

# Company Analysis of Madras Rubber Factory (MRF) Limited

Kunal Madhav Vispute

Student, Department of Finance, Jannalal Bajaj Institute of Management Studies (JBIMS), Mumbai, India

**Abstract:** This research paper aims at valuation of MRF Ltd. The valuation has been performed using Free Cash Flow Models empowered with deep fundamental analysis, past financial performance, management performance, strategies adopted and various macroeconomic factors associated to it. The Tyre Sector has been analysed in detail that holds a strong positive uphold in the upcoming time. Various tools have been incorporated in this study that takes into consideration both quantitative and qualitative factors into the consideration. These factors have finally helped in making proper assumptions followed by determining an optimal capital structure that will help in the valuations of MRF effectively. The report will help an investor to gain deep insights about MRF and will help in making the investment decisions in the company.

**Keywords:** Ace Equity, Annual Reports, Industry Reports

## 1. Introduction

Valuation is not an objective exercise, and any preconceptions and biases that an analyst brings to the process will find their way into value". Damodaran. The last decade demand for valuation services has grown dramatically. Globalization and thus capital and trade border relaxations have favored business growth. Business introduction on the stock exchange occurs not only on local stock markets but also internationally. Business valuation is not a precise science, the value of a company determines subjectively. There is no right way to estimate the value since there are many factors that influence it. The value is in the eye of the beholder, any price can be justified if there are others who are willing to pay that price. The best standard of value is the market value. "Fair market value is the price at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or sell and both having reasonable knowledge of the relevant facts". However, applying of "fair value" requires a perfect market without external and internal disturbance which is impossible to achieve in reality. Prerequisites vary for each particular case in regard to access to information, purpose and time available for valuation. Complete business valuation requires knowledge about many economic theories and understanding of the particular company's operation.

Thus, it requires comprehension of national economics, marketing, management, accounting and others, since the company's value is determined by many factors. The value

depends on above all the possibility to generate future income, in the form of cash flow and the availability of the assets it possesses. Other factors that influence the value are, for instance, level of competition, difference and maturity of the company's products, how long the company has existed, environment opinion and so on.

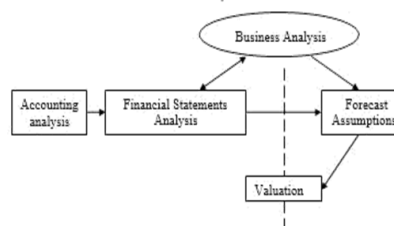


Fig. 1. Business Valuation Process

Business valuation aims to determine an intrinsic value, on the basis of existing information about a business and its environment. To achieve a reliable valuation, the appraiser should accomplish an accurate business analysis before determining the final value. The quantitative method that is always used to obtain the company's value, should be complemented by qualitative method, i.e. the appraiser should analyses the company, its industry, competitors, products, research, human resources, marketing etc. to understand how all these aspects come together to create the value for the business.

### A. Objectives

- To estimate the value of the shares of the companies belonging to the tyre sector by Free Cash Flow Models and perform their fundamental analysis
- Estimating the future Balance sheets and Profits & Loss statements which will be hence used for the valuation.
- Analysis of various quantitative and qualitative measures for the proper assumption making.
- To help an investor to analyze the companies and help in decision making on whether to invest in that stock or not.

## 2. Review of literature

The basic models for valuation are based on discounted cash

flows. The main method uses the free cash flow for valuation. Different models use different premises, and an overall truth is that if the required premises are real and correct, the value will be appropriately accurate. All the methods originate from the premise that the value of an asset is the present value of its future cash flows. Valuation models and techniques should be adapted to the rapidly changing world, but the basic statements remain the same. On the other hand there is a need for more accurate models in order to help investors get as much information as they could. Today information is one of the most important resources and financial models should keep up with this trend. The DCF-model uses future cash flow and discounts it at a present value and relates also to dividends and accounting earnings. The free cash flow to firm is the free money that remains after paying the operational costs and taxes, meeting the working capital need, and fulfilling the capital reinvestment. The free cash flow to firm can be determined using the net income or the EBIT. The main goal of calculating the free cash flow is to define the amount of money which can be freely used by the debt and equity owners. Thus the earnings before interest and taxes are corrected by some items in order to calculate the free cash flow. Such items are depreciation, amortization and all the other costs that were subtracted from the income in order to calculate profit, but did not involve actual cash outflows. Another item that should be taken into consideration is the so-called capital expenditures, those investments that are necessary for the business. The type of the investments depends on the activity of the firm. According to Damodaran one of the most useful approaches to value a firm is using the free cash flow to firm. On the same basis for the valuation of equity free cash flow to equity should be used. He wrote down that the value of a firm is equal to the free cash flow to firm (FCFF) discounted by the weighted average cost of capital (WACC). This is the so-called intrinsic valuation, more precisely the discounted cash flow approach (Damodaran, 2013). There are cases when the free cash flow to equity could not be calculated, for example in the case of financial service firms. In these cases not the cash flows, but the dividends will be discounted for calculating value.

#### A. Data to be collected

- Standalone and Consolidated Balance Sheets and profit and loss statements of the companies.
- Past share prices of the companies.
- Annual reports and other set of valid reports available.
- Industry Reports

#### B. Sources of data

- Ace Equity
- Annual Reports
- Industry Reports
- Company website
- Research Papers.

### 3. Methodology

The various tools and analysis used are as follows:-

#### A. Fundamental analysis & assumption making

At the company level, fundamental analysis involves examination of financial data, management, business concept and competition. As with most analysis, the goal is to derive a forecast and profit from future price movements. By believing that prices do not accurately reflect all available information, fundamental analysts look to capitalize on perceived price discrepancies. Fundamental analysis determines the health and performance of an underlying company by looking at key numbers and economic indicators. The purpose is to identify fundamentally strong companies or industries and fundamentally weak companies or industries. Investors go long on the companies that are strong, and short the companies that are weak. It includes the qualitative and quantitative information that contributes to the economic well-being and the subsequent financial valuation of a company, security or currency. Once the fundamental analysis is complete, then the assumptions have to be made with respect to various parameters like sales, costs, taxes etc. This will help in taking the views of the fundamental analysis done and will help in predicting the future Balance Sheets and Profit & Loss Statements. The various tools used are:

#### B. Industry analysis

Industry analysis is a tool that facilitates a company's understanding of its position relative to other companies that produce similar products or services. Understanding the forces at work in the overall industry is an important component of effective strategic planning. An industry analysis consists of three major elements: the underlying forces at work in the industry; the overall attractiveness of the industry; and the critical factors that determine a company's success within the industry.

#### C. DuPont analysis

The DuPont equation captures the impact of five major factors on profitability.

- Tax liability (1 - PAT/PBT is the rate of tax)
- Cost of borrowings (1 - PBT/PBIT is the share of operating profit used for paying interest)
- Operating Profit Margin (PBIT/Net Sales)
- Total Assets Turnover (Net Sales/Average Total Assets)
- Financial Leverage

$$ROE = (PAT/PBT) * (PBT/PBIT) * (PBIT/Net\ Sales) * (Net\ Sales/Average\ Total\ Assets) * (Average\ Total\ Assets/Average\ Equity)$$

#### D. Ratio analysis

A ratio analysis is a quantitative analysis of information contained in a company's financial statements. Ratio analysis is used to evaluate various aspects of a company's operating and

financial performance such as its efficiency, liquidity, profitability and solvency. Ratio analysis involves evaluating the performance and financial health of a company by using data from the current and historical financial statements. The data retrieved from the statements is used to - compare a company's performance over time to assess whether the company is improving or deteriorating; compare a company's financial standing with the industry average; or compare a company to one or more other companies operating in its sector to see how the company stacks up.

#### E. Market analysis

Market analysis strives to determine the attractiveness of a market, currently and in the future. Investors evaluate future attractiveness of a company by understanding evolving opportunities, and threats as they relate to that organization's own strengths and weaknesses. This will involve strategies adopted, movement of share in the market for the past one year, competitive advantage gained etc. Preparing projected Balance Sheet & Profit and Loss Statements. Common size balance sheet and common size profit & loss statement are used to predict the future statements. Common size balance sheet is a statement where all the assets and liabilities are expressed as a percentage of total assets of the company whereas in common size profit & loss statement, all the items are expressed as a percentage of net sales. Hence the assumption are made as a percentage of net sales for predicting the future profit & loss statement of the company.

#### F. Free cash flow models

The accounting earnings used in the dividend discount models are subject to manipulation by changing the methods of accounting and by playing with some discretionary items like depreciation. Therefore, many analysts argue that using dividends for valuation of stocks is not appropriate. They suggest the use of free cash flows.

- Free cash flow to equity (FCFE)
- Free cash flow to firm (FCFF)

FCFE is calculated as follows:

$FCFE = \text{Profit after tax} + \text{Depreciation} - \text{Capital Expenditure} - \text{Change in Non-cash Working Capital} + \text{Net Debt Raised}$ . The value of stock is then calculated by discounting the future FCFE for next 10 years. The discount rate to be used is cost of equity. The cash balance is then added to the value arrived and divided by the number of shares outstanding to arrive the value per share.

#### G. Capital asset pricing model – CAPM

The capital asset pricing model (CAPM) is a model that describes the relationship between systematic risk and expected return for assets, particularly stocks. CAPM is widely used throughout finance for the pricing of risky securities, generating expected returns for assets given the risk of those assets and calculating costs of capital.

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

The general idea behind CAPM is that investors need to be compensated in two ways: time value of money and risk. The time value of money is represented by the risk-free ( $R_f$ ) rate in the formula and compensates the investors for placing money in any investment over a period of time. The other half of the CAPM formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk. This is calculated by taking a risk measure (beta) that compares the returns of the asset to the market over a period of time and to the market premium ( $R_m - R_f$ ): the return of the market in excess of the risk-free rate. Beta reflects how risky an asset is compared to overall market risk and is a function of the volatility of the asset and the market as well as the correlation between the two.

- FCFF is the cash flow available for disbursement to all the contributors of capital including equity shareholders and creditors. FCFF is calculated as

$FCFF = EBIT \cdot (1 - \text{Tax Rate}) + \text{Depreciation} - \text{Capital Expenditures} - \text{Change in Non-cash Working Capital}$ . Here, the future cash flows are discounted to the Weighted Average Cost of Capital (WACC).  $WACC = \text{Cost of Equity} \cdot (\text{Equity} / (\text{Debt} + \text{Equity})) + \text{Cost of Debt} \cdot (1 - t) \cdot (\text{Debt} / (\text{Debt} + \text{Equity}))$ . Value of debt should be deducted from the value of firm and the cash balance and the value of investments not considered for estimating capital expenses should be added to arrive at the value of equity. The value then should be divided by the number of shares outstanding to arrive at the value per share.

- *Capital Structure* The optimal capital structure is a mix of debt and equity that seeks to lower the cost of capital and maximize the value of the firm. To calculate the optimal capital structure of a firm, analysts calculate the weighted average cost of capital (WACC) to determine the level of risk. Capital structure is most often referred to as a firm's debt-to-equity ratio, which provides insight into how risky a company is for potential investors. Determining an optimal capital structure is a chief requirement of any firm's corporate finance department.
- *Levered and Unlevered Beta* Beta is an important metric in financial management that offers investors an idea of a stock's volatility against the market. Beta measures systematic risk which is prevalent in the entire marketplace, economy and industry and cannot be diversified away. Levered beta takes into consideration the company's debt, which generally results in a beta value closer to zero as due to tax advantages. Unlevered beta also measures a security's performance in relation to market movements. However, unlike beta calculation, unlevered beta calculates the risk of a company that has no debt against risk of the market.  $\text{Unlevered Beta} = \text{Levered Beta} / [1 + (1 - TC) \cdot D/E]$ . For the purpose, the beta obtained from the past one year share prices was first unlevered. Then, for different debt to equity ratio, the

beta was again levered at different D/E ratios and accordingly the cost of equity and WACC were determined at various levels.

- **Synthetic Rating:** The Synthetic Rating has been used in the optimal capital structure estimation. The main purpose of the synthetic rating is for the estimation of cost of debt. Once the Interest Coverage Ratio (ICR) has been determined for the different levels of debt ratios, then the ICR can be linked to these ratings to determine the spread above the risk free rate for determining the interest expenses. The Synthetic Rating table lists different ranges of Interest Coverage Ratios linked to their respective ratings and spreads. The concept of maintainable EBIT has also been used which is the EBIT that is expected to be maintained over the coming next years. The Interest Coverage Ratio is then calculated as the ratio of maintainable EBIT to interest expense. Interest Coverage Ratio = Maintainable EBIT/Interest

#### H. Expense

The lowest WACC thus derived has been used for the FCFE cash flows discounting and the respective cost of equity has been used as the discounting factor for FCFE. When referencing your figures and tables within your paper, use the abbreviation “Fig.” even at the beginning of a sentence. Do not abbreviate “Table.” Tables should be numbered with Roman Numerals.

#### I. Tyre industry analysis

Tyre Industry, has become the most competitive markets in the world and with the help of new technology, ultra-modern production facilities and availability of raw materials, the sector is set to grow further. The Indian tyre industry has witnessed a remarkable growth in last few years on the back of growth in automobiles demand, especially in passenger vehicles and two-wheeler segments. The Indian tyre industry is ancillary to the automobile industry. Demand swings in any of the auto segments (Commercial vehicles, cars, two-wheelers) have an impact on the tyre demand. Indian Tyre Industry is in modernization phase and is largely driven by demand and supply conditions.

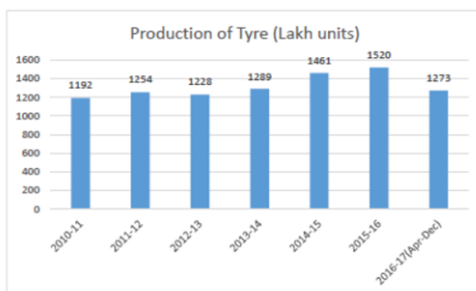


Fig. 2. Production of tyre

The industry can be divided principally into two key

segments - the OEM and replacement markets. The demand for tyres in the OEM sector is dependent on the sales trend of new vehicles, while the demand in the replacement sector is related to usage patterns and replacement cycles. Driven by the strong demand in automobile OEM sector and replacement market, the Indian tyre industry has been witnessing stupendous growth since last two years. While in the Commercial and Farm segments, replacement sales forms a major chunk, in the passenger segment both Institutional and OEM and replacement sales play an almost equal role. The tyre industry provides direct and indirect employment to more than a million people, comprising of dealers, re-traders and truck operators. The truck business is controlled by nearly 2.6 million small operators.

#### J. Market wise distribution

Tyre demand originates from two end-user categories, i.e., OEMs and the replacement segment. Consumption by OEMs is dependent on new automobile sales trend while the replacement segment is linked to usage patterns and replacement cycles. Demand from the replacement segment dominates the Indian tyre market contributing about 56% of demand, in terms of units. The major reason for high replacement share is due to the fact that the number of registered vehicles/annual sales remains at about 10x at close to 20 crore registered vehicles (industry estimates) vis- à-vis 2.4 crore annual vehicle sales.

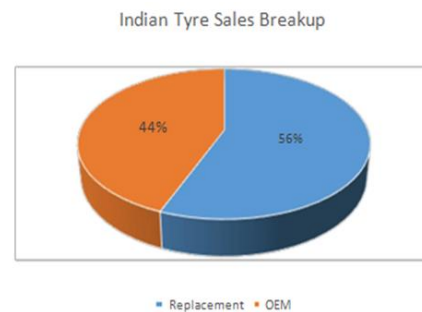


Fig. 3. Indian tyres sales break up

There were 39 companies (2014-15) in the domestic tyre industry as per ATMA and the industry is valued at around Rs 535 billion as of 2015-16 with the top 10 companies accounting for 85-90% of the market share.

#### K. Tyre production

Indian tyre industry is highly competitive with the presence of a large number of global and Indian auto-companies. However, top 10 companies account for about 80% of the market share. Tyre demand is directly proportional to the automobiles demand. Therefore, demand swings in the automobiles have an impact on the demand for tyres. India’s annual automobiles production registered a sluggish growth of 2.6% y-o-y in 2015-16. This led to decline in demand for tyres as well during the year. Tyres production (in volume terms) increased only marginally by about 4% in 2015-16 after increasing by about 13% in the preceding year. Category wise, two & three wheeler tyres have a share of about 53% in the

overall tyre production. This is followed by passenger vehicles and commercial vehicles with a share of about 26% and 17% respectively. Tractor segment constitutes only about 4% of the total tyre produced in the country. Off-the-road and other tyres constitute minute shares of less than 1% of the industry production. A similar share trend is witnessed in the sales of tyres registered in the country. In 2016-17 (Apr-Dec), tyre production increased by 11.9% y-o-y on back of increased OEM demand as well as the replacement market. PV production grew by about 12%, Tractors by about 17%, CVs and Two and Three wheelers production by about 4% and 5.5% respectively during the same period. However, cheaper imports from China and slower exports pose a threat to this growth in production of tyres.

*L. Strong demand in OEM and replacement market*

Demand of two-wheelers and small cars has been hit slightly in past few months on account of demonetization. However, auto sector has seen some recovery on the back of lower cost of ownership of auto vehicles, triggered by series of interest rate cuts and push on manufacturing and infrastructure segment by the government. Indian Tyre manufacturers are likely to take benefit from this turnaround in OEM demand and stable replacement demand. Tyre manufacturers who supplies to commercial vehicles, passengers vehicles and tractors segment are likely to get the maximum advantage in the near term, as outlook for these auto segments in the Indian market is relatively more positive than two-wheelers. The trend in tyre production and sales for OEM market has been in line with the automobile sales over the past few years i.e., production of tyres has been about 1.5 times that of a vehicle produced. Moreover, domestic and export demand for tyres is likely to remain strong during 2017-18 on the back of steady growth prospects for Auto OEMs as well as the stable replacement market.

*M. Raw materials*

Raw material cost forms the largest cost head in the tyre industry accounting for about 65-70% of the total. The main raw materials used to manufacture tyres are natural rubber, poly butadiene rubber (PBR), styrene butadiene rubber (SBR) and nylon tyre cord fabric. All these raw materials impart different properties, which are combined to develop tyres with particular characteristics. Hence any change in the prices of these materials impact the overall industry’s profitability.

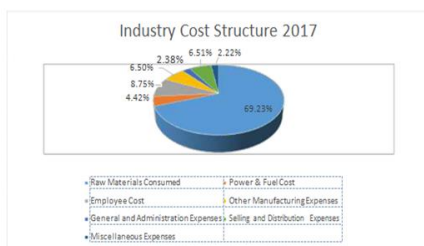


Fig. 4. Fundamental Analysis of MRF Ltd

MRF Limited is an India-based company engaged in

manufacturing, distribution and sale of tyres for various kinds of vehicles. The Company is primarily engaged in the manufacture of rubber products, such as tyres, tubes, flaps, tread rubber and conveyor belt. The Company has diverse business interests which also include pretreads, paint and coats and toys. The Company manufactures tyres for passenger cars, two wheelers, trucks and services, tubes and flaps. The Company’s new products launches include MRF Wanderer-Sport and MRF S3P4. MRF Wanderer-Sport is asymmetric tread pattern SUV tyre for the soft-roaders. MRF S3P4 is a mileage radial for drive axle fitment. The Company’s subsidiary companies include MRF Lanka Pvt. Ltd. MRF International Ltd., and MRF Corp Limited. MRF Corp Limited manufactures specialty coatings for a range of application. Madras Rubber Factory was started by K. M. Mammen Mappillai as a toy balloon manufacturing unit in 1946 at Tiruvottiyur, Madras (now Chennai). In 1952, the company ventured into the manufacture of tread rubber. Madras Rubber Factory limited was incorporated as a private company in November 1960 and ventured into manufacture of tyres in partnership with Mansfield Tire & Rubber Company based in Ohio, United States. The company went public on 1 April 1961 and an office was established in Beirut, Lebanon to develop the export market in 1964 and its current logo of the muscleman was born. In 1967, it became the first Indian company to export tyres to USA. In 1973, MRF started manufacturing Nylon tyres for the first time. The Company entered into with a technical know-how collaboration with B.F Goodrich in 1978. The Mansfield Tire & Rubber Co sold out its share in 1979 and the name of the company was changed to MRF Ltd in the year. The company finalized a technical collaboration agreement with Marangoni TRS SPA, Italy for the manufacture of pre-cured tread rubber for retreading industry. MRF tyres supplied tyres to Maruti 800, India's first modern small car. In 1989, the company collaborated with Hasbro International United States, the world's largest toy maker and launched Funskool India. Also, they entered into a pact with Vapocure of Australia to manufacture polyurethane paint formulations and with Italian tyre manufacturer Pirelli for conveyor and elevator belt manufacture. During the year 2004-05, the product range of the company expanded with Go-kart & rally tyres and tyres for two/three wheelers. MRF won the JD Power Award for the record 11th time in 2014. The company has won several awards and accolades including the All India Rubber Industries Association's (AIRIA) award for 'Highest Export Awards (Auto Tyre Sector)', 'Top Export Award' from Chemicals & Allied Products Export Promotion Council (CAPEXIL) for 2009-10. In 2014, MRF was ranked 48th among India's most trusted brands according to the Brand Trust Report, a study conducted by Trust

*N. Research advisor.*

*1) Products of the company*

- *Tyres* - It manufactures various tyres for passenger cars, two-wheelers, trucks, buses, tractors, light

commercial vehicles and off-the-road tyres.

- *Conveyor Belting* - It manufactures its Muscle flex brand of conveyor belting at one of the most advanced state-of-the-art facilities in India. Incorporating the latest manufacturing techniques in processes beginning with mixing, calendaring and the like to manufacturing of the finished products, all of which is in-house, Muscle flex -conveyor belting has gained rapid acceptance in markets worldwide.
- *Retreads* - It is the most advanced procured re-treading system in India. MRF forayed into re-treading as far back as 1970. Today, MRF has perfected the art of recurred re-treading with its extensive knowledge in tyres and rubber.

O. Research & development

Table 1  
Research & development

DESCRIPTION	Mar-17	Mar-16	Sep-14	Sep-13	Sep-12	Sep-11	Sep-10
Capital Expenditures	158.92	6.34	5.44	4.22	1.33	1.39	0.28
Recurring Expenditures	40.76	48.55	28.64	27.4	24.31	20.51	17.28
Total	199.68	54.89	34.08	31.62	25.64	21.9	17.56
% of Turnover (Net Sales)	1.51%	0.41%	0.26%	0.26%	0.22%	0.22%	0.24%

- Since 2011, MRF has increased its capital expenditure on Research & Development. In the year 2017, the capital expenditure on R&D is around Rs. 159 Cr which is around 1.51% of the net sales for that year. The effect of increasing expenditure on R&D is visible on the decreasing raw material costs as they are able to improve their efficiency and reduce cost structure.
- MRF has unveiled luxury and premium range of passenger car tyres 'PERFINZA' in Chennai targeted at serving high end automobiles. With this new range of PERFINZA tyres, the company now offers additional products for the luxury and premium vehicle segment. The tyres unveiled will initially serve the domestic market and later be shipped to overseas.

P. Raw materials

As can be seen form the above chart, the raw material cost as a percentage of net sales is decreasing since 2011 and was around 58.29% for the year 2017. This reduction in their raw material costs is directly linked to the capital expenditure on R&D that the MRF has been doing in order to improvise its operating efficiency.

Table 2  
Raw materials

	Mar-17	Mar-16	Sep-14	Sep-13	Sep-12	Sep-11
Raw material cost/Net Sales	58.29%	56.33%	63.34%	65.34%	70.52%	76.08%
Employee cost/Net Sales	7.42%	6.33%	5.55%	4.97%	4.33%	4.59%
Power cost/Net Sales	4.38%	4.23%	5.04%	4.95%	5.21%	4.48%
Other Mfg. expenses/Net Sales	4.79%	4.51%	3.93%	3.58%	3.32%	3.73%
Depreciation / Net Sales	4.60%	3.69%	3.21%	3.07%	2.54%	2.54%
General and admin expenses/Net Sales	1.11%	0.95%	0.84%	0.77%	0.69%	0.73%
Selling and Distribution Expenses/Net Sales	5.23%	4.87%	5.85%	5.39%	4.88%	4.81%
Miscellaneous expenses/Net Sales	0.88%	0.88%	0.68%	0.66%	0.58%	0.41%

Q. Share price movement

- The market movement of the MRF share for the past one year has been attractive as depicted by the above

graph as well with annual returns of around 64.83% against the annual returns of Sensex which is 12.45%.

- The unsystematic risk is around 20.82% which is much higher as compared to its market risk which is 9.71. This implies that much of the risk for MRF lies on its disruption of Management control over the company.

Table 3  
Share price movement

	MRF	Sensex
Returns(Annual)	64.83%	12.45%
Beta	0.94	1
Standard Deviation	1.93%	0.66%
Standard Deviation(Annual)	30.54%	10.37%
Market Risk	9.71%	10.37%
Unsystematic Risk	20.82%	0.00%

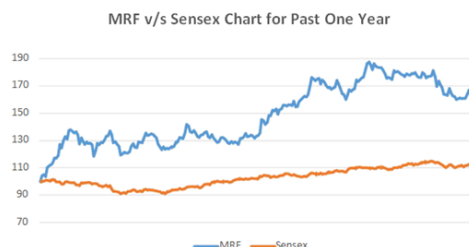


Fig. 5. Equity Performance Analysis

Table 4  
Equity ratios

Equity Ratios	Mar-17	Mar-16	Sep-14	Sep-13	Sep-12	Sep-11	Sep-10
EPS	3422.36	3889.78	2117.67	1892.00	1349.91	1460.90	834.86
DPS	60	66.67	50	30	25	25	50
Payout Ratio	1.75%	1.71%	2.36%	1.59%	1.85%	1.71%	5.99%
Retention Ratio	98.25%	98.29%	97.64%	98.41%	98.15%	98.29%	94.01%
Book Value per Share	20151.93	16889.65	10654.81	8597.03	6740.09	5419.27	3987.45

- Since 2011, MRF has maintained a quite high retention ratio of about 98% throughout its consecutive years, thus maintaining a payout ratio of about 1.7%. This shows that the company is has a huge potential to grow in long run as it is paying a relatively low dividend to its shareholders as compared to its retained amount.
- Though the company has decreased the payout ratio from 2.36% to 1.71% in year 2016, it managed to provide a dividend of Rs 66.67 for the respective year and DPS of Rs 60 for the FY 2017 despite the decrease in sales for the FY 2017. This shows that the company looks for providing the value to the shareholders of the company.
- The DPS and EPS have risen since 2011 onwards indicating the good equity performance of the company for the past few years. The reason for decline of the same for the FY 2017 was due to some short term temporary factors such as high rubber prices and demonetisation.

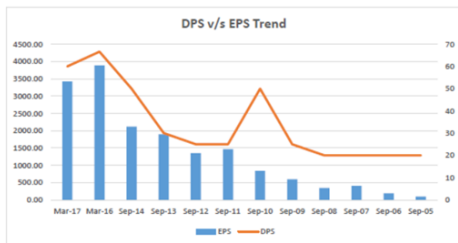


Fig. 6. DPS and EPS

**R. Segment analysis**

	Mar-17	Mar-16
Revenue From Operations	14651.24	22030.91
Automobile Tubes	1167.01	1724.87
Automobile Tyres	13019.27	19619.11
Others	464.96	686.93

Table 6

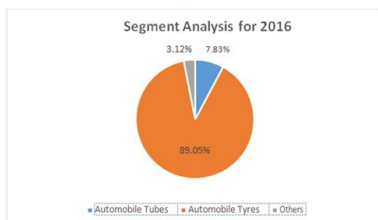


Fig. 7. Segment analysis

From the segment analysis, it is clear that the MRF pays more attention on the operations and manufacturing of the tyres (around 90%) rather than tubes. This is one of the main reason for the success of the company as they can charge high for tyres and are also replaceable from time to time. Moreover, MRF is now charging high premiums for its high end luxurious tyres.

Segment Analysis for 2017

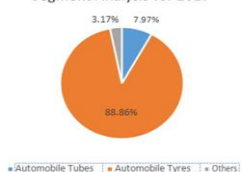


Fig. 8. Segment analysis for 2017

**S. Ratio analysis**

Table 5  
Ratio analysis

Profitability	Mar-17	Mar-16	Sep-14	Sep-13	Sep-12	Sep-11	Sep-10
Cash Profit Margin	22.19%	24.98%	18.78%	18.30%	14.23%	11.71%	15.22%
Operating Profit Margin	14.96%	18.29%	11.41%	11.49%	8.09%	5.77%	7.64%
Net Profit Margin	10.96%	12.44%	6.80%	6.61%	4.82%	6.36%	4.74%
ROA	14.09%	21.11%	16.68%	18.02%	14.17%	10.88%	16.90%
ROE	18.48%	28.24%	22.00%	24.67%	22.20%	31.06%	23.20%
ROE(NNRT)#	14.21%	24.58%	20.41%	23.78%	20.96%	9.52%	21.40%

Table 6  
Turn over

Turnover	Mar-17	Mar-16	Sep-14	Sep-13	Sep-12	Sep-11	Sep-10
Total assets	0.94	1.15	1.46	1.57	1.75	1.89	2.21
Fixed Assets	2.21	2.73	3.57	3.64	3.74	4.03	4.90
Current Assets	2.76	2.94	3.04	3.25	3.54	3.65	4.29

The operating profit margin has significantly improved up to 18.29% for the FY 2016 since past 5 years. The effects of better efficiency of the company can also be visible from the trends of

Return on Assets and Net Profit Margin. The Return on Equity (ROE) seems to be fluctuating around 20% but is expected to improve further in the upcoming years.

The Fixed Assets Turnover Ratio plays a major impact on the valuation of equity. It can be seen that the fixed asset turnover ratio is declining over the past few years due to high expenditure on fixed assets mainly for the purpose of R&D. The ratio is expected to improve further and will help for the better valuation of the company.

**T. Optimal Capital Structure and Valuation of MRF Ltd**

**1) Optimal capital structure**

The purpose of determining the optimal capital structure is to determine the appropriate mix of debt and equity where the Weighted Average Cost of Capital (WACC) is the lowest. The risk free rate has been determined by taking the last fifteen years average of 10 years G-Sec yields which came out to be 7.44%. The market return has been taken as 15% and the market risk premium came out to be as 7.56%.

Table 7  
Optimal capital structure

Risk Free Rate	7.44%
Market Return	15%
Market Risk Premium	7.56%

The various parameters have been determined below out of which the main step was to convert Levered Beta to the Unlevered Beta and then again levering the beta according to different debt to equity ratios. The parameters for FY 2017 are shown as below.

Table 8  
Various parameters

	2017
MRF Return for the past one year	14.21%
Cost of Debt (Adjusted for tax)	8.95%
Cost of Equity	14.52%
WACC	13.55%
Beta Levered	0.94
Beta Unlevered	0.82
Cost of Equity with Unlevered Beta	13.67%
Price per Share (As on 22 Sep)	63400
Market Value of Equity	26881.60
Value of Debt	1811.66
Market Value of Firm (Total Capital)	28693.26
Debt Ratio (D/(D+E))	6.31%

The Unlevered Beta has been calculated on the last one year share prices data. As of now, the WACC is 13.55% which account for 6.31% of debt ratio. MRF's past one year return (ROE) is around 14.21% which is greater than WACC but the difference is small. The Synthetic Rating table has been shown below. The main purpose of the synthetic rating is for the estimation of cost of debt. Once the Interest Coverage Ratio

(ICR) has been determined for the different levels of debt ratios, then the ICR can be linked to these ratings to determine the spread above the risk free rate for determining the interest expenses.

Table 9  
Expenses

If interest coverage ratio is >	Column1	Column2	Column3
>	Rating Is	Spread Is	Spread Is
-100000	0.499999	02/D	14.00%
0.5	0.799999	C2/C	10.50%
0.8	1.249999	C2/CC	8.00%
1.25	1.499999	Caa/CCC	6.30%
1.5	1.999999	B3/B	5.50%
2	2.499999	BBB	3.11%
2.5	2.999999	BBB	2.86%
3	3.499999	BBB+	2.61%
3.5	3.999999	A	2.36%
4	4.499999	A	2.11%
4.5	5.999999	A+	1.86%
6	7.499999	AA	1.36%
7.5	9.499999	AA	1.01%
9.5	12.499999	AA+	0.76%
12.5	100000	Aaa/AAA	0.60%

Table 10

The optimal capital structure has been found out on that level of debt ratio where the WACC is minimum. The optimal capital structure for the firm is shown below.

Table 10  
Ratio

Debt Ratio	44%
Total Capital	28693.26
Amount of Debt	12625.03
Amount of Equity	16068.23
Debt to Equity Ratio(D/E)	78.57%
Beta	1.242
Cost of Equity	16.83%
Maintainable EBIT	3065.29
Interest Expense	1515.00
Interest Coverage Ratio	2.02
Rating	BBB-
Spread	3.11%
Cost of Debt	10.55%
Interest Expense(New)	1331.941129
WACC	12.416%

Table 11

U. Valuation

The assumptions form the backbone of the whole valuation. The next 10 years cash flows have to be discounted as on present to determine the value of firm in the Free Cash Flow Models. For the purpose, the 3 stage model has been used for the valuation where the growth in net sales for the next 5 years is expected to be 12% and the steady state is assumed to be 6%.

Table 11  
Valuation

Raw Material Consumed	55.00%
Power & Fuel Cost	4.76%
Employee Cost	4.00%
Other Manufacturing Expenses	4.03%
General and Administration Expenses	1.20%
Selling and Distribution Expenses	5.24%
Miscellaneous Expenses	0.90%
Interest (% of total borrowings)	8.00%
Provision for Tax	35.00%
Net Block	3.20

The assumptions are being used in predicting the future Profit & Loss and Balance Sheets which in turn have been used in estimating the free cash flows to firm and equity.

Table 12  
FCFE

	2018	2019	2020	2021	2022	2023
FCFE	6198.77	2357.28	2613.75	2901.44	3224.09	3647.90
PV of FCFE	5305.80	1727.04	1639.08	1557.38	1481.27	1434.55

	2024	2025	2026	2027	Steady State	
FCFE	4080.31	4511.04	4928.34	5319.45	5578.32	
PV of FCFE	1373.45	1299.70	1215.38	1122.85	10872.54	
			Add: Investments (2017)		3394.35	
			Add: Cash (2017)		274.42	
					32697.82	
					Value per share	77117.51

Table 13  
FCFF

	2018	2019	2020	2021	2022	2023
FCFF	3819.32	1816.06	2044.81	2300.83	2587.40	2988.11
PV of FCFF	3397.47	1437.05	1439.34	1440.68	1441.17	1480.54

	2024	2025	2026	2027	Steady State	
FCFF	3411.66	3850.84	4296.82	4739.36	5047.63	
PV of FCFF	1503.69	1509.80	1498.58	1470.36	17958.31	
			Add: Investments (2017)		3394.35	
			Add: Cash (2017)		274.42	
					38245.75	
					Debt (2017)	1811.66
						36434.09
					Value per share	85929.46

The above calculations represent a base case assumption model outputs. The next ten years cash flows have been discounted in both the model with their respective discounting factors and the value per share have been arrived. As per table 18, the value per share by FCFE Model should be Rs. 77117 and as per table 19, the value per share by FCFF Model should be Rs 85929. The variations in the actual market prices and the model prices is due to asymmetric information, demand supply adjustments and lack of knowledge within the investors.

4. Conclusion

The value of MRF shares under various views have been shown in the following table.

Table 13  
MRF shares

Scenario	Pessimistic	Realistic	Optimistic
FCFE	49447.9	77117.5	100345.1
FCFF	54408.54	85929.46	103628.9

The realistic case is the base case for the MRF and as of now the recommendation will be to buy the MRF shares or the already holders of the MRF shares are advised to hold. The optimistic case is expected to reach the share value up to Rs. 136000 if all the assumptions stand valid. MRF is the only Indian tyre company to post double digit growth for a long time, and they have kept their focus on building a good dealer network and keeping prices under check. That's why the stock has been gaining strength. Also, the company hasn't split its stock, and that helps it maintain such a high price. MRF had pioneered the manufacturing of Nylon tyres in India, the most common variety in use before radial tyres became popular in



the early 1970s. Today, the company has eight manufacturing facilities across India and exports to over 65 countries. Dominant in all segments as well as a leader in the replacement market, MRF is the only company commanding a premium in all categories. MRF has also found exceptional success in brand building through its association with cricket, India's most popular sport, and rally racing. It has also cemented its position as the market leader, largely through dominance in the motorcycle and car segment, controlling 24% of the Indian tyre industry.

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