

EQUITY VALUATION BY FREE CASH FLOW TO EQUITY APPROACH: A CASE STUDY OF TATA STEEL

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Abstract

Equity valuation, unlike the valuation of bond, has been a matter of challenge for the researchers as well as for academicians. This is supported by the fact that cash flows associated with equity are highly uncertain and unpredictable. For this reason, almost all the valuation models developed so far are based on some assumptions which are far away from the real-life situation. However, a continuous effort has been made to eliminate uncertainty and derive a realistic value. In this paper, one of the most commonly trusted equity valuation model Free Cash Flow to Equity (FCFE) has been used to evaluate the equity price of Tata Steel Limited. Based on the growth trend of FCFE for last 10 years, projected FCFE for next 5 years has been calculated and discounted with a required rate of return derived from Capital Asset Pricing Model (CAPM) model. The analysis revealed that the FCFE of the company is gradually decreasing; the share price is much lesser than its market price. But at the same time, the company is repaying its old debts as well as investing in the new asset which will enhance its future earning capacity. This research concludes that investing in the shares of Tata Steel would yield good results in the future.

Key Words: FCFE, CAPM, valuation models, uncertainty.

1. Introduction:

Investment and return are relative words revolving around the complexity of valuation. It is the valuation of the asset that guides us whether we will buy it or not. Similarly at the time of assessing the return

on the asset, we have to value the benefits obtained during the period of holding the asset. This concept is also applicable in the case of equity investment. But the complexity of valuation is very high in case of equity valuation. The complexity arises

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due to factors such as uncertainty in predicting the growth rate, cash flow, the cost of equity and overall the macroeconomic environment in which the organization operates. Even if these conditions prevail, the attempt to arrive at a right value is at risk. Various models of valuation developed so far are clear evidence of the same. In this paper, the focus is only on FCFE (Free Cash Flow to Equity) model to value the share price of leading steel company, TATA Steel Ltd.

This paper has the following objectives:

- To understand the Free Cash Flow to Equity model of equity valuation
- To determine the equity value of TATA Steel Ltd.

2. Literature review:

Mohsen, Dastgir and others (2010) conducted a study by taking 54 listed firms in the Tehran Exchange regarding firm valuation. In their study, they had used the method of capital cash flow discounted at the Weighted Average Cost of Capital (WACC) before tax. They found that with an appropriate discount rate and considering the

advantage of tax shield whatever value of the firm is obtained will give the same result as other methods.

(Sheng-Syan Chen and others 2009) studied the impact of the free cash flow on the value enhancing the potential of the stock market liberalization at the firm level. The study revealed that the response to the market liberalization is more felt by the organization having high growth potentials. They also noticed that the firm with high cash flows experienced the low announcement period returns associated with stock market liberalization.

Jean-Paul Decamps and others (2008) in their study regarding the issuance and payout policies that maximize the value of a firm considering both agency costs of free cash flow and the external financing costs concluded that firms optimally issue equity. Equity distributes no dividends until a target cash level is reached while new equity is issued when the firm runs out of cash. The main insight of this paper is that the introduction of exogenous issuance costs is enough to generate heteroscedasticity of stock market prices, even when earnings are independently distributed.

Gentry and others (2002) made a

comparative study between the accounting earning approach and the finance FCFE approach to understand which method provides a better explanation for estimating the capital gain rates of return on American and Japanese equities. They found strong support for using the net earnings approach to explain the capital gain rates of return for both American and Japanese companies during the period 1981-1999 and 1986-1999, respectively. They also found that there exists a strong relationship between capital gain returns and net cash flow associated with operations, interest and debt financing. And they also found that the accrual accounting information is more useful in explaining capital gain rates of return than free cash flow components because accrual information tends to be more stable than cash flow data.

By taking both the Free Cash Flow to Firm (FCFF) and FCFE method Ignaco Velez—Pareja and Josegh Tham (2001) examined the interrelationship between these methods. They compared the other traditional methods such as Modigliani & Miller's (M&M) WACC with the WACC approach used by Harris and Pringle (1985). They came out with three approaches to

calculate total firm and equity value with different expressions for WACC, they are the M&M WACC (the traditional WACC) the HP WACC and the TV WACC. The results of the first were not consistent; the second one is consistent as long as there are no losses and/or losses carried forward. The last one, the TV WACC, produces a consistent result either with no losses and losses carried forward. It can be shown that when taxes are paid the following year after accrual, the only one that gives consistent results is TV WACC.

3. Valuation model used in this paper:

Valuation methods

3.1 Discounted Cash Flow (DCF):

Luehman (1997), considered this valuation method as the best way of doing valuations during 1970's.

This model uses the estimated future free cash-flows based on the past growth, discounts them on the basis of the cost of capital of the firm, and derives an estimated present value.

This is the way it is calculated:

$$DCF = \frac{CF_1}{(1+WACC)} + \frac{CF_2}{(1+WACC)^2} + \dots + \frac{CF_n}{(1+WACC)^n}$$

Therefore, the share price is much lesser than

its market price. But at the same time, the company is repaying its old debts as well as investing in the new asset which will enhance its future earning capacity. This research concludes that investing in the shares of Tata Steel would yield good results in the future.

It is an important model as it considers all the factors, which can affect the firm, like the growth of the sales, the margins, the discount rate, the cost of capital, among others. Although the DCF method has many advantages like using free cash flows which are a trustworthy measure, it also has some disadvantages such as the fact of relying on assumptions made, which can mislead the whole valuation when not being correct. It also uses WACC to discount the future cash flows to the present value. This immediately creates a considerable limitation. The fact is that, in doing so, we are assuming that the company will keep the same structure of the capital for the rest of the time.

Damodaran and Aswath (2006) define FCF to Equity as: “Calculating FCFE from the net income. Net income is taken from the income statement, minus capital expenditures minus depreciation, both are taken from cash flow statement minus the change in working capital plus the long-term debt position. The

change in working capital is the difference of account receivable plus inventory from one year to the next year, less the difference in account payable from one year to the next”.

So,

$$FCFE = NI - (CE - D) - (\Delta WC) + (NDI - DR)$$

Where:

FCFE = Free Cash Flow to Equity

NI = Net Income

(CE-D) = Net Capital Expenditure (Capital Expenditure - Depreciation)

D = Depreciation

ΔWC = Change in Non-Cash Working Capital Account: account receivable, Inventory and payable

NDI- DR = new debt issues are a cash inflow while the repayment of Outstanding debt is a cash inflow.

The difference is the net effect of debt financing on cash flow

NDI = New Debt Issue

DR = Debt Retired

Net Borrowing = long- and short-term new debt issues – long- and short-term debt payment

The above method is to calculate historical FCF and apply a growth rate under assumptions that growth will be constant and fundamental factors will be maintained.

Free Cash Flow to Equity valuation model by Damodaran. :

The single stage constant-growth FCFE model is a parallel to the single stage FCFE model with required return on equity instead

$$\text{Value of Equity} = \frac{FCFE_1}{R - g} = \frac{FCFE_0 * (1+g)}{r - g}$$

Where:

FCFE₁ = expected FCFE in one year

FCFE₀ = starting level of FCFE

g = constant expected growth rate in FCFE

r = required return on equity

of Weighted Average Cost of Capital (WACC).

3.2 Terminal Value:

As the business does not stop after the end of the forecasted or projected cash flow period, we have to find out a terminal value of the business for the time period beyond the estimated cash flow period. It is calculated at the end of the projected cash flow period. While calculating terminal value we have to take some assumptions based on real data otherwise, it would be impossible to calculate an accurate value. Young et al. (1999), consider the terminal value to be the essential part of every valuation. "One practical drawback common to all present value models is that they are highly sensitive to things we do not know. More specifically, the terminal value is the most important element in any valuation estimate and yet it is extraordinarily difficult to estimate it with any degree of accuracy." (Young et al., 1999). It is calculated:

$$TV_t = \frac{\text{Cash flow } (t+1)}{r - g \text{ (stable)}}$$

3.3 Cost of equity:

Cost of equity is the return expected by the equity share holder for the capital that they had invested. It is like a reward for the risk of investing in that firm. Unlike the cost of debt

$$R_e = R_f + (R_m - R_f) b$$

R_e – required rate of return on equity

R_f – risk free rate

$(R_m - R_f)$ – Market risk premium

b – beta

3.4 Cost of debt:

Most of the time, the cost of debt is the same as the market rate the firm is paying on the debt. So, the cost of debt is the rate, in effective terms that the firm pays on the debt. To calculate the cost of debt, we have to consider the tax to be deducted on the interest paid.

So it is calculated:

$$\text{After tax cost of debt} = R_d (1 - t_c)$$

R_d is the cost of the debt and t_c is the tax rate.

3.5 Risk free rate:

We consider risk free rate as the gain from investing in a project without risk. Most of the time, we use the interest rate of the Treasury bill as the risk free rate. Across the globe, Treasury bills are considered to be the investment with least risk, owing to the fact that they are backed by the Government.

3.6 Beta

It measures the relative riskiness of the stock as compared to the market return.

$b < 1$ means that the share price of the firm

moves in the same way as the market.

$b > 1$ means price is moving faster than the market.

$b < 1$ means share price tends to be less volatile than the market.

Beta is a useful measure because it helps to create a portfolio that matches the risk tolerance.

4. Data analysis and interpretations:

The data analysis for this paper has been done with the help of the Microsoft Excel spreadsheet. The data has been collected mainly from the secondary sources such as the website of NSE and Tata Steel for the period of 10 years ranging from 2007-08 to 2016-17. In the first step, the FCFE has been calculated which is shown in Table-1

The FCFE so calculated is shown in graphical form in figure-1. This clearly

indicates that the FCFE figure is gradually decreasing from the year 2008 to 2017. The trend line is also shown in the graph. The negative free cash flow does not necessarily mean a bad sign for the organization. After thorough examination of the financial statement it is clear that during the period when the company had had a negative FCFE, it had used the available cash balance in repaying its long-term loan and also it had acquired some fixed assets which would help it to increase its future earning capacity.

In the next step, the average FCFE of the last ten years which comes to be 1301.21 cores is calculated. On the basis of this average value

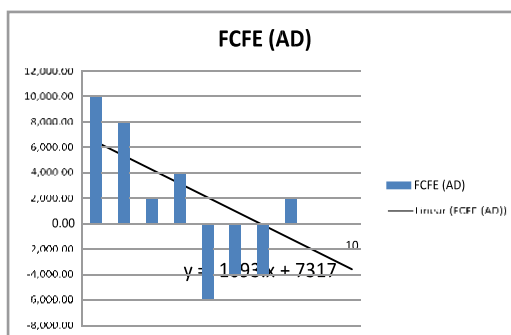


Table-1

Calculation of FCFE

YEAR Ending	Net Income	Depreciation	Capital Expenditure	Current asset	Current Liability	? WC	FCFE (BD)	NEW Borrowings	Repayment of Borrowings	NCF D	FCFE (AD)
8-Mar	4,687.03	834.61	-2458.97	3,148.46	1,783.53	1,364.93	4,427.60	17632.7	11335.06	6297.64	10,725.24
9-Mar	5,201.74	973.4	-2786.29	4,116.45	3,842.78	273.67	3,662.52	6494.43	2140.86	4353.57	8,016.09
10-Mar	5,046.80	1,083.18	-2102.04	3,512.58	3,341.87	170.71	4,198.65	6457.36	9005.01	-2547.65	1,651.00
11-Mar	6,865.69	1,146.19	-4321.58	4,377.78	4,464.81	-87.03	3,603.27	7912.04	6132.43	1779.61	5,382.88
12-Mar	6,696.42	1,151.44	-7059.2	5,763.07	5,973.23	-210.16	578.5	3092.43	9805.76	-6713.33	-6,134.83
13-Mar	5,062.97	1,640.38	-7508.55	6,054.86	6,369.91	-315.05	-1,120.25	6087.61	8640.42	-2552.81	-3,673.06
14-Mar	6,412.19	1,928.70	-9549.13	6,778.62	8,263.61	-1,484.99	-2,693.23	5325.46	7973.35	-2647.89	-5,341.12
15-Mar	6,439.12	1,997.59	-6922.58	8,533.46	5,801.98	2,731.48	4,245.61	7121.04	8616.01	-1494.97	2,750.64
16-Mar	4,900.95	1,933.11	-4777.91	7,716.61	7,706.13	10.48	2,066.63	8893.35	10783.5	-1890.15	176.48
17-Mar	3,444.55	3,541.55	-3172.87	12,243.37	10,717.44	1,525.93	5,339.16	2906.18	8786.57	-5880.39	-541.23

Source- Authors own calculation

and the growth rate of the FCFE of the last ten years, which is -1.25%, we project the FCFE for the next five years from 2108 to 2022. Followed by this, the projected FCFE values are discounted with a required rate of return. The required rate of return is the cost of equity which we calculate on the basis of the CAPM. In this way, the present value of the projected cash flows is obtained.

Table-2			
Present value of the projected FCFE			
Projected FCFE and present value			
Year	FCFE	Discounting factor	PV
11	1284.83	0.909091	1168.03
12	1268.67	0.826446	1048.48
13	1252.71	0.751315	941.17
14	1236.94	0.683013	844.85
15	1221.38	0.620921	758.38
		Total p.v.	4760.93

For the calculation of the cost of capital CAPM model is adopted. The risk free return is the 91-days Treasury bill rate prevailing on March 31, 2017. The market return is the return on NSE NIFTY index for the last 10 years. And the beta is calculated by considering the monthly return of Tata Stock and the NIFTY.

Further the terminal value of FCFE is calculated by projecting the cash flow for the sixth year and discounting it back with the appropriate rate which is given in equation -1 and equation -2 respectively.

Table-3
Cost of equity calculation

Beta	1.73
Rf	6.36
Rm	8.4
Ke	9.89

Finally the present value of the projected FCFE and the terminal Value of the FCFE is added to find out the total value of FCFE available for the equity share holders as on March 31, 2017. This value is divided with the total number of outstanding share as on that date to find out the value of per equity share.

$$\begin{aligned} \text{FCFE}_6 &= \text{FCFE}_5(1+g) = 1221.385(1+(-1.25\%)) = 1206.08 \text{---(1)} \\ \text{Present value of the terminal value} &= \text{FCFE}_6 / (r-g) \text{---(2)} \\ &= 1206.08 / (0.110 + 0.0125) \\ &= 10720 \end{aligned}$$

Table - 4	
Current value of the FCFE total	
Particulars	Amount in cores
Present value of FCFE	4760.93
Present value of Terminal value	10720.16
Total	15481.1
Total number of outstanding equity share as on 31.03.2017	927.41
FCFE per Share in Rupees	16.69

5. Conclusions:

The value of the equity share is calculated to be Rs 16.69, which is much lesser than the prevailing market price of Rs 482.7. The intrinsic value reflects the true value of the equity based on the cash flows to be received in the future. The increased market price may be due to higher expectations prevailing in the minds of the investors. Though the cash

flows available to the equity shareholder is decreasing, the company has a high potential to earn high revenue in the current future. Further in-depth analysis has to be done regarding the other factors responsible for

the deviation of market price from the true intrinsic value. Further, a series of intrinsic values may be calculated to find out the relationship between the intrinsic value and the market value of the stock.

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