8 July, 2020

## Recapitalising Reliance Industries.

The recent private equity investments into Reliance Industries Limited (RIL) and the corresponding market reaction to soar up the beat-up stock to new highs, out-performing the market, prompted a few questions for which I created a hypothesis to solve. In essence, what we saw was an increase in the market valuation of the firm.

To validate if this increase in valuation has anything to do with the company's agenda of becoming net-debt free, we need to understand the effect of debt and equity levels on the valuation of a company.

Looking into the consolidated financials of RIL till 2019, we find that over the period of years since 2015, the *book value* of Debt to Equity (D/E) has been maintained at around 73% and where as the *market* D/E has significantly dropped from 48% to 30% levels.
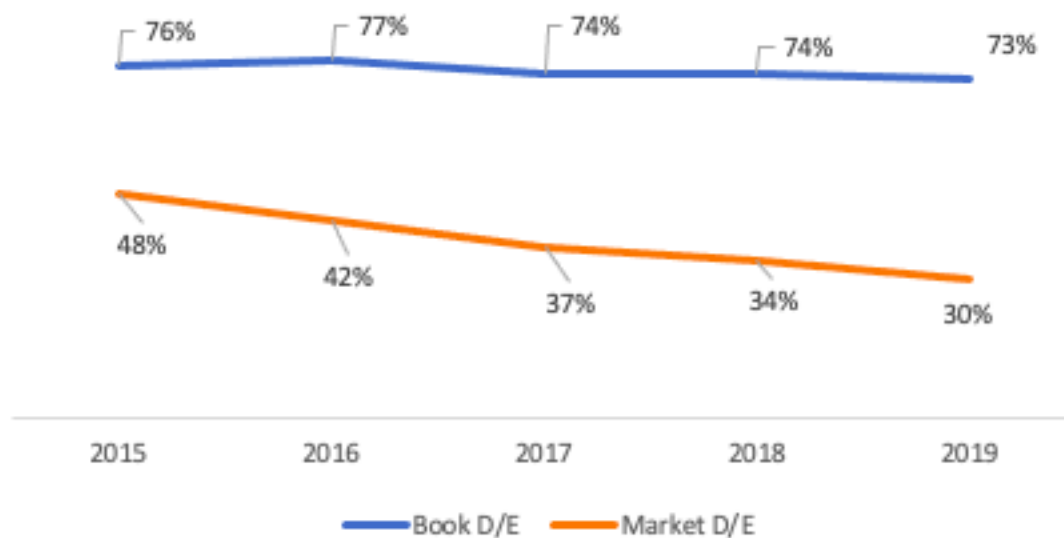


| Year | Book Value | | | Market Value | | |
|---|---|---|---|---|---|---|
| | Debt | Equity | D/E | Debt | Equity | D/E |
| 2019 | 2,87,505 | 3,95,392 | 0.73 | 2,52,307 | 8,55,977 | 0.29 |
| 2018 | 2,18,763 | 2,97,045 | 0.74 | 1,75,230 | 5,22,305 | 0.34 |
| 2017 | 1,96,621 | 2,66,626 | 0.74 | 1,43,250 | 3,90,578 | 0.37 |
| 2016 | 1,80,665 | 2,34,912 | 0.77 | 1,30,391 | 3,08,068 | 0.42 |
| 2015 | 1,60,352 | 2,12,033 | 0.76 | 1,16,450 | 2,43,119 | 0.48 |

If RIL makes use of this raised capital to retire some of its debt and become net-debt free, the market D/E hover around 15% (approx.).

***What happens when D/E ratio is 15%? Why does RIL want it to be 15%? Why does it has to become net debt free? What is the optimum level of debt and equity?***

I would like to walk through an intuitive approach of playing with debt capacity of a company, circling into finding the optimum financial mix for any company in any industry for that matter.
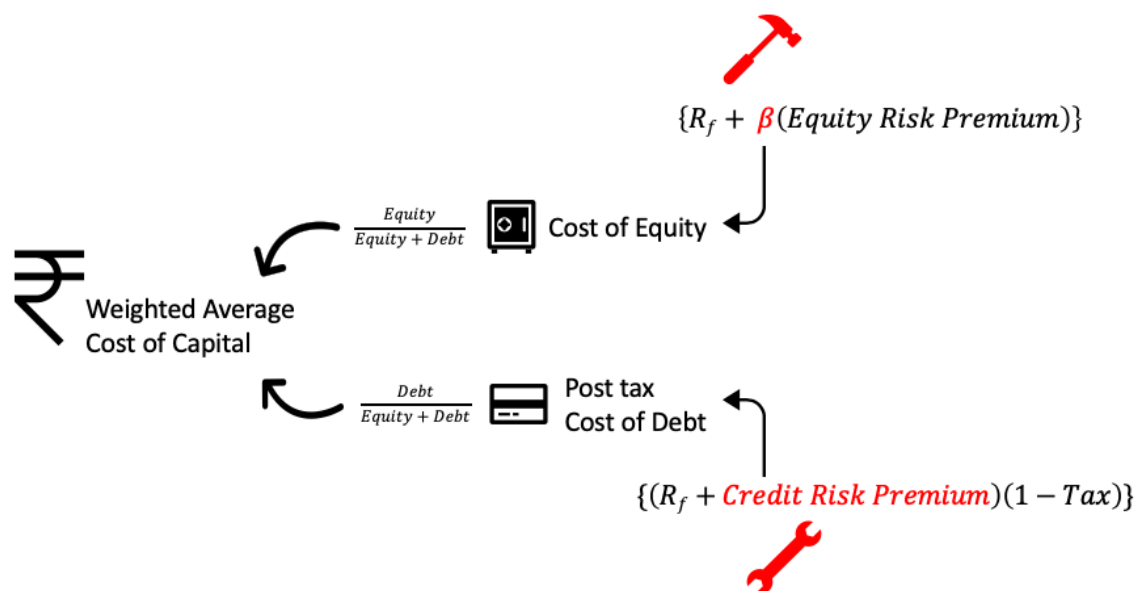
My aim in doing this exercise is to understand better about the effect of debt and equity. At least at this point in time, I wouldn't lose sleep upon getting just a ballpark number in the end of this approach. This approach takes in few assumptions for making it simple and it does not hurt much.

To understand what RIL has been doing since 2017, I borrowed this approach from the book *"Applied Corporate Finance"*, by Prof. Aswath Damodaran.

The idea in a nutshell is that, **the intrinsic valuation of a company will increase when the expected free cash flows to the firm are discounted at a lower cost of capital.**

This approach breaks down the Weighted Average Cost of Capital (WACC) to understand the impact of debt and equity levels.

WACC = E/(D+E) times the Cost of Equity + D/(D+E) times the Cost of Debt

$$\{R_f + \beta(Equity\ Risk\ Premium)\}$$

$$\frac{Equity}{Equity + Debt}\quad \text{Cost of Equity}$$

Weighted Average Cost of Capital

$$\frac{Debt}{Equity + Debt}\quad \text{Post tax Cost of Debt}$$

$$\{(R_f + Credit\ Risk\ Premium)(1 - Tax)\}$$

Elements of the Cost of Equity and Cost of Debt such as the market Beta and credit risk premium are affected by the leverage used by the firm. Thus in essence, performing a what-if analysis on WACC by changing the D/E ratios will directly lead us to whether or not there will be an impact in the valuation of the firm.

In the process of calculating the existing WACC, to come up with the weights for the cost of capital, "market values" of the debt and equity are more relevant than the book values because of the fact that new funding (both debt and equity) are raised at prevailing market prices. I'm sure that RIL being a publicly traded company, its financial reports can lead to the market value of debt and equity to come up with the weights for WACC.

But, How much is the risk free rate? How much equity risk premium and credit risk premium does RIL bear? What is the beta for RIL?

**i) Risk-free Rate and Equity Risk Premium**

Risk free rate is the actual rate of return on an asset class having ZERO default risk and ZERO reinvestment risk for the duration and currency of the analysis.

It would be natural for us to assume the rate of return on a tradable long term (say 10 yr) government bond to be the risk free rate. However, it is also appropriate to say that governments are not default free. The sovereign rating of a country at the time of study can give us a peek into default risk that they are bearing.

By Mar 19 (fiscal year end for RIL), the rate of return on the 10 year government bond was 7.41% and Moody's sovereign rating for India was Baa2 (which was recently dropped to Baa3).

| Year | Feb-19 | Feb-19 | Apr-20 |
|---|---|---|---|
| Country | United States | India | India |
| Moody Rating | AAA (base for calc) | Baa2 | Baa2 |
| Sovereign CDS | 0.40% | - | 3.01% |
| Adj Default Spread | 0% | 2.15% | 2.82% |
| Equity risk premium | 5.96% | 8.60% | 9.49% |
| Country risk premium | 0% | 2.64% | 3.48% |
| Corporate tax | 25% | 35% | 30% |

A look-up table by the Prof, gives us the implied default spreads and equity risk premium for a country. If you think about it - a sneak peek into the Credit Default Swap (CDS) market can also give us the credit risk spreads on the risk free asset class of a country.

The default spread for a sovereign rating is computed by comparing dollar or euro-denominated sovereign bonds issued by emerging market countries to the default free U.S. rate (treasury) or Euro rate (the German ten-year bond).

Risk-free Rate (Rf) = 10yr Bond rate - Default spread for India = 7.41% - 2.15% = 5.26%

The equity risk premium is what the marginal investors expect from the market portfolio (of a country) for choosing it over a risk-free asset class. In general, premiums on the markets can be derived by estimating geometric means of historical returns of stocks as compared its respective risk-free asset classes (say treasury bills). Such calculated risk premiums can usually be said in reference to a base market that is mature market/ AAA sovereign rated market.

Equity Risk Premium = Basic Premium for mature market + Country specific credit premium = 8.60%

## ii) Beta for RIL

Beta is a measure of volatility in the returns of the company as compared to that of the market. I went about calculating an approximate beta in two ways and *let a sensitivity analysis bring in sanity to the argument if required.*

Method 1) Regression Beta

Statistically, beta is the slope of the regression equation between the stock and market's returns and the adjusted R square of regression can also tell us, how much percent of the total risk borne by the company is systematic risk or market risk.

When the beta of a company/asset class tend to 1, it "becomes the market".

The scepticism around using the regression beta is that, it will be different for different time periods(number of years), different time intervals (daily/weekly/monthly) and different indices (Nifty 50 or 500). This method of calculating the regression beta assumes that the market always values the company right (even when wrong, corrects the valuation in a short period).

The regression model of 10 years of weekly returns till the end of Mar 2019, of Reliance Industries and NIFTY50 yielded a beta of 1.10 and Adj Rsq of 44.25%.

And the regression beta for Reliance and NIFTY500 is 1.06 with an Adj Rsq of 29.03%

Such discretionary differences can be seeded out by a sensitivity analysis.

Dependent Variable - RIL
Independent Variable - NIFTY50

$y = 1.1015x + 0.0004$
$R^2 = 0.4425$
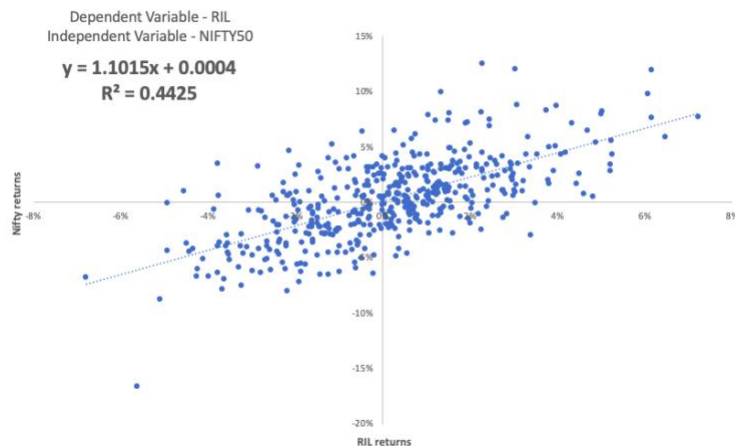
Method 2) Bottom-Up Beta

Breaking RIL by business lines and estimating a weighted beta for RIL basis other publicly traded comparable firms under each business line (globally - for the law of large numbers to play in favour). Such market betas are levered values, and they can be unlevered by using respective debt-equity ratio, tax rate and even the cash to firm ratio.

I have used an average market D/E of 70% (which was the level around 2017) to negate the assumption that markets always value securities at the right price.

A look-up table by the Prof, gives us the industry-wise Beta values for firms globally.

| Business Line | Revenue 18-19 | Weightage | Unlevered Beta |
|---|---|---|---|
| Refining | 3,06,154 | 52.69% | 0.94 |
| Petrochemicals | 1,39,259 | 23.97% | 0.94 |
| oil and Gas | 4,384 | 0.75% | 0.94 |
| Organised Retai | 1,15,257 | 19.84% | 0.84 |
| Digital services | 2,071 | 0.36% | 0.67 |
| Others | 13,895 | 2.39% | 0.94 |
| | 5,81,020 | | 0.916 |

| | |
|---|---|
| Debt to Equity Ratio | 0.70 |
| Marginal Tax Rate | 34.4% |

$\beta_L = \beta_u(1 + (1 - t)(D/E))$

| | |
|---|---|
| Levered Beta | 1.34 |

| Comparable Ind | Number of firms | Beta | D/E | Effective tax | Unlevered beta | Cash/firm ratio | UB adj cash |
|---|---|---|---|---|---|---|---|
| Oil/Gas (Integra | 4 | 1.30 | 26.82% | 24.54% | 1.08 | 3.10% | 1.12 |
| Oil/Gas (Produc | 269 | 1.48 | 56.39% | 3.70% | 1.04 | 3.51% | 1.08 |
| Oil/Gas Distribu | 24 | 1.02 | 89.69% | 5.46% | 0.61 | 1.63% | 0.62 |
| Telecom. Servic | 67 | 1.05 | 79.19% | 4.17% | 0.66 | 1.35% | 0.67 |
| Retail (Distribut | 80 | 1.28 | 60.86% | 11.96% | 0.88 | 1.74% | 0.89 |
| Retail (General) | 18 | 1.14 | 32.10% | 15.49% | 0.92 | 2.53% | 0.95 |
| Retail (Grocery | 13 | 0.59 | 96.66% | 12.78% | 0.34 | 1.26% | 0.35 |
| Retail (Online) | 70 | 1.23 | 12.87% | 2.92% | 1.12 | 3.24% | 1.16 |
| Apparel | 51 | 1.06 | 41.77% | 11.11% | 0.80 | 3.16% | 0.83 |
| Electronics (Con | 20 | 1.28 | 20.67% | 5.45% | 1.10 | 11.72% | 1.25 |
| Broadcasting | 27 | 1.21 | 98.45% | 13.31% | 0.70 | 4.35% | 0.73 |

The bottom-up approach gives me a levered Beta of 1.34 and an unlevered Beta of 0.916.

*This unlevered beta or the equity beta for RIL can be used to cross-validate for various debt to equity ratios of RIL.*

### iii) Company-specific Credit Risk Premium

On top of the risk-free rate, companies are charged with a spread proportionate to the credit risk they are carrying. Credit rating agencies like CRISIL and Moody's also rate the companies which can be used to weigh in the company specific premium. As of July'19 Moody's had rated Reliance Industries at Baa2.

To decode the ratings, a synthetic rating using the interest coverage ratio (a good proxy) to measure the company's credit risk premium can be created for cross-validation.

| Income | | | 18-19 in cr | 17-18 in cr | 16-17 in cr | 15-16 in cr |
|---|---|---|---|---|---|---|
| | Revenue from Operations | | 5,81,020 | 4,08,265 | 3,30,180 | 2,93,298 |
| Expenses | | | | | | |
| | Cost of materials consumed | | 2,75,237 | 2,07,448 | 1,75,087 | 1,58,199 |
| | Purchase of Stock-in-Trade | | 1,23,930 | 68,628 | 42,431 | 28,055 |
| | Changes in Inventories | | (4,680) | (8,610) | (5,218) | 2,560 |
| | Excise duty and service tax | | 13,885 | 16,588 | 24,798 | 19,299 |
| | Employee Benefit Expense | | 12,488 | 9,523 | 8,388 | 7,407 |
| | Other Expenses (Adjusted for leases) | | 76,414 | 50,650 | 38,547 | 36,087 |
| | | | | | | |
| EBITDA (adjusted for leases) | | | 83,746 | 64,038 | 46,147 | 41,691 |
| DA (adjusted for leases) | | | 21,018 | 16,790 | 11,730 | 11,649 |
| EBIT (Adjusted for leases) | | | 62,728 | 47,248 | 34,417 | 30,042 |
| | | | | | | |
| Interest Expense | | | 16,495 | 8,052 | 3,849 | 3,691 |
| | | | | | | |
| Interest Coverage Ratio | | | 3.80 | 5.87 | 8.94 | 8.14 |

Typically, emerging market firms with an interest coverage ratio of 3-4 are rated Ba2/BB slapping a credit risk premium of 2.40%. However, Reliance has maintained an average interest coverage ratio of 4.86 over the few years which translates to Baa2 rating.

Moody's has rated Reliance Industries at Baa2, which implies a credit risk premium of 1.56% from the synthetic look-up table by Prof.

Adding up the pieces to get the Cost of Equity and Cost of Debt,

| | |
|---|---|
| Cost of Debt = Riskfree rate + Country Default spread + Company Default | 8.97% |
| Marginal Tax Rate | 34.44% |
| Post Tax Cost of Debt | 5.88% |

Also, we can derive at the,

| | |
|---|---|
| Cost of Equity = Risk free rate + Beta (Equity Risk Premium) | 16.75% |

### iv) Market Value of Debt and Equity for WACC

The balance sheet will give us the accounting value of current and non-current borrowings and the income statement will give us the total finance cost (interest expense) of the borrowings.

*To come up with the weights for the cost of capital, market values of the debt and equity are more relevant than the book values because of the fact that new fundings (both debt and equity) are raised at prevailing market prices.*

Estimated Market Value of the total debt is present value of all interest payments and principal repayments over the *weighted maturity period* discounted at *pretax cost of debt*. The maturity of the borrowings are provided in the notes to the balance sheet.

By 31 Mar 2019, RIL had a total of Rs 2,87,505 cr in borrowings and the notes to the financial statements gives us the maturity of the various borrowings.

Calculating market value of debt as on Mar 2019,

| Year Due | Maturity in yrs | Amount Due | Weightage | Weightage*Maturity |
|----------|-----------------|------------|-----------|--------------------|
| 19-20 | 0.5 | 79,999 | 27.83% | 0.14 |
| 20-21 | 2 | 20049 | 6.97% | 0.14 |
| 21-22 | 3 | 23536 | 8.19% | 0.25 |
| 22-23 | 4 | 11571 | 4.02% | 0.16 |
| 23-24 | 5 | 90779 | 31.57% | 1.58 |
| 24-25 | 6 | 11986 | 4.17% | 0.25 |
| 25-26 | 7 | 1571 | 0.55% | 0.04 |
| 26-27 | 8 | 388 | 0.13% | 0.01 |
| 27-28 | 9 | 5566 | 1.94% | 0.17 |
| 28-29 | 10 | 31849 | 11.08% | 1.11 |
| 35-36 | 17 | 1383 | 0.48% | 0.08 |
| 40-41 | 22 | 3489 | 1.21% | 0.27 |
| 44-45 | 26 | 5186 | 1.80% | 0.47 |
| 46-47 | 28 | 67 | 0.02% | 0.01 |
| 96-97 | 78 | 86 | 0.03% | 0.02 |
| | | 2,87,505 cr | | 4.69 <- Weighted Maturity |

| | |
|---|---|
| Interest Expense | 16,495 cr |
| PV of all interest payments | 61008 cr |
| PV of principal payment at end of tenure | 192121 cr |
| Estimated market value of total debt | 2,53,129 cr |

Accounting in the long term lease agreements as debt, it adds another Rs 7285 cr to this total debt. Thus the *total outstanding debt at its market value becomes Rs 2,60,415 cr.*

Now, the market value of equity of a publicly traded company is the product of the total number of share outstanding and current stock price. And as of Mar-19, trading at Rs 1350.4 with about 633 cr of outstanding shares, the *market value of equity stood at Rs 8,55,977 cr.*

The debt to capital ratio from the derived market values is 23.33%.

Plugging in all the known values into the equation, we get

*Weighted Average Cost of Capital 14.225%*

To summarise, it costs reliance 14.225% to raise money through equity and debt *at the current levels of operating figures like EBIT.*

Now, the approach tries to reverse engineer the cost of capital at various debt to equity levels. It is important to understand that the approach tries to gauge the effect of debt on the current operations of RIL. So, it is a what-if analysis on the debt-to-equity ratio at same EBIT level.

Having a broken down cost of capital is going to help us do that.

If we think about where all the debt to equity ratio has had an effect on the cost of capital - i) the market debt to equity ratio was used factor in leverage into un levered beta; ii) the side-kick of debt which is the interest expense ratio was used as a proxy to determine the synthetic rating which gave us the spread on cost of debt.

So, a data table for the new cost of capital and cost of debt for various debt to equity ratios needs to be populated.

Notice that, at different debt to equity ratios a little bit of iterations may be required to find out the likely rating from the synthetic look-up table which gives us the expected rating and implied spread on cost of debt.

| D/(D+E) | 0% | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 50% | 60% | 70% | 80% | 90% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D/E | 0.00% | 5.26% | 11.11% | 17.65% | 25.00% | 33.33% | 42.86% | 53.85% | 66.67% | 100.00% | 150.00% | 233.33% | 400.00% | 900.00% |
| Debt | - | 58,714 | 1,23,952 | 1,96,865 | 2,78,892 | 3,71,857 | 4,78,101 | 6,00,691 | 7,43,713 | 11,15,570 | 16,73,354 | 26,02,996 | 44,62,278 | 1,00,40,126 |
| EBITDA | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 | 83,746 |
| DA | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 | 21,018 |
| EBIT | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 | 62,728 |
| Interest on debt | - | 4,721 | 10,524 | 19,312 | 25,017 | 58,047 | 76,735 | 1,12,630 | 1,67,559 | 2,51,338 | 3,77,007 | 5,86,455 | 10,05,351 | 22,62,040 |
| Pretax Interest coverage ratio | | 13.29 | 5.96 | 3.25 | 2.51 | 1.08 | 0.82 | 0.56 | 0.37 | 0.25 | 0.17 | 0.11 | 0.06 | 0.03 |
| | | | | | | | | | | | | | | |
| Likely Rating | AAA | AAA | A3 | BA2 | B1 | CA2 | CA2 | C2 | D2 | D2 | D2 | D2 | D2 | D2 |
| Likely Pre tax Cost of De | 8.04% | 8.04% | 8.63% | 9.81% | 10.92% | 16.05% | 16.05% | 18.75% | 22.53% | 22.53% | 22.53% | 22.53% | 22.53% | 22.53% |
| Applied Interest Rate 1 | 8.97% | 8.04% | 8.04% | 8.63% | 8.49% | 10.92% | 15.61% | 16.05% | 18.75% | 22.53% | 22.53% | 22.53% | 22.53% | 22.53% |
| Applied Interest Rate 2 | 8.04% | | 8.49% | 9.41% | 10.92% | 12.56% | 16.05% | 18.75% | 22.53% | | | | | |
| Applied Interest Rate 3 | | | 8.63% | 9.81% | | 15.61% | | | | | | | | |
| | | | | | | | | | | | | | | |
| Tax Rate | 34.44% | 34.44% | 34.44% | 34.44% | 34.44% | 34.44% | 28.15% | 19.18% | 12.89% | 8.60% | 5.73% | 3.68% | 2.15% | 0.96% |
| After Tax Cost of Debt | 5.27% | 5.27% | 5.66% | 6.43% | 7.16% | 10.52% | 11.53% | 15.15% | 19.63% | 20.59% | 21.24% | 21.70% | 22.05% | 22.31% |

| Debt to Capital Ratio | D/E | Levered Beta | Cost of Equity | Post tax Cost of Debt | WACC | Likely Rating |
|---|---|---|---|---|---|---|
| 0% | 0% | 0.92 | 13.14% | 5.27% | 13.14% | AAA |
| 5% | 5% | 0.95 | 13.41% | 5.27% | 13.00% | AAA |
| 10% | 11% | 0.98 | 13.71% | 5.66% | 12.91% | A3 |
| 15% | 18% | 1.02 | 14.05% | 6.43% | 12.91% | BA2 |
| 20% | 25% | 1.07 | 14.43% | 7.16% | 12.98% | B1 |
| 25% | 33% | 1.12 | 14.86% | 10.52% | 13.78% | CA2 |
| 30% | 43% | 1.17 | 15.35% | 11.53% | 14.21% | CA2 |
| 35% | 54% | 1.24 | 15.92% | 15.15% | 15.65% | C2 |
| 40% | 67% | 1.32 | 16.58% | 19.63% | 17.80% | D2 |
| 50% | 100% | 1.52 | 18.31% | 20.59% | 19.45% | D2 |
| 60% | 150% | 1.82 | 20.89% | 21.24% | 21.10% | D2 |
| 70% | 233% | 2.32 | 25.20% | 21.70% | 22.75% | D2 |
| 80% | 400% | 3.32 | 33.81% | 22.05% | 24.40% | D2 |
| 90% | 900% | 6.33 | 59.66% | 22.31% | 26.05% | D2 |

The populated data table gives us a clear picture of the optimum finance mix where the cost of capital is the lowest at 12.91%.

*Optimum Debt to Capital ratio of 10-15% or*
*Optimum Debt to Equity ratio of 11-18%*

Now, Validating with the expected market values of debt and equity, if the investments and the rights issues in this year we used to recapitalise as per my hypothesis.

| Recapitalisation | INR Amt in cr |
|---|---|
| Equity | 1,04,328 |
| Rights | 53,124 |
| Total | 1,57,452 |

| | Old | New | |
|---|---|---|---|
| Outstanding shares | 634 | 676.13 | cr |
| Price of each stock | 1350.4 | 1600 | Rs |

| Year 2020 | Old | New |
|---|---|---|
| Debt | 2,59,592 | 1,55,264 |
| Equity | 8,55,977 | 10,81,807 |
| D+E | 11,15,570 | 12,37,071 |
| D/E | 30.3% | 14.35% |
| D/(D+E) | 23.27% | 12.55% |

**The market D/E after recapitalisation would be 14.35% which is the optimum financial mix as per our derivation.**

## Conclusion

So what will happen as RIL moves to its optimum finance mix?
- The intrinsic enterprise value will increase when discounted at a lower cost of capital.
- By how much? The answer would be the present value of all the savings in the finance cost it would get by moving over to the optimum finance mix.
  - Savings = Finance cost at existing WACC – Finance cost at optimum WACC
  - 259592 * (14.225 – 12.91)% = Rs 3418 cr
  - Net Present Value of all such savings discounted at the risk free rate (proxy for growth rate for the firm in the long run) = Rs 44,690 cr
- So Ideally, the increase in the stock prices can be attributed to this expected increase in the valuation.
- My view on the increase in stock prices can also be attributed to the positive vibe that private equities are attracted seeing potential in generating revenue multiples over not just the cost of equity but also over the industry average in expected returns. Just know, even venture capitalists expect 20-25% return on investment in firms.
- So, *are you now thinking at what enormous rate RIL should grow its EBIT to pay back the private equity investments expecting such bulk returns? Me too.*

- Also, the approach in this case yield a lower optimum cost of capital than the current WACC and this is not necessarily the case all the time. This would be different for companies in different industries and in different stages in the growth cycle. A company may have a higher optimum cost of capital which would require it to raise debt to buy back shares or invest in better projects in order to increase its intrinsic valuation.