

Stock Valuation – Why, When and How



“Stock Market”, the term itself gives a nightmare to most of us because of the fluctuation (volatility) associated with the market prices of stocks. However, this is the only asset class which gives higher real returns (inflation-adjusted returns) over the long term. But, that does not mean we can invest in equity share of any company and expect it to deliver higher risk-adjusted real-returns. Buying a stock (Equity Share) is buying a part of the Company. If the Company is doing well over the long term, the share price will eventually follow it. So, valuing a stock is to make ourselves fit enough to avoid a nightmare by not overpaying for the ownership. Read on to know more...



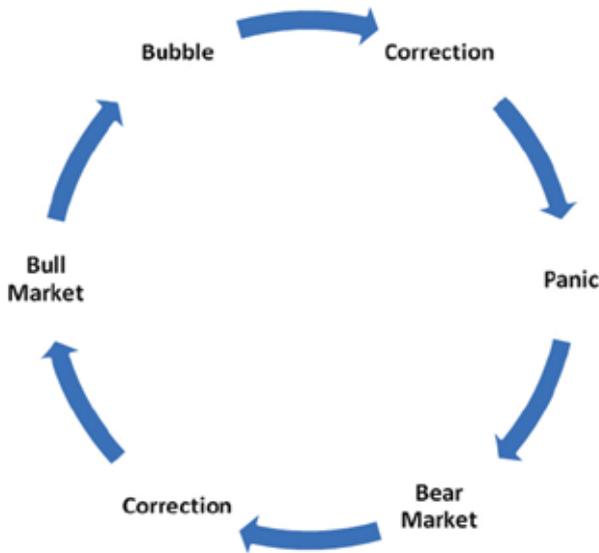
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Why?

Those who had speculated (not invested) their money at the peaks of Tech Bubble in late 1990s and the Sub-prime crisis in 2007 and paid the price for it, will never ask “Why I have to value a Stock before investing?” For most of the first time of investors, they won’t heed to the term “Stock Valuation” until they burn their fingers. From tooth-paste to flight ticket, we are valuing whether it is worth for the price paid by us, then, why not analyse the ticker prices of common stocks worth it?

When?



In the Bull Market, most people will buy stocks, never mind whatever the valuation is, till the market is moving upwards. When it finally ends up in a bubble and bursts, they will panic and sell the stocks (again whatever the valuation is). By doing this, they will add more fuel to the debate of “Bear Market or Correction” between the “so called” market experts.

In the Bear Market, most will never think of bottom fishing at the rock-bottom valuations, even though they bought the same stocks at much higher valuations in the earlier bull market euphoria. But few intelligent investors, by following Mr. Warren Buffet’s principle “Be greedy, when others are fearful” will start buying, which sets the initial phase of next Bull Market. Soon, Mr. Market will correct upwards and trade at fair value and pave way for the next bull market euphoria.

It is a cycle of ups and downs as shown in the figure.

So, it is wiser to evaluate the price of stocks periodically, to sell to over optimists in a bubble and buy from panic pessimists in a crash.

How?

Investing in a company’s shares based on its intrinsic value is Value Investing. Intrinsic Value of the company calculated based on discounted free cash flow model is more reliable than the relative valuation methods like Price-to-Book Value, Price-to-Earnings & Dividend-Yield Methods.

Discounted Free Cash Flow Analysis

A company is worth of all the cash flows that it could make available to the shareholders in the future. Since

these cash flows will be earned in the future years and the value of the money will be less than today’s value, these cash flows need to be discounted.

Since the future cash flows are uncertain, we have to forecast free cash flows during the forecasting period and make some assumptions to calculate the “intrinsic value” of a Company.

1. Determining Forecasting Period
2. Forecasting Free Cash flows
3. Calculating Discount rate
4. Calculating Terminal value
5. Calculating Enterprise Value
6. Calculating Intrinsic Value of an Equity Share
7. Calculating Risk-Adjusted Intrinsic Value

1. Determining Forecasting Period

Generally, the free cash flows are to be forecast, till the period the company will be able to earn returns on fresh investments that are greater than its cost of capital. This period is known as “Excessive Return” period.

However, there are no restrictions that the free cash flows are to be calculated only for the excessive return period. We can also calculate free cash flows for “n” number of periods (including slow growth/no growth periods).

Illustration:

XYZ Ltd is a company having a strong brand name operating in the FMCG industry.

With strong demographic profile of India and increasing discretionary spending of the people, let us assume that XYZ will be able to generate excess returns at least for the next 5 years.

2. Forecasting Free Cash flows

After zeroing-in on the number of years to forecast, we have to forecast free cash flows.

Before calculating free cash flow, we should know “what is free cash flow?”

Free cash flow represents the cash that a company is able to generate, after laying out the money

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required to maintain or expand its asset base. (Source: Investopedia)

Formula:

Free Cash Flow = EBIT (1-T) + Depreciation - Change in Working Capital - Capital Expenditure

This can also be expressed as

Free Cash Flow = Sales Revenue – Operating Costs – Taxes - Change in Working Capital – Net Investment

Where,

EBIT (1-T) = Sales Revenue – Operating Costs – Taxes

Net Investment = Capital Expenditure – Depreciation

For calculating FCF, we should calculate the above components.

a. Forecasting Sales Revenue:

Before calculating Sales Revenue, we should collect data & make ourselves informed about the industry in which the company is operating, brand/segment-wise revenue and possible change in government policies affecting the business (positive as well as negative), market share, pricing power and dominance of the company in the industry.

Due to the strong brand name & favourable demographics, we can assume that the sales of the company will grow at the rate of 15% for the next five years.

₹ in crore

Year	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Sales Growth (%)		15%	15%	15%	15%	15%
XYZ Sales	44,000	50,600	58,190	66,919	76,956	88,500

b. Forecasting Operating Costs:

For selling the product, the company needs to expend towards raw materials, conversion costs, wages, selling & distribution expenses (incl. advertisement costs), R&D, etc;

For forecasting Operating Costs, we should know how much paisa the company is expending to generate revenue of a rupee, which is nothing but “Operating Margin”.

Operating margin = Operating Costs/Sales Revenue

Operating Margin may not be same for all the years, because both the product market (Selling to Customers & Purchasing Raw materials from Suppliers) and the factor market (Payment towards Factors of Production) are subject to demand and supply forecasts.

While calculating free Cash Flows, we have forecast cash flows only for the next 5 years (i.e. up to F.Y. 2017-18). If we discontinue with this calculation, it means the company has stopped its operations at the end of 5th year. So, we need to proceed the forecasting of free cash flows with the assumption that the company will be in existence forever as a going concern.

So, we have to make a reasonable assessment of inflationary pressures, demand & supply forecasts, unemployment ratio and other factors affecting the operating costs.

The historical Operating Margin for the company (Average of last 5 years) is 23.50%. i.e. Average Operating Costs is equal to 76.50% of Sales Revenue.

Let us assume, due to favourable monsoon forecasts and increase in unemployment ratio for the current year and next year, both raw materials costs & wages will decrease and Operating Costs will be 70% for the next two years. Thereafter, the Operating Costs will gradually increase towards 76% for the Financial Year 2017-18 by increasing 2% each year.

₹ in crore

Year	2013-14	2014-15	2015-16	2016-17	2017-18
XYZ Sales	50,600	58,190	66,919	76,956	88,500
Operating Costs %	70%	70%	72%	74%	76%
Operating Costs	35,420	40,733	48,181	56,948	67,260

c. Forecasting Tax Expenditure:

No one can predict what will be the speech of the Finance Minister at the February end of each financial year. Though the Marginal Income-tax rate for the Companies is 33.99% (incl. Surcharge & Cess), the tax Expenditure as per the Income Statement rarely match with the Profit, because there may be differences in accounting profit and tax profit, tax-breaks, SEZ scheme benefits, tax holidays, etc.

So, it is better to consider the tax rate on Operating Profit of the past 2 or 3 years (if there is no significant change made in the Tax Rates & Methodology).

XYZ Ltd.'s average tax rate for the last 3 years is 31.13%.

d. Forecasting Net Investment:

Net Investment = CAPEX – Depreciation

CAPEX includes both Maintenance Capital Expenditures needs to be made to maintain the current

capacity levels & Fresh Capital Expenditures made towards capacity expansion.

Since XYZ Ltd. has increased its capacity substantially before a couple of years and it has sufficient capacity to take care of demand for the next two years, only maintenance expenditure to be made (which is 1% of the Total Sales as per the latest Annual Report).

The Capacity Expansion of FMCG Industry can be completed immediately unlike Infrastructure Sector, which will take long gestation periods. Hence, the management of XYZ Ltd. plans to incur additional ₹2,000 crore for Capacity Expansion at the end of 2015-16 to meet the increase in demand for the forthcoming years.

Depreciation is nothing but amortisation of the Capital Expenditure incurred over its useful life. Since it is not fresh/cash expenditure, it has to be deducted from the fresh CAPEX incurred during the current year.

₹ in crore					
Year	2013-14	2014-15	2015-16	2016-17	2017-18
XYZ Sales	50,600	58,190	66,919	76,956	88,500
Maintenance CAPEX (A)	506	582	669	770	885
Fresh CAPEX (B)	-	-	2,000	-	-
Depreciation (C)	900	850	825	1,050	1,000
Net Investment (D)	-394	-268	1,844	-280	-115

e. Forecasting Changes in Working Capital:

Working Capital is the cash that is required for day-to-day operations and it increases with expansion of business.

Working Capital = Current Assets *minus* Current liabilities.

When sales revenue increases, working capital also increases almost in the same proportion.

Working Capital as on 31st March 2013: ₹3,245 Crores.

₹ in crore						
Year	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Growth (%)		15%	15%	15%	15%	15%
Working Capital	3,245	3,732	4,292	4,935	5,676	6,527
Change in WC		487	560	644	740	851

f. Forecasted Free Cash Flows:

FCF = Sales Revenue – Operating Costs – Taxes-Change in Working Capital – Net Investment

₹ in crore					
Year	2013-14	2014-15	2015-16	2016-17	2017-18
Sales Revenue	50,600	58,190	66,919	76,956	88,500
Operating Costs	35,420	40,733	48,181	56,948	67,260
Taxes	4,726	5,434	5,833	6,229	6,612
Net Investment	-394	-268	1,844	-280	-115
Change in Working Capital	487	560	644	740	851
Free Cash Flow	10,361	11,731	10,417	13,319	13,892

3. Calculating Discount Rate

Next step after calculating free cash flows is to determine appropriate discount rate. The free cash flows are discounted to find out the present value (today's worth).

The discount rate is nothing but Cost of capital of the Company.

Company's Capital Structure	Appropriate Discount Rate
Unlevered (Only Equity)	Cost of Equity, Ke
Levered (Both Debt & Equity)	Weighted Average Cost of Capital, WACC

XYZ Ltd.'s assets are predominantly funded by internal accruals. The company is having very small amount of debt.

XYZ Ltd.'s Net worth – ₹22,500 crore

XYZ Ltd.'s Long Term Net Debt – ₹780 crore

Since XYZ Ltd.'s Balance Sheet is levered, we have to find out WACC.

$$WACC = \{[E*Ke] + [D*Kd*(1-T)]\} / \{E+D\}$$

Where,

E = Net worth

D = Long-term Debt

Ke = Cost of Equity

Kd = Cost of Debt

T = Tax Rate

To calculate WACC, we need to find out Cost of Equity & Cost of Debt.

a. Cost of Equity:

Equity does not have a fixed rate of interest like debt. Though the cost is not explicit, equity shareholders always expect return from the

Before investing in a stock by using risk-adjusted intrinsic value, we should analyse several quantitative factors like book value, earnings, dividend yield and qualitative factors like business in which the company is operating, economic forecasts affecting the business, corporate governance, long term growth and durability of the business, etc;

Company by way of dividends and capital appreciation.

William Sharpe's Nobel Prize winning CAPM (Capital Asset Pricing Model) solves the problem of finding out Cost of Equity, K_e .

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

Where,

R_f = Risk-free rate of return:

This is the yield of sovereign bonds (G-Secs) issued by RBI on behalf of the Government of India.

R_m = Expected Rate of Return from Stock Market:

Generally, Expected rate of return from a Stock Index (Sensex/Nifty) is considered as R_m .

Further, " $R_m - R_f$ " is known as "Risk Premium", i.e. increase in expected return for taking additional risk to invest in stocks than fixed rate risk-free G-Secs.

β – Beta:

It is a metric that measures the volatility of the market price of an individual stock in correlation with a stock index/broader market.

If $\beta = 1$, the stock moves in tandem with broader market.

If $\beta > 1$, the volatility of market price of the stock is more than the volatility in broader market.

If $\beta < 1$, the volatility of market price of the stock is less than the volatility in broader market.

Calculation of Cost of Equity for XYZ Ltd:

R_f – Yield of 10 year Benchmark Bond – 8.26%

R_m – Expected Return from Sensex (Historical Average for last 10 years) – 15.73%

β of XYZ ltd – 0.93

$$K_e = 8.26\% + 0.93 (15.73\% - 8.26\%) = 15.21\%$$

b. Cost of Debt:

The interest rate at which the Company has borrowed is Cost of Debt (Kd). As per the Revised Schedule VI of the Companies Act, the Companies have to disclose the rate of interest for each

borrowing. Otherwise, this can be calculated as follows:

Cost of Debt = Interest Expense for the current financial year / Average Balance of Borrowings*

*Average Balance of Borrowings = (Opening Balance of Borrowings + Closing Balance of Borrowings) / 2

Since interest is a tax deductible expenditure, After-tax Cost of Debt is to be considered for calculating WACC.

Calculation of After-Tax Cost of Debt for XYZ Ltd:

Interest Rate (Kd): 9.80% (Fixed)

Marginal Tax rate: 33.99%

$$\text{After Tax Cost-of Debt, } K_d(1-T) = 9.80\% * (1 - 0.3399) = 6.47\%$$

c. Calculation of Discount Rate (WACC):

$$WACC = (E * K_e) + (D * K_d(1-T)) / (E + D)$$

$$= ((22500 * 15.21\%) + (780 * 6.47\%)) / (22500 + 780)$$

$$\text{Discount Rate} = 14.92\%$$

4. Calculating Terminal Value:

While calculating Free Cash Flows, we have forecast cash flows only for the next 5 years (i.e. up to F.Y. 2017-18). If we discontinue with this calculation, it means the company has stopped its operations at the end of 5th year. So, we need to proceed the forecasting of free cash flows with the assumption that the company will be in existence forever as a going concern.

Let us assume that the Company's FCF will grow 12% every year from Year 6 to Year 10 (Stable Growth Period) and from Year 11 it grows at 8% every year (Maturity Period).

To calculate Terminal Value, we should calculate the FCF at the end of Stable Growth Period. i.e. Year 10

Since FCF is increasing at the rate of 12% for each year from F.Y. 2018-19 to 2022-23, FCF for the F.Y. 2022-23 = ₹8,216 crore $*(1.12)^5 = ₹24,482$ crore (refer calculations in next step).

The formula for calculating Terminal value as per Gordon Growth Model (most commonly used method):

$$\text{Forecasted FCF of Final Year} * (1 + \text{Long-Term Growth Rate (Maturity Period)})$$

$$\text{Terminal Value} = \frac{\text{Forecasted FCF of Final Year} * (1 + \text{Long-Term Growth Rate (Maturity Period)})}{\text{Discount Rate} - \text{Long-Term Growth Rate (Maturity Period)}}$$

$$= \frac{\{24,482 * (1.08)\}}{.1492 - .08}$$

$$= ₹3,82,089 \text{ crore.}$$

5. Calculating Enterprise Value:

Enterprise Value is the sum of present value of Free Cash Flows and Terminal Value forecasted for the future. WACC is the discount rate to be used for calculating present value.

Year	FCF (₹ in Cr.)	Discount Factor @ 14.92%	Discounted FCF (₹ in Cr.)
1 (2013-14)	10,361	0.8702	9,016
2 (2014-15)	11,731	0.7572	8,883
3 (2015-16)	10,417	0.6589	6,864
4 (2016-17)	13,319	0.5733	7,636
5 (2017-18)	13,892	0.4989	6,931
6 (2018-19)	15,559	0.4341	6,754
7 (2019-20)	17,426	0.3778	6,584
8 (2020-21)	19,517	0.3287	6,415
9 (2021-22)	21,859	0.2860	6,252
10 (2022-23)	24,482	0.2489	6,094
Terminal Value	3,82,089	0.2489	95,102
Enterprise Value			1,66,531

6. Calculating Intrinsic Value of an Equity Share:

Enterprise Value is the Value of a Company including debt. Our purpose is to find out Value of Equity.

Value of Equity = Enterprise Value – Debt
 = ₹1,66,531 crore – ₹780 crore
 = ₹1,65,751 crore.

Intrinsic Value of an Equity Share = Value of Equity/ No. of Outstanding Equity Shares

XYZ Ltd's Total Equity Share Capital is comprised of 800 crore shares of ₹1 each/-.

Intrinsic Value of XYZ Ltd's Equity Share = 1,65,751 crore/800 crore = ₹207.20 (Rounded-off)

Since most of the factors used to calculate intrinsic value using DCF method are only assumptions, different persons may come out with different intrinsic value for the same company.

6. Calculating Risk-Adjusted Intrinsic Value of an Equity Share:

As intrinsic value is not a fixed number and is not free from errors, it is always advised to take caution by adopting a strategy "Margin of Safety" coined by Benjamin Graham, mentor of Warren Buffet.

Margin of Safety is the discount% at which a stock is bought in relation to its intrinsic value. In case of XYZ Ltd., if the actual growth is less than our forecasted growth, the intrinsic value of XYZ Ltd will be substantially lower than ₹207.20. So, it is always advised to buy at a discount to intrinsic value.



If we are buying XYZ Ltd.'s equity share for ₹155.40, which means we have a 25% Margin of Safety.

{(207.20-155.40)/207.20}.

Margin of Safety is a double-edged sword. On one side, if the margin of safety is higher, return is also higher. On the other side, stressing on too much margin of safety may lead to miss some great opportunities.

Margin of Safety% varies for each individual and it depends on their risk profile.

Risk-Adjusted Intrinsic Value = Intrinsic Value * (1- Desired Margin of Safety %)

Now, our job is to compare the Risk-Adjusted Intrinsic Value of the Share with the ticker prices (market price) quoting at the stock exchanges. If the stock quotes at less than Risk-Adjusted Intrinsic Value, then it is a "BUY".

Conclusion

Before investing in a stock by using risk-adjusted intrinsic value, we should analyse several quantitative factors like book value, earnings, dividend yield and qualitative factors like business in which the company is operating, economic forecasts affecting the business, corporate governance, long term growth and durability of the business, etc.

Value investing is preferred over other strategies because it is the only method that will not disturb our sleep in the midnight and keep our acidity levels in control.

Happy (value) investing... ■