Concept Paper on Estimating Discount Rates in Valuation

Valuation Standards Board

and

ICAI Registered Valuers Organisation

The Institute of Chartered Accountants of India

(Setup by an Act of Parliament)

New Delhi

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MESSAGE

Valuation involves research, evaluation and analysis of all relevant information and also requires appropriate experience, knowledge and judgment of a valuer to make a reasonable and justifiable opinion of value. In Valuation, there is no scope for error as Valuation lies at the heart of every transaction and the health of a country's economy is immensely impacted by the outcome of a valuation report.

ICAI RVO aims to develop Valuation as a discipline of knowledge such that the Registered Valuers are not only valuation professionals, but also the most valuable professionals globally. As part of its continuous endeavour towards the enrichment of knowledge base of Registered Valuers and other stakeholders, ICAI Registered Valuers Organisation and the Valuation Standards Board of ICAI have undertaken this joint initiative and are bringing out this Concept Paper on Estimating Discount Rates in Valuation.

I compliment the efforts of all the members of the Valuation Standards Board (VSB) of ICAI under the Chairmanship of CA. Anil S. Bhandari, Vice Chairman CA. M P VijayKumar and my colleagues on the Board of ICAI RVO Shri Pawan Singh Tomar, Shri Ashok Haldia, Prof. Anil Saini, CA. Nihar N. Jambusaria & CA. Prafulla P. Chhajed for their efforts and support.

I also appreciate the efforts of Shri. Rakesh Sehgal, Managing Director ICAI RVO and CA. Sarika Singhal, Officiating CEO ICAI RVO and Secretary, Valuation Standards Board and Ms. S. Rita, Deputy Secretary ICAI for their significant contribution in finalisation of this Concept Paper.

I am confident that the Registered Valuers (RVs) and Valuation Professionals will find this Concept Paper extremely useful in developing their skills and competencies.

Date: 30th January, 2022 Rajeev Kher

Place: New Delhi Chairperson and Independent Director, ICAI RVO

MESSAGE

As we all know, the valuation profession is a vital institution of the economy, and it directly or indirectly affects everyone. The credibility of the Valuation profession lies heavily on the Valuation Report prepared by the Valuers. Therefore, utmost care and caution must be exercised by the Valuers while deriving the value and prepare a well explained valuation report covering all aspects in detail.

One of the most important and a complex factor to be considered by a Valuer in the Valuation Report is the Discount Rate. The discount rate measures the risk associated with an investment, i.e., the risk of low returns, and it determines what should be the ideal expected rate of return to compensate the undertaken risk. An investor expects to be compensated for both risk and the time value of money which together form the expected rate of return or the Discount Rate for Valuation.

It is a welcome step that the Valuation Standards Board of ICAI and ICAI Registered Valuers Organisation, in their joint research endeavours, bringing out this Concept Paper on Estimating Discount Rate in Valuation.

I extend my sincere appreciation to CA. Anil S. Bhandari, Chairman, CA. M. P. Vijay Kumar, Vice-Chairman, and all other members of the Valuation Standards Board in supporting and contributing towards bringing out the Concept Paper for the benefit of members and other stakeholders. I also thank all the directors of the Board of ICAI RVO specially Shri Rajeev Kher, Chairman RVO for this joint effort.

I am confident that this Concept Paper would be extremely helpful for the members and other stakeholders in unlocking new opportunities in this emerging area of practice.

Date: 30th January, 2022
Place: New Delhi

CA. Nihar N. Jambusaria
President, ICAI
Director ICAI RVO

MESSAGE

The Companies (Registered Valuers and Valuation) Rules, 2017 have ushered in a unified institutional framework for the development and regulation of valuation profession, which have become mandatory for valuations required under the Companies Act, 2013 and the Insolvency and Bankruptcy Code 2016 (Code) and. Further, the Draft Valuers Bill, 2020 aims to cover all valuation related services in the country in future.

Valuation is as good as the inputs assumptions and reasonings contemplated by a valuer and one of the significant factors to be considered is Discount Rate. The discount rate is the risk associated with an asset. While discount rate is an important factor in valuation but at the same time estimating discount rate is complex and also subjective. Therefore, understanding the methodology and concepts in determining an appropriate discount rate is extremely critical for valuers.

We at ICAI are committed to providing continued knowledge and support to the Members and other stakeholders and in addition to our various initiatives, I am happy that the Valuation Standards Board of ICAI and ICAI Registered Valuers Organisation has decided to publish this Concept Paper on Estimating Discount Rates to support the valuation professionals as well as to create awareness amongst all related stakeholders.

I extend my appreciation to the members of the Board of ICAI RVO and the Valuation Standards Board of ICAI and especially to CA. Anil S. Bhandari, Chairman, Valuation Standards Board and CA. M. P. Vijay Kumar, Vice-Chairman, Valuation Standards Board for bringing out this Concept Paper for the benefit of members and other stakeholders. The contribution by CA. T. V. Balasubramanian and CA. Parag Kulkarni is also praiseworthy.

I am sure that the members and other stakeholders will find this Concept Paper extremely useful in guiding and supporting them in successful completion of their valuation assignments.

Date: 30th January, 2022
Place: New Delhi

CA. (Dr.) Debashis Mitra
Vice-President, ICAI

MESSAGE

Value arrived at by a valuer is his opinion as to what the value of an asset should be and it is not a certification since valuation as it is not an exact science. It may also be stated that the mathematical precision and exactitude are not the attributes of valuation. Views of valuers may differ in their conclusions or even reasoning but the variation must not be significant between two valuations prepared fairly by two valuers applying the correct approach and the principles.

An important aspect in valuation is selection and estimation of a correct Discount Rate. Discount Rate shall be indicative of the risk associated with the cash flows arising from the asset to be valued. ICAI Valuation Standard-103 "Valuation Approaches and Methods" do provide guidance with respect to Discount Rate calculation, but a need was felt to further clarify the intricacies involved in estimating this complex and important factor of valuation.

Valuation Standards Board (VSB) of ICAI in its endeavour to further strengthen the ecosystem surrounding the valuation profession, is bringing out this Concept Paper on Estimating Discount Rates in Valuation. The Concept Paper provides detailed guidance with respect to the methods and principles to be considered in estimating Discount Rates and also explains the impact of Cross- Border transactions and Economic Crisis while estimating Discount Rates.

We extend our appreciation to the members of the Board of ICAI RVO and the Valuation Standards Board in supporting and contributing towards bringing out this Concept Paper for the benefit of members and other stakeholders.

We commend the efforts CA. Parag Kulkarni and CA. T. V. Balasubramanian who helped in finalisation of the Draft Concept Paper. We commend the efforts of Shri Rakesh Sehgal, Managing Director, ICAI RVO; CA. Sarika Singhal, Officiating CEO, ICAI RVO and Secretary VSB, ICAI for their contribution in finalisation of this Concept Paper and also their team members viz. Ms. Seema Jangid, Assistant Secretary ICAI and CA. Pragya Agrawal, Assistant Project Officer ICAI for their technical and administrative support.

We are sure that this Concept Paper will help members and other stakeholders in developing a better understanding of the subject and drive greater efficacy in valuation activities undertaken by them.

CA. Anil S. Bhandari
Chairman,
Valuation Standards Board

CA. M. P. VijayKumar
Vice-Chairman,
Valuation Standards Board

Date : 30th January, 2022
Place : New Delhi

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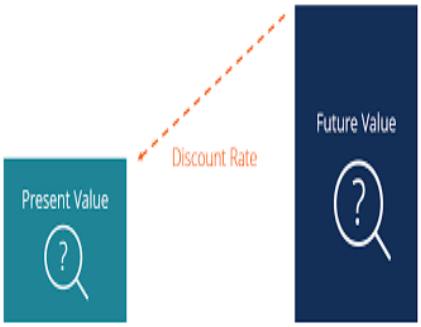
Discount rate used in valuation reflects the riskiness of the asset and is one of the critical inputs of Discounted Cash Flow method.

ICAI Valuation Standards 2018 defines "Discount Rate" as the return expected by a market participant from a particular investment and shall reflect not only the time value of money but also the risk inherent in the asset being valued as well as the risk inherent in achieving the future cash flows.

ICAI Valuation Standards recognise the following three approaches in valuation and they are globally accepted approaches as well: -

1) Market Approach
2) Income Approach
3) Cost Approach



Income approach is considered as one of the most appropriate approach under-going concern as it determines the intrinsic value of an asset by estimating the present value of future earnings of assets. Income Approach is also not as vulnerable to accounting conventions (like depreciation, inventory valuation) in comparison with the other techniques/ approaches since it is based on cash flows rather than accounting profits.

The Income Approach includes a number of methods, such as Discounted Cash Flow (DCF) Method, Relief from Royalty (RFR) Method, Multi-Period Excess Earnings Method (MEEM), With and Without Method (WWM) and Option pricing models such as Black-Scholes-Merton formula or binomial (lattice) model.

Discounted Cash Flow Method (DCF) is the most commonly used method in valuation and it arrives at a value by projecting the cash flows in the future and then discounting the cash flows back to the date of the valuation using the Discount Rate.

While discount rate is an important factor in valuation but at the same time estimating discount rate is difficult and also prone to judgement. Therefore, understanding the methodology and concepts in determining an appropriate discount rate is extremely critical for valuers.

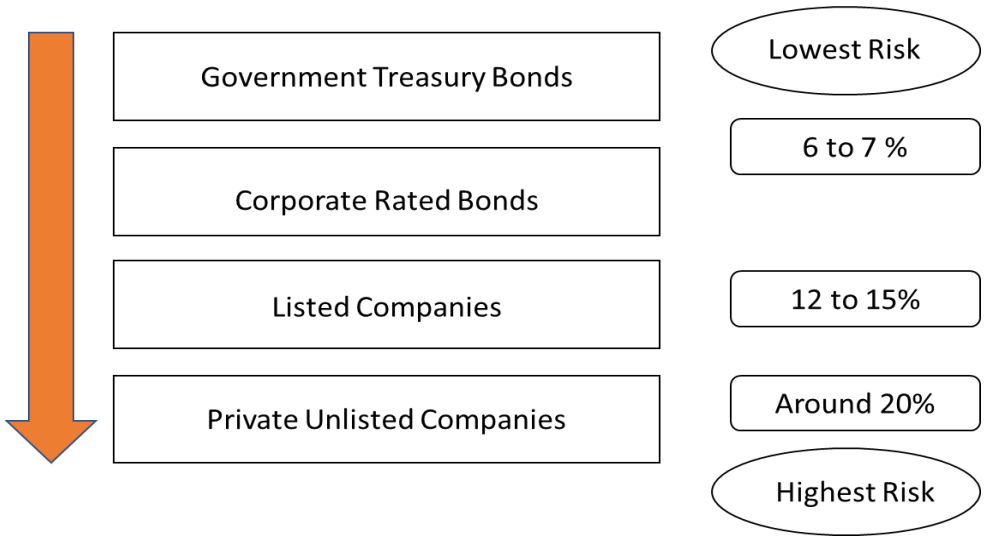
2. Discount Rate & Relationship between Risk and Return

Discount Rate is the return expected by a market participant from a particular investment and shall reflect not only the time value of money but also the risk inherent in the asset being valued as well as the risk inherent in achieving the future cash flows.

An Investor expects to be compensated for both risk and the time value of money which together forms the expected return on investment. An investor selects between different investments options on the basis of the assessment and comparison of the risk involved and the expected rate of return from each investment option.

Theoretically, the time value of money on an investment without any risk is normally represented by a risk-free rate of return but hardly any investment is completely risk-free. Hence there is always a need to compensate the investor for the higher level of risk by giving a higher rate of return. The fundamental relationship between risk and return is "*Higher the risk associated with an investment higher is the expected return from it*" and this is what drives an Investors decision.

The diagram hereunder clearly depicts how an expected rate of return varies basis the risk involved in the asset (the percent range given below is only an example).



The discount rate measures the risk associated with the investment, i.e., the danger of low returns that is different from the expected return on investment. It determines what should be the idle expected rate of return to compensate/reward for the danger or risk undertaken by an investor. This together with the risk-free market rate of return forms the Discount rate for Discounted Cash Flow method.

3. Types of Discount Rates

Following are the commonly used Discount Rates in Discounted Cash Flow Method:-

i) **The Cost of Equity ("COE")** – It reflects the return expected by the equity shareholders, to compensate for the risk assumed through their investment in the business.

ii) The Weighted Average Cost of C**apital ("WACC")** – It is based on the proportionate weights of each component of the source of capital, i.e., weighted average of COE and COD wherein the ratio of Equity/Debt on total capital is the proportionate weights. WACC constitutes all capital sources:

- Equity shares
- Preference shares
- Long term debts
- Short term debts

The discount rate to be selected typically depends on the type of projected cash flow used in valuation which in turn depends on the purpose of valuation as defined in the terms of engagement. There are two widely used variants of the DCF methodology, while one determines the Equity Value the other helps in determining the Enterprise Value.

The key difference between the two is that Equity value is the total value of all outstanding stock of the company whereas Enterprise Value is the total worth of a company without factoring in the financial structuring involved.

i) Enterprise Value: Enterprise Value is the value attributable to the equity shareholders plus the value of debt and debt-like items, minority interest, preference share less the amount of non-operating cash and cash equivalents. It can also be formulated as:

Enterprise Value = Free Cash Flow to the Firm (FCFF)/ Weighted Average Cost of Capital

= (Earnings Before Interest and Tax * (1-tax rate) + Depreciation/Non-Cash Expenditure – Capital Expenditure – Increase in Non-Cash Working Capital)/ WACC

ii) Equity Value: Equity Value is the value of the business attributable to equity shareholders after all expenses, reinvestments and debt obligations have been met by the company.

Equity Value = Free Cash Flow to Equity ("FCFE")/ Cost of Equity
= (Net Income or Profit After Tax + Depreciation & Amortization – Capital Expenditure – Increase in Non-Cash Working Capital + Change in Debt)/ Cost of Equity

Hence for calculating Equity Value using Free Cash Flow to Equity, we use Cost of Equity (COE) as discount rate while for calculating Enterprise Value using Free Cash Flow to Firm approach, Weighted Average Cost of Capital (WACC) is used to discount the future cash flows. Of course, to both the COE and WACC, suitable premiums or discounts may be adjusted to arrive at the discount rate based on the factors such as liquidity, control, size, specific risks etc.

Equity Value can be determined from Enterprise Value by eliminating following:

Add/(Less)	: Adjustments
Add	: Cash & Cash Equivalents (to the extent it is in excess of routine business)
Add	: Fair Value of Surplus Assets including Land
Add	: Fair Value of Investments and Deposits
Add	: PV of MAT Credit
(Less)	: Fair Value of Contingent Liability
(Less)	: Fair Value of Long-Term Debt
(Less)	: Fair Value of Short-Term Debt

("Further adjustments would be required if there are preference shares and / or non-controlling interests are involved, which have not been considered in the above example").

As per ICAI Valuation Standards 2018 a valuer may consider the following factors while determining the discount rate:

i) type of asset being valued, example: debt, preference shares, business, real estate, intangibles, etc.;

ii) life of the asset such as the risk-free rate used for determining the cost of equity in the CAPM model differs for an asset with a one-year life vs an indefinite life;

iii) geographic location of the asset;

iv) currency in which the projections have been prepared;

v) type of cash flows;

vi) risk in achieving the projected cash flows;

vii) cash flows used for the projections as FCFE needs to be discounted by Cost of Equity whereas FCFF to be discounted using WACC;

viii) discount the cash flows in the functional currency using a discount rate appropriate for that functional currency; and

ix) pre-tax cash flows need to be discounted by pre-tax discount rate and post-tax cash flows to be discounted by post-tax discount rate;

4. Industry Wise Cost of Equity & Weighted Average Cost of Capital

Discount rates are a measure of the cost of capital and the thumb rule for the same is:-

- Riskier / more uncertain the cash flow, higher should be the cost of capital
- Higher the amount of debt lower should be the cost of capital

Based on the above thumb rule, the industry-wise availability of capital and cost of capital varies majorly on account of following factors: -

i) Capital Structure choices for each Industry, for e.g.: asset heavy sector like telecom will have higher debt

ii) Government policies governing the industry

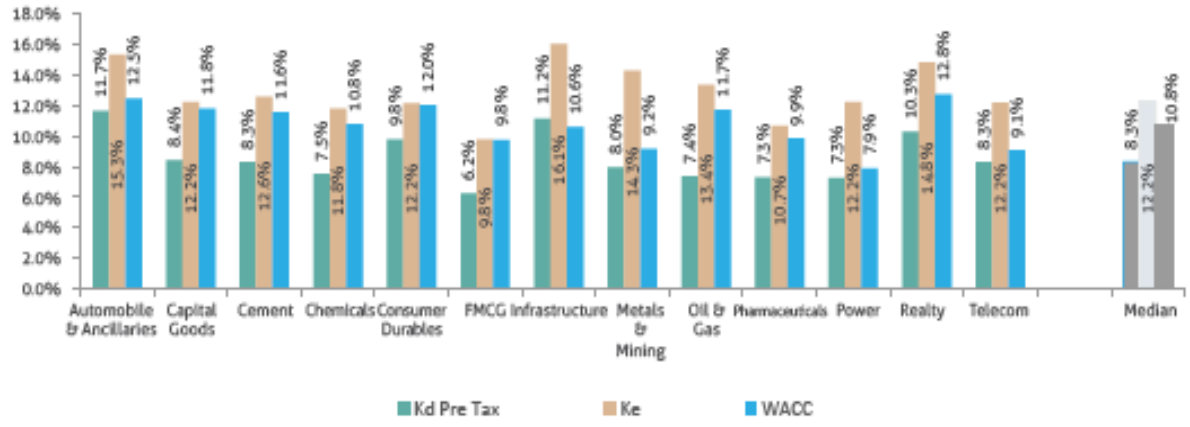
iii) Restriction on investments in terms of Foreign Direct Investment and Foreign Institutional Investor

iv) Risk perception of the investor

v) Risk Structure specific to the industry

Based on a study of 135 companies listed on NSE in 2020, presented hereunder are the cost of debt (kd), cost of equity (ke) and weighted average cost of capital across 13 sectors.

Source: RBSA study 2020



Now let us understand, how one can derive the Cost of Equity, Cost of Debt and Weighted Average Cost of Capital individually:

5. Cost of Equity (COE)

Cost of Equity (COE) reflects the return expected by investors in equity of Business to compensate for the risk assumed by him through his investment in the business. It is a key input for the Discounted Cash Flow model and at the same time is very difficult to estimate as it is an implicit cost that vary prudently across different investors for the same equity investment.

For e.g.: an investor who expands his portfolio to include investment in multiple firms in different industries reduces his level of risk through diversification and hence his expected return can be lower against an investor whose entire portfolio consists of one asset only.

The traditional and most common methods of determining cost of equity are:

i) Dividend capitalization model and
ii) The Capital Asset Pricing Model (CAPM).
iii) Build up Method (generally used only in absence of market inputs).

5.1. Dividend Capitalization Method

As we know that the value of equity is obtained by discounting expected cash flows to equity holders at the cost of equity. Thus, for publicly traded stocks if it is assumed that the market price is correct and the expected dividends are known, which will be the cash flow to equity, then the internal rate of return can be well assumed to be the cost of equity.

$$Market\ price\ of\ Equity = \frac{Expected\ Dividend\ per\ share\ next\ year}{Cost\ of\ Equity - Expected\ Growth\ Rate}$$

Or,

$$P_0 = \frac{D_1}{K_e - g}$$

P_0 = Market Price of Equity

D_1 = Expected dividend per share next year

K_e = Cost of Equity

g = Expected Growth Rate

Hence it can well be said that:

$$Cost\ of\ Equity\ = \frac{Expected\ dividend\ per\ share\ next\ year}{Market\ Price\ of\ Equity} + Expected\ Growth\ Rate$$

Or,

$$K_e\ = \frac{D_1}{P_0} + g$$

The limitation of this approach is its base assumption that the current stock price is the correct value of stock, which is rarely the case. Prices often have very little to do with the value of an asset, as market prices are determined by the perceptions of buyers and sellers and not by anything as specific as cashflows or earnings. In case of an efficient market, the market price is the best estimate of value and the purpose of any valuation model is then the justification of this value only.

Hence this approach can be practically applied only after applying some creative variations. For e.g., in a particular industry, the cost of equity is determined for multiple firms within the industry and then the average cost of equity for all can be considered as the general cost of equity (Ke) for that industry.

This method is also appropriate where it is reasonable to consider that the market price is driven by the dividend returns over a long period of time rather than by the growth of share price itself over the years. Typically, in the Indian scenario where the average dividend to the market price is in the range of 2–3%, this may present a very high cost of equity situation.

Illustration 1: -

XYZ Ltd. has current stock price of Rs. 150 at NSE and its current year EPS is Rs 20, its dividend pay-out ratio is 50% and expected growth rate is 5% for next year. What will be its Cost of Equity?

Solution:

Dividend/share paid in Current Year	= 20*50%	= Rs 10/-
Expected Dividend/share next year	= 10*105%	= Rs 10.5/-
Cost of Equity (Ke)	= (10.5/150) +5%	= 12%

5.2. Capital Asset Pricing Model (CAPM)

Capital Asset Pricing Model (CAPM) is the most commonly used method for determining Cost of Equity, and it describes the relationship between systematic risk and expected return for assets. It is based on the assumption that all investors are well diversified, so only systemic risk is relevant. The compensation is usually greater than the risk-free rate known as Risk Premium.

A judicious use of the CAPM without over reliance on historical data is considered to be the most effective way of dealing with risk in valuation.

The formula for calculating cost of equity under CAPM is:

$$\boldsymbol{K_e = R_f + (R_m - R_f) \times \beta}$$

K_e = Cost of equity

R_f = Risk free rate of return

$R_m - R_f$ = Market risk premium

β = Beta = Risk Index for systematic risk (regression coefficient)

CAPM is usually the preferred model to determine Cost of Equity (Ke), unlike the dividend capitalization model, as it considers following factors while determine the discounting factor.

- The country-specific risk is considered while selecting the Risk-free rate of return.
- The risks inherent with the specific business or industry of the firm are reflected in the β applied.
- The model also accounts for expectations of returns from the market through the risk premium.

Let us now look at these three key inputs of CAPM individually.

5.3. Risk-Free Rate of Return

Risk-free rate of return is the return on the risk-free assets. Risk-free assets are those assets where the expected returns are known with certainty and actual returns are same as the expected returns. Investors expect to be compensated for risk and the time value of money for any investment. The risk-free rate of return in the CAPM formula accounts for the time value of money.

Most valuers consider yields on long term default free government bonds, of the country where company's headquarter is located, as the Risk-Free Rate of Returns. Government bonds are well recognised to represent minimum risk. In general practice, it is the 10-year government bonds rate that is considered as a reasonable measure of the risk-free rate.

In case of multi-national companies, the above doesn't hold good because two different companies that compete in the same markets on a global basis, which are exposed to the same risks and use the same functional currency (e.g., USD), should always be valued on the basis of same cost of capital regardless of the country where they are headquartered.

In order to maintain consistency, it is important that the risk-free rate shall also be based on the same currency as the currency in which the estimated cash flows have been developed. This is a common mistake that is made in case of valuation for countries where the government doesn't issue long-term currency bonds and hence valuers tend to use the discount rates based on the mature market like United States, while the projected cash flows are based on local currency only. This would result in incorrect valuation as the expected inflation built into the discount rate and the cash flow will vary. In such cases, one possible solution is to value using the discount rate of the mature market and by converting the future expected cash flows in local currency to the currency of the mature market using future expected exchange rates. The other and more common option is to use the risk-free rate of return for the mature market and increase/decrease it basis the country's default spread or country risk premium. The Country risk premium is commonly available vide various sources and can be based on Moody's country risk Ratings. It is basically derived by regressing the local country's equity returns against the mature market's returns. However, while using this method care need to be taken to ensure that the default spread is not double counted in both risk-free rate and equity risk premium.

Risk-free rate of return for India can be taken from the zero-coupon yield curve (ZCYC) data from the RBI's data base and same is available over multiple tenors.

The ZCYC on 16th and 17th March 2021 were as under:

Maturity (Yrs)	16-Mar-21	17-Mar-21
0	3.2	3.2
0.5	3.54	3.53
1	3.94	3.94

Maturity (Yrs)	16-Mar-21	17-Mar-21
1.5	4.3	4.3
2	4.62	4.62
2.5	4.91	4.91
3	5.16	5.16
3.5	5.39	5.39
4	5.59	5.59
4.5	5.77	5.77
5	5.93	5.93
5.5	6.07	6.07
6	6.2	6.2
6.5	6.31	6.31
7	6.41	6.41
7.5	6.5	6.5
8	6.58	6.58
8.5	6.65	6.65
9	6.71	6.71
9.5	6.76	6.76
10	6.81	6.81
10.5	6.85	6.85
11	6.88	6.88
11.5	6.91	6.91
12	6.94	6.94

Source: ccilindia.com

5.4. Equity Risk Premium

Equity Risk Premium is the additional returns required by an investor to move his/her assets from a risk-free investment to average risk investment. For e.g.: An investor will move his investment from a risk-free government bond with YTM of 7% to any equity instrument, which involves average risk, only if he expects the rate of return to be more than 7%. This additional return over and above 7% is Equity risk Premium.

The most common method of valuing Equity Risk Premium is the Historical Approach, wherein historical data for a group of stocks (E.g.: Index like Sensex or Nifty) is used to determine by how much the average return on equity exceeds the Risk-free rate of returns.

$$\boldsymbol{ERP = R_m - R_f}$$

Where;

ERP = Equity Risk Premium

R_m = *Historical Return of a well diversified group of Equity(preferable an INDEX)*

R_f = *Risk-Free Rate of Return*

It is important to note here that the above calculation shall be based on long term data so as to avoid any periodic economic impact like the recent pandemic or the economic crisis of 2009. During the global crisis the volatility in economy has a rippling effect on the equity risk premium leading to its increase, which in turn pulls down the share valuations, and the equity index. Further a valuer shall be well aware about the selection of time period in calculating the ERP.

The time period selected for calculation the ERP may vary from 5-10 years. Those who select a shorter period contest that the risk aversion tendency of an average investor changes over long period.

There are various studies available for equity risk premium, however, while using same valuer must understand the assumptions and calculation method adopted in same. For e.g.: Country Wise Equity Risk Premium shared hereunder has been updated in January 2021 by Mr. Aswath Damodaran and is determined by adding the country risk premium to base premium for mature equity market. In the following table, the country risk premium has been derived basis Moody's Rating while the current risk premium for a mature equity market (herein US Market) is considered at 4.72%.

Source: http://pages.stern.nyu.edu/~adamodar/

Country	GDP (in billions) in 2019	Moody's rating	Adj. Default Spread	Equity Risk Premium	Country Risk Premium	Corp. Tax Rate
France	2715.5	Aa2	0.44%	5.20%	0.48%	28%
Germany	3845.6	Aaa	0.00%	4.72%	0.00%	30%
Switzerland	703.1	Aaa	0.00%	4.72%	0.00%	15%

Country	GDP (in billions) in 2019	Moody's rating	Adj. Default Spread	Equity Risk Premium	Country Risk Premium	Corp. Tax Rate
United Kingdom	2827.1	Aa3	0.53%	5.31%	0.59%	19%
Canada	1736.4	Aaa	0.00%	4.72%	0.00%	27%
United States	21374.4	Aaa	0.00%	4.72%	0.00%	27%
Russia	1699.9	Baa3	1.95%	6.85%	2.13%	20%
Brazil	1839.8	Ba2	2.65%	7.63%	2.91%	34%
Colombia	323.8	Baa2	1.68%	6.56%	1.84%	32%
Mexico	1258.3	Baa1	1.41%	6.27%	1.55%	30%
Australia	1392.7	Aaa	0.00%	4.72%	0.00%	30%
New Zealand	206.9	Aaa	0.00%	4.72%	0.00%	28%
China	14342.9	A1	0.62%	5.40%	0.68%	25%
India	2875.1	Baa3	1.95%	6.85%	2.13%	30%
Japan	5081.8	A1	0.62%	5.40%	0.68%	31%
Singapore	372.1	Aaa	0.00%	4.72%	0.00%	17%
South Africa	351.4	Ba2	2.65%	7.63%	2.91%	28%

5.5. Beta Coefficient

The third and the most critical input of the CAPM model is the Beta Coefficient. It is the sensitivity of the stock or asset to the market and is derived by statistically analysing returns from a particular share over a period compared to the overall market return. It is the Beta coefficient that incorporates the stock specific risk in the discounting factor under CAPM model. Beta Coefficient for a firm whose stocks has publicly traded for a long length of time is measured as under:

Beta of an asset = Covariance of asset with Market Portfolio/Variance of the market portfolio

The commonly used method to arrive at beta is to take the company's returns over a time period and compare it with the Index returns say Sensex or Nifty for the same period. Once we have both data sets, we take the co-variance of the stock returns and the index returns for the

same period and divide it by the variance of the index returns. This gives us a coefficient that measures the relative risk of the concerned company with respect to the market. For example, if the coefficient is 1.5, then if the index moves by 1% up or down then the company moves 1.5% in the respective direction.

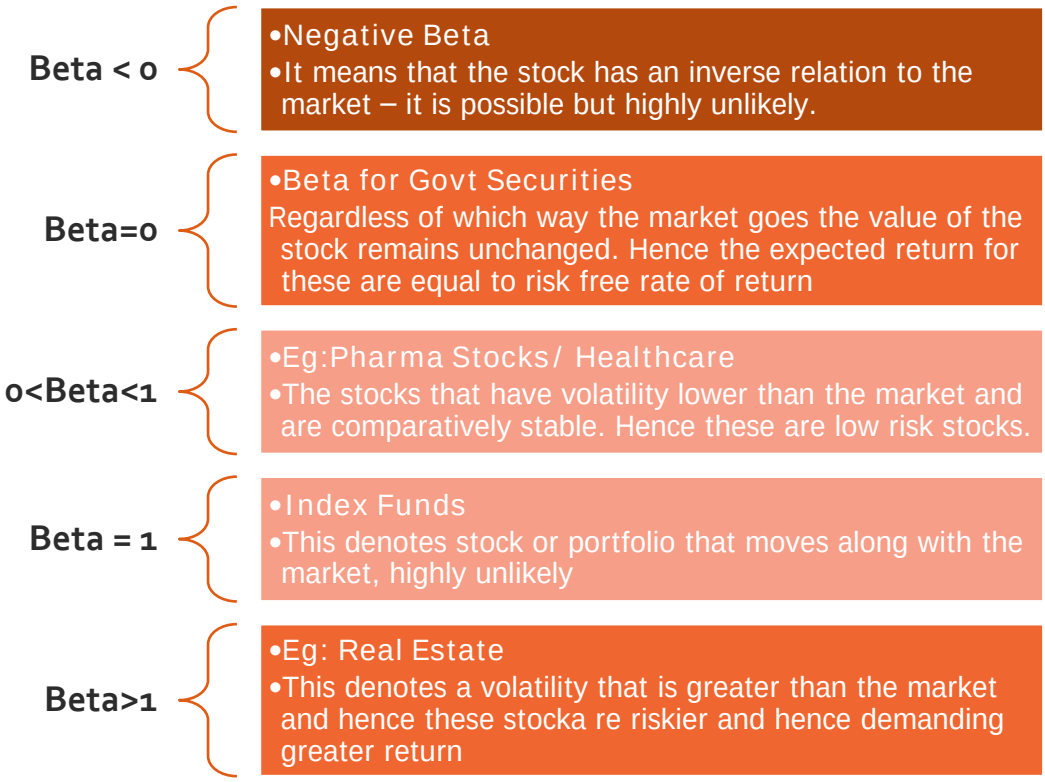
Hence, the assets that are riskier than average will have betas that are greater than 1 and assets that are safer than the average will have betas that are less than 1. For an average index like Nifty or Sensex, beta by above definition will be equal to 1. Every intelligent strategy to deliver high average returns ends up delivering high market beta.

For computing Beta for Unlisted Companies and companies for which the above data is not sufficiently available, one can determine a proxy beta. This proxy beta can be determined by using the published beta for similar companies whose shares are traded on the stock market. While selecting the peer group of companies one has to ensure that they all have a similar risk profile as the subject company. However, the average beta so determined has to be adjusted for the gearing ratios involved. The benefit of this approach is that since the beta is obtained by averaging across a large number of companies hence, it is more likely to be precise as against individual beta computation.

Steps involved for determining beta for unlisted companies or companies for whom sufficient data is not available can be summarised as under

- Comparable Companies - Identify the list of comparable listed companies with similar risk profile as the subject company.
- Beta Estimation – Obtain beta for the above comparable companies. Betas can be obtained from databases, newspapers and websites or even it can be calculated using slope function of any spreadsheet like MS Excel.
- Unlever Beta - Un-lever these betas using debt-equity ratio and tax rate of respective comparable companies. (formula for unlevering discussed ahead)
- Averaging Beta - Calculate average of above un-levered betas across comparable companies
- Lever the average Beta - Re-lever above beta with debt-equity ratio and tax rate of the subject company. (formula for levering discussed ahead)

Interpretation of Various Beta Values



Leveraged/Unleveraged Beta

Beta Values for companies reflects risk in comparison to the market and includes both the following risks: -

- Business risk (resulting from operations)
- Finance risk (resulting from their level of financial leverage)

Hence there are two types of Beta:

- Asset or "ungeared" beta Ba, which reflects purely the systemic risk of the business area
- Equity or "geared" beta Be, which reflects the systemic risk of the business area and the company specific gearing ratio

It is generally considered that an increase in financial gearing will increase the equity beta of a company as higher leverage/debt in a company is expected to make equity investment riskier.

This is because a higher amount of fixed interest paying debt can increase earnings per share in good times but during crisis it can also bring down the earnings per share for equity holders.

We can lever the unlevered beta according to capital structure of the company under valuation.

Formula to calculate levered beta from unlevered beta is as under:

Levered Beta = Unlevered Beta*[1+Debt/Equity*(1-Marginal rate of Tax)]

$$\beta_l = \beta_u \times (1 + \text{Debt/Equity} \times (1 - t))$$

β_l= Levered equity beta

β_u= Unlevered equity beta

t =Marginal rate of income tax

Formula to calculate Un-levered beta from levered beta is as under:

Unlevered Beta = Levered Beta/[1+Debt/Equity*(1-Marginal rate of Tax)]

$$\beta_u = \beta_l / (1 + \text{Debt/Equity} \times (1 - t))$$

β_l= Levered equity beta

β_u= Unlevered equity beta

t =Marginal rate of income tax

Illustration 2: -

PQR Ltd is operating in telecom industry and has a debt-equity ratio of 50%. Using comparable publicly traded telecom firms listed in the market it is estimated that unlevered beta of firms is 0.7. Marginal rate of tax for the country is 30% and the rate of return on 10-year risk free treasury bonds is 4.5%. The average historical risk premium for the market is 5%. What will be its Cost of Equity?

Solution: -

Leveraged Beta for PQR Ltd = Unlevered Beta [1+(1-MTR)(D/E ratio)]

= 0.7[1+(1-.3)(.50)] = 0.945

Cost of Equity as per CAPM = 4.5% + (0.945*5%)

= 9.225%

Illustration 3: - Sample Beta Calculation for Titan over 24 months from Jan-19 to Dec-20:

Months	BSE	Titan	% Changes in Titan Stock	% Changes in Index Prices	X Bar = Average of x over 24 months = 2.58%	Y Bar = Average of y over 24 months = 1.48%	Variance in Market	Covariance between stock and market
	Close Price	Close Price	(x)	(y)	(x-x bar)	(y-y bar)	(y-y bar)^2	(x-xbar) x (y-y bar)
Jan-19	36256.7	995.4						
Feb-19	35867.4	1026.95	3.17%	-1.07%	0.59%	-2.56%	0.07%	-0.02%
Mar-19	38672.9	1137.5	10.76%	7.82%	8.18%	6.34%	0.40%	0.52%
Apr-19	39031.5	1156.15	1.64%	0.93%	-0.94%	-0.56%	0.00%	0.01%
May-19	39714.2	1233.55	6.69%	1.75%	4.11%	0.27%	0.00%	0.01%
Jun-19	39394.6	1334.85	8.21%	-0.80%	5.63%	-2.29%	0.05%	-0.13%
Jul-19	37481.1	1056.15	-20.88%	-4.86%	-23.46%	-6.34%	0.40%	1.49%
Aug-19	37332.8	1104.95	4.62%	-0.40%	2.04%	-1.88%	0.04%	-0.04%
Sep-19	38667.3	1272.8	15.19%	3.57%	12.61%	2.09%	0.04%	0.26%
Oct-19	40129.0	1332.35	4.68%	3.78%	2.10%	2.30%	0.05%	0.05%
Nov-19	40793.81	1160.75	-12.88%	1.66%	-15.46%	0.17%	0.00%	-0.03%
Dec-19	41253.74	1187.6	2.31%	1.13%	-0.27%	-0.36%	0.00%	0.00%
Jan-20	40723.49	1188.1	0.04%	-1.29%	-2.54%	-2.77%	0.08%	0.07%
Feb-20	38297.29	1254.75	5.61%	-5.96%	3.03%	-7.44%	0.55%	-0.23%
Mar-20	29468.49	933.5	-25.60%	-23.05%	-28.19%	-24.54%	6.02%	6.92%
Apr-20	33717.62	969.8	3.89%	14.42%	1.31%	12.94%	1.67%	0.17%
May-20	32424.1	890.6	-8.17%	-3.84%	-10.75%	-5.32%	0.28%	0.57%
Jun-20	34915.8	950.05	6.68%	7.68%	4.09%	6.20%	0.38%	0.25%
Jul-20	37606.89	1043.25	9.81%	7.71%	7.23%	6.22%	0.39%	0.45%
Aug-20	38628.29	1099.2	5.36%	2.72%	2.78%	1.23%	0.02%	0.03%
Sep-20	38067.93	1200.5	9.22%	-1.45%	6.63%	-2.93%	0.09%	-0.19%
Oct-20	39614.07	1164.9	-2.97%	4.06%	-5.55%	2.58%	0.07%	-0.14%
Nov-20	44149.72	1357.85	16.56%	11.45%	13.98%	9.97%	0.99%	1.39%
Dec-20	47751.33	1567.5	15.44%	8.16%	12.86%	6.67%	0.45%	0.86%

Sum							12%	12.28%
Covariance (Stock, Market)			Cov(x,y) = SUM [(X-X bar) x (y-ybar)] / (n-1)					0.56%
Variance (Market)			Var = sum of (y- y bar)^2 / (n-1)					0.55%
Beta			[Covariance (Stock, Market)/Variance (Market)]					1.02
Beta			Excel Formula = Slope (X1:X23, Y1:Y23)					

5.6. Build – Up – Method

The Build-up method can also be used to determine the Cost of Equity. However, it is only used when there is no appropriate market data available for Beta computation for the subject company or for comparable companies of the subject. Hence it is normally used for smaller and closely held companies.

In absence of Beta, under build-up method the firm specific systematic risk is addressed by including the industry risk premium and the company specific risk factors. The formula for build-up method is as under: -

ke = Risk-Free Rate + Equity Risk Premium (ERP) + Size Premium +/- Industry Risk Premium + Specific Company Risk

ke = Rf +ERP + Rs +/- IRP+ Rc

Where;
Re = Expected rate of return of the company
Rf = Risk-free rate of return
ERP = Equity risk premium
Rs = Size premium
IRP= Industry Risk Premium
Rc = Specific company risk

The Industry Risk represents the risk an investor expects in the future return of the industry the subject company is in, over and above the return on market. The Specific Risk is risk

primarily related to the size of the firm, liquidity and operating risk of the firm and it also relates to the subject company's risks, including management, market, and suppliers and customers' concentration risk.

6. Cost of Debt

The Cost of Debt ("COD") is the current or expected cost for borrowing funds for the company or firm to fund its assets. It can be easily provided by the management of the company and is generally assumed to be the market rate for borrowing. Hence, it will be different from the book value or rate of debt.

Further, it differs from one entity to another basis their embedded default risk. For firms that are rated by any agency, we can refer to their credit rating to determine their default spread and thereafter by adding this default spread to the risk-free rate of return we can determine their cost of debt.

For example - A company whose credit rating is BBB+ then its default spread, say, will be 1.25%. Now assuming the 10 years treasury bond rate to be 10%, it can be well said that the company's cost of Debt is likely to be 11.25%

In case of non-rated entities, one should look at the borrowing rate of their latest borrowings, same will give an idea of their default spread and hence their cost of debt.

Cost of Debt considered for DCF is always post Tax and same can be determined as under:

After Tax Cost of Debt = Pre-tax Cost of Debt * (1-Marginal rate of Tax)

Marginal Tax rates are the highest tax slab applicable for entity i.e., the tax paid on the last penny of income. The reason for using marginal tax rates is that it is used to calculate the tax advantage on interest cost which is offsetting the marginal income. Hence the Marginal Tax rate is not equal to the effective tax rate of the firm as per its books.

For all profit-making listed companies, the marginal tax rate is generally the highest tax slab for the country where the firm operates. However in case of loss-making companies, there will be no tax advantage or savings on Interest hence no tax reduction shall be considered while determining the cost of debt for the years of operating losses. Further, there will be benefit of carry forward losses for the company and impact of same shall also be considered in years when same is offsetting revenue to determine the effective tax rate.

7. Weighted Average Cost of Capital (WACC)

The Weighted Average Cost of Capital is derived from averaging the firm's cost of equity and cost of debt according to the weights determined as per the market value of the capital structure. While calculating WACC, market value weights of the different components of financing are preferred over book value weights as the cost of capital is forward looking and measures the cost of raising new funds for the company.

DCF methodology– WACC - Discount Rate Derivation

$$WACC = K_d \times \frac{D}{D+E} + K_e \times \frac{E}{D+E}$$

Post tax cost of debt

Cost of equity (CAPM)

Kd = (Rf + DM) x (1-t)	**Ke = Rf + (β x ERP) + Alpha**
Where;	Where;
kd - Cost of debt financing	ke - Cost of equity financing
Rf - Risk-free rate of return	Rf - Risk-free rate of return
DM - Debt margin	β - Beta
T - Tax rate	ERP - Equity market risk premium
D - Debt	Alpha – Company specific risk
E – Equity	premium

The current market value of capital structure will yield the cost to capital for current year, however same is subject to change in future. If proportion of these sources in capital structure is expected to change during explicit period, then it is appropriate to calculate different WACC for different years. But if no significant changes are expected then a single WACC may be used for entire explicit period.

It may also be appropriate in certain cases to consider the weights based on industry average/norms instead of using the actual weights as applicable to the particular business case. Further, though market weights are preferred, it is not uncommon in India to use book weights for the WACC computation too.

Illustration 4:-

Particulars	31 March 2018
Risk-free rate	7.4%
Market Risk-premium	7.0%
Unlevered beta (industry average)	0.73
Debt-Equity ratio	22%
Re-levered beta	0.89
Cost of debt (pre-tax)	10.8%
Tax rate	27.82%
Cost of debt (post-tax)	7.8%
Cost of Equity	13.6%
WACC(Post-Tax)- Rounded	12.50%

8. Estimating Cost of Capital in Cross Border Investments

Assessment of Cost of Capital in cross border investments warrants few complex issues such as correlation of cost of capital and currency of cash flow, country risk premium, and risk-free rate. If an investor from India is investing in an investee company in another country, how relevant is it to use the Indian Government Bond rate as a measure of risk-free rate? What if the investee company's country has not issued a sovereign bond (for e.g. if the investee is located in UAE)? Conversely, if an investor from another country (e.g. USA) wants to bid for the acquisition of an Indian Company, would the US Investor's cost of capital be different from the Indian Investor's cost of capital bidding for the same acquisition? If yes, both of them will end up valuing same company in a fundamentally different manner. Paradoxically, the investee company's intrinsic capabilities are investor agnostic (assuming nil synergy). Theoretically, the fair value of the investee company shall be independent of the country of investor.

Let us try to further our discussion by using following example.

Peace Ltd. an auto manufacturing company in USA is willing to sell its segment for USD 1 million. Investor is expected to receive USD 1.3 million after 5 years from the investment date. If we infer a concept of cost of equity as a rate representative of returns expected by the equity investor, and we assume that potential acquisition is fully funded by equity capital, the investor in USA is expecting a return of 5.387% per annum. Hence, you may conclude that the cost of equity of US based investor for a given segment acquisition is 5.387%.

Now, let us extend the same example under assumption that Indian Investor is willing to acquire Peace Ltd.'s segment at USD 1 million and in 5 years it is expecting to realise USD 1.2 million. As at zero date, INR-USD exchange rate is Rs.65/$. Inflation in India is expected at 5% per annum and inflation in USA is expected at 0.5% per annum. Consequently, the INR-USD exchange rate after 5 years is expected at Rs.84.84/$. Consequently, as at zero date, Indian investor would invest Rs.6.5 Crore and realise Rs.11.03 Crore after 5 years. If we infer a concept of cost of equity as a rate representative of returns expected by the equity investor, and we assume that potential acquisition is fully funded by equity capital, the investor in India is expecting a return of 11.16% per annum. Hence, you may conclude that the cost of equity of Indian investor for a given segment acquisition is 11.16%.

Summary

Year	USD	INR
0	(1,000,000.00)	(6,50,00,000.00)
5	1,300,000.00	11,02,94,974.98
ke	5.387%	11.155%

Current Rs./$ on 0th Day	65.00
India inflation over 5 years	6.00%
USA inflation over 5 years	0.50%
Forward Rs./$ at the end of 5th year	84.84

From the above example, we can conclude that despite the same fair valuation (in different currency terms at a given point in time), the cost of capital is different in case of both the investors. Is it safe to conclude that cost capital needs to be quoted in the context of currency of valuation? Is it okay to conclude that ke of 5.387% USD Cash flows is equivalent to ke of 11.155% INR Cash flows?

As a valuer, we are expected to correlate the currency of cash flows with the cost of capital. However, a mistake of using an INR ke to discount USD cash flows and bidding at $0.77 million (instead of $1.0 million) would mean a devaluation of the segment and Indian investor may lose a bid for underquoting.

We can extend the above example to identify international cost of capital for various investors located in multiple geographies as follows:

Country of Investor	Cur	Spot Rate/$	Inflation	Forward Rate	Investment at '0' date	Realisation after '5' years	Cost of Capital
India	INR	65	6.00%	84.84	6,50,00,000	11,02,94,974.98	11.16%
Singapore	SGD	1.25	1.00%	1.28	12,50,000	16,65,827.11	5.91%
UAE	Dinar	3.25	3.00%	3.67	32,50,000	47,77,300.15	8.01%
Germany	Euro	1.2	2.00%	1.29	12,00,000	16,79,945.33	6.96%
China	Yuan	6.5	2.50%	7.17	65,00,000	93,24,933.15	7.49%
Pakistan	PKR	120	10%	188.50	12,00,00,000	24,50,51,697.56	15.35%

Sri Lanka	LKR	160	7%	218.88	16,00,00,000	28,45,45,626.35	12.20%
Bangladesh	BDT	75	7.50%	105.02	7,50,00,000	13,65,26,396.70	12.73%
USA	USD	1	0.50%	NA	10,00,000	13,00,000.00	5.39%

Above conclusions require us to analyse cost of capital and reconcile the differences. There are multiple attributes for the differing cost of capital such as varying inflation, currency forwards, country specific risk etc.

9. Estimating Discount Rates during unprecedented times such as global economic crisis

Economic crisis can be defined as the wild fluctuations, outside the acceptable limits of change, in the prices or supplies in any markets of commodity or services, or factors of production. Such economic crisis can be micro-economic or macro-economic.

Macro Economics Crisis - Most common examples for macro-economic crisis are the 1930's great depression and 2008's global economic crisis and most recent Covid-19 crisis wherein almost all the countries and sectors were impacted adversely.

Micro Economic Crisis - In micro-economic crisis, only a particular country or region or market sector gets impacted.

The Economic Crisis leads to economic distress that afflicts most companies operating in the economy. Some of the economic distress factors are temporary, while other factors may leave behind a permanent change in the business landscape. It is critical to identify whether factors causing distress are temporary or long-term to be able to chart the future course of action and valuation. The duration of impact and recovery period is dependent on various factors like business and consumer confidence, the speed of resumption of international trade, and the recovery of asset values, availability and distribution of vaccines.

Economic distress at times overlaps with micro factors resulting in financial distress. Some of the key micro factors contributing to financial distress are situations wherein firms cannot meet or have difficulty paying off their financial obligations.

In times of market uncertainty, performing valuation is certainly more judgmental and a lot trickier. While the standard valuation methodologies remain the same, it is the valuation inputs and assumptions that require thoughtful adjustments and revisions to include the impact of market volatility.

An entity's ability to continue as a going concern shall be the first test to be undertaken in valuation, as the impact of global crisis can be far reaching on a company's financials making it unviable. Often economic distress causes financial distress in entities wherein they are unable

to meet off their financial obligations to their creditors, typically due to high fixed costs, illiquid assets or revenues that are sensitive to economic downturns. In such a scenario, wherein a firm is unable to meet the going concern assumptions, liquidation approach instead of income shall be considered as the valuation approach. A mix of both the approach can also be used, in case the cash flow during the explicit period can be ascertained; and then the terminal value can be determined using the liquidation approach.

It is also important to ascertain the industry-wise impact rather than blindly adjusting the overall economic impacts in valuation inputs/variables. This is because some industries may be immensely impacted while others might have benefited/less immensely impacted during this period. Even the recovery period will vary from industry to industry and needs to be ascertained cautiously. For e.g.: - while tourism and hospitality industries were most badly impacted in COVID-19 the relative impact on Telecom was much lower.

The discount rate is the risk associated with the cash flow and investments, hence in common parlance investing in assets and business will be much riskier under crisis rather than in normal circumstances, hence the discounting rate is expected to go up during crisis.
Let's see how factors determining discount rate will get impacted and what adjustments are required therein.

i) Cost of Equity

As discussed above the formula for calculating Cost of equity under CAPM model is:

Cost of Equity (**Ke) under CAPM = Risk Free Rate of Return (Rf) + Beta (β) X Risk** Premium (Rp)

Now let us understand the impact of economic crisis/ pandemic on each one of these inputs:-

a) Risk Free Rate of Return – Long-term default free government bonds, of the country where company's headquarter is located is mostly treated as the Risk-Free Rate of Returns. During the time of global crisis, the risk-free rates are bound to go down as government takes action to mitigate the decline in economy and to stimulate growth. Lower interest rates stimulate economy by making it cheaper to borrow money. The fall in interest rates of short-term government bonds i.e., 1-3 years will be much more significant than the fall in 5-10 years. This fall in the risk-free rate of return shall however

be mitigated by the rise in ERP and betas because the cost of Equity is expected to go up during a crisis.

b) Equity Risk Premium- It is the additional returns required by an investor to move his assets from a risk-free investment to average risk investment. The most common method of valuing same is historical approach, wherein historical data for a group of stocks (E.g.: Indexes like Sensex or Nifty) is used to determine by how much the average return on equity exceeds the Risk-free rate of returns.

However, during the global crisis historical approach is not suitable as the volatility in the economy has a rippling effect on the equity risk premium leading to its increase, which in turn pulls down the share valuations, and the equity index. Mr. Aswath Damodaran has increased the Equity Risk Premium from 7.08% to 9.49% during COVID Pandemic.

However, care should be taken that the dual impact of crisis is avoided in valuation i.e., if the impact of crisis has already been considered in future cash-flows then the need to apply additional risk premium shall be avoided.

c) Beta Coefficient – It is the sensitivity of the stock or asset to the market and is measured as under

Beta of an asset = Covariance of asset with Market Portfolio/Variance of the market portfolio

During Crisis it is extremely important to determine the business specific risk premium as the magnitude of impact of crisis will vary from one industry to other and there can be many industries that might have been stable during the period of global crisis. This company wise sensitivity to economy is captured in Beta of the asset as some firms might look more favourable for investments as against others.

ii) Cost of Debt

The Cost of Debt ("COD") is the current or expected cost for borrowing funds for the company or firm to fund its assets. However, it differs from one entity to other basis their embedded default risk. Under normal circumstances it can easily be determined by looking at the latest

borrowing of the company and if rated, its credit ratings. However, under a situation of global crisis it will depend on the factors whether company is funded long term or short term and what are its future borrowing needs.

Further, a Valuer needs to consider the tax implications and the relevant government policies introduced during the global crisis. Further, the effect of carry forward losses from crisis period to post crisis period shall be adequately considered. Hence ascertainment of cost of debt shall vary from case-to-case basis and shall be arrived at after adequate judgement.

10. Conclusion

Discount Rate is one of the critical inputs in valuation and is also difficult to estimate owing to its intrinsic nature. While it is an extremely complex factor to estimate but at the same time it is also subjected to maximum adjustments as it has a direct and far-reaching impact on Value to be ascertained. Future cash flows are discounted at the discount rate, so higher the discount rate lower will be the present value of the future cash flows. Similarly, a lower discount rate leads to a higher present value.

In addition to the ICAI Valuation Standards, the Concept Paper has been issued with an objective to clarify the process of estimating the Discount rates and to bring about uniformity in the methods used in discount rate estimation in Valuation.

Valuation Standards Board

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