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IMPACT OF CAPITAL STRUCTURE ON LEVERAGE RATIOS & MARKET RETURN: A STUDY ON LEADING INDIAN AUTOMOBILE COMPANIES

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Abstract
Analysis of financial leverage occupies a substantial portion of Financial Management, because of importance of profitability as an index for assessing business efficiency and controversy surrounding the relationship between financial leverage & profitability. Leverage means the Debt Equity ratio of a firm. It refers to the ability of a Firm to meet its Fixed Financial Charges. It is an investment strategy of using borrowed capital in order to increase the potential return on investment. Though, Cost of Debt is cheaper than Cost of Equity but it increases the company's risk in terms of bankruptcy if sufficient Profits are not earned. Increase in Debt also increases Interest costs which also have an impact on Equity Earnings. The main objective of a Company is to maximise its Shareholders wealth. Higher the degrees of leverage, higher the risk, at the same time higher the expected return. This paper focuses on analysing the Leverage and Coverage ratios as well as the impact of Debt Equity ratio on Returns, EPS and P/E of the Leading Indian Automobile Companies.

Keywords: Leverage, Profitability, Operating Leverage, Financial Leverage, Combined Leverage, ROCE, ROE, ROTA, EPS, P/E, Net Worth, Interest and Dividend Coverage, D/E ratio.

I. Indian Automobile Sector & its Leading players

India holds a strong position in Automobile manufacturing in terms of tractor, bus and heavy trucks manufacturing. It currently manufactures 25 mn vehicles, of which 3.5 mn are exported. Increase in income and standard of living has been the key factor behind the sale of passenger cars and two wheelers. During 2019, Automobile exports increased by 14.5% and sale of passenger cars by 2.7% and two-wheeler by 4.86%.
The main components of Automobile Sectors are Passenger Cars, Utility & Light Commercial Vehicles, Medium & Heavy Commercial Vehicles, Scooters, Mopeds and Motorcycles.

Ashok Leyland: Founded in 1948, headquartered in Chennai, Ashok Leyland is a leading automobile company. It is the 2nd largest manufacturer of commercial vehicles in India & 4th largest manufacturer of buses in the world & 12th largest manufacturer of trucks globally.

Bajaj Auto Limited: It was established by Jamnalal Bajaj in Rajasthan during 1940's. It manufactures both two-wheeler & three-wheeler and is the largest exporter of two and three-wheelers.

Hero MotoCorp: It is the world's largest manufacturer of two-wheelers. It has 4 manufacturing facilities in Dharuhera and Gurgaon in Haryana, Haridwar in Uttarakhand & Neemrana in Rajasthan.

Mahindra & Mahindra established in 1945, is an Indian multinational car manufacturer headquartered in Mumbai. It operates in 9 segments: automotive segment comprises of sales of automobiles spare parts and related services.

Maruti Suzuki is the largest passenger car company accounting for over 50% of the Indian market. It is a 56.21% owned subsidiary of Suzuki Motor Corporation.

Tata Motors headquartered in Mumbai is an Indian multinational automotive manufacturing company. It is a leading global automobile manufacturer of cars, utility vehicles, buses, trucks and defence vehicles. It has a strong global network and operates in UK, South Korea, Thailand, South Africa & Indonesia.

II. Objective of the Study

1. To analysis the Financial, Operating & Combined Leverage of leading Automobile Companies like Ashok Leyland
2. Bajaj Auto, Hero Motor-Corp, Mahindra & Mahindra, Maruti Suzuki and Tata Motors
3. To analysis the Interest and Dividend Coverage ratios of the leading Indian Automobile Companies
4. To highlight the impact of Leverage on Shareholders wealth creation ie, EPS and P/E ratio.

Review of Literature

Several researchers in finance and accounting have extensively researched on Leverage and its impact on profitability. These have motivated the corporate to identify and improvise upon their financial performance. A brief review of some of these studies has been presented.

Bindiya Soni and Jigna Trivedi: Analysed the impact of both financial leverage as well as operating leverage on the profitability through Earning Per Share on selected paint companies of India. Five listed paint companies of India were selected based upon the market capitalization for the research purpose. The study investigates the impact of DFL & DOL on EPS with the help of correlation analysis. Along with this analysis, the paper also investigates the impact of debt-equity ratio on the EPS of the said firms to see the impact of debt on the wealth of the firms. The findings suggest that financial leverage had no significant relationship on profitability while operating leverage had significant relationship on profitability with the exceptions of few.

Kumar Ramana, focussed on the relationship between profitability & leverage of Bata India Limited. The financial statements of Bata have been collected over a period of 7 years (2005-06 to 2012- 13). The data collected is analyzed by the percentages, averages, ratios and Correlation analysis tools reveals that the research evidence of the study indicates that, that degree of operating leverage is statistically significant positive correlation with the ROI. It is observed that degree of financial leverage is positively correlated with the ROI .It means that degree of financial leverage of Bata India was not at optimum level. It is suggested to Bata to revise its capital structure which should include the optimum blend of equity and borrowed funds so that it has positive impact on Return on Investment. More over degree of combined leverage is positively correlated with ROI of Bata India. The financial performance of the Bata India is satisfactory. The Bata India is employing less debt funds so it can't get the financial leverage benefits. Therefore the Bata India has to revise its capital structure so that financial leverage will help to maximize the shareholders wealth.

Sanjay J. Bhayani and Butalal Ajmera studied the theoretical approaches and practical application of financial leverage, EPS and DPS of Maruti Udyog Ltd. with data for the period of 2001-02 to 2008-09. For the purpose of analysis, researcher has used ratio techniques and to test hypothesis for correlation-co-efficient has been used. The result of the study indicates that there is a correlation between DFL and EPS and the difference is insignificant where as result of correlation coefficient at 5% level of significance showed that the diffidence is significant between DFL and DPS and EPS and DPS.

Khushbakht Tayyaba, studied the effect of leverage on the profitability of the oil and gas sector. The study shows the relationship between leverage (Financial, operating and combined) and Earning per Share (EPS) of this sector. It analyses how earning capacity of this sector is affected by operating costs and fixed financial charges. It also shows the relationship between the Debt equity ratio and Earning per Share (EPS) and how this sector does debt financing efficiently. In this paper, oil and gas companies are selected for analysis and hypotheses are examined with the balanced panel using descriptive statistics, correlation and estimate equation.

Ebaid (2009): Leverage mitigates lower agency costs, since firm's reputation and managers' wages are at stake. On the other hand, higher leverage also means that the firm has higher commitment to fulfil its future obligations, in terms of principal and interest payments. Furthermore, higher leverage ratios also lead to higher costs relating to financial distress.

V. Kalpana, analysed the impact of leverage on profitability of the select firms and the relationship among financial leverage, operating leverage and Composite leverage with earning per share of the firms. In addition to this it focuses on how profitability is influenced by fixed financial charges and fixed operating cost. In this study, select steel companies which are traded in BSE are taken for analysis and the study is based on the secondary data. Hypotheses are examined with the help of correlation and test of significance and also analysis of variance (ANOVA). From this study it is found out that there is a negative correlation between DOL and EPS, DFL and EPS, and DCL and EPS. The result shows that the use of debt and fixed cost expenses would reduce the profitability of the firms. It implies that in order to increase the earnings the firms need to reduce the use of debt in capital structure and fixed cost in operation of the firm.

III. Scope of Study

The financial statement is a mirror, which reflects the financial position and operational strength and weakness of concern. But a mere look at the financial statement will not reveal some crucial information. To bring out the hidden information, financial statements over a period are analysed.

This study is concerned with the analysis of Operating, Financial, Combined Leverage of the Leading Indian Automobile Companies and impact of DOL, DFL, EPS, ROCE, ROE on P/E ratio.

Period of Study: The study covers a period of 6 years from 2013-14 to 2018-19.

Methodology

Sources of Data

The study is based on secondary data. Information required for the study has been collected from the Annual Reports of the Companies and different books, journal, magazines, and data collected from various websites.

Tools Applied

In this study various tools: Financial Tools – Ratio Analysis and Statistical Tools (i.e.) Mean and ANOVA, t-test has been used for data analysis.

MEAN = Sum of variable/N

Standard Deviation is used to see how measurements for a group are spread out from Mean. A low Standard Deviation means that most of the numbers are very close to the average and vice-versa.

(SD) = $\sqrt{\sum X^2/N-(\sum X/N)}$

Coefficient of Variation is a standardized measure of dispersion of a probability distribution or frequency distribution. It is the ratio of standard deviation to mean. Higher the coefficient of variation, the greater the level of dispersion around mean and vice-versa. **Coefficient of Variation (COV) = SD/MEAN* 100**

t-Test (Two-Sample Assuming Unequal Variances): t-test assesses whether the means of two groups are statistically different from each other.

Hypothesis

An ANOVA is statistical hypothesis in which the sampling distribution of test statistic when null hypotheses is true. Null hypotheses have been set and adopted for the analysis of data. The null hypotheses are represented by H_0. It is a negative statement which avoids personal bias of investigator during data collection as well as the time of drawing conclusion.

IV. Limitation of the Study

1. The study is related to a period of 6 years.
2. Data is secondary i.e. they are collected from the published Annual Reports
3. Leverage, Structural, Coverage and Valuation ratios have been taken for the study.

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Preface

Financing Decisions involve planning for procurement of funds from different sources, its utilisation as well as its management with the sole objective of maximising shareholders wealth.

Capital Structure Decision refers to the Debt Equity ratio which has an impact on Profitability as well as Liquidity. Increase in proportion of Debt in Capital Structure reduces Weighted Average Cost of Capital (WACC) but also increases the risk of insolvency as well as reduce Equity Earnings of a firm. Moreover, Debt are Fixed interest bearing securities on which interest has to be paid irrespective of the amount of Profit. Therefore, the risk of the shareholders increase when there is a high proportion of borrowed funds which in turn increases their expected return on investments (K_E).

The objective of a firm is to blend its Debt and Equity in such as way which maximises reduces WACC and Maximise Shareholders Return.

Profitability & Growth

Profit is the prime motive of every business. It plays a pivotal role behind the success and growth of an enterprise. Profitability is the main base for liquidity as well as solvency. Analysing a company's profitability is an important part of financial statement analysis. Profitability of a company measures the ability to generate earnings.

Exhibit 1: Ashok Leyland

(INR Millions)	2014	2015	2016	2017	2018	2019	CAGR
Revenue	1,18,592	1,57,082	2,17,279	2,32,654	3,00,533	3,36,207	
Revenue (Growth %)		32.5%	38.3%	7.1%	29.2%	11.9%	**23.17%**
PBIT	5,053	8,307	21,338	28,778	37,923	43,739	
PBIT (Growth %)		64.4%	156.9%	34.9%	31.8%	15.3%	**53.98%**
Earnings Per Share (Rs)	-0.62	0.50	2.40	5.58	6.01	7.08	
EPS (Growth %)		-180.6%	380.0%	132.5%	7.7%	17.80%	**-262.75%**

The above Exhibit depicts that Ashok Leyland's Revenue has increased at a CAGR of 23.17% while, CAGR for PBIT has been 53.98%. Since 2017, EPS of the Co have move up steadily.

Exhibit 2: Bajaj Automobiles

(INR Millions)	2014	2015	2016	2017	2018	2019	CAGR
Revenue	2,01,583	2,16,143	2,25,865	2,17,667	2,52,189	3,02,500	
Revenue (Growth %)		7.2%	4.5%	-3.6%	15.9%	19.9%	**8.46%**
PBIT	46,557	40,894	56,799	55,890	59,347	69,601	
PBIT (Growth %)		-12.2%	38.9%	-1.6%	6.2%	17.3%	**8.37%**
Earnings Per Share (Rs)	108.32	94.62	120.23	140.98	145.80	170.29	
EPS (Growth %)		-12.6%	27.1%	17.3%	3.4%	16.80%	**9.47%**

The above Exhibit depicts that Bajaj Auto's Revenue has grown at a CAGR of 8.46% while, CAGR for PBIT has been 8.37% & EPS 9.47%.

Exhibit 3: Hero Motor Corp

(INR Millions)	2014	2015	2016	2017	2018	2019	CAGR
Revenue	2,52,755	2,75,380	2,84,571	2,86,104	3,24,584	3,39,708	
Revenue (Growth %)		9.0%	3.3%	0.5%	13.4%	4.7%	**6.09%**
PBIT	28,759	33,037	44,016	49,127	53,229	51,415	
PBIT (Growth %)		14.9%	33.2%	11.6%	8.4%	-3.4%	**12.32%**
Earnings Per Share (Rs)	94.23	107.21	143.09	179.48	186.30	172.42	
EPS (Growth %)		13.8%	33.5%	25.4%	3.8%	-7.45%	**12.84%**

The above Exhibit depicts that Hero Motor's Revenue has grown at a CAGR of 6.09% while, CAGR for PBIT & EPS have been 12.32% & 12.84% respectively.

Exhibit 4: Mahindra & Mahindra

(INR Millions)	2014	2015	2016	2017	2018	2019	CAGR
Revenue	7,40,009	7,14,480	7,58,414	8,37,731	9,20,940	10,47,207	
Revenue (Growth %)		-3.4%	6.1%	10.5%	9.9%	13.7%	**7.19%**
PBIT	87,735	74,694	90,396	99,987	1,43,126	1,38,922	
PBIT (Growth %)		-14.9%	21.0%	10.6%	43.1%	-2.9%	**9.63%**
Earnings Per Share (Rs)	77.30	51.33	58.22	59.54	69.14	48.86	
EPS (Growth %)		-33.6%	13.4%	2.3%	16.1%	-29.33%	**-8.77%**

The above Exhibit depicts that Mahindra & Mahindra's Revenue has grown at a CAGR of 7.19% though there was a fall in Revenue during 201-15 which also lead to fall in both PBIT & EPS. Its PBIT has increased at a CAGR of 9.63% while EPS have fallen since 2015.

Exhibit 5: Maruti Suzuki

(INR Millions)	2014	2015	2016	2017	2018	2019	CAGR
Revenue	4,43,963	5,08,014	5,75,890	6,80,850	7,98,094	8,60,685	
Revenue (Growth %)		14.4%	13.4%	18.2%	17.2%	7.8%	**14.16%**
PBIT	39,183	51,938	76,664	1,02,166	1,15,127	1,06,997	
PBIT (Growth %)		32.6%	47.6%	33.3%	12.7%	-7.1%	**22.25%**
Earnings Per Share (Rs)	92.43	120.98	182.03	248.67	260.93	253.28	
EPS (Growth %)		30.9%	50.5%	36.6%	4.9%	-2.93%	**22.34%**

The above Exhibit depicts that Maruti's Revenue has grown at a CAGR of 14.16% while, its PBIT & EPS have increased at a CAGR of 22.25% and 22.34% respectively.

Exhibit 6: Tata Motors

(INR Millions)	2014	2015	2016	2017	2018	2019	CAGR
Revenue	23,28,337	26,31,590	27,30,456	26,96,925	29,15,505	30,19,384	
Revenue (Growth %)		13.0%	3.8%	-1.2%	8.1%	3.6%	**5.34%**
PBIT	2,36,184	2,65,641	1,90,149	1,35,528	1,58,368	-2,56,126	
PBIT (Growth %)		12.5%	-28.4%	-28.7%	16.9%	-261.7%	**-201.63%**
Earnings Per Share (Rs)	43.10	43.26	34.10	21.95	26.47	-84.89	
EPS (Growth %)		0.4%	-21.2%	-35.6%	20.6%	-420.70%	**-214.52%**

The above Exhibit depicts that Tata Motors's Revenue has grown at a CAGR of 5.34% while, both its PBIT & EPS have fallen over the years.

Leverage refers to the usage of fund or employment of asset in the capital structure of the firm for which the firm has to pay fixed return. Employment of such fund helps a firm to increase its profitability. If the firm uses higher Leverage it will be riskier for the firm if it's earning gets decreased gradually because it has to pay fixed interest for the amount borrowed. In other words the Leverage effect will be favourable for the firm if it is able to earn more than the amount borrowed.

Leverage Analysis is the methodical classification of the data given in the financial statement. It is the process of identifying the financial strength and weakness of a firm from the available accounting data and financial statements.

Leverage can be viewed from both Income Statement and Balance Sheet angle. From Income Statement angle Leverage Analysis considers Operating, Financial and Combined Leverage.

Operating Leverage

Operating Leverage refers to the use of fixed cost in the operations of the firm. A firm has to bear the fixed cost expenses irrespective of output. Operating Leverage refers to a company's division between Fixed Operating Cost and Variable Cost. Fixed Costs remains constant or unchanged with the change in the level of production or sales while Variable Cost varies. Operating Leverage refers to a firm's share of Fixed Operating Cost in its production (Hillier et al., 2010). This means that, for a particular firm, the higher the Operating Leverage, the larger the sum they have to cover with sales, but the contribution margin will be relatively higher (Penman, 2012).

DOL = % Change in PBIT / % Change in Sales

Exhibit 7: Degree of Operating Leverage

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2015	1.985	-1.684	1.662	4.309	2.256	0.958
2016	4.093	8.646	9.958	3.419	3.563	-7.564
2017	4.928	0.441	21.552	1.015	1.825	23.391
2018	1.089	0.390	0.621	4.344	0.737	2.079
2019	1.292	0.866	-0.731	-0.214	-0.900	-73.457
Mean	2.677	1.732	6.612	2.574	1.496	-10.919
SD	1.731	3.990	9.337	2.065	1.679	36.775
COV	0.647	2.304	1.412	0.802	1.122	-3.368

Exhibit-7 depicts that Hero Motor's reported the highest mean followed by Ashok Leyland, Mahindra & Mahindra, Bajaj, Maruti. Tata Motors reported the maximum SD of 36.775 which indicates the maximum deviation from the mean value.

Hypothesis: H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (DOL of Automobile Companies doesn't differ over years)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (DOL of Automobile Companies differ over years)

Exhibit 8: Degree of Operating Leverage: Anova

Anova: Single Factor

Groups	Count	Sum	Average	Variance
ASHOK LEYLAND	5	13.38629	2.677258	2.997388
BAJAJ	5	8.659869	1.731974	15.92328
HERO MOTOR	5	33.06078	6.612155	87.18191
MAHINDRA & MAHINDRA	5	12.87141	2.574283	4.265229
MARUTI	5	7.480848	1.49617	2.819704
TATA MOTORS	5	-54.5934	-10.9187	1352.371

Anova: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	895.3431	5	179.0686	0.733107	0.605762	2.620654
Within Groups	5862.233	24	244.2597			
Total	6757.576	29				

Above analysis shows that the F value (0.733107) is less than the table value (2.620654) so, null hypothesis is accepted. Therefore it is concluded that DOL of the Automobile Companies does not differ over the years.

Financial Leverage

Employment of fixed interest bearing securities like, debt and preference share in capital structure along with owner's equity is called financial Leverage or trading on equity. Financial Leverage may be favourable or unfavourable. Financial Leverage is concerned with the extent to which firms rely on debt, and is therefore directly concerned with the Capital Structure of a firm. A firm with debt must make interest payments regardless of the sales, which leads to an increased risk. The debt payments - in contrast to Equity dividends - have to be paid and debt-holders are thus prioritized over equity-holders in terms of cash-flow. The debt payments can therefore be seen as a Fixed Financial Cost. The priority remains in the case of a bankruptcy when the remaining assets are claimed.

A benefit of Financial Leverage is that it can contribute to increased profits if the return on investment (ROI) exceeds the interest rate on the debt, hence, companies may have incentives to use debt-financing.

DFL = % Change in EPS / % Change in PBIT

Exhibit 9: Degree Of Financial Leverage

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2015	-2.504	1.040	0.926	2.260	0.949	0.030
2016	3.389	0.696	1.007	0.639	1.060	0.745
2017	3.800	-10.773	2.190	0.214	1.101	1.240
2018	0.243	0.553	0.455	0.374	0.389	1.222
2019	1.161	0.972	2.186	9.986	0.415	1.607
Mean	1.218	-1.503	1.353	2.694	0.783	0.969
SD	2.559	5.186	0.791	4.157	0.352	0.608
COV	2.101	-3.452	0.585	1.543	0.450	0.627

Exhibit-9 depicts that Mahindra & Mahindra reported the highest mean followed by Hero Motor, Ashok Leyland etc. Bajaj reported the maximum SD of 5.186 which indicates the maximum deviation from the mean value.

Hypothesis:H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (DFL of Automobile Companies doesn't differ over years)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (DFL of Automobile Companies differ over years)

Exhibit 10: Degree of Financial Leverage: Anova

Anova: Single Factor

Groups	Count	Sum	Average	Variance
ASHOK LEYLAND	5	6.08813	1.217626	6.547213
BAJAJ	5	-7.51281	-1.50256	26.89883
HERO MOTOR	5	6.764464	1.352893	0.625771
MAHINDRA & MAHINDRA	5	13.47169	2.694339	17.27907
MARUTI	5	3.913218	0.782644	0.123977
TATA MOTORS	5	4.844535	0.968907	0.369368

Anova: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	46.57157	5	9.314315	1.077958	0.397371	2.620654
Within Groups	207.3769	24	8.640705			
Total	253.9485	29				

Above analysis shows that the F value (1.077958) is less than the table value (2.620654) so, null hypothesis is accepted. Therefore it is concluded that DFL of the Automobile Companies does not differ over the years.

Combined Leverage

Combined Leverage is a use of operating Leverage and financial Leverage in an appropriate proportion in the business. Operating Leverage affects the firm's operating profit and financial Leverage affects the earnings of the shareholder or EPS. Firm has to use a correct mixture of both the Leverages to take the fullest possible advantage of growing business opportunities.

DCL = % Change in EPS / % Change in Sales

Exhibit – 11: Degree of Combined Leverage

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2015	-4.97	-1.751	1.539	9.738	2.141	0.029
2016	13.871	6.017	10.027	2.183	3.777	-5.636
2017	18.724	-4.755	47.206	0.217	2.009	29.014
2018	0.264	0.216	0.283	1.623	0.286	2.541
2019	1.500	0.842	-1.599	-2.139	-0.374	-118.075
Mean	5.878	0.114	11.491	2.324	1.568	-18.426
SD	9.966	3.955	20.455	4.468	1.644	57.281
COV	1.695	34.764	1.780	1.922	1.049	-3.109

Exhibit-11 depicts that Hero Motor's reported the highest mean followed by Ashok Leyland, Mahindra & Mahindra etc. Tata Motors reported the maximum SD of 57.28197 indicating the maximum deviation from the mean value.

Hypothesis:H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (DCL of Automobile Companies doesn't differ over years)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (DCL of Automobile Companies differ over years).

Exhibit 12: Degree of Combined Leverage: Anova

Anova: Single Factor

Groups	Count	Sum	Average	Variance
ASHOK LEYLAND	5	29.390	5.878	99.319
BAJAJ	5	0.569	0.114	15.643
HERO MOTOR	5	57.455	11.491	418.423
MAHINDRA & MAHINDRA	5	11.622	2.324	19.962
MARUTI	5	7.839	1.568	2.704
TATA MOTORS	5	-92.128	-18.426	3281.089
ASHOK LEYLAND	5	29.390	5.878	99.319

Anova: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2562.614	5	512.5227	0.801414	0.559683	2.620654
Within Groups	15348.56	24	639.5232			
Total	17911.17	29				

Above analysis shows that the F value (0.801414) is less than the table value (2.620654) so, null hypothesis is accepted. Therefore it is concluded that DCL of the Automobile Companies does not differ over the years.

Capital Structure refers the total amount of Capital Employed by a firm to finance its operations and assets. Leverage from Balance Sheet angle relates to Structural ie, Debt Equity or Debt-to-Capital Ratio.

Debt Equity Ratio: It measures the total Debt of a company as a percentage of Equity share holders fund. A high Debt Equity ratio indicates high amount of Interest expenses which has to be paid irrespective of the profit volume.

Debt Equity Ratio = Total Debt / Equity Share Holders Fund

Exhibit 13: Debt Equity Ratio (D/E)

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	2.16	0.026	0.064	0.878	0.114	1.150
2015	2.05	0.023	0.030	0.703	0.044	1.740
2016	2.18	0.017	0.034	0.728	0.034	1.204
2017	2.10	0.014	0.033	0.835	0.043	2.005
2018	2.20	0.014	0.029	0.751	0.041	1.193
2019	2.27	0.008	0.033	0.900	0.047	2.239
Mean	2.163	0.017	0.037	0.799	0.054	1.588
SD	0.078	0.007	0.013	0.083	0.030	0.473
COV	0.036	0.391	0.356	0.104	0.551	0.297

Exhibit-13 depicts that Ashok Leyland reported the minimum mean in terms of D/E ratio followed by Tata Motors. High D/E ratio leads to high Interest Expenses which have an impact on the Financial Leverage of a Co. Tata Motors reported the maximum SD of 0.473 indicating the maximum deviation from the mean value.

Hypothesis:H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (D/E Ratio Automobile Companies doesn't differ over years)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (D/E Ratio of Automobile Companies differ over years)

Exhibit 14: Debt Equity Ratio: Anova
Anova: Single Factor

Groups	Count	Sum	Average	Variance
ASHOK LEYLAND	6	12.97563	2.162606	0.006056
BAJAJ	6	0.10187	0.016978	4.42E-05
HERO MOTOR	6	0.222518	0.037086	0.000175
MAHINDRA & MAHINDRA	6	4.794951	0.799159	0.006853
MARUTI	6	0.32406	0.05401	0.000885
TATA MOTORS	6	9.530449	1.588408	0.223282
ASHOK LEYLAND	6	12.97563	2.162606	0.006056

Anova: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	25.35957	5	5.071913	128.2435	2.62122E-19	2.533555
Within Groups	1.186473	30	0.039549			
Total	26.54604	35				

Above analysis shows that the F value (128.2435) is more than the table value (2.533555) indicating rejection of null hypothesis. Therefore it is concluded that Debt Equity Ratio (D/E) of the Automobile Companies differs over the years

Coverage Ratio is a measure about a company's ability to service its debt, ie, meeting its financial obligations as well as paying of Dividend. Higher the ratio it is better for the company. Leverage ratios are related to Coverage Ratios like Interest and Dividend Coverage.

Interest Coverage Ratio is expressed as the number of times Operating Profit is more than Interest.
Interest Coverage Ratio = PBIT / Interest Expenses

Exhibit 15: Interest Coverage Ratio

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	0.63	5677.7	243.31	2.97	21.24	4.97
2015	0.95	630.1	282.36	2.37	23.85	5.46
2016	2.31	5409.5	301.27	2.68	93.84	3.89
2017	2.74	3992.1	180.08	2.74	114.28	3.20
2018	3.09	4530.3	172.82	3.59	33.29	3.38
2019	2.91	1553.6	138.29	2.77	140.97	0.70
Mean	2.11	3632.21	219.69	2.85	71.24	3.60
SD	1.06	2079.04	65.63	0.41	51.79	1.68
COV	0.502	0.572	0.299	0.144	0.727	0.466

Exhibit-15 depicts that Bajaj reported the maximum mean in terms of Interest Coverage ratio followed by Hero Motor, Maruti. High D/E ratio leads to high Interest Expenses which have an impact on Interest Coverage ratio. Bajaj reported the maximum SD of 2079.04 indicating the maximum deviation from the mean value.

Hypothesis:H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Interest Coverage ratio Automobile Companies doesn't differ over years)
H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Interest Coverage ratio of Automobile Companies differ over years)

Exhibit 16: Interest Coverage Ratio: Anova

Anova: Single Factor

Groups	Count	Sum	Average	Variance
ASHOK LEYLAND	6	12.63162	2.10527	1.116274
BAJAJ	6	21793.26	3632.211	4322388
HERO MOTOR	6	1318.139	219.6898	4306.752
MAHINDRA & MAHINDRA	6	17.11752	2.852921	0.168407
MARUTI	6	427.4636	71.24394	2682.355
TATA MOTORS	6	21.60825	3.601376	2.810901
ASHOK LEYLAND	6	12.63162	2.10527	1.116274

Anova: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	64019619	5	12803924	17.74469	3.59107E-08	2.533555
Within Groups	21646908	30	721563.6			
Total	85666527	35				

Above analysis shows that the F value (17.74469) is more than the table value (2.533555) indicating rejection of null hypothesis. Therefore it is concluded that Interest Coverage ratio of the Automobile Companies differs over the years.

Dividend Coverage Ratio essentially calculates the capacity of the firm to pay the dividend. It is the relation between EPS and Dividend Declared. Higher the coverage ratio better for the firm and vice-versa. The amount that is not paid out as dividend is held by the company for growth. It is termed as Retained Earnings.
Dividend Coverage Ratio = Earnings per Share / Dividend per Share

Exhibit 17: Dividend Coverage Ratio

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	0	2.2	1.57	5.52	6.16	20.52
2015	1.11	2.1	1.49	4.28	4.84	0
2016	2.63	2.6	1.68	4.85	5.20	68.20
2017	3.72	2.6	1.89	4.58	3.32	0
2018	2.55	2.4	2.14	9.22	3.26	0
2019	2.42	2.8	1.85	5.75	3.17	0
Mean	2.07	2.44	1.77	5.70	4.32	14.79
SD	1.31	0.28	0.24	1.81	1.26	27.42
COV	0.633	0.113	0.135	0.318	0.291	1.855

Exhibit-17 depicts that Tata Motors reported the maximum mean in terms of Dividend Coverage ratio followed by Mahindra & Mahindra and Maruti. But Tata Motors dividend has been inconsistent and the company have declared dividend twice during FY 2013-14 and FY2015-16. So, it reported the maximum SD of 27.42 indicating the maximum deviation from mean value.

Hypothesis:

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Dividend Coverage ratio Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Dividend Coverage ratio of Automobile Companies differ over years)

Exhibit 18: Dividend Coverage Ratio: Anova

Anova: Single Factor

Groups	Count	Sum	Average	Variance
ASHOK LEYLAND	6	12.43143	2.071906	1.717857
BAJAJ	6	14.64128	2.440213	0.076463
HERO MOTOR	6	10.62756	1.77126	0.057086
MAHINDRA & MAHINDRA	6	34.1975	5.699583	3.282561
MARUTI	6	25.94528	4.324214	1.579806
TATA MOTORS	6	88.72381	14.7873	752.0962
ASHOK LEYLAND	6	12.43143	2.071906	1.717857

Anova: Variation

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	732.5324	5	146.5065	1.158444	0.352278041	2.533555
Within Groups	3794.05	30	126.4683			
Total	4526.582	35				

Above analysis shows that the F value (1.158444) is less than the table value (2.533555) so, null hypothesis is accepted. Therefore it is concluded that Dividend Coverage ratio of the Automobile Companies does not differ over the years.

T-Test: It is used to determine the difference between two sample means from two normally distributed populations with unknown variances. It uses small sample size in order to test the difference between the samples when two normal distributions are unknown. If t Stat value lies between - t Critical two tail and + t Critical two test we don't reject Null Hypothesis.

Here, T test has been done to show the relationship between D/E ratio and Returns as well as EPS and P/E of Automobile Companies.

Exhibit 19: T-Test: Two-Sample Assuming Unequal Variances: Ashok Leyland

	ROCE	ROE	ROTA	EPS	P/E	D/E RATIO
Mean	11.0662	13.0096	1.8483	3.4717	42.5833	2.1626
Variance	24.5002	220.6729	8.0518	10.2714	1262.8817	0.0061
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	5	5	5	5	5	
t Stat	**4.40556**	**1.78857**	**-0.27118**	**1.00021**	**2.78610**	
P(T<=t) one-tail	0.00349	0.06686	0.39855	0.18156	0.01931	
t Critical one-tail	2.01505	2.01505	2.01505	2.01505	2.01505	
P(T<=t) two-tail	0.00699	0.13371	0.79709	0.36312	0.03862	
t Critical two-tail	**2.57058**	**2.57058**	**2.57058**	**2.57058**	**2.57058**	

ROCE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

ROE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & D/E, Variance is Equal)
Here, Stat value lies between - **2.570582** & + **2.570582**. Therefore, we reject Null Hypothesis stating that variances are equal.

ROTA & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & D/E, Variance is Equal)
Here, t Stat value lies between - **2.570582** & + **2.570582**. Therefore, we reject Null Hypothesis stating that variances are equal.

EPS & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & D/E, Variance is Equal)
Here, t Stat value lies between - **2.570582** & + **2.570582**. Therefore, we reject Null Hypothesis stating that variances are equal.

P/E & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

EXHIBIT 20: T-TEST: Two-Sample Assuming Unequal Variances: BAJAJ AUTO

	ROCE	ROE	ROTA	EPS	P/E	D/E RATIO
Mean	34.9559	25.1387	19.0394	130.0400	18.9667	0.01698
Variance	40.4291	20.0058	7.3927	762.1389	5.0987	4.42E-05
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	5	5	5	5	5	

t Stat	**13.4598**	**13.7577**	**17.1372**	**11.5366**	**20.5564**	
P(T<=t) one-tail	2.03E-05	1.82E-05	6.19E-06	4.29E-05	2.52E-06	
t Critical one-tail	2.01505	2.01505	2.01505	2.01505	2.01505	
P(T<=t) two-tail	4.05E-05	3.64E-05	1.24E-05	8.58E-05	5.04E-06	
t Critical two-tail	**2.570582**	**2.570582**	**2.570582**	**2.570582**	**2.570582**	

ROCE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

ROE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

ROTA & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

EPS & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

P/E & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

Exhibit 21: T-Test: Two-Sample Assuming Unequal Variances: Hero Motorcorp

	ROCE	**ROE**	**ROTA**	**EPS**	**P/E**	**D/E RATIO**
Mean	45.2467	33.3119	21.6591	147.1217	19.1833	0.0371
Variance	33.7201	17.0719	3.5612	1525.7466	3.5017	0.0002
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	5	5	5	5	5	
t Stat	**19.070**	**19.726**	**28.065**	**9.224**	**25.062**	
P(T<=t) one-tail	3.65E-06	3.09E-06	5.38E-07	0.000126	9.44E-07	
t Critical one-tail	2.0150	2.0150	2.0150	2.0150	2.0150	
P(T<=t) two-tail	7.31E-06	6.18E-06	1.08E-06	0.000252	1.89E-06	
t Critical two-tail	**2.570582**	**2.570582**	**2.570582**	**2.570582**	**2.570582**	

ROCE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

ROE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

ROTA & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

EPS & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

P/E & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

Exhibit 22: T-Test: Two-Sample Assuming Unequal Variances: Mahindra & Mahindra

	ROCE	**ROE**	**ROTA**	**EPS**	**P/E**	**D/E RATIO**
Mean	17.107	15.103	4.840	60.732	18.437	0.799
Variance	7.559	19.375	1.972	116.453	5.830	0.007
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	5	5	5	5	5	
t Stat	**14.5228**	**7.9584**	**7.0348**	**13.6035**	**17.8828**	
P(T<=t) one-tail	1.4E-05	0.000253	0.000448	1.92E-05	5.02E-06	
t Critical one-tail	2.01505	2.01505	2.01505	2.01505	2.01505	
P(T<=t) two-tail	2.79E-05	0.000505	0.000896	3.85E-05	1E-05	
t Critical two-tail	**2.570582**	**2.570582**	**2.570582**	**2.570582**	**2.570582**	

ROCE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

ROE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

ROTA & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

EPS & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

P/E & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

Exhibit 23: T-Test: Two-Sample Assuming Unequal Variances: Maruti Suziki

	ROCE	**ROE**	**ROTA**	**EPS**	**P/E**	**D/E RATIO**
Mean	22.51	16.956	12.017	193.053	24.983	0.054
Variance	14.574	6.207	3.588	5353.768	26.534	0.0009
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	5	5	5	5	5	
t Stat	**14.408**	**16.616**	**15.469**	**6.461**	**11.854**	
P(T<=t) one-tail	1.45E-05	7.21E-06	1.03E-05	0.000661	3.76E-05	
t Critical one-tail	2.0150	2.0150	2.0150	2.0150	2.0150	
P(T<=t) two-tail	2.9E-05	1.44E-05	2.05E-05	0.001322	7.52E-05	
t Critical two-tail	**2.570582**	**2.570582**	**2.570582**	**2.570582**	**2.570582**	

ROCE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

ROE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

ROTA & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

EPS & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

P/E & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

Exhibit 24: T-Test: Two-Sample Assuming Unequal Variances: Tata Motors

	ROCE	**ROE**	**ROTA**	**EPS**	**P/E**	**D/E RATIO**
Mean	7.829	5.009	1.879	28.147	9.7	1.588
Variance	122.777	721.094	33.890	264.180	47.096	0.223
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	5	5	5	5	5	
t Stat	**1.3783**	**0.3119**	**0.1221**	**4.0008**	**2.8884**	
P(T<=t) one-tail	0.1133	0.3838	0.4538	0.0052	0.0171	
t Critical one-tail	2.0150	2.0150	2.0150	2.0150	2.0150	
P(T<=t) two-tail	0.2266	0.7677	0.9076	0.0103	0.0342	
t Critical two-tail	**2.570582**	**2.570582**	**2.570582**	**2.570582**	**2.570582**	

ROCE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & D/E, Variance is Equal)
Here, Stat value lies between - **2.570582** & + **2.570582**. Therefore, we reject Null Hypothesis stating that variances are equal.

ROE & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & D/E, Variance is Equal)
Here, Stat value lies between - **2.570582** & + **2.570582**. Therefore, we reject Null Hypothesis stating that variances are equal.

ROTA & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & D/E, Variance is Equal)
Here, Stat value lies between - **2.570582** & + **2.570582**. Therefore, we reject Null Hypothesis stating that variances are equal.

EPS & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

P/E & D/E RATIO

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & D/E, Variance is not Equal)
H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & D/E, Variance is Equal)
Here, t Stat value do not lie between - **2.570582** & + **2.570582**. Therefore, we accept Null Hypothesis stating that the variances are not equal.

Conclusion

For every organization Profitability and Liquidity management plays a significant role. Leverage refers to debt funds to finance company's long term activities as well as Working Capital Management. Increase in browning without sufficient increase in PBIT have an impact on Equity Earnings, EPS as well as Market Price. Leverage affects volatility of Stock market which is negatively related to stock return. When volatility rises, expected returns tend to increase, leading to a drop in the stock price. As a consequence, volatility and stock returns are negatively correlated. The second explanation is based on financial leverage. When stock prices fall, financial leverage increases, leading to an increase in stock return volatility. The above analysis shows that D/E mix has significant impact on both EPS and P/E ratio.

Anova Findings

The study Reveals: Ashok Leyland's reported the maximum CAGR in terms of Revenue (23.17%) & PBIT (53.98%) followed by Maruti Suzuki

1. Maruti Suzuki reported the maximum CAGR in terms of EPS of 22.34%.
2. Hero Motor's reported the highest mean in terms of DOL followed by Ashok Leyland
3. Mahindra & Mahindra reported the highest mean in terms of DFL followed by Hero Motor's
4. Hero Motor's reported the highest mean in terms of DCL followed by Ashok Leyland, Mahindra & Mahindra.
5. Ashok Leyland reported the minimum mean in terms of D/E ratio followed by Tata Motors
6. Bajaj reported the maximum mean in terms of Interest Coverage ratio followed by Hero Motor, Maruti
7. Though, Tata Motors reported the maximum mean in terms of Dividend Coverage ratio but, its dividend has been inconsistent and the company have declared dividend twice during FY 2013-14 and FY2015-16. Mahindra & Mahindra and Maruti's Dividend Coverage ratio have been 5.7 & 4.32 and consistent.

T-Test Conducted with selected Automobile Firms revealed:

1. There is significant relationship between DOL & P/E Ratio
2. There is significant relationship between DFL & P/E Ratio
3. There is significant relationship between EPS & P/E Ratio
4. There is significant relationship between ROCE & P/E Ratio
5. There is significant relationship between ROE & P/E Ratio

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