its value. Before we start understanding the financial ratios, we need to be aware of certain attributes of the financial ratios.

On its own merit, the financial ratio of a company conveys very little information. For instance, assume Ultratech Cements Limited has a profit margin of 15%, how useful do you think this information is? Well, not much really. 15% profit margin is good, but how would I know if it is the best?

However, assume you figure out ACC Cement's profit margin is 12%. Now, as we comparing two similar companies, comparing the profitability makes sense. Clearly, Ultratech Cements Limited seems to be a more profitable company between the two. The point that I am trying to drive across is that more often than not, Financial Ratios on its own is quite mute. The ratio makes sense only when you compare the ratio with another company of a similar size or when you look into the trend of the financial ratio. This means that once the ratio is computed the ratio has to be analyzed (either by comparison or tracking the ratio's historical trend) to get the best possible inference.

Also, here is something that you need to be aware off while computing ratios. Accounting policies may vary across companies and across different financial years. A fundamental analyst should be cognizant of this fact and should adjust the data accordingly, before computing the financial ratio.

9.2 – The Financial Ratios

Financial ratios can be 'somewhat loosely' classified into different categories, namely –

1. Profitability Ratios
2. Leverage Ratios
3. Valuation Ratios
4. Operating Ratios

The Profitability ratios help the analyst measure the profitability of the company. The ratios convey how well the company is able to perform in terms of generating profits. Profitability of a company also signals the competitiveness of the management. As the profits are needed for business expansion and to pay dividends to its shareholders a company's profitability is an important consideration for the shareholders.

The Leverage ratios also referred to as solvency ratios/ gearing ratios measures the company's ability (in the long term) to sustain its day to day operations. Leverage ratios measure the extent to which the company uses the debt to finance growth. Remember for the company to sustain its operations, it has to pay its bills and obligations. Solvency ratios help us understand the company's long term sustainability, keeping its obligation in perspective.

The Valuation ratios compare the stock price of the company with either the profitability of the company or the overall value of company to get a sense of how cheap or expensive the stock is trading. Thus this ratio helps us in analyzing whether the current share price of the company is perceived as high or low. In simpler words, the valuation ratio compares the cost of a security with the perks of owning the stock.

The Operating Ratios, also called the 'Activity Ratios' measures the efficiency at which a business can convert its assets (both current and non current) into revenues. This ratio helps us understand how efficient the management of the company is. For this reason, Operating Ratios are sometimes called the 'Management Ratios'.

Strictly speaking, ratios (irrespective of the category it belongs to) convey a certain message, usually related to the financial position of the company. For example, 'Profitability Ratio' can convey the efficiency of the company, which is usually measured by computing the 'Operating Ratio'. Because of such overlaps, it is difficult to classify these ratios. Hence the ratios are 'somewhat loosely' classified.

9.3 – The Profitability Ratios

We will look into the following ratios under 'The Profitability Ratio':

1. EBITDA Margin (Operating Profit Margin)
   - EBITDA Growth (CAGR)
2. PAT Margin
   - PAT Growth (CAGR)
3. Return on Equity (ROE)
4. Return on Asset (ROA)
5. Return on Capital Employed (ROCE)

EBITDA Margin:

The Earnings before Interest Tax Depreciation & Amortization (EBITDA) Margin indicates the efficiency of the management. It tells us how efficient the company's operating model is. EBITDA Margin tells us how profitable (in percentage terms) the company is at an operating level. It always makes sense to compare the EBITDA margin of the company versus its competitor to get a sense of the management's efficiency in terms of managing their expense.

In order to calculate the EBITDA Margin, we first need to calculate the EBITDA itself.

EBITDA = [Operating Revenues – Operating Expense]

Operating Revenues = [Total Revenue – Other Income]

Operating Expense = [Total Expense – Finance Cost – Depreciation & Amortization]

EBIDTA Margin = EBITDA / [Total Revenue – Other Income]

Continuing the example of Amara Raja Batteries Limited, the EBITDA Margin calculation for the FY14 is as follows:

We first calculate EBITDA , which is computed as follows:

[Total Revenue – Other Income] – [Total Expense – Finance Cost – Depreciation & Amortization]

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Note: Other income is income by virtue of investments and other non operational activity. Including other income in EBITDA calculation would clearly skew the data. For this reason, we have to exclude Other Income from Total Revenues.

[3482 – 46] – [2942 – 0.7 – 65]

= [3436] – [2876]

= 560 Crores

Hence the EBITDA Margin is:

560 / 3436

= 16.3%

I have two questions for you at this stage:

> **1.** What does an EBITDA of Rs.560 Crs and an EBITDA margin of 16.3% indicate?
> **2.** How good or bad an EBITDA margin of 16.3% is?

The first question is a fairly simple. An EBITDA of Rs.560 Crs means that the company has retained Rs.560 Crs from its operating revenue of Rs.3436 Crs. This also means out of Rs.3436 Crs the company spent Rs.2876 Crs towards its expenses. In percentage terms, the company spent 83.7% of its revenue towards its expenses and retained 16.3% of the revenue at the operating level, for its operations.

Now for the 2nd question, hopefully you should **not** have an answer.

Remember we did discuss this point earlier in this chapter. A financial ratio on its own conveys very little information. To make sense of it, we should either see the trend or compare it with its peers. Going with this, a 16.3% EBITDA margin conveys very little information.

To makes some sense of the EBITDA margin, let us look at Amara Raja's EBITDA margin trend for the last 4 years, (all numbers in Rs Crs, except EBITDA margin):

Year	Operating Revenues	Operating Expense	EBITDA	EBITDA Margin
2011	1761	1504	257	14.6%
2012	2364	2025	340	14.4%
2013	2959	2508	451	15.2%
2014	3437	2876	560	16.3%

It appears that ARBL has maintained its EBITDA at an average of 15%, and in fact on a closer look it is clear the EBITDA margin is increasing. This is a good sign as it shows consistency and efficiency in the management's operational capabilities.

In 2011 the EBITDA was Rs.257 Crs and in 2014 the EBITDA is Rs.560 Crs. This translates to a 4 year **EBITDA CAGR growth** of 21%.

Please note, we have discussed the formula for CAGR in module 1.

Clearly, it appears that both EBITDA margin and EBITDA growth are quite impressive. However we still do not know if it is the best. In order to find out if it is the best one needs to compare these numbers with its competitors. In case of ARBL it would be Exide batteries Limited. I would encourage you to do the same for Exide and compare the results.

PAT Margin:

While the EBITDA margin is calculated at the operating level, the Profit After Tax (PAT) margin is calculated at the final profitability level. At the operating level we consider only the operating expenses however there are other expenses such as depreciation and finance costs which are not considered. Along with these expenses there are tax expenses as well. When we calculate the PAT margin, all expenses are deducted from the Total Revenues of the company to identify the overall profitability of the company.

PAT Margin = [PAT/Total Revenues]

PAT is explicitly stated in the Annual Report. ARBL's PAT for the FY14 is Rs.367 Crs on the overall revenue of Rs.3482 Crs (including other income). This translates to a PAT margin of:

= 367 / 3482

=10.5 %

Here is the PAT and PAT margin trend for ARBL:

Year	PAT (in INR Crs)	PAT Margin
2011	148	8.4%
2012	215	8.9%
2013	287	9.6%
2014	367	10.5%

The PAT and PAT margin trend seems impressive as we can clearly see a margin expansion. The 4 year CAGR growth stands at 25.48 %, which is again good. Needless to say, it always makes sense to compare ratios with its competitors.

Return on Equity (RoE):

The Return on Equity (RoE) is a very important ratio, as it helps the investor assess the return the shareholder earns for every unit of capital invested. RoE measures the entity's ability to generate profits from the shareholders investments. In other words, RoE shows the efficiency of the company in terms of generating profits to its shareholders. Obviously, higher the RoE, the better it is for the shareholders. In fact this is one of the key ratios that helps the investor identify investable attributes of the company. To give you a perspective, the average RoE of top Indian companies vary between 14 – 16%. I personally prefer to invest in companies that have a RoE of 18% upwards.

This ratio is compared with the other companies in the same industry and is also observed over time.

Also note, if the RoE is high, it means a good amount of cash is being generated by the company, hence the need for external funds is less. Thus a higher ROE indicates a higher level of management performance.

RoE can be calculated as: [Net Profit / Shareholders Equity* 100]

There is no doubt that RoE is an important ratio to calculate, but like any other financial ratios it also has a few drawbacks. To help you understand its drawbacks, consider this hypothetical example.

Assume Vishal runs a Pizza store. To bake pizza's Vishal needs an oven which costs him Rs.10,000/-. Oven is an asset to Vishal's business. He procures the oven from his own funds and seeks no external debt. At this stage you would agree on his balance sheet he has a shareholder equity of Rs.10,000 and assets equivalent to Rs.10,000.

Now, assume in his first year of operation, Vishal generates a profit of Rs.2500/-. What is his RoE? This is quite simple to compute:

RoE = 2500/10000*100

=25.0%.

Now let us twist the story a bit. Vishal has only Rs.8000/- he borrows Rs.2000 from his father to purchase an oven worth Rs.10000/-. How do you think his balance sheet would look?

On the liability side he would have:

Shareholder Equity = Rs.8000

Debt = Rs.2000

This makes Vishal's total liability Rs. 10,000. Balancing this on the asset side, he has an asset worth Rs.10,000. Let us see how his RoE looks now:

RoE = 2500 / 8000*100

= 31.25%

With an additional debt, the RoE shot up quite significantly. Now, what if Vishal had only Rs.5000 and borrowed the additional Rs.5000 from his father to buy the oven. His balance sheet would look like this:

On the liability side he would have:

Shareholder Equity = Rs.5000

Debt = Rs.5000

Vishal's total liability is Rs. 10,000. Balancing this on the asset side, he has an asset worth Rs.10,000. Let us see how his RoE looks now:

RoE = 2500 / 5000 *100

=50.0%

Clearly, higher the debt Vishal seeks to finance his asset, (which in turn is required to generate profits) higher is the RoE. A high RoE is great, but certainly not at the cost of high debt. The problem is with a high amount of debt, running the business gets very risky as the finance cost increases drastically. For this reason inspecting the RoE closely becomes extremely important. One way to do this is by implementing a technique called the '**DuPont Model' also called DuPont Identity.**

This model was developed in 1920's by the DuPont Corporation. DuPont Model breaks up the RoE formula into three components with each part representing a certain aspect of business. The DuPont analysis uses both the P&L statement and the Balance sheet for the computation.

The RoE as per DuPont model can be calculated as:

$$\text{Return on Equity} = \frac{\text{Net Profit}}{\text{Net Sales}} \times \frac{\text{Net Sales}}{\text{Avg Total Assets}} \times \frac{\text{Avg Total Assets}}{\text{Shareholder Equity}}$$

If you notice the above formula, the denominator and the numerator cancels out with one another eventually leaving us with the original RoE formula which is:

RoE = Net Profit / Shareholder Equity *100

However in the process of decomposing the RoE formula, we gained insights into three distinct aspects of the business. Let us look into the three components of the DuPont model that makes up the RoE formula :

◉ **Net Profit Margin = Net Profits/ Net Sales*100**
This is the first part of the DuPont Model and it expresses the company's ability to generate profits. This is nothing but the PAT margin we looked at earlier in this chapter. A low Net profit margin would indicate higher costs and increased competition.

◉ **Asset Turnover = Net Sales / Average Total asset**
Asset turnover ratio is an efficiency ratio that indicates how efficiently the company is using its assets to generate revenue. Higher the ratio, it means the company is using its assets more efficiently. Lower the ratio, it could indicate management or production problems. The resulting figure is expressed as number of times per year.

◉ **Financial Leverage = Average Total Assets / Shareholders Equity**
Financial leverage helps us answer this question – 'For every unit of shareholders equity, how many units of assets does the company have'. For example if the financial leverage is 4, this means for every Rs.1 of equity, the company supports Rs.4 worth of assets. Higher the financial leverage along with increased amounts of debt, will indicate the company is highly leveraged and hence the investor should exercise caution. The resulting figure is expressed as number of times per year.

As you can see, the DuPont model breaks up the RoE formula into three distinct components, with each component giving an insight into the company's operating and financial capabilities.

Let us now proceed to implement the DuPont Model to calculate Amara Raja's RoE for the FY 14. For this we need to calculate the values of the individual components.

Net Profit Margin: As I mentioned earlier, this is same as the PAT margin. From our calculation earlier, we know the Net Profit Margin for ARBL is **9.2%**

Asset Turnover = Net Sales / Average Total assets

We know from the FY14 Annual Report, Net sales of ARBL stands at Rs.3437 Crs.

The denominator has Average Total Assets which we know can be sourced from the Balance Sheet. But what does the word 'Average' indicate?

From ARBL's balance sheet, the total asset for FY14 is Rs.2139Crs. But think about this, the re-ported number is for the Financial Year 2014, which starts from 1st of April 2013 and close on 31st March 2014. This implies that at the start of the financial year 2014 (1st April 2013), the company must have commenced its operation with assets that it carried forward from the previous finan-cial year (FY 2013). During the financial year (FY 2014) the company has acquired some more as-sets which when added to the previous year's (FY2013) assets totaled to Rs.2139 Crs. Clearly the company started the financial year with a certain rupee value of assets but closed the year with a totally different rupee value of assets.

Keeping this in perspective, if I were to calculate the asset turnover ratio, which asset value should I consider for the denominator? Should I consider the asset value at the beginning of the year or at the asset value at the end of the year? To avoid confusion, the practice is to take aver-age of the asset values for the two financial years.

Do remember this technique of averaging line items, as we will be using this across other ratios as well.

From ARBL's annual report we know:

Net Sales in FY14 is Rs.3437Crs

Total Assets in FY13 is Rs.1770 Crs

Total Assets in FY14 is Rs.2139 Crs

Average Assets = (1770 + 2139) / 2

= 1955

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Asset Turnover = 3437 / 1955

= 1.75 times

This means for every Rs.1 of asset deployed, the company is generating Rs.1.75 in revenues.

We will now calculate the last component that is the Financial Leverage.

Financial Leverage = Average Total Assets / Average Shareholders Equity

We know the average total assets is Rs.1955. We just need to look into the shareholders equity. For reasons similar to taking the "Average Assets" as opposed to just the current year assets, we will consider "Average Shareholder equity" as opposed to just the current year's shareholder equity.

Shareholders Equity for FY13 = Rs.1059 Crs

Shareholders Equity for FY14 = Rs.1362 Crs

Average shareholder equity = Rs.1211 Crs

Financial Leverage = 1955 / 1211

= 1.61 times

Considering ARBL has little debt, Financial Leverage of 1.61 is indeed an encouraging number. The number above indicates that for every Rs.1 of Equity, ARBL supports Rs.1.61 of assets.

We now have all the inputs to calculate RoE for ARBL, we will now proceed to do the same:

RoE = Net Profit Margin X Asset Turnover X Financial Leverage

= 9.2% * 1.75 * 1.61

~ 25.9%. Quite impressive I must say!

I understand this is a lengthy way to calculate RoE, but this is perhaps the best way as in the process of calculating RoE, we can develop valuable insights into the business. DuPont model not only answers what the return is but also the quality of the return.

However if you wish do a quick RoE calculation you can do so the following way:

RoE = Net Profits / Avg shareholders Equity

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From the annual report we know for the FY14 the PAT is Rs.367 Crs

RoE = 367 / 1211

= 30.31%

Return on Asset (RoA):

Having understood the DuPont Model, understanding the next two ratios should be simple. Return on Assets (RoA) evaluates the effectiveness of the entity's ability to use the assets to create profits. A well managed entity limits investments in non productive assets. Hence RoA indicates the management's efficiency at deploying its assets. Needless to say, higher the RoA, the better it is.

RoA = [Net income + interest*(1-tax rate)] / Total Average Assets

From the Annual Report, we know:

Net income for FY 14 = Rs.367.4 Crs

And we know from the Dupont Model the Total average assets (for FY13 and FY14) = Rs.1955 Crs

So what does **interest *(1- tax rate)** mean? Well, think about it, the loan taken by the company is also used to finance the assets which in turn is used to generate profits. So in a sense, the debt holders (entities who have given loan to the company) are also a part of the company. From this perspective the interest paid out also belongs to a stake holder of the company. Also, the company benefits in terms of paying lesser taxes when interest is paid out, this is called a 'tax shield'. For these reasons, we need to add interest (by accounting for the tax shield) while calculating the ROA.

The Interest amount (finance cost) is Rs.1 Crs, accounting for the tax shield it would be

= 7* (1 – 32%)

= 4.76 Crs . Please note, 32% is the average tax rate.

Hence ROA would be –

RoA = [367.4 + 4.76] / 1955

~ 372.16/ 1955

~19.03%

Return on Capital Employed (ROCE):

The Return on Capital employed indicates the profitability of the company taking into consideration the overall capital it employs.

Overall capital includes both equity and debt (both long term and short term).

ROCE = [Profit before Interest & Taxes / Overall Capital Employed]

Overall Capital Employed = Short term Debt + Long term Debt + Equity

From ARBL's Annual Report we know:

Profit before Interest & Taxes = Rs.537.7 Crs

Overall Capital Employed:

Short term debt: Rs.8.3 Crs

Long term borrowing: Rs.75.9 Crs

Shareholders equity = Rs.1362 Crs

Overall capital employed: 8.3 + 75.9 + 1362 = 1446.2 Crs

ROCE = 537.7 / 1446.2

= 37.18%

Key takeaways from this chapter:

1. A Financial ratio is a useful financial metric of a company. On its own merit the ratio conveys very little information

2. It is best to study the ratio's recent trend or compare it with the company's peers to develop an opinion

3. Financial ratios can be categorized into 'Profitability', 'Leverage', 'Valuation', and 'Operating' ratios. Each of these categories give the analyst a certain view on the company's business

4. EBITDA is the amount of money the company makes after subtracting the operational expenses of the company from its operating revenue

5. EBITDA margin indicates the percentage profitability of the company at the operating level

6. PAT margin gives the overall profitability of the firm

7. Return on Equity (ROE) is a very valuable ratio. It indicates how much return the shareholders are making over their initial investment in the company

8. A high ROE and a high debt is not a great sign

9. DuPont Model helps in decomposing the ROE into different parts, with each part throwing light on different aspects of the business

10. DuPont method is probably the best way to calculate the ROE of a firm

11. Return on Assets in an indicator of how efficiently the company is utilizing its assets

12. Return on Capital employed indicates the overall return the company generates considering both the equity and debt.

13. For the ratios to be useful, it should be analyzed in comparison with other companies in the same industry.

14. Also, ratios should be analyzed both at a single point in time and as an indicator of broader trends over time

The Financial Ratio Analysis (Part 2)

10.1 – The Leverage Ratios

We touched upon the topic of financial leverage while discussing Return on Equity and the Du-Pont analysis. The use of leverage (debt) is like a double edged sword.

Well managed companies seek debt if they foresee a situation where, they can deploy the debt funds in an environment which generates a higher return in contrast to the interest payments the company has to makes to service its debt. Do recollect a judicious use of debt to finance assets also increases the return on equity.

However if a company takes on too much debt, then the interest paid to service the debt eats into the profit share of the shareholders. Hence there is a very thin line that separates the good and the bad debt. Leverage ratios mainly deal with the overall extent of the company's debt, and help us understand the company's financial leverage better.

We will be looking into the following leverage ratios:

1. Interest Coverage Ratio

2. Debt to Equity Ratio

3. Debt to Asset Ratio

4. Financial Leverage Ratio

So far we have been using Amara Raja Batteries Limited (ARBL) as an example, however to understand leverage ratios, we will look into a company that has a sizable debt on its balance sheet. I have chosen Jain Irrigation Systems Limited (JISL), I would encourage you calculate the ratios for a company of your choice.

Interest Coverage Ratio:

The interest coverage ratio is also referred to as debt service ratio or the debt service coverage ratio. The interest coverage ratio helps us understand how much the company is earning relative to the interest burden of the company. This ratio helps us interpret how easily a company can pay its interest payments. For example, if the company has an interest burden of Rs.100 versus an income of Rs.400, then we clearly know that the company has sufficient funds to service its debt. However a low interest coverage ratio could mean a higher debt burden and a greater possibility of bankruptcy or default.

The formula to calculate the interest coverage ratio:
[Earnings before Interest and Tax / Interest Payment]

The 'Earnings before Interest and Tax' (EBIT) is:
EBITDA – Depreciation & Amortization

Let us apply this ratio on Jain Irrigation Limited. Here is the snapshot of Jain Irrigation's P&L statement for the FY 14, I have highlighted the Finance costs in red:

We know EBITDA = [Revenue – Expenses]

To calculate the expenses, we exclude the Finance cost (Rs.467.64Crs) and Depreciation & Amortization cost (Rs.204.54) from the total expenses of Rs.5730.34 Crs.

Therefore EBITDA = Rs.5828.13 – 5058.15 Crs
EBITDA = Rs. 769.98 Crs

We know EBIT is EBITDA – [Depreciation & Amortization]

= Rs. 769.98 - Rs. 204.54

= Rs. 565.44

We know Finance Cost = Rs.467.64, Hence Interest coverage is:

= 565.44/ 467.64
= **1.209x**

The 'x' in the above number represents a multiple. Hence 1.209x should be read as 1.209 'times'.

Interest coverage ratio of 1.209x suggests that for every Rupee of interest payment due, Jain Irrigation Limited is generating an EBIT of 1.209 times.

Debt to Equity Ratio:
This is a fairly straightforward ratio. Both the variables required for this computation can be found in the Balance Sheet. It measures the amount of the total debt capital with respect to the total equity capital. A value of 1 on this ratio indicates an equal amount of debt and equity capital. Higher debt to equity (more than 1) indicates higher leverage and hence one needs to be careful. Lower than 1 indicates a relatively bigger equity base with respect to the debt.

The formula to calculate Debt to Equity ratio is:
[Total Debt/Total Equity]

Please note, the total debt here includes both the short term debt and the long term debt.

Here is JSIL's Balance Sheet, I have highlighted total equity, long term, and short term debt:

CONSOLIDATED BALANCE SHEET AS AT 31-MARCH-2014

₹ in Million

	Note No.	31-Mar-2014	31-Mar-2013
EQUITY AND LIABILITIES			
Shareholders' Funds			
Share capital	2	924.83	909.83
Reserves and surplus	3	20,830.66	20,607.97
Money received against share warrants	4	-	161.81
		21,755.49	21,679.61
Minority Interest		204.77	-
Non-current liabilities			
Long term borrowings	5	14,976.63	14,329.38
Deferred tax liabilities (net)	6	1,411.72	1,841.30
Other long term liabilities	7	177.85	75.12
Long term provisions	8	64.30	49.14
		16,630.50	16,294.94
Current liabilities			
Short term borrowings	9	21,889.15	19,840.56
Trade payables	10	13,432.69	13,378.84
Other current liabilities	11	7,579.49	6,522.43
Short term provisions	12	552.38	491.46
		43,453.71	40,233.29
TOTAL		**82,044.47**	**78,207.84**

Total debt = Long term borrowings + Short term borrowings

= 1497.663 + 2188.915

= Rs.3686.578 Crs

Total Equity is Rs.2175.549 Crs

Thus, Debt to Equity ratio will be computed as follows:

= 3686.578 / 2175.549

= 1.69

Debt to Asset Ratio:

This ratio helps us understand the asset financing pattern of the company. It conveys to us how much of the total assets are financed through debt capital.

The formula to calculate the same is:

Total Debt / Total Assets

For JSIL, we know the total debt is Rs.3686.578 Crs.

From the Balance Sheet, we know the total assets as Rs.8204.447 Crs:

		31-Mar-2014	31-Mar-2013
ASSETS			
Non-current assets			
Fixed assets			
Goodwill on consolidation		2,192.12	1,759.49
Tangible assets	13[A]	25,003.91	23,772.59
Intangible assets	13[B]	575.41	554.00
Capital work-in-progress	13[C]	806.88	748.95
		28,578.32	26,835.03
Non-current investments	14	14.16	38.38
Deferred tax assets (net)	6	1,194.25	929.16
Long term loans and advances	15	3,260.87	2,264.10
Other non-current assets	16	1,050.66	1,694.75
Current assets			
Inventories	17	18,363.88	17,230.64
Trade receivables	18	17,994.04	19,546.59
Cash and bank balances	19	1,968.15	2,358.86
Short term loans and advances	20	5,557.59	3,543.74
Other current assets	21	4,062.55	3,766.59
		47,946.21	46,446.42
TOTAL		**82,044.47**	**78,207.84**

Hence the Debt to Asset ratio is:

=3686.578 / 8204.44

= 0.449 or ~45%.

This means roughly about 45% of the assets held by JSIL is financed through debt capital or creditors (and therefore 55% is financed by the owners). Needless to say, higher the percentage the more concerned the investor would be as it indicates higher leverage and risk.

Financial Leverage Ratio

We briefly looked at the financial leverage ratio in the previous chapter, when we discussed about Return on Equity. The financial leverage ratio gives us an indication, to what extent the assets are supported by equity.

The formula to calculate the Financial Leverage Ratio is:

Average Total Asset / Average Total Equity

From JSIL's FY14 balance sheet, I know the average total assets is Rs.8012.615. The average total equity is Rs.2171.755. Hence the financial leverage ratio or simply the leverage ratio is:

8012.615 / 2171.755

= 3.68

This means JISL supports Rs.3.68 units of assets for every unit of equity. Do remember higher the number, higher is the company's leverage and the more careful the investor needs to be.

10.2 – Operating Ratios

Operating Ratios also called 'Activity ratios' or the 'Management ratios' indicate the efficiency of the company's operational activity. To some degree, the operating ratios reveal the management's efficiency as well. These ratios are called the Asset Management Ratios, as these ratios indicate the efficiency with which the assets of the company are utilized.

Some of the popular Operating Ratios are:

1. Fixed Assets Turnover Ratio

2. Working Capital Turnover Ratio

3. Total Assets Turnover Ratio

4. Inventory Turnover Ratio

5. Inventory Number of Days

6. Receivable Turnover Ratio

7. Days Sales Outstanding (DSO)

The above ratios combine data from both the P&L statement and Balance sheet. We will understand these ratios by calculating them for Amara Raja Batteries Limited.

To get a true sense of how good or bad the operating ratios of a company are, one must compare the ratios with the company's peers /competitors or these ratios should be compared over the years for the same company.

Fixed Assets Turnover

The ratio measures the extent of the revenue generated in comparison to its investment in fixed assets. It tells us how effectively the company uses its plant and equipment. Fixed assets include the property, plant and equipment. Higher the ratio, it means the company is effectively and efficiently managing its fixed assets.

Fixed Assets Turnover = Operating Revenues / Total Average Asset

The assets considered while calculating the fixed assets turnover should be net of accumulated depreciation, which is nothing but the net block of the company. It should also include the capital work in progress. Also, we take the average assets for reasons discussed in the previous chapter.

From ARBL's FY14 Balance Sheet:

ASSETS			
Non-current assets			
Fixed assets	10		
Tangible assets		6,198.94	3,554.97
Intangible assets		32.96	33.69
Capital work-in-progress		1,443.60	1,024.97
Intangible assets under development		3.14	4.84
		7,678.64	4,618.47

= (767.864 + 461.847)/2

= Rs.614.855 Crs

We know the operating revenue for FY14 is Rs.343.7 Crs, hence the Fixed Asset Turnover ratio is:

= 343.7 / 614.85

=0.558

While evaluating this ratio, do keep in mind the stage the company is in. For a very well established company, the company may not be utilizing its cash to invest in fixed assets. However for a growing company, the company may invest in fixed assets and hence the fixed assets value may increase year on year. You can notice this in case of ARBL as well, for the FY13 the Fixed assets value is at Rs.461.8 Crs and for the FY14 the fixed asset value is at Rs.767.8 Crs.

This ratio is mostly used by capital intensive industries to analyze how effectively the fixed assets of the company are used.

Working Capital Turnover

Working capital refers to the capital required by the firm to run its day to day operations. To run the day to day operations, the company needs certain type of assets. Typically such assets are – inventories, receivables, cash etc. If you realize these are current assets. A well managed company finances the current assets by current liabilities. The difference between the current assets and current liabilities gives us the working capital of the company.

Working Capital = Current Assets – Current Liabilities

If the working capital is a positive number, it implies that the company has **working capital surplus** and can easily manage its day to day operations. However if the working capital is negative, it means the company has a **working capital deficit**. Usually if the company has a working capital deficit, they seek a working capital loan from their bankers.

The concept of 'Working Capital Management' in itself is a huge topic in Corporate Finance. It includes inventory management, cash management, debtor's management etc. The company's CFO (Chief Financial Officer) strives to manage the company's working capital efficiently. Of course, we will not get into this topic as we will digress from our main topic.

The working capital turnover ratio is also referred to as Net sales to working capital. The working capital turnover indicates how much revenue the company generates for every unit of working capital. Suppose the ratio is 4, then it indicates that the company generates Rs.4 in revenue for every Rs.1 of working capital. Needless to say, higher the number, better it is. Also, do remember

all ratios should be compared with its peers/competitors in the same industry and with the company's past and planned ratio to get a deeper insight of its performance.

The formula to calculate the Working Capital Turnover:
Working Capital Turnover = [Revenue / Average Working Capital]

Let us implement the same for Amara Raja Batteries Limited. To begin with, we need to calculate the working capital for the FY13 and the FY14 and then find out the average. Here is the snapshot of ARBL's Balance sheet, I have highlighted the current assets (red) and current liabilities (green) for both the years:

Current liabilities					
Short-term borrowings	7	83.83		98.63	
Trade payables	8	1,277.79		1,362.84	
Other current liabilities	9	2,156.68		1,807.26	
Short-term provisions	6	2,818.73		2,493.20	
			6,337.03		5,761.93
Total			21,394.41		17,704.70
ASSETS					
Non-current assets					
Fixed assets	10				
Tangible assets		6,198.94		3,554.97	
Intangible assets		32.96		33.69	
Capital work-in-progress		1,443.60		1,024.97	
Intangible assets under development		3.14		4.84	
		7,678.64		4,618.47	
Non-current investments	11	160.76		160.76	
Long-term loans and advances	12	567.69		353.52	
Other non-current assets	13	1.22		3.43	
			8,408.31		5,136.18
Current assets					
Inventories	14	3,350.08		2,928.58	
Trade receivables	15	4,527.89		3,806.77	
Cash and bank balances	16	2,945.67		4,107.90	
Short-term loans and advances	12	2,119.30		1,656.78	
Other current assets	13	43.16		68.49	
			12,986.10		12,568.52

The average working capital for the two financial years can be calculated as follows:

Current Assets for the FY13	Rs.1256.85
Current Liabilities for the FY13	Rs.576.19
Working Capital for the FY13	Rs.680.66
Current Asset for the FY14	Rs.1298.61
Current Liability for the FY14	Rs.633.70
Working Capital for the FY14	Rs.664.91
Average Working Capital	Rs.672.78

We know the revenue from operations for ARBL is Rs.3437 Crs. Hence the working capital turnover ratio is:

= 3437 / 672.78

= 5.11 times

The number indicates that for every Rs.1 of working capital, the company is generating Rs.5.11 in terms of revenue. Higher the working capital turnover ratio the better it is, as it indicates the company is generating better sales in comparison with the money it uses to fund the sales.

Total Assets Turnover

This is a very straight forward ratio. It indicates the company's capability to generate revenues with the given amount of assets. Here the assets include both the fixed assets as well as current assets. A higher total asset turnover ratio compared to its historical data and competitor data means the company is using its assets well to generate more sales.

Total Asset Turnover = Operating Revenue / Average Total Assets

The average total assets for ARBL is as follows –

Total Assets for FY 13 – Rs.1770.5 Crs and Total Assets for FY 14 – 2139.4 Crs. Hence the average assets would be Rs. 1954.95 Crs.

Operating revenue (FY 14) is Rs. 3437 Crs. Hence Total Asset Turnover is:

= 3437 / 1954.95

= 1.75 times

Inventory Turnover Ratio

Inventory refers to the finished goods that a company maintains in its store or showroom with an expectation of selling the finished goods to prospective clients. Typically, the company besides keeping the goods in the store would also keep some additional units of finished goods in its warehouse.

If a company is selling popular products, then the goods in the inventory gets cleared rapidly, and the company has to replenish the inventory time and again. This is called the 'Inventory turnover'.

For example think about a bakery selling hot bread. If the bakery is popular, the baker probably knows how many pounds of bread he is likely to sell on any given day. For example, he could sell 200 pounds of bread daily. This means he has to maintain an inventory of 200 pounds of bread

every day. So, in this case the rate of replenishing the inventory and the inventory turnover is quite high.

This may not be true for every business. For instance, think of a car manufacturer. Obviously selling cars is not as easy as selling bread. If the manufacturer produces 50 cars, he may have to wait for sometime before he sells these cars. Assume, to sell 50 cars (his inventory capacity) he will need 3 months. This means, every 3 months he turns over his inventory. Hence in a year he turns over his inventory 4 times.

Finally, if the product is really popular the inventory turnover would be high. This is exactly what the 'Inventory Turnover Ratio' indicates.

The formula to calculate the ratio is:
Inventory Turnover = [Cost of Goods Sold / Average Inventory]

Cost of goods sold is the cost involved in making the finished good. We can find this in the P&L Statement of the company. Let us implement this for ARBL.

To evaluate the cost of goods sold, I need to look into the expense of the company, here is the extract of the same:

EXPENSES			
Cost of materials consumed	19	21,011.95	17,603.12
Purchases of stock-in-trade	20	2,113.69	2,632.54
Changes in inventories of finished goods, work-in-process and stock-in-trade	20	(292.10)	(320.89)
Employee benefits expense	21	1,583.16	1,262.30
Finance costs	22	7.18	2.69
Depreciation and amortisation expense [includes impairment loss of ₹Nil (PY ₹75.52 million)]	23	645.71	660.92
Other expenses	24	4,346.60	3,904.24

Cost of materials consumed is Rs.2101.19 Crs and purchases of stock-in-trade is Rs.211.36 Crs. These line items are directly related to the cost of goods sold. Along with this I would also like to inspect 'Other Expenses' to identify any costs that are related to the cost of goods sold. Here is the extract of Note 24, which details 'Other Expenses'.

NOTE 24: OTHER EXPENSES   ₹ million

Particulars	Year ended March 31, 2014		Year ended March 31, 2013	
A. Manufacturing expenses				
a. Stores and spares consumed (including packing material)		449.41		378.41
b. Power and fuel		922.56		978.14
c. Insurance		8.49		7.29
d. Repairs and maintenance to				
i) Machinery	44.46		55.79	
ii) Buildings	18.72	63.18	14.28	70.07
Total (A)		1,443.64		1,433.91
B. Selling expenses				
a. Advertisement and promotion		275.85		154.41
b. Freight outward		595.20		553.25
c. Commission on sales		8.40		10.13
d. Service expenses		219.36		94.16
e. Warehousing and secondary freight		250.50		223.43
f. Other sales expenses		242.15		155.81
g. Royalty on sales		-		0.05
h. Product warranties		383.15		494.62
Total (B)		1,974.61		1,685.86

There are two expenses that are directly related to manufacturing i.e. Stores & spares consumed which is at Rs.44.94 Crs and the Power & Fuel cost which is at Rs.92.25Crs.

Hence the Cost of Goods Sold = Cost of materials consumed + Purchase of stock in trade + Stores & spares consumed + Power & Fuel

= 2101.19 + 211.36 + 44.94 + 92.25

COGS= Rs.2449.74 Crs

This takes care of the numerator. For the denominator, we just take the average inventory for the FY13 and FY14. From the balance sheet – Inventory for the FY13 is Rs.292.85 Crs and for the FY14 is Rs.335.00 Crs. The average works out to Rs.313.92 Crs

The Inventory turnover ratio is:

= 2449.74 / 313.92

= 7.8 times

~ 8.0 times a year

This means Amara Raja Batteries Limited turns over its inventory 8 times in a year or once in every 1.5 months. Needless to say, to get a true sense of how good or bad this number is, one should compare it with its competitor's numbers.

Inventory Number of days

While the Inventory turnover ratio gives a sense of how many times the company 'replenishes' their inventory, the 'Inventory number of Days' gives a sense of how much time the company takes to convert its inventory into cash. Lesser the number of days, the better it is. A short inven-

tory number of day's number implies, the company's products are fast moving. The formula to calculate the inventory number of days is:

Inventory Number of Days = 365 / Inventory Turnover

The inventory number of days is usually calculated on a yearly basis. Hence in the formula above, 365 indicates the number of days in a year.

Calculating this for ARBL:
= 365 / 7.8
= 46.79 days
~ 47.0 days

This means ARBL roughly takes about 47 days to convert its inventory into cash. Needless to say, the inventory number of days of a company should be compared with its competitors, to get a sense of how the company's products are moving.

Now here is something for you to think about – What would you think about the following situation?

   1. A certain company under consideration has a high inventory turnover ratio

   2. Because of a high inventory turnover ratio, the inventory number of days is very low

On the face of it, the inventory management of this company looks good. A high inventory turnover ratio signifies that the company is replenishing its inventory quickly, which is excellent. Along with the high inventory turnover, a low inventory number of days indicate that the company is quickly able to convert its goods into cash. Again, this is a sign of great inventory management.

However, what if the company has a great product (hence they are able to sell quickly) but a low production capacity? Even in this case the inventory turnover will be high and inventory days will be low. But a low production capacity can be a bit worrisome as it raises many questions about the company's production:

   1. Why is the company not able to increase their production?

   2. Are they not able to increase production because they are short of funds?

   3. If they are short of funds, why can't they seek a bank loan?

   4. Have they approached a bank and are not been able to raise a loan successfully?

   5. If they are not able to raise a loan, why?

6. What if the management does not have a great track record, hence the banks hesitation to give a loan?

7. If funds are not a problem, why can't the company increase production?

8. Is sourcing raw materials difficult? Is the raw material required regulated by government (like Coal, power, Oil etc).

9. Difficult access to raw material – does that mean the business is not scalable?

As you can see, if any of the points above is true, then a red flag is raised, hence investing in the company may not be advisable. To fully understand the production issues (if any), the fundamental analyst should read through the annual report (especially the management discussion & analysis report) from the beginning to the end.

This means whenever you see impressive inventory numbers, always ensure to double check the production details as well.

Accounts Receivable Turnover Ratio

Having understood the inventory turnover ratio, understanding the receivable turnover ratio should be quite easy. The receivable turnover ratio indicates how many times in a given period the company receives money/cash from its debtors and customers. Naturally a high number indicates that the company collects cash more frequently.

The formula to calculate the same is:
Accounts Receivable Turnover Ratio = Revenue / Average Receivables

From the balance sheet we know,
Trade Receivable for the FY13 : Rs.380.67 Crs
Trade Receivable for the FY14 : Rs. 452.78 Crs
Average Receivable for the FY13 : Rs.416.72
Operating Revenue for the FY14 : Rs.3437 Crs

Hence the Receivable Turnover Ratio is:
= 3437 / 416.72
= 8.24 times a year
~ 8.0 times

This means ARBL receives cash from its customers roughly about 8.24 times a year or once every month and a half.

Days Sales Outstanding (DSO))/ Average Collection Period/ Day Sales in Receivables

The days sales outstanding ratio illustrates the average cash collection period i.e the time lag between billing and collection. This calculation shows the efficiency of the company's collection department. Quicker/faster the cash is collected from the creditors, faster the cash can be used for other activities. The formula to calculate the same is:

Days Sales outstanding = 365 / Receivable Turnover Ratio

Solving this for ARBL,

= 365 / 8.24

= 44.29 days

This means ARBL takes about 45 days from the time it raises an invoice to the time it can collect its money against the invoice.

Both Receivables Turnover and the DSO indicate the credit policy of the firm. A efficiently run company, should strike the right balance between the credit policy and the credit it extends to its customers.

Key takeaways from this chapter

1. Leverage ratios include Interest Coverage, Debt to Equity, Debt to Assets and the Financial Leverage ratios

2. The Leverage ratios mainly study the company's debt with respect to the company's ability to service the long term debt

3. Interest coverage ratio inspects the company's earnings ability (at the EBIT level) as a multiple of its finance costs

4. Debt to equity ratio measures the amount of equity capital with respect to the debt capital. Debt to equity of 1 implies equal amount of debt and equity

5. Debt to Asset ratio helps us understand the asset financing structure of the company (especially with respect to the debt)

6. The Financial Leverage ratio helps us understand the extent to which the assets are financed by the owner's equity

7. The Operating Ratios also referred to as the Activity ratios include – Fixed Assets Turnover, Working Capital turnover, Total Assets turnover, Inventory turnover, Inventory number of days, Receivable turnover and Day Sales Outstanding ratios

8. The Fixed asset turnover ratio measures the extent of the revenue generated in comparison to its investment in fixed assets

9. Working capital turnover ratio indicates how much revenue the company generates for every unit of working capital

10. Total assets turnover indicates the company's ability to generate revenues with the given amount of assets

11. Inventory turnover ratio indicates how many times the company replenishes its inventory during the year

12. Inventory number of days represents the number of days the company takes to convert its inventory to cash

    a. A high inventory turnover and therefore a low inventory number of days is a great combination

    b. However make sure this does not come at the cost of low production capacity

13. The Receivable turnover ratio indicates how many times in a given period the company receives money from its debtors and customers

14. The Days sales outstanding (DSO) ratio indicates the Average cash collection period i.e the time lag between the Billing and Collection

The Financial Ratio Analysis (Part 3)

11.1 – The Valuation Ratio

Valuation in general, is the estimate of the 'worth' of something. In the context of investments, 'something' refers to the price of a stock. When making an investment decision, irrespective of how attractive the business appears, what matters finally is the valuation of the business. Valuations dictate the price you pay to acquire a business. Sometimes, a mediocre business at a ridiculously cheap valuation may be a great investment option as opposed to an exciting business with an extremely high valuation.

The valuation ratios help us develop a sense on how the stock price is valued by the market participants. These ratios help us understand the attractiveness of the stock price from an investment perspective. The point of valuation ratios is to compare the price of a stock viz a viz the benefits of owning it. Like all the other ratios we had looked at, the valuation ratios of a company should be evaluated alongside the company's competitors.

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Valuation ratios are usually computed as a ratio of the company's share price to an aspect of its financial performance. We will be looking at the following three important valuation ratios:

1. Price to Sales (P/S) Ratio
2. Price to Book Value (P/BV) Ratio and
3. Price to Earnings (P/E) Ratio

Continuing with the Amara Raja Batteries Limited (ARBL) example, let us implement these ratios to see how ARBL fares. The stock price of ARBL is a vital input used to calculate the valuation ratios. As I write this chapter on 28th of Oct 2014, ARBL is trading at Rs.661 per share.

We also need the total number of shares outstanding in ARBL to calculate the above ratios. If you recollect, we have calculated the same in chapter 6. The total number of shares outstanding is 17,08,12,500 or 17.081Crs

Price to Sales (P/S) Ratio

In many cases, investors may use sales instead of earnings to value their investments. The earnings figure may not be true as some companies might be experiencing a cyclical low in their earning cycle. Additionally due to some accounting rules, a profitable company may seem to have no earnings at all, due to the huge write offs applicable to that industry. So, investors would prefer to use this ratio. This ratio compares the stock price of the company with the company's sales per share. The formula to calculate the P/S ratio is:

Price to sales ratio = Current Share Price / Sales per Share

Let us calculate the same for ARBL. We will take up the denominator first:

Sales per share = Total Revenues / Total number of shares

We know from ARBL's P&L statement the:

Total Revenue = Rs.3482 Crs

Number of Shares = 17.081 Crs

Sales per share = 3482 / 17.081

Therefore the Sales per share = Rs. 203.86

This means for every share outstanding, ARBL does Rs.203.86 worth of sales.

Price to Sales Ratio = 661 / 203.86

= 3.24x or 3.24 times

A P/S ratio of 3.24 times indicates that, for every Rs.1 of sales, the stock is valued Rs.3.24 times higher. Obviously, higher the P/S ratio, higher is the valuation of the firm. One has to compare the P/S ratio with its competitors in the industry to get a fair sense of how expensive or cheap the stock is.

Here is something that you need to remember while calculating the P/S ratio. Assume there are two companies (Company A and Company B) selling the same product. Both the companies generate a revenue of Rs.1000/-each. However, Company A retains Rs.250 as PAT and Company B retains Rs.150 as PAT. In this case, Company A has a profit margin of 25% versus Company B's which has a 15% profit margin. Hence the sales of Company A is more valuable than the sales of Company B. Hence if Company A is trading at a higher P/S, then the valuation maybe justified, simply because every rupee of sales Company A generates, a higher profit is retained.

Hence whenever you feel a particular company is trading at a higher valuation from the P/S ratio perspective, do remember to check the profit margin for cues.

Price to Book Value (P/BV) Ratio

Before we understand the Price to Book Value ratio, we need to understand what the term 'Book Value' means.

Consider a situation where the company has to close down its business and liquidate all its assets. What is the minimum value the company receives upon liquidation? The answer to this lies in the "Book Value" of the firm.

The "Book Value" of a firm is simply the amount of money left on table after the company pays off its obligations. Consider the book value as the salvage value of the company. Suppose the book value of a company is Rs.200 Crs, then this is the amount of money the company can expect to receive after it sells everything and settles its debts. Usually the book value is expressed on a per share basis. For example, if the book value per share is Rs.60, then Rs.60 per share is what the shareholder can expect in case the company decides to liquidate. The 'Book Value' (BV) can be calculated as follows:

BV = [Share Capital + Reserves (excluding revaluation reserves) / Total Number of shares]

Let us calculate the same for ARBL:

From ARBL's balance sheet we know:

Share Capital = Rs.17.1 Crs

Reserves = Rs.1345.6 Crs

Revaluation Reserves = 0

Number of shares: 17.081

Hence the Book Value per share = [17.1+1345.6 – 0] / 17.081

= Rs.79.8 per share

This means if ARBL were to liquidate all its assets and pay off its debt, Rs.79.8 per shares is what the shareholders can expect.

Moving ahead, if we divide the current market price of the stock by the book value per share, we will get the price to the book value of the firm. The P/BV indicates how many times the stock is trading over and above the book value of the firm. Clearly the higher the ratio, the more expensive the stock is.

Let us calculate this for ARBL. We know:

Stock price of ARBL = Rs.661 per share

BV of ARBL = 79.8 per share

P/BV = 661/79.8

= 8.3x or 8.3 times

This means ARBL is trading over 8.3 times its book value.

A high ratio could indicate the firm is overvalued relative to the equity/ book value of the company. A low ratio could indicate the company is undervalued relative to the equity/ book value of the company.

Price to Earning (P/E) Ratio

The Price to Earnings ratio is perhaps the most popular financial ratio. Everybody likes to check the P/E of a stock. Because of the popularity the P/E ratio enjoys, it is often considered the 'financial ratio superstar'.

The P/E of a stock is calculated by dividing the **current stock price** by the **Earning Per share** (EPS). Before we proceed further to understand the PE ratio, let us understand what "Earnings per Share" (EPS) stands for.

EPS measures the profitability of a company on a per share basis. For example assume a certain company with 1000 shares outstanding generates a profit of Rs.200000/-. Then the earnings on a per share basis would be:

=200000 / 1000

= Rs.200 per share.

Hence the EPS gives us a sense of the profits generated on a per share basis. Clearly, higher the EPS, better it is for its shareholders.

If you divide the current market price with EPS we get the Price to Earnings ratio of a firm. The P/E ratio measures the willingness of the market participants to pay for the stock, for every rupee of profit that the company generates. For example if the P/E of a certain firm is 15, then it simply means that for every unit of profit the company earns, the market participants are willing to pay 15 times. Higher the P/E, more expensive is the stock.

Let us calculate the P/E for ARBL. We know from its annual report –

PAT = Rs.367 Crs

Total Number of Shares = 17.081 Crs

EPS = PAT / Total Number of shares

= 367 / 17.081

= Rs.21.49

Current Market Price of ARBL = 661

Hence P/E = 661 / 21.49

= 30.76 times

This means for every unit of profit generated by ARBL, the market participants are willing to pay Rs.30.76 to acquire the share.

Now assume, ARBL's price jumps to Rs.750 while the EPS remains at Rs.21.49, the new P/E would be:

= 750/21.49

= 34.9 times

While the EPS stayed flat at Rs.21.49 per share, the stock's P/E jumped. Why do you think this happened?

Clearly, the P/E Ratio jumped because of the increase in the stock price. As we know the stock price of a company increases when the expectations from the company increases.

Remember, P/E Ratio is calculated with 'earnings' in its denominator. While looking at the P/E ratio, do remember the following key points:

1. P/E indicates how expensive or cheap the stock is trading at. Never buy stocks that are trading at high valuations. I personally do not like to buy stocks that are trading beyond 25 or at the most 30 times its earnings, irrespective of the company and the sector it belongs to

2. The denominator in P/E ratio is the 'Earnings', and the earnings can be manipulated

3. Make sure the company is not changing its accounting policy too often – this is one of the ways the company tries to manipulate its earnings.

4. Pay attention to the way depreciation is treated. Provision for lesser depreciation can boost earnings

5. If the company's earnings are increasing but not its cash flows and sales, then clearly something is not right

11.2 – The Index Valuation

Just like a stock, the stock market indices such as the BSE Sensex and the CNX Nifty 50 have their valuations which can be measured by the P/E ,P/B and Dividend Yield ratios. The Index valuation is usually published by the stock exchanges on a daily basis. The index valuations give us a sense of how cheap or expensive the market is trading at. To calculate the CNX Nifty 50 P/E ratio, the National Stock Exchange combines the market capitalization for all the 50 stocks and divides that amount by the combined earnings for all the 50 stocks. Tracking the Index P/E ratio, gives a sense of the current state of market as perceived by the market participants. Here is the historical chart of Nifty 50 P/E ratio* –

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Nifty P/E Ratio

*Source – Creytheon

From the P/E chart above, we can make a few important observations –

1. The peak Index valuation was 28x (early 2008), what followed this was a major crash in the Indian markets

2. The corrections drove the valuation down to almost 11x (late 2008, early 2009). This was the lowest valuation the Indian market had witnessed in the recent past

3. Usually the Indian Indices P/E ratio ranges between 16x to 20x, with an average of 18x

4. As of today (2014) we are trading around 22x, which is above the average P/E ratio

Based on these observations, the following conclusions can be made –

1. One has to be cautious while investing in stocks when the market's P/E valuations is above 22x

2. Historically the best time to invest in the markets is when the valuations are around 16x or below.

One can easily find out Index P/E valuation on a daily basis by visiting the National Stock Exchange (NSE) website.

On NSE's home page click on Products > Indices > Historical Data > P/E, P/B & Div > Search

In the search field enter today's date and you will get the latest P/E valuation of the market. Do note, the NSE updates this information around 6:00 PM every day.

Here is a snapshot of the search result –

P/E, P/B & Div Yield values

Select the index you want:

Select Index: CNX NIFTY ▼

Select a time period: 13-11-2014   To 13-11-2014

☑ P/E ☑ P/B ☑ Div Yield ☑ All

Get Data

Historical CNX NIFTY P/E, P/B & Div. Yield values			
For the period 13-11-2014 to 13-11-2014			
Date	P/E	P/B	Div Yield
13-Nov-2014	21.26	3.53	1.27

Download file in csv format

Clearly as of today (13th Nov 2014) the Indian market is trading close to the higher end of the P/E range; history suggests that we need to be cautious while taking investment decisions at this level.

Key takeaways from this chapter

1. Valuation in general, is the estimate of the 'worth' of something

2. Valuation ratios involves inputs from both the P&L statement and the Balance Sheet

3. The Price to Sales ratio compares the stock price of the company with the company's sales per share

   • Sales per share is simply the Sales divided by the Number of shares

4. Sales of a company with a higher profit margin is more valuable in comparison to the sales of a company with lower profit margins

5. If a company is going bankrupt, the 'Book Value' of a firm is simply the amount of money left on table after the company pays off its obligations

6. Book value is usually expressed on a per share basis

7. The Price/BV indicates how many times the stock price is trading over and above the book value of the firm

8. EPS measures the profitability of a company on a per share basis

9. The P/E ratio indicates the willingness of market participants to pay for a stock, keeping the company's earnings in perspective

10. One has to be cautious about the earning manipulation while evaluating the P/E ratio

11. The Indices have a valuation which can be measured by the P/E ,P/B or Dividend Yield ratio

12. It is advisable to exercise caution when the Index is trading at a valuation of 22x or above

13. A valuation gets attractive when the index is trading at 16x or below

14. The index valuations are published by NSE on their website on a daily basis

The Investment Due Diligence

12.1 – Taking stock

Over the last few chapters we understood how to read the financial statements and calculate a few important financial ratios. These chapters have laid the foundation to the final objective of this module which is – To use fundamental analysis to identify the stocks to invest. If you recollect in the earlier chapters, we had discussed about investable grade attributes. Investable grade attributes simply define the prerequisites of a company that needs to be validated before making an investment decision. Think of the investable grade attributes as a checklist based on the fundamentals of the company. A company that satisfies most of the items in the checklist, is considered investment worthy.

Now this is where few differences come up. For instance, what I consider as an investable grade attribute may not be so important to you. For example – I may pay a lot of attention to corporate governance but another investor may choose not pay so much attention to corporate govern-

ance. He could simply brush it off saying "all companies have shades of grey, as long as the numbers add up I am fine investing in the company".

So the point is, there is no prescribed checklist. Each investor has to build his own checklist based on his investment experience. However, one has to ensure that each item on the checklist is qualified based on sound logic. Later in this chapter, I will share a checklist that I think is reasonably well curated. You could take pointers from this checklist, if you are starting out fresh. We will keep this checklist as a guideline and proceed further in this module.

12.2 – Generating a stock idea

Now before we proceed further and generate a checklist, we must address a more basic issue. The process of investing requires us to first select a stock that looks interesting. After selecting the stock we must subject it to the checklist to figure out if the stock matches all the checklist criteria, if it does we invest, else we look for other opportunities.

So in the first place, how do we even select a stock that looks interesting? In other words, how do we generate a list of stocks that seems interesting enough to investigate further? Well, there are a few methods to do this –

1. **General Observation** – This may sound rudimentary, but believe me this is one of the best ways to develop a stock idea. All you need to do is keep your eyes and ears open and observe the economic activity around you. Observe what people are buying and selling, see what products are being consumed, keep an eye on the neighborhood to see what people are talking about. In fact Peter Lynch, one of the most illustrious Wall Street investor advocates this method in his book "One up on Wall Street". Personally I have used this method to pick some of my investments – PVR Cinemas Ltd (because I noticed PVR multiplexes mushrooming in the City), Cummins India Limited (because I noticed most of the buildings had a Cummins diesel generator in their premises), and Info Edge Limited (Info Edge owns naukri.com, which is probably the most preferred job portal).

2. **Stock screener** – A stock screener helps to screen for stocks based on the parameters you define and therefore helps investors perform quality stock analysis .For example you can use a stock screener to identify stocks that have a ROE of 25% along with PAT margins of 20%. A stock screener is very helpful tool when you want to shortlist a handful of investment ideas from a big basket of stocks. There are many stock screeners available; I personally like the Google finance's stock screener and screener.in.

3. **Macro Trends** – Keeping a general tab on the macroeconomic trend is a great way of iden-tifying good stocks. Here is an illustration of the same – As of today there is a great push for infrastructure projects in India. An obvious beneficiary of this push would be the cement companies operating in India. Hence, I would look through all the cement companies and apply the checklist to identify which amongst all the cement companies are well positioned to leverage this macro trend.

4. **Sectoral Trends** – This is sector specific. One needs to track sectors to identify emerging trends and companies within the sector that can benefit from it. For example the non alco-holic beverages market is a very traditional sector. Mainly, three kinds of products are sold and they are coffee, tea, and packaged water. Hence, most of the companies manufacture and sell just these three products. However there is a slight shift in the consumer taste these days – the market for energy drink is opening up and it seems to be promising. Hence the in-vestor may want to check for companies within the sector that is best positioned to lever-age this change and adapt to it.

5. **Special Situation** – This is a slightly complicated way of generating a stock idea. One has to follow companies, company related news, company events etc to generate an idea based on special situation. One example that I distinctly remember was that of Cox & Kings. You may know that Cox & Kings is one of the largest and the oldest tour operator in India. In late 2013, the company announced inclusion of Mr.Keki Mistry (from HDFC Bank) to its advisory board. Corporate India has an immense respect for him as he is known to be a very transpar-ent and efficient business professional. A colleague of mine was convinced that Cox & Kings would benefit significantly with Mr. Keki Mistry on its board. This alone acted as a primary trigger for my colleague to investigate the stock further. Upon further research my colleague happily invested in Cox & Kings Limited. Good for my him, as I write this today I know he is sitting on a 200% gain.

6. **Circle of Competence** – This is where you leverage your professional skills to identify stock ideas. This is a highly recommended technique for a newbie investor. This method re-quires you to identify stocks within your professional domain. For example, if you are a medical professional your circle of competence would be the healthcare industry. You will probably be a better person to understand that industry than a stock broker or an equity re-search analyst. All you need to do is identify which are the listed companies in this space and pick the best based on your assessment. Likewise if you are banker, you will probably know more about banks than the others do. So, leverage your circle of competence to pick your investments.

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The point is that the trigger for investigating stocks may come from any source. In fact, as and when you feel a particular stock looks interesting, just add it to your list. This list over time will be your 'watch list'. A very important thing to note here is that a stock may not satisfy the checklist items at a particular time, however as the time progresses, as business dynamics change at some point it may match up to the checklist. Hence, it is important to evaluate the stocks in your watch list from time to time.

12.3 – The Moat

After selecting a stock, one has to run the checklist to investigate the stock further. This is called the "Investment due diligence". The due diligence process is very critical and one has to ensure maximum attention is paid to each and every aspect of this exercise. I will shortly present a checklist that I think is reasonable. But before that, we need to talk about 'The Moat'.

Moat (or economic moat) is a term that was popularized by Warren Buffet. The term simply refers to the company's competitive advantage (over its competitors). A company with a strong moat, ensures the company's long term profits are safeguarded. Of course the company should not only have a moat, but it should also be sustainable over a long period of time. A company which possesses wider moat characteristics (such as better brand name, pricing power, and better market share) would be more sustainable, and it would be difficult for the company's rivals to eat away its market share.

To understand moats, think of "Eicher Motors Limited". Eicher Motors is a major Indian automobile manufacturer. It manufactures commercial vehicles along with the iconic Royal Enfield bikes. The Royal Enfield bikes enjoy a huge fan following both in India and outside India. It has a massive brand recall. Royal Enfield caters to a niche segment which is growing fast. Their bikes are not as expensive as the Harley Davidson nor are they as inexpensive as probably the TVS bikes. It would be very hard for any company to enter this space and shake up or rattle the brand loyalty that Royal Enfield enjoys. In other words, displacing Eicher Motors from this sweet spot will require massive efforts from its competitors. This is one of Eicher Motors' moat.

There are many companies that exhibit such interesting moats. In fact true wealth creating companies have a sustainable moat as an underlying factor. Think about Infosys – the moat was labor arbitrage between US and India, Page Industries – the moat was manufacturing and distribution license of Jockey innerwear, Prestige Industries – the moat was manufacturing and selling pressure cookers, Gruh Finance Limited – the moat was small ticket size credits disbursed to a certain market segment…so on an so forth. Hence always invest in companies which have wider economic moats.

12.4 – The Due Diligence

The equity research due diligence process involves the following stages –

1. Understanding the business – requires reading the annual reports

2. Application of the checklist and

3. Valuation – to estimate the intrinsic value of the business

In **stage 1** i.e **Understanding the business** we dwell deep into the business with a perspective of knowing the company inside out. We need to make a list of questions for which we need to find answers to. A good way to start would be by posting a very basic question about the company – **What business is the company involved in?**

To find the answer, we do not go to Google and search, instead look for it in the company's latest Annual Report or their website. This helps us understand what the company has to say about themselves.

When it comes to my own investing practice, I usually like to invest in companies where the competition is less and there is very little government intervention. For example, when I decided to invest in PVR Cinemas, there were only 3 listed players in that space. PVR, INOX, and Cinemax. PVR and Cinemax merged leaving just 2 listed companies in that space. However, there are a few new players who have entered this space now, hence it is time for me to re evaluate my investment thesis in PVR.

Once we are comfortable knowing the business, we move to **stage 2** i.e **application of the checklist.** At this stage we get some performance related answers. Without much ado, here is the 10 point checklist that I think is good enough for a start –

Sl No	Variable	Comment	What does it signify
1	Gross Profit Margin (GPM)	> 20%	Higher the margin, higher is the evidence of a sustainable moat
2	Net Profit Growth	In line with the gross profit growth	Revenue growth should be in line with the profit growth
3	EPS	EPS should be consistent with the Net Profits	If a company is diluting its equity then it is not good for its shareholders
4	Debt Level	Company should not be highly leveraged	High debt means the company is operating on a high leverage. Plus the finance cost eats away the earnings
5	Inventory	Applicable for manufacturing companies	A growing inventory along with a growing PAT margin is a good sign. Always check the inventory number of days
6	Sales vs Receivables	Sales backed by receivables is not a great sign	This signifies that the company is just pushing its products to show revenue growth
7	Cash flow from operations	Has to be positive	If the company is not generating cash from operations then it indicates operating stress
8	Return on Equity	>25%	Higher the ROE, better it is for the investor, however make sure you check the debt levels along with this
9	Business Diversity	1 or 2 simple business lines	Avoid companies that have multiple business interests. Stick to companies that operate in 1 or 2 segments
10	Subsidiary	Not many	If there are too many subsidiaries then it could be a sign of the company siphoning off money. Be cautious while investing in such companies.

Lastly, a company could satisfy each and every point mentioned in the checklist above, but if the stock is not trading at the right price in the market, then there is no point buying the stock. So how do we know if the stock is trading at the right price or not? Well, this is what we do in **stage 3**. We need to run a **valuation exercise** on the stock. The most popular valuation method is called the **"Discounted Cash Flow (DCF) Analysis".**

Over the next few chapters, we will discuss the framework to go about formally researching the company. This is called **"Equity Research"**. The focus of our discussion on equity research will largely be on Stage 2 and 3, as I believe stage 1 involves reading up the annual report in a fairly detailed manner.

Key takeaways from this chapter

1. A stock idea can come from any source

    • Circle of competence and General observation is a great way to start

2. It is advisable to have a watch list which includes stocks that look interesting

3. Once a stock is identified we should look for sustainable moats

4. The due diligence process involves understanding the business, running the checklist to understand its financial performance, and the valuation exercise

5. When it comes to understanding the business, one should be completely thorough with the business operations of the company

6. The checklist should be improvised as and when the investor gains investment experience

7. The DCF method is one of the best techniques to identify the intrinsic value of the business

Equity Research (Part 1)

13.1 – What to expect?

Having set the context in the previous chapter, we will now proceed to develop a methodology for conducting a 'limited resource' equity research. The reason why I call it 'limited resource' is because you and I as a retail investor have access to just few resources to conduct equity research. These resources are – internet, company annual report, and MS Excel. Whilst an Institution has access to human resource (analyst), access to company management, financial data base (such as Bloomberg, Reuters, Factset etc), industry reports etc. So my objective here is to demonstrate how one can understand a company and its business better with the limited resources at hand. Of course we will do this exercise keeping the end objective in perspective i.e to make a decision on whether to buy or not to buy a stock.

As mentioned in the previous chapter, we will structure the equity research process in 3 stages-

1. Understanding the Business

2. Application of the checklist

3. Intrinsic Value estimation (Valuation) to understand the fair price of the stock

Each stage mentioned above has several steps within it. One must understand that there is no shortcut to this and one must not compromise any of these steps.

13.2 – Stock Price vs Business Fundamentals

When we take up a company for research, the first step is to understand the business as much as possible. People often miss this crucial step and go directly into the stock price analysis. Well, just analyzing the stock price is great if you have a short term perspective. However for long term investments, understanding the business is essential.

Why is it important you may wonder? Well, the reason is simple, the more you know the company the higher is your conviction to stay put with the investment especially during bad times (aka bear markets). Remember during bear markets, the prices react and not the business fundamen-

tals. Understanding the company and its business well gives you the required conviction to reason out why it makes sense to stay invested in the stock even though the market may think otherwise. They say bear markets creates value, so if you have a high conviction on the company you should consider buying into the stock during bear markets and not really selling the stock. Needless to say, this is highly counter intuitive and it takes years of investment practice to internalize this fact.

Anyway, moving ahead the best source to get information related to the business is the company's website and its annual report. We need to study at least the last 5 year annual report to understand how the company is evolving across business cycles.

13.3– Understanding the Business

As a first step towards understanding the business, we need to make a list of questions for which we need to find answers to. Do note, the answers to all these questions can be found out by reading through the company's annual report and website.

Here are a bunch of questions that I think helps us in our quest to understand the business. I have discussed the rationale behind each question.

Sl No	Question	Rational behind the question
1	What does the company do?	To get a basic understanding of the business
2	Who are its promoters? What are their backgrounds?	To know the people behind the business. A sanity check to eliminate criminal background, intense political affiliation etc
3	What do they manufacture (in case it is a manufacturing company)?	To know their products better, helps us get a sense of the product's demand supply dynamics
4	How many plants do they have and where are they located?	To get a sense of their geographic presence. Also at times their plants could be located in a prime location, and the value of such location could go off balance sheet, making the company highly undervalued
5	Are they running the plant in full capacity?	Gives us an idea on their operational abilities, demand for their products, and their positioning for future demand
6	What kind of raw material is required?	Helps us understand the dependency of the company. For example the raw material could be regulated by Govt (like Coal) or the raw material needs to be imported either of which needs further investigation
7	Who are the company's clients or end users?	By knowing the client base we can get a sense of the sales cycle and efforts required to sell the company's products
8	Who are their competitors?	Helps in knowing the competitors. Too many competing companies means margin pressure. In such a case the company has to do something innovative. Margins are higher if the company operates in – monopoly, duopoly, or oligopoly market structure
9	Who are the major shareholders of the company?	Besides the promoter and promoter group, it helps to know who else owns the shares of the company. If a highly successful investor holds the shares in the company then it could be a good sign

Sl No	Question	Rational behind the question
10	Do they plan to launch any new products?	Gives a sense on how ambitious and innovative the company is. While at the same time a company launching products outside their domain raises some red flags – is the company losing focus?
11	Do they plan to expand to different countries?	Same rational as above
12	What is the revenue mix? Which product sells the most?	Helps us understand which segment (and therefore the product) is contributing the most to revenue. This in turns helps us understand the drivers for future revenue growth
13	Do they operate under a heavy regulatory environment?	This is both good and bad – Good because it acts a natural barrier from new competition to enter the market, bad because they are limited with choices when it comes to being innovative in the industry
14	Who are their bankers, auditors?	Good to know, and to rule out the possibility of the companies association with scandalous agencies
15	How many employees do they have? Does the company have labor issues?	Gives us a sense of how labor intensive the company's operations are. Also, if the company requires a lot of people with niche skill set then this could be another red flag
16	What are the entry barriers for new participants to enter the industry?	Helps us understand how easy or difficult it is for new companies to enter the market and eat away the margins
17	Is the company manufacturing products that can be easily replicated in a country with cheap labor?	If yes, the company maybe sitting on a time bomb – think about companies manufacturing computer hardware, mobile handsets, garments etc
18	Does the company have too many subsidiaries?	If yes, you need to question why? Is it a way for the company to siphon off funds?

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These questions are thought starters for understanding any company. In the process of finding answers you will automatically start posting new questions for which you will have to find answers to. It does not matter which company you are looking at, if you follow this Q&A framework I'm very confident your understanding of the company would drastically increase. This is because the Q&A process requires you to read and dig out so much information about the company that you will start getting a sense of greater understanding of the company.

Remember, this is the first step in the equity research process. If you find red flags (or something not right about the company) while discovering the answers, I would advise you to drop researching the company further irrespective of how attractive the business looks. In case of a red flag, there is no point proceeding to stage 2 of equity research.

From my experience I can tell you that stage 1 of equity research i.e 'Understanding the Company' takes about 15 hours. After going through this process, I usually try to summarize my thoughts on a single sheet of paper which would encapsulate all the important things that I have discovered about the company. This information sheet has to be crisp and to the point. If I'm unable to achieve this, then it is a clear indication that I do not know enough about the company. Only after going through stage 1, I proceed to stage 2 of equity research, which is "Application of Checklist". Please do bear in mind the equity research stages are sequential and should follow the same order.

We will now proceed to stage 2 of equity research. The best way to understand stage 2 is by actually implementing the checklist on a company.

We have worked with Amara Raja Batteries Limited (ARBL) throughout this module, hence I guess it makes sense to go ahead and evaluate the checklist on the same company. Do remember, the company may differ but the equity research framework remains the same.

As we proceed, a word of caution at this point – the discussion going forward will mainly revolve around ARBL as we will understand this company better. The idea here is not to showcase how good or bad ARBL is but instead to illustrate a framework of what I perceive as a 'fairly adequate' equity research process.

13.4 – Application of checklist

The stage 1 of equity research process helps us understand the how, what, who, and why of the business. It helps us develop a holistic view on the company. However, like they say – the proof of the pudding is in the eating; so no matter how attractive the business looks the numbers of the company should also look attractive.

The objective of the 2nd stage of equity research is to help us comprehend the numbers and actually evaluate if both the nature of the business and the financial performance of the business complement each other. If they do not complement each other then clearly the company will not qualify as investible grade.

We looked at the checklist in the previous chapter; I'll reproduce the same here for quick reference.

Sl No	Variable	Comment	What does it signify
1	Net Profit Growth	In line with the gross profit growth	Revenue growth should be in line with the profit growth
2	EPS	EPS should be consistent with the Net Profits	If a company is diluting its equity then it is not good for its shareholders
3	Gross Profit Margin (GPM)	> 20%	Higher the margin, higher is the evidence of a sustainable moat
4	Debt Level	Company should not be highly leveraged	High debt means the company is operating on a high leverage. Plus the finance cost eats away the earnings
5	Inventory	Applicable for manufacturing companies	A growing inventory along with a growing PAT margin is a good sign. Always check the inventory number of days
6	Sales vs Receivables	Sales backed by receivables is not a great sign	This signifies that the company is just pushing its products to show revenue growth
7	Cash flow from operations	Has to be positive	If the company is not generating cash from operations then it indicates operating stress
8	Return on Equity	>25%	Higher the ROE, better it is for the investor, however make sure you check the debt levels along with this

Let us go ahead and evaluate each of the checklist items on Amara Raja Batteries and see what the numbers are suggesting. To begin with we will look into the P&L items – Gross Profit, Net Profit, and EPS of the company.

Revenue & Pat Growth

The first sign of a company that may qualify as investable grade is the rate at which it is growing. To evaluate the growth the company, we need to check the revenue and PAT growth. We will evaluate growth from two perspectives –

1.Year on Year growth – this will gives us a sense of progress the company makes on a yearly basis. Do note, industries do go through cyclical shifts. From that perspective if a company has a flat growth, it is ok. However just make sure you check the competition as well to ensure the growth is flat industry wide.

2.Compounded Annual Growth Rate (CAGR) – The CAGR gives us a sense of how the company is evolving and growing across business cycles. A good, investable grade company is usually the first company to overcome the shifts in business cycles. This will eventually reflect in a healthy CAGR.

Personally I prefer to invest in companies that are growing (Revenue and PAT) over and above 15% on a CAGR basis.

Let us see how ARBL fares here…

	FY 09 -10	FY 10-11	FY 11-12	FY 12 -13	FY 13 – 14
Revenue (INR Crs)	1481	1769	2392	3005	3482
Revenue Growth		19.4%	35.3%	25.6%	15.9%
PAT (INR Crs)	167	148	215	287	367
PAT Growth		(11.3%)	45.2%	33.3%	27.8%

The 5 year CAGR revenue growth is 18.6% and the 5 year CAGR PAT growth is 17.01%. These are an interesting set of numbers; they qualify as a healthy set of numbers. However, we still need to evaluate the other numbers on the checklist

Earnings per Share (EPS)

The earnings per share represent the profitability on a per share basis. The EPS and PAT growing at a similar rate indicates that the company is not diluting the earnings by issuing new shares, which is good for the existing shareholders. One can think of this as a reflection of the company's management's capabilities.

	FY 09 -10	FY 10-11	FY 11-12	FY 12 -13	FY 13 – 14
EPS (In INR)	19.56	17.34	12.59	16.78	21.51
Share Cap(INR Crs)	17.08	17.08	17.08	17.08	17.08
EPS Growth	–	-11.35%	-27.39%	33.28%	28.18%

The 5 year EPS CAGR stands at 1.90% for the FY14.

Gross Profit margins

Gross profit margins, expressed as a percentage is calculated as a –

Gross Profits / Net Sales

Where,

Gross Profits = [Net Sales – Cost of Goods Sold]

Cost of goods sold is the cost involved in making the finished good, we had discussed this calculation while understanding the inventory turnover ratio. Let us proceed to check how ARBL's Gross Profit margins has evolved over the years.

In INR Crs, unless indicated	FY 09-10	FY 10-11	FY 11-12	FY 12 -13	FY 13 – 14
Net Sales	1464	1757	2359	2944	3404
COGS	1014	1266	1682	2159	2450
Gross Profits	450	491	677	785	954
Gross Profit Margins	30.7%	27.9%	28.7%	26.7%	28.0%

Clearly the Gross Profit Margins (GPM) looks very impressive. The checklist mandates a minimum GPM of 20%. ARBL has a much more than the minimum GPM requirement. This implies a couple of things –

1. ARBL enjoys a premium spot in the market structure. This maybe because of the absence of competition in the sector, which enables a few companies to enjoy higher margins

2. Good operational efficiency, which in turn is a reflection of management's capabilities

Debt level – Balance Sheet check

The first three points in the checklist were mainly related to the Profit & Loss statement of the company. We will now look through a few Balance sheet items. One of the most important line item that we need to look at on the Balance Sheet is the Debt. An increasingly high level of debt indicates a high degree of financial leverage. Growth at the cost of financial leverage is quite dangerous. Also do remember, a large debt on balance sheets means a large finance cost charge. This eats into the retained earnings of the firm.

Here is how the debt stands for ARBL –

Debt(INR Crs) Evaluation –

	FY 09-10	FY 10-11	FY 11-12	FY 12 -13	FY 13 – 14
Debt	91.19	95.04	84.07	87.17	84.28
EBIT	261	223	321	431	541
Debt/EBIT(%)	35%	42.61%	26.19%	20.22%	15.57%

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The debt seems to have stabilized around 85Crs. In fact it is encouraging to see that the debt has come down in comparison to the FY 09-10. Besides checking for the interest coverage ratio (which we have discussed previously) I also like to check the debt as a percent of 'Earnings before interest and taxes' (EBIT). This just gives a quick perspective on how the company is managing its finance. We can see that the Debt/EBIT ratio has consistently reduced.

I personally think ARBL has done a good job here by managing its debt level efficiently.

Inventory Check

Checking for the inventory data makes sense only if the company under consideration is a manufacturing company. Scrutinizing the inventory data helps us in multiple ways –

1. Raising inventory with raising PAT indicates are signs of a growing company

2. A stable inventory number of days indicates management's operational efficiency to some extent

Let us see how ARBL fares on the inventory data –

	FY 09-10	FY 10-11	FY 11-12	FY 12 -13	FY 13 – 14
Inventory (INR Crs)	217.6	284.7	266.6	292.9	335.0
Inventory Days	68	72	60	47	47
PAT (INR Crs)	167	148	215	287	367

The inventory number of days is more or less stable. In fact it does show some sign of a slight decline. Do note, we have discussed the calculation of the inventory number of days in the previous chapter. Both the inventory and PAT are showing a similar growth signs which is again a good sign.

Sales vs Receivables

We now look at the sales number in conjunction to the receivables of the company. A sale backed by receivables is not an encouraging sign. It signifies credit sales and therefore many questions arise out of it. For instance – are the company sales personal force selling products on credit? Is the company offering attractive (but not sustainable) credit to suppliers to push sales?

	FY 09-10	FY 10-11	FY 11-12	FY 12 -13	FY 13 – 14
Net Sales(INR Crs)	1464	1758	2360	2944	3403
Receivables (INR Crs)	242.3	305.7	319.7	380.7	452.6
Receivables as as a% of Net Sales	16.5%	17.4%	13.5%	12.9%	13.3%

The company has shown stability here. From the table above we can conclude a large part of their sales is not really backed back receivables, which is quite encouraging. In fact, just liked the inventory number of days, the receivables as % of net sales has also showed signs of a decline, which is quite impressive.

Cash flow from Operations

This is in fact one of the most important checks one needs to run before deciding to invest in a company.

The company should generate cash flows from operations; this is in fact where the proof of the pudding lies. A company which is draining cash from operations raises some sort of red flag.

In INR Crs	FY 09-10	FY 10-11	FY 11-12	FY 12 -13	FY 13 – 14
Cash flow from Operations	214.2	86.1	298.4	335.4	278.7

The cash flow from operations though a bit volatile has remained positive throughout the last 5 years. This only means ARBL's core business operations are generating cash and therefore can be considered successful.

Return on Equity

We have discussed at length about Return on Equity in chapter 9 of this module. I would encourage you to go through it again if you wish to refresh. Return on Equity (ROE) measures in percentage the return generated by the company keeping the shareholders equity in perspective. In a sense ROE measures how successful the promoters of the company are for having invested their own funds in the company.

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Here is how ARBL's ROE has fared for the last 5 years –

In INR Crs	FY 09-10	FY 10-11	FY 11-12	FY 12 -13	FY 13 – 14
PAT	167	148	215	287	367
Shareholders' Equity	543.6	645.7	823.5	1059.8	1362.7
ROE	30.7%	22.9%	26.1%	27.1%	27.0%

These numbers are very impressive. I personally like to invest in companies that have a ROE of over 20%. Do remember, in case of ARBL the debt is quite low, hence the good set of return on equity numbers is not backed by excessive financial leverage, which is again highly desirable.

Conclusion

Remember we are in stage 2 of equity research. I see ARBL qualifying quite well on almost all the required parameters in stage 2. Now, you as an equity research analyst have to view the output of stage 2 in conjunction with your finding from stage 1 (which deals with understanding the business). If you are able to develop a comfortable opinion (based on facts) after these 2 stages, then the business surely appears to have investable grade attributes and therefore worth investing.

However before you go out and buy the stock, you need to ensure the price is right. This is exactly what we do in stage 3 of equity research.

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Key takeaways from this chapter

1. 'Limited Resource' Equity Research can be performed in 3 stages

    a. Understanding the Business

    b. Application of the checklist

    c. Valuations

2. The objective of the stage 1 i.e understanding the business requires us to gather all information related to the business. The best way to go about this is the Q&A way

3. In the Q&A way, we begin with posting some simple and straightforward questions for which we find answers

4. By the time we finish stage 1, we should be through with all the information related to the business

5. Most of the answers required in stage 1 is present in the company's annual report and website

6. Do remember while researching the company in stage 1, if there is something not very convincing about the company, it is often a good idea to stop researching further

7. It is very important for you get convinced (based on true facts) about the company in stage 1. This is how you will develop a strong conviction to stay put during bear markets

8. Stage 2 of Equity Research requires you to evaluate the performance of the company on various counts.

9. You will proceed to stage 3 only after the company clears in stage 1 & 2.

DCF Primer

14.1 – The Stock Price

In the previous chapter we understood stage 1 and stage 2 of equity research. Stage 1 dealt with understanding the business and stage 2 dealt with understanding the financial performance of the company. One can proceed to stage 3, only if he is convinced with the findings of both the earlier stages. Stage 3 deals with the stock price valuation.

An investment is considered a great investment only if a great business is bought at a great price. In fact, I would even stretch to say that it is perfectly fine to buy a mediocre business, as long as you are buying it at a great price. This only shows the significance of 'the price' when it comes to investing.

The objective of the next two chapters is to help you understand "the price". The price of a stock can be estimated by a valuation technique. Valuation per say helps you determine the 'intrinsic value' of the company. We use a valuation technique called the **"Discounted Cash Flow (DCF)"** method to calculate the intrinsic value of the company. The intrinsic value as per the DCF method is the evaluation of the 'perceived stock price' of a company, keeping all the future cash flows in perspective.

The DCF model is made up of several concepts which are interwoven with one another. Naturally we need to understand each of these concepts individually and then place it in the context of DCF. In this chapter we will understand the core concept of DCF called "The Net Present Value (NPV)" and then we will proceed to understand the other concepts involved in DCF, before understanding the DCF as a whole.

14.2 – The future cash flow

The concept of future cash flow is the crux of the DCF model. We will understand this with the help of a simple example.

Assume Vishal is a pizza vendor who serves the best pizza's in town. His passion for baking pizzas leads him to an innovation. He invents an automatic pizza maker which automatically bakes pizzas. All he has to do is, pour the ingredients required for making a pizza in the slots provided and within 5 minutes a fresh pizza pops out. He figures out that with this machine, he can earn an annual revenue of Rs.500,000/- and the machine has a life span of 10 years.

His friend George is very impressed with Vishal's pizza machine. So much so that, George offers to buy this machine from Vishal. Now here is a question for you – What do you think is the minimum price that George should pay Vishal to buy this machine? Well, obviously to answer this question we need to see how economically useful this machine is going to be for George. Assuming he buy this machine today (2014), over the next 10 years, the machine will earn him Rs.500,000/- each year.

Here is how George's cash flow in the future looks like –

2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000

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Do note, for the sake of convenience, I have assumed the machine will start generating cash starting from 2015.

Clearly, George is going to earn Rs.50,00,000/- (10 x 500,000) over the next 10 years, after which the machine is worthless. One thing is clear at this stage, whatever is the cost of this machine, it cannot cost more than Rs.50,00,000/-. Think about it – Does it make sense to pay an entity a price which is more than the economic benefit it offers?

To go ahead with our calculation, assume Vishal asks George to pay "Rs.X" towards the machine. At this stage, assume George has two options – either pay Rs.X and buy the machine or invest the same Rs.X in a fixed deposit scheme which not only guarantees his capital but also pays him an interest of 8.5%. Let us assume that George decides to buy the machine instead of the fixed deposit alternative. This implies, George has foregone an opportunity to earn 8.5% risk free interest. This is the 'opportunity cost' for having decided to buy the machine.

So far, in our quest to price the automatic pizza maker we have deduced three crucial bits of information –

1. The total cash flow from the pizza maker over the next 10 years – Rs.50,00,000/-

2. Since the total cash flow is known, it also implies that the cost of the machine should be less than the total cash flow from the machine

3. The opportunity cost for buying the pizza machine is, an investment option that earns 8.5% interest

Keeping the above three points in perspective, let us move ahead. We will now focus on the cash flows. We know that George will earn Rs.500,000/- every year from the machine for the next 10 years. So think about this – George in 2014, is looking at the future –

1. How much is the Rs.500,000/- that he receives in 2016 worth in today's terms?

2. How much is the Rs.500,000/- that he receives in 2018 worth in today's terms?

3. How much is the Rs.500,000/- that he receives in 2020 worth in today's terms?

4. **To generalize, how much is the cash flow of the future worth in today's terms?**

The answer to these questions lies in the realms of the **"Time value of money"**. In simpler words, if I can calculate the value of all the future cash flows from that machine in terms of today's value, then I would be in a better situation to price that machine.

Please note – in the next section we will digress/move away from the pizza problem, but we will eventually get back to it.

14.3 – Time Value of Money (TMV)

Time value of money plays an extremely crucial role in finance. The TMV finds its application in almost all the financial concepts. Be it discounted cash flow analysis, financial derivatives pricing, project finance, calculation of annuities etc, the time value of money is applicable. Think of the 'Time value of money' as the engine of a car, with the car itself being the "Financial World".

The concept of time value of money revolves around the fact that, the value of money does not remain the same across time. Meaning, the value of Rs.100 today is not really Rs.100, 2 years from now. Inversely, the value of Rs.100, 2 years from now is not really Rs.100 as of today. Whenever there is passage of time, there is an element of opportunity. Money has to be accounted (adjusted) for that opportunity.

If we have to evaluate, what would be the value of money that we have today sometime in the future, then we need to move the 'money today' through the future. This is called the **"Future Value (FV)"** of the money. Likewise, if we have to evaluate the value of money that we are expected to receive in the future in today's terms, then we have to move the future money back to today's terms. This is called the **"Present Value (PV)"** of money.

In both the cases, as there is a passage of time, the money has to be adjusted for the opportunity cost. This adjustment is called "Compounding" when we have to calculate the future value of money. It is called "Discounting" when we have to calculate the present value of money.

Without getting into the mathematics involved (which by the way is really simple) I will give you the formula required to calculate the FV and PV.

Example 1 – How much is Rs.5000/- in today's terms (2014) worth five years later assuming an opportunity cost of 8.5%?

This is a case of Future Value (FV) computation, as we are trying to evaluate the future value of the money that we have today –

Future Value = Amount * (1+ opportunity cost rate) ^ Number of years.
= 5000 *(1 + 8.5%) ^ 5

= 7518.3

This means Rs.5000 today is comparable with Rs.7518.3 after 5 years, assuming an opportunity cost of 8.5%.

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Example 2 – How much is Rs.10,000/- receivable after 6 years, worth in today's terms assuming an opportunity cost of 8.5%?

This is clearly the case of Present Value (PV) computation as we are trying to evaluate the present value of cash receivable in future in terms of today's value.

Present Value = Amount / (1+Discount Rate) ^ Number of years

= 10,000 / (1+ 8.5%) ^ 6

= 6129.5

This means Rs.10,000/- receivable after 6 years in future is comparable to Rs.6,129.5 in today's terms assuming a discount rate of 8.5%.

Example 3 – If I reframe the question in the first example – How much is Rs.7518.3 receivable in 5 years worth in today's terms given an opportunity cost @ 8.5%?

We know this requires us to calculate the present value. Also, since we have done the reverse of this in example 1, we know the answer should be Rs.5000/- . Let us calculate the present value to check this –

= 7518.3 / (1 + 8.5%) ^ 5

= 5000.0

Assuming you are clear with the concept of time value of money, I guess we are now equipped to go back to the pizza problem.

14.4 – The Net Present Value of cash flows

We are still in the process of evaluating the price of the pizza machine. We know George is entitled to receive a stream of cash flows (by virtue of owning the pizza machine) in the future. The cash flow structure is as follows

2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
5,00,000	5,00,000	5,00,000	5,00,000	5E+05	5,00,000	5,00,000	5,00,000	5,00,000	5,00,000

We posted this question earlier, let me repost it again – **How much is the cash flow of the future worth in today's terms?**

As we can see, the cash flow is uniformly spread across time. We need to calculate the present value of each cash flow (receivable in the future) by discounting it with the opportunity cost.

Here is a table that calculates the PV of each cash flow keeping the discount rate of 8.5% –

Year	Cash Flow (INR)	Receivable in (years)	Present Value (INR)
2015	5,00,000	1	460829
2016	5,00,000	2	424808
2017	5,00,000	3	391481
2018	5,00,000	4	360802
2019	5,00,000	5	332535
2020	5,00,000	6	306485
2021	5,00,000	7	282470
2022	5,00,000	8	260335
2023	5,00,000	9	239946
2024	5,00,000	10	221151
Total	50,00,000		32,80,842

The sum of all the present values of the future cash flow is called **"The Net Present Value (NPV)"**. The NPV in this case is Rs. **32,80,842.** This also means, the value of all the future cash flows from the pizza machine in today's terms is Rs. **32,80,842**. So if George has to buy the pizza machine from Vishal, he has to ensure the price is Rs. **32,80,842** or lesser, but definitely not more than that and this is roughly how much the pizza machine should cost George.

Now, think about this – What if we replace the pizza machine with a company? Can we discount all future cash flows that the company earns with an intention to evaluate the company's stock price? Yes, we can and in fact this is exactly what will we do in the "Discounted Cash Flow" model.

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Key takeaways from this chapter

1. A valuation model such as the DCF model helps us estimate the price of a stock

2. The DCF model is made up of several inter woven financial concepts

3. The 'Time Value of Money' is one of the most crucial concept in finance, as it finds its application in several financial concepts including the DCF method

4. The value of money cannot be treated the same across the time scale – which means the value of money in today's terms is not really the same at some point in the future

5. To compare money across time we have to 'time travel the money' after accounting for the opportunity cost

6. Future Value of money is the estimation of the value of money we have today at some point in the future

7. Present value of money is the estimation of the value of money receivable in the future in terms of today's value

8. The Net Present Value (NPV) of money is the sum of all the present values of the future cash flows

Equity Research (Part 2)

15.1 – Getting started with the DCF Analysis

We discussed about "The Net Present Value (NPV)" in the previous chapter. NPV plays a very important role in the DCF valuation model. Having understood this concept, we now need to understand a few other topics that are related to DCF valuation model. In fact, we will learn more about these concepts by implementing the DCF model on Amara Raja Batteries Limited (ARBL). With this, we will conclude the 3rd stage of Equity Research i.e 'The Valuation'.

In the previous chapter in order to evaluate the price of the pizza machine, we looked at the future cash flows from the pizza machine and discounted them back to get the present value. We added all the present value of future cash flows to get the NPV. Towards the end of the previous chapter we also toyed around with the idea –What will happen if the pizza machine is replaced by the company's stock? Well, in that case we just need an estimate of the future cash flows from the company and we will be in a position to price the company's stock.

But what cash flow are we talking about? And how do we forecast the future cash flow for a company?

15.2 – The Free Cash Flow (FCF)

The cash flow that we need to consider for the DCF Analysis is called the **"Free Cash flow (FCF)"** of the company. The free cash flow is basically the excess operating cash that the company generates after accounting for capital expenditures such as buying land, building and equipment. This is the cash that shareholders enjoy after accounting for the capital expenditures. The mark of a healthy business eventually depends on how much free cash it can generate.

Thus, the free cash is the amount of cash the company is left with after it has paid all its expenses including investments.

When the company has free cash flows, it indicates the company is a healthy company. Hence investors often look out of such companies whose share prices are undervalued but who have high or rising free cash flow, as they believe over time the disparity will disappear as the share price will soon increase.

Thus the Free cash flow helps us know if the company has generated earnings in a year or not. Hence as an investor to assess the company's true financial health, look at the free cash flow besides the earnings.

FCF for any company can be calculated easily by looking at the cash flow statement. The formula is –

FCF = Cash from Operating Activities – Capital Expenditures

Let us calculate the FCF for the last 3 financial years for ARBL –

Particular	2011 -12	2012 -13	2013 -14
Cash from Operating Activities (after income tax)	Rs.296.28 Crs	Rs.335.46	Rs.278.7
Capital Expenditures	Rs.86.58	Rs.72.47	Rs.330.3
Free Cash Flow (FCF)	**Rs.209.7**	**Rs.262.99**	**(Rs.51.6)**

Here is the snapshot of ARBL's FY14 annual report from where you can calculate the free cash flow –

Particulars		Year ended March 31, 2014		Year ended March 31, 2013	
I. CASH FLOW FROM OPERATING ACTIVITIES					
Profit before tax from continuing operations			5,366.70		4,218.17
Add/(Less): Adjustments for					
a. Depreciation	636.69			577.20	
b. Amortisation	11.04			8.20	
c. Impairment loss	-			75.52	
d. Net income on sale of tangible fixed assets	(2.26)			(0.04)	
e. Tangible fixed assets written off	24.90			44.27	
f. Donation of tangible fixed asset	0.03			-	
g. Interest paid on working capital facilities	0.03			0.11	
h. Provisions and credit balances written back	(3.90)			(6.44)	
i. Bad debts written off	32.33			4.84	
j. Provision for doubtful trade receivables and advances (net)	(30.50)			(38.69)	
k. Exchange gain on restatement - other than borrowings (net)	(33.81)			(13.18)	
l. Provision for leave encashment	14.83			33.43	
m. Provision for gratuity	6.75			8.74	
n. Provision for warranty	(40.22)			156.14	
o. Dividend received	(144.19)			(145.27)	
p. Interest received on bank and other deposits	(137.94)			(112.29)	
q. Interest on income tax	6.70			2.03	
r. Provision for wealth tax	2.00	342.48		1.83	596.40
Operating profit before working capital changes			5,709.18		4,814.57
Add/(Less): Adjustments for working capital changes					
a. Increase in inventories	(421.50)			(262.41)	
b. Increase in trade receivables	(711.71)			(571.57)	
c. Increase in loans and advances	(445.72)			(421.49)	
d. Increase/(decrease) in trade payables	(77.73)			490.32	
e. Increase in other current liabilities	341.23	(1,315.43)		671.36	(93.79)
Cash generated from operations			4,393.75		4,720.78
Less: a. Income tax	1,604.42			1,365.95	
b. Wealth tax	1.83	1,606.25		0.18	1,366.13
Net cash from operating activities - A			2,787.50		3,354.65
II. CASH FLOW FROM INVESTING ACTIVITIES					
a. Purchase of tangible fixed assets		(3,303.66)		(724.78)	
b. Purchase of intangible fixed assets		(10.30)		(20.97)	
c. Increase in capital work-in-progress		(423.26)		(718.50)	
d. Decrease/(increase) in intangible assets under development		1.69		(0.25)	
e. Sale of tangible fixed assets		4.98		1.80	
g. Interest received on bank and other deposits		137.94		112.29	

Please note, the Net cash from operating activities is computed after adjusting for income tax. The net cash from operating activities is highlighted in green, and the capital expenditure is highlighted in red.

You may now have a fair point in your mind – When the idea is to calculate the future free cash flow, why are we calculating the historical free cash flow? Well, the reason is simple, while working on the DCF model, we need to predict the future free cash flow. The best way to predict the future free cash flow is by estimating the historical average free cash flow and then sequentially growing the free cash flow by a certain rate.. This is a standard practice in the industry.

Now, by how much do we grow the free cash flow is the next big question? Well, the growth rate you would assume should be as conservative as possible. I personally like to estimate the FCF for at least 10 years. I do this by growing the cash flow at a certain rate for the first 5 years, and then I factor in a lower rate for the next five years. If you are getting a little confused here, I would encourage you to go through the following step by step calculation for a better clarity.

Step 1 – Estimate the average cash flow

As the first step, I estimate the average cash flow for the last 3 years for ARBL –

= 209.7 + 262.99 + (51.6) / 3

=**Rs.140.36 Crs**

The reason for taking the average cash flow for the last 3 years is to ensure, we are averaging out extreme cash flows, and also accounting for the cyclical nature of the business. For example in case of ARBL, the latest year cash flow is negative at Rs.51.6 Crs. Clearly this is not a true representation of ARBL's cash flow, hence for this reason it is always advisable to take the average free cash flow figures.

Step 2 – Identify the growth rate

Select a rate which you think is reasonable. This is the rate at which, the average cash flow will grow going forward. I usually prefer to grow the FCF in 2 stages. The first stage deals with the first 5 years and the 2nd stage deals with the last 5 years. Specifically with reference to ARBL, I prefer to use 18% for the first 5 years and around 10% for the next five years. If the company under consideration is a mature company, that has grown to a certain size (as in a large cap company), I would prefer to use a growth rate of 15% and 10% respectively. The idea here is to be as conservative as possible.

Step 3 – Estimate the future cash flows

We know the average cash flow for 2013 -14 is Rs.140.36 Crs. At 18% growth, the cash flow for the year 2014 – 2015 is estimated to be –

= 140.36 * (1+18%)

= Rs. 165.62 Crs.

The free cash flow for the year 2015 – 2016 is estimated to be –

165.2 * (1 + 18%)

= Rs. 195.43 Crs.

So on and so forth. Here is a table that gives the detailed calculation…

Estimate of future cash flow –

Sl No	Year	Growth rate assumed	Future Cash flow (INR Crs)
1	2014 – 15	18%	165.62
2	2015 – 16	18%	195.43
3	2016 – 17	18%	230.61
4	2017 – 18	18%	272.12
5	2018 – 19	18%	321.10
6	2019 – 20	10%	353.21
7	2020 – 21	10%	388.53
8	2021 – 22	10%	427.38
9	2022 – 23	10%	470.11
10	2023 – 24	10%	517.12

With this, we now have a fair estimate of the future free cash flow. How reliable are these numbers you may ask. After all, predicting the free cash flow implies we are predicting the sales, expenses, business cycles, and literally every aspect of the business. Well, the estimate of the future cash flow is just that, it is an estimate. The trick here is to be as conservative as possible while assuming the free cash flow growth rate. We have assumed 18% and 10% growth rate for the future, these are fairly conservative growth rate numbers for a well managed and growing company.

15.3 – The Terminal Value

We have tried to predict the future free cash flow for upto 10 years. But what would happen to the company after the 10th year? Would it cease to exist? Well, it would not. A company is expected to be a 'going concern' which continues to exist forever. This also means as long as the company exists, there is some amount of free cash being generated. However as companies mature, the rate at which the free cash is generated starts to diminish.

The rate at which the free cash flow grows beyond 10 years (2024 onwards) is called the **"Terminal Growth Rate"**. Usually the terminal growth rate is considered to be less than 5%. I personally like to set this rate between 3-4%, and never beyond that.

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The **"Terminal Value"** is the sum of all the future free cash flow, beyond the 10th year, also called the terminal year. To calculate the terminal value we just have to take the cash flow of the 10th year and grow it at the terminal growth rate. However, the formula to do this is different as we are calculating the value literally to infinity.

Terminal Value = FCF * (1 + Terminal Growth Rate) / (Discount Rate – Terminal growth rate)

Do note, the FCF used in the terminal value calculation is that of the 10th year. Let us calculate the terminal value for ARBL considering a discount rate of 9% and terminal growth rate of 3.5% :

= 517.12*(1+ 3.5%) / (9% – 3.5%)

= Rs.9731.25 Crs

15.4 – The Net Present Value (NPV)

We know the future free cash flow for the next 10 years and we also know the terminal value (which is the future free cash flow of ARBL beyond the 10th year and upto infinity). We now need to find out the value of these cash flows in today's terms. As you may recall, this is the present value calculation. Once we find out the present value, we will add up these present values to estimate the net present value (NPV) of ARBL.

We will assume the discount rate at 9%.

For example in 2015 – 16 (2 years from now) ARBL is expected to receive Rs.195.29 Crs. At 9% discount rate the present value would be –

= 195.29 / (1+9%)^2

= Rs.164.37 Crs

So here is how the present value of the future cash flows stack up –

Sl No	Year	Growth rate	Future Cash flow (INR Crs)	Present Value (INR Crs)
1	2014 – 15	18%	165.62	151.94
2	2015 – 16	18%	195.29	164.37

Sl No	Year	Growth rate	Future Cash flow (INR Crs)	Present Value (INR Crs)
3	2016 – 17	18%	230.45	177.94
4	2017 – 18	18%	271.93	192.72
5	2018 – 19	18%	320.88	208.63
6	2019 – 20	10%	352.96	210.54
7	2020 – 21	10%	388.26	212.48
8	2021 – 22	10%	427.09	214.43
9	2022 – 23	10%	470.11	216.55
10	2023 – 24	10%	517.12	218.54
Net Present Value (NPV) of future free cash flows				Rs.1968.14 Crs

Along with this, we also need to calculate the net present value for the terminal value, to calculate this we simply discount the terminal value by discount rate –

$$= 9731.25 / (1+9\%)^{10}$$

= Rs.4110.69 Crs

Therefore, the sum of the present values of the cash flows is = NPV of future free cash flows + PV of terminal value

= 1968.14 + 4110.69

= Rs.6078.83 Crs

This means standing today and looking into the future, I expect ARBL to generate a total free cash flow of Rs.6078.83 Crs all of which would belong to the shareholders of ARBL.

15.5 – The Share Price

We are now at the very last step of the DCF analysis. We will now calculate the share price of ARBL based on the future free cash flow of the firm.

We now know the total free cash flow that ARBL is likely to generate. We also know the number of shares outstanding in the markets. Dividing the total free cash flow by the total number of shares would give us the per share price of ARBL.

However before doing that we need to calculate the value of 'Net Debt' from the company's balance sheet. Net debt is the current year total debt minus current year cash & cash balance.

Net Debt = Current Year Total Debt – Cash & Cash Balance

For ARBL this would be (based on FY14 Balance sheet) –

Net Debt = 75.94 – 294.5

= (Rs.218.6 Crs)

A negative sign indicates that the company has more cash than debt. This naturally has to be added to the total present value of free cash flows.

= Rs.6078.83 Crs – (Rs. 218.6 Crs)

= Rs.6297.43 Crs

Dividing the above number by the total number of shares should give us the share price of the company also called the intrinsic value of the company.

Share Price = Total Present Value of Free Cash flow / Total Number of shares

We know from ARBL's annual report the total number of outstanding shares is 17.081 Crs. Hence the intrinsic value or the per share value is –

= Rs.6297.43 Crs / 17.081 Crs

~ Rs.368 per share!

This in fact is the final output of the DCF model.

15.6 – Modeling Error & the intrinsic value band

The DCF model though quite scientific is built on a bunch of assumptions. Making assumptions, especially in finance takes on an art form. You get better at it, as you progress through and gain more experience. Hence for all practical purposes, it is advisable for us to assume (yet another assumption) that we have made a few errors while making the intrinsic value calculation and hence we should accommodate for modeling errors.

A leeway for the modeling error simply allows us to be a flexible with the calculation of the per share value. I personally prefer to add + 10% as an upper band and – 10% as the lower band for what I perceive as the intrinsic value of the stock.

Applying that on our calculation –

Lower intrinsic value = 368 * (1- 10%) = Rs. 331

Upper intrinsic value = Rs.405

Hence, instead of assuming Rs.368 as the fair value of the stock, I would now assume that the stock is fairly valued between 331 and 405. This would be the intrinsic value band.

Now keeping this value in perspective, we check the market value of the stock. Based on its current market price we conclude the following –

1. If the stock price is below the lower intrinsic value band, then we consider the stock to be undervalued, hence one should look at buying the stock

2. If the stock price is within the intrinsic value band, then the stock is considered fairly valued. While no fresh buy is advisable, one can continue to hold on to the stock if not for adding more to the existing positions

3. If the stock price is above the higher intrinsic value band, the stock is considered overvalued. The investor can either book profits at these levels or continue to stay put. But should certainly not buy at these levels.

Keeping these guidelines, we could check for the stock price of Amara Raja Batteries Limited as of today (2nd Dec 2014). Here is a snapshot from the NSE's website –

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The stock is trading at Rs.726.70 per share! Way higher than the upper limit of the intrinsic value band. Clearly buying the stock at these levels implies one is buying at extremely high valuations.

15.7 –Spotting buying opportunities

Long term investment and activities surrounding long term investing is like a slow moving loco-motive train. Active trading on the other hand is like the fast bullet train. When long term value opportunity is created, the opportunity lingers in the market for a while. It does not really disap-pear in a hurry. For instance, we now know that Amara Raja Batteries Limited is overvalued at cur-rent market price as it is trading way higher than the upper limit of the intrinsic value band. But the scene was totally different a year ago. Recall based on FY 2013- 2014, ARBL's intrinsic value band is between Rs. 331 and Rs.405.

Here is the chart of ARBL –

The blue highlight clearly shows that, the stock was comfortable trading within the band for al-most 5 months! You could have bought the stock anytime during the year. After buying, all you had to do was stay put for the returns to roll!

In fact this is the reason why they say – Bear markets create value. The whole of last year (2013) the markets were bearish, creating valuable buying opportunities in quality stocks.

15.8 – Conclusion

Over the last 3 chapters, we have looked at different aspects of equity research. As you may have realized, equity research is simply the process of inspecting the company from three different perspectives (stages).

In stage 1, we looked at the qualitative aspects of the company. At this stage, we figured out who, what, when, how, and why of the company. I consider this as an extremely crucial stage of equity research. If something is not really convincing here, I do not proceed further. Remember markets are an ocean of opportunities, so do not force yourself to commit on to an opportunity that does not give you the right vibe.

I proceed to stage 2 only after I am 100% convinced with my findings in stage 1. Stage 2 is basically the application of the standard checklist, where we evaluate the performance of the company. The checklist that we have discussed is just my version, of what I think is a fairly good checklist. I would encourage you to build your own checklist, but make sure you have a reasonable logic while including each checklist item.

Assuming the company clears both stage 1 and 2 of equity research, I proceed to equity research stage 3. In stage 3, we evaluate the intrinsic value of the stock and compare it with the market value. If the stock is trading cheaper than the intrinsic value, then the stock is considered a good buy. Else it is not.

When all the 3 stages align to your satisfaction, then you certainly would have the conviction to own the stock. Once you buy, stay put, ignore the daily volatility (that is in fact the virtue of capital markets) and let the markets take its own course.

Please note, I have included a DCF Model on ARBL, which I have built on excel. You could download this and use it as a calculator for other companies as well.

Key takeaways from this chapter

1. The free cash flow (FCF) for the company is calculated by deducting the capital expenditures from the net cash from operating activates

2. The free cash flow tracks the money left over for the investors

3. The latest year FCF is used to forecast the future year's cash flow

4. The growth rate at which the FCF is grown has to be conservative

5. Terminal growth rate is the rate at which the company's cash flow is supposed to grow beyond the terminal year

6. The terminal value is the value of the cash flow the company generates from the terminal year upto infinity

7. The future cash flow including the terminal value has to be discounted back to today's value

8. The sum of all the discounted cash flows (including the terminal value) is the total net present value of cash flows

9. From the total net present value of cash flows, the net debt has to be adjusted. Dividing this by the total number of shares gives us the per share value of the company

10. One needs to accommodate for modeling errors by including a 10% band around the share price

11. By including a 10% leeway we create a intrinsic value band

12. Stock trading below the range is considered a good buy, while the stock price above the intrinsic value band is considered expensive

13. Wealth is created by long term ownership of undervalued stocks

14. Thus, the DCF analysis helps the investors to identify whether the current share price of the company is justified or not.

The Finale

16.1 – The follies of DCF Analysis

In this concluding chapter, we will discuss a few important topics that could significantly impact the way you make your investment decisions. In the previous chapter, we learnt about the intrinsic value calculation using the Discounted Cash Flow (DCF) analysis. The DCF method is probably one of the most reliable methods available to evaluate the intrinsic value of a company's stock. However, the DCF method has its fair share of drawbacks which you need to be aware of. The DCF model is only as good as the assumptions which are fed to it. If the assumptions used are incorrect, the fair value and stock price computation could be skewed.

1. **DCF requires us to forecast** – To begin with, the DCF model requires us to predict the future cash flow and the business cycles. This is a challenge, let alone for a fundamental analyst but also for the top management of the company

2. **Highly sensitive to the Terminal Growth rate** – The DCF model is highly sensitive to the terminal growth rate. A small change in the terminal growth rate would lead to a large difference in the final output i.e. the per share value. For instance in the ARBL case, we have as-

sumed 3.5% as the terminal growth rate. At 3.5%, the share price is Rs.368/- but if we change this to 4.0% (an increase of 50 basis points) the share price would change to Rs.394/-

3. **Constant Updates** – Once the model is built, the analyst needs to constantly modify and align the model with new data (quarterly and yearly data) that comes in. Both the inputs and the assumptions of the DCF model needs to be updated on a regular basis.

4. **Long term focus** – DCF is heavily focused on long term investing, and thus it does not offer anything to investors who have a short term focus. (i.e. 1 year investment horizon)

Also, the DCF model may make you miss out on unusual opportunities as the model are based on certain rigid parameters.

Having stated the above, the only way to overcome the drawbacks of the DCF Model is by being as conservative as possible while making the assumptions. Some guidelines for the conservative assumptions are –

1. **FCF (Free Cash Flow) growth rate** – The rate at which you grow the FCF year on year has to be around 20%. Companies can barely sustain growing their free cash flow beyond 20%. If a company is young and belongs to the high growth sector, then probably a little under 20% is justified, but no company deserves a FCF growth rate of over 20%

2. **Number of years** – This is a bit tricky, while longer the duration, the better it is. At the same time longer the duration, there would be more room for errors. I generally prefer to use a 10 year 2 stage DCF approach

3. **2 stage DCF valuation** – It is always a good practice to split the DCF analysis into 2 stages as demonstrated in the ARBL example in the previous chapter. As discussed ,In stage 1 I would grow the FCF at a certain rate, and in stage 2 I would grow the FCF at a rate lower than the one used in stage 1

4. **Terminal Growth Rate** – As I had mentioned earlier, the DCF model is highly sensitive to the terminal growth rate. Simple thumb rule here – keep it as low as possible. I personally prefer to keep it around 4% and never beyond it.

16.2 – Margin of Safety

Now, despite making some conservative assumptions things could still go wrong. How do you insulate yourself against that? This is where the concept of 'Margin of Safety' would arrive. The margin of safety thought process was popularized by Benjamin Graham in his seminal book titled "Intelligent Investor". The 'margin of safety' simply suggests that an investor should buy stocks only when it is available at a discount to the estimated intrinsic value calculation. Following the Mar-

gin of Safety does not imply successful investments, but would provide a buffer for errors in calculation.

Here is how I exercise the 'Margin of Safety' principle in my own investment practice. Consider the case of Amara Raja Batteries Limited; the intrinsic value estimate was around Rs.368/- per share. Further we applied a 10% modeling error to create the intrinsic value band. The lower intrinsic value estimate was Rs.331/-. At Rs.331/- we are factoring in modeling errors. The Margin of Safety advocates us to further discount the intrinsic value. I usually like to discount the intrinsic value by another 30% at least.

But why should we discount it further? Aren't we being extra conservative you may ask? Well, yes, but this is the only way you can insulate yourself from the bad assumptions and bad luck. Think about it, given all the fundamentals, if a stock looks attractive at Rs.100, then at Rs.70, you can be certain it is indeed a good bet! This is in fact what the savvy value investors always practice.

Going back to the case of ARBL –

    1. Intrinsic value is Rs.368/-

    2. Accounting for modeling errors @10% the lower intrinsic band value is Rs.331/-

    3. Discounting it further by another 30%, in order to accommodate for the margin of safety, the intrinsic value would be around Rs.230/-

    4. At 230/- I would be a buyer in this stock with great conviction

Of course, when quality stocks falls way below its intrinsic value they get picked up by value investors. Hence when the margin of safety is at play, you should consider buying it as soon as you can. As a long term investor, sweet deals like this (as in a quality stock trading below its intrinsic value) should not be missed.

Also, remember good stocks will be available at great discounts mostly in a bear market, when people are extremely pessimistic about stocks. So make sure you have sufficient cash during bear markets to go shopping!

16.3 – When to sell?

Throughout the module we have discussed about buying stocks. But what about selling? When do we book profits? For instance assume you bought ARBL at around Rs.250 per share. It is now trading close to Rs.730/- per share. This translates to an absolute return of 192%. A great rate of return by any yardstick (considering the return is generated in over a year's time). So does that

mean you actually sell out this stock and book a profit? Well the decision to sell depends on the disruption in investible grade attributes.

Disruption in investible grade attributes – Remember the decision to buy the stock does not stem from the price at which the stock trades. Meaning, we do not buy ARBL just because it has declined by 15%. We buy ARBL only because it qualifies through the rigor of the"investible grade attributes". If a stock does not showcase investible grade attributes we do not buy. Therefore going by that logic, we hold on to stocks as long as the investible grade attributes stays intact.

The company can continue to showcase the same attributes for years together. The point is, as long as the attributes are intact, we stay invested in the stock. By virtue of these attributes the stock price naturally increases, thereby creating wealth for you. The moment these attributes shows signs of crumbling down, one can consider selling the stock.

16.4 – How many stocks in the portfolio?

The number of stocks that you need to own in your portfolio is often debated. While some say holding many stocks help you diversify risk, others say holding far fewer helps you take concentrated bets which can potentially reap great rewards. Here is what some of the legendary investors have advised when it comes to the number of stocks in your portfolio –

Seth Kalrman – 10 to 15 stocks

Warren Buffet – 5 to 10 stocks

Ben Graham – 10 to 30 stocks

John Keynes – 2 to 3 stocks

In my own personal portfolio, I have about 13 stocks and at no point I would be comfortable owning beyond 15 stocks. While it is hard to comment on what should be the minimum number of stocks, I do believe there is no point owning a large number of stocks in your portfolio. When I say large, I have a figure of over 20 in my mind.

16.5 – Final Conclusion

Over the last 16 chapters, we have learnt and discussed several topics related to the markets and fundamental analysis. Perhaps it is now the right time to wrap up and leave you with a few last points that I think are worth remembering –

1. **Be reasonable** – Markets are volatile; it is the nature of the beast. However if you have the patience to stay put, markets can reward you fairly well. When I say "reward you fairly well" I have a CAGR of about 15-18% in mind. I personally think this is a fairly decent and realistic expectation. Please don't be swayed by abnormal returns like 50-100% in the short term, even if it is achievable it may not be sustainable

2. **Long term approach** – I have discussed this topic in chapter 2 as to why investors need to have a long term approach. Remember, money compounds faster the longer you stay invested

3. **Look for investible grade attributes** – Look for stocks that display investible grade attributes and stay invested in them as long as these attributes last. Book profits when you think the company no longer has these attributes

4. **Respect Qualitative Research** – Character is more important than numbers. Always look at investing in companies whose promoters exhibit good character

5. **Cut the noise, apply the checklist** – No matter how much the analyst on TV/newspaper brags about a certain company don't fall prey to it. You have a checklist, just apply the same to see if it makes any sense

6. **Respect the margin of safety** – As this literally works like a safety net against bad luck

7. **IPO's** – Avoid buying into IPOs. IPOs are usually overpriced. However if you were compelled to buy into an IPO then analyze the IPO in the same 3 stage equity research methodology

8. **Continued Learning** – Understanding markets requires a lifetime effort. Always look at learning new things and exploring your knowledge base.

I would like to leave you with 4 book recommendations that I think will help you develop a great investment mindset.

    a.The Essays of Warren Buffet : Lessons for Investors & Managers

    b.The Little Book that Beats the Market – By Joel Greenblatt

    c.The Little Book of Valuations – By Aswath Damodaran

    d.The Little Book that Builds Wealth – By Pat Dorsey

So friends, with these points I would like to close this module on Fundamental Analysis. I hope you enjoyed reading this as much as I enjoyed writing it.