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WORKING CAPITAL MANAGEMENT & ITS IMPACT ON P/E RATIO: A STUDY ON INDIAN AUTOMOBILE COMPANIES

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Abstract
Working Capital Management is one of the aspects of Financial Management. It involves procurement, investment and management of short term funds which in turn have a close relation with Profitability & Liquidity of a firm. Efficient management of working capital is a fundamental part of the overall corporate strategy since it affects liquidity, profitability and at the same time has an impact on both EPS and PE ratio. According to Smith K.V,"Working capital management is concerned with the problems that arise in attempting to manage the current assets, current liabilities and the interrelationship that exist between them." This paper studies the impact of Working Capital Turnover on ROCE, ROE, ROTA, EPS and P/E of the Indian Leading Automobile Companies

Keywords: Indian Automobile Sector, Revenue, Operating Profit Margin, Net Profit Margin, Current Ratio, Liquid Ratio, Working Capital Turnover, Inventory, Receivables, Payables Turnover, ROCE, ROE, Operating Cash Flow Margin, EPS, P/E

I. Objective of the study

1. To analysis the Working Capital of leading Indian Automobile Companies & show their impact of Working Capital Turnover on ROCE, ROE, Operating Cash Flow Margin, EPS & P/E by using t-Test: Two-Sample Assuming Unequal Variances.
2. To highlight financial performance & return of the companies using Profitability Ratios, Working Capital Ratios, Liquidity Ratios

Review of Literature

The researcher and economists have recognized that proper Working Capital Management is necessary to analyse and improve the financial performance of Automobile sector. A large number of studies have been conducted in the field of operation and financial performance of Cement Companies. A brief review of some of these studies has been presented.

Grablowsky (1976), a significant relationship between various success measures and the employment of formal working capital policies and procedures was found. Cash conversion cycle and cash flow management plays vital role for overall financial management of all firms, especially those which are capital constrained and more reliant on short-term sources of finance .

Narasimhan & Murty (2001), focus on improving return on capital employed by targeting some critical areas such as cost containment, reducing investment in working capital and improving working capital efficiency.
Bierman Chopra and Thomas (1975), made an attempt to interrelate the working capital and capital structure decisions. They found that the use of working capital is not only a cushion to avoid run – off but also to offset sales. They concluded that working capital influenced the earnings of firms.

S.Sujatha (2014) This paper was a clear focus on working capital management of TVS motors ltd for five years from FY 2008 to year 2013. After Hero Motocorp and Bajaj, it is third largest two-wheeler producer in the nation. TVS group has more than 30 companies under its umbrella. Ratio analysis was done to study the efficiency of operational capital. The study concluded that the ratios were not satisfactory. Further Mrs. Sujatha suggests that the firm should curtail its overheads and improve its solvency and liquidity. Moreover, the firm is using more of funds from debts than from shareholder's equity.

Shin & Soenen (1998) studied the effect of working capital management on corporate profitability using sample of 58,985 firm years covering the period 1975-1994. They examined the relationship between firm's net trade cycle and its profitability and found a strong negative relationship. They also found that shorter net trade cycles are associated with higher risk adjusted stock returns.

Deloof (2003) studied effect of working capital management on Belgian firms' profitability. He used gross operating income as a measure of profitability and found significant negative relation between gross operating income and the number of days accounts receivable, inventories, accounts payable. He also suggested that less profitable firms wait longer to pay their bills hence negative relationship between accounts payable and profitability.

Raheman & Nasr (2007) analysed different variables of working capital management on firms listed on Karachi Stock Exchange. They used net operating profit as a measure of profitability. Along with measures of working capital management including average collection period, inventory turnover ratio, average payment period and cash conversion cycle they includes current ratio as a measure of liquidity and found it to be most important liquidity measure that affects profitability.

A. Ajanthan (2013) studied the relationship between liquidity and profitability of trading companies in Sri Lanka using current and quick ratio for liquidity and return on equity and return on asset for profitability. He found significant impact of liquidity on profitability.

Chandra Kartik (2012) in his paper on "Trends in Liquidity Management & impact on profitability": states that the selected companies always try to maintain adequate amount of net working capital In relation to Current Liability so as to maintain a good amount of liquidity.

Eljelly (2004) examined the liquidity-profitability trade-off on sample of firms in Saudi Arabia. He found significant negative relationship between liquidity, measured by current ratio, and profitability. He also found negative relationship being more evident in case of firms having longer cash conversion cycles and higher current ratios.

II. Scope of study

The study studies the Working Capital Management of Leading Indian Automobile Companies and impact of Working Capital Turnover on ROCE, ROE, ROTA, EPS, P/E ratio. Management of working capital refers to management of current assets, current liabilities and the relationship between them with the basic goal of maintaining a satisfactory level of working capital. Sound working capital policy ensures higher profitability and proper liquidity of a firm.

Period of study

The study covers a period of 6 years from 2014 to 2019.

Methodology

Sources of Data

The study is based on secondary data. Information and data has been collected from Annual Reports of Ashok Leyland, Bajaj, Hero Motor, Mahindra & Mahindra, Maruti Suzuki, Tata Motors and different books, journal, magazines, and various websites.

III. 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) = √∑X2/N-(∑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. Profitability, Liquidity and Working Capital ratios have been taken for the study.

Indian automobile sector & its key players

Indian Automobile Sector holds a strong position in terms of manufacturing of tractor, bus, heavy vehicles and passenger cars. It currently manufactures 25 mn vehicles, of which 3.5 mn are exported. Increase in income, standard of living has been the key factor behind the sale of passenger cars &two wheelers. During 2019, Automobile exports increased by 14.5% and sale of passenger cars by 2.7% & two-wheeler by 4.86%.

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.

Revenue: It is the income a business generates from its Operating Activities, after deducting Sales Returns and Indirect Taxes. It plays a pivotal role behind the success and growth of an enterprise.

EXHIBIT – 1: REVENUE

Millions	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	1,18,592	2,01,583	2,52,755	7,40,009	4,43,963	23,28,337
2015	1,57,082	2,16,143	2,75,380	7,14,480	5,08,014	26,31,590
2016	2,17,279	2,25,865	2,84,571	7,58,414	5,75,890	27,30,456
2017	2,32,654	2,17,667	2,86,104	8,37,731	6,80,850	26,96,925
2018	3,00,533	2,52,189	3,24,584	9,20,940	7,98,094	29,15,505
2019	3,36,207	3,02,500	3,39,708	10,47,207	8,60,685	30,19,384
Mean	2,27,058	2,35,991	2,93,850	8,36,463	6,44,583	27,20,366
SD	82,584	36,611	32,322	1,27,926	1,64,438	2,40,712
COV	0.364	0.155	0.110	0.153	0.255	0.088
CAGR (%)	23.2	8.5	6.1	7.2	14.2	5.3

Tata Motors reported the highest mean value in terms of Revenue followed by Mahindra & Mahindra & Maruti. Ashok Leyland reported the maximum CAGR of 23.2% followed by Maruti, indicating the maximum growth in Revenue.

Hypothesis:

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

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

Exhibit – 2: Revenue: Automobile Companies: Anova

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	1362345	227057.5333	6820078328
BAJAJ	6	1415947	235991.0833	1340391857
HERO MOTOR	6	1763102	293850.4	1044716064
MAHINDRA & MAHINDRA	6	5018780	836463.3833	16365123712
MARUTI	6	3867496	644582.6667	27039840245
TATA MOTORS	6	16322197	2720366.1	57942076712

ANOVA: VARIATION

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	2.767E+13	5	5.534E+12	300.3469	1.15E-24	2.53355
Within Groups	5.52761E+11	30	18425371153			
Total	2.82228E+13	35				

Above analysis shows that the F value (300.3469) is more than the table value (2.53355) so, null hypothesis is rejected. Therefore it is concluded that Revenue of Automobile Companies differs over the years.

Profitability

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.

Operating Profit Margin Ratio: It shows the relationship between Operating Profit and Net Sales.

Exhibit – 3: operating profit margin (%)

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	4.3	23.1	11.4	11.9	8.8	10.1
2015	5.3	18.9	12.0	10.5	10.2	10.1
2016	9.8	25.1	15.5	11.9	13.3	7.0
2017	12.4	25.7	17.2	11.9	15.0	5.0
2018	12.6	23.5	16.4	15.5	14.4	5.4
2019	13.0	23.0	15.1	13.3	12.4	-8.5
Mean	9.6	23.2	14.6	12.5	12.4	4.9
SD	3.9	2.4	2.4	1.7	2.4	6.9
COV	0.41	0.10	0.16	0.14	0.20	1.42
CAGR (%)	25	-0.1	5.9	2.3	7.1	-196.5

Bajaj depicted the maximum mean in terms of Operating Profit Margin followed by Hero Motor Mahindra & Mahindra Maruti. Only Tata Motors had a negative margin of 8.5% in 2019. Ashok Leyland reported the Maximum CAGR of 25%.

Hypothesis:

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Operating Profit Margin of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Operating Profit Margin of Automobile Companies differ over years)

Exhibit – 4: Operating Profit Margin: ANOVA

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	57.36762961	9.561271602	15.10869226
BAJAJ	6	139.3811521	23.23019202	5.679363486
HERO MOTOR	6	87.547631	14.59127183	5.608289976
MAHINDRA & MAHINDRA	6	74.97212842	12.49535474	3.018380023
MARUTI	6	74.22424151	12.37070692	5.846124793
TATA MOTORS	6	29.1766808	4.862780133	47.62527775

ANOVA: variation

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1114.484	5	222.8968	16.135	9.95E-08	2.53355
Within Groups	414.4306	30	13.81435			
Total	1528.914	35				

Above analysis shows that the F value (16.135) is more than the table value (2.53355) therefore null hypothesis is rejected. Therefore it is concluded that Operating Profit Margin of the Automobile Companies differs over the years.

Net Margin Ratio: It shows the relationship between Net profit (ie, Profit left for equity share holders) and Net sales.

Exhibit – 5: Net Profit Margin (%)

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	-2.0	16.0	8.3	5.8	6.4	6.1
2015	-1.4	13.0	8.5	3.6	7.5	5.3
2016	3.3	18.0	10.9	4.7	9.5	4.1
2017	7.0	18.7	12.4	4.8	11.0	2.2
2018	6.0	16.7	11.5	8.6	9.9	2.3
2019	6.5	16.3	10.2	5.7	8.9	-9.6
Mean	3.3	16.5	10.3	5.6	8.9	1.7
SD	4.0	2.0	1.6	1.7	1.7	5.8
COV	1.236	0.121	0.157	0.307	0.191	3.301
CAGR (%)	-227.3	0.3	4.1	-0.3	6.9	-209.6

Bajaj depicted the maximum mean in terms of Net Profit Margin followed by Hero Motor, Maruti and Mahindra & Mahindra. Maruti reported the Maximum CAGR of 6.9%.

Hypothesis:

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Net Profit Margin of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Net Profit Margin of Automobile Companies differ over years)

Exhibit – 6: Operating Profit Margin: ANOVA

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	19.5432	3.2572	16.21107
BAJAJ	6	98.79601	16.466	3.939899
HERO MOTOR	6	61.86348	10.31058	2.635841
MAHINDRA & MAHINDRA	6	33.37954	5.563256	2.924803
MARUTI	6	53.18035	8.863392	2.866457
TATA MOTORS	6	10.46831	1.744718	33.16916

ANOVA: variation

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	868.6855	5	173.7371	16.882	6.15E-08	2.53355
Within Groups	308.7362	30	10.29121			
Total	1177.422	35				

Above analysis shows that the F value (16.882) is more than the table value (2.53355) therefore null hypothesis is rejected. Therefore it is concluded that Net Profit Margin of the Automobile Companies differs over the years.

Liquidity & working capital management

Working Capital Management plays a significant role to enhance the profitability of an entity. Moreover, Profit has a direct relation with Liquidity. WC is a financial metric which represents operating liquidity available to an entity. WC is calculated as Current Assets minus Current Liabilities. If Current Assets are less than Current Liabilities, an entity has a Working Capital Deficiency.

Exhibit – 7: working capital

Millions	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	-8,648	8,936	11,347	1,20,361	62,790	34,892
2015	-2,726	73,229	21,587	60,173	3,419	1,633
2016	6,271	19,519	27,318	72,677	-30,930	28,743
2017	6,404	62,557	33,938	89,553	-44,388	4,903
2018	2,301	51,394	45,209	99,265	-75,185	-72,467
2019	11,716	21,994	40,040	1,06,627	-17,878	-2,20,262
Mean	2,553	39,605	29,906	91,443	-17,029	-37,093
SD	7,294	26,270	12,438	22,188	47,146	97,552
COV	2.857	0.663	0.416	0.243	-2.769	-2.630
CAGR (%)	-206.3	19.7	28.7	-2.4	-177.8	-244.6

Mahindra & Mahindra depicted the maximum mean in terms of Working Capital followed by Bajaj & Hero Motor. Hero Motor reported the Maximum CAGR of 28.7% indicating the maximum growth in Working Capital.

Hypothesis

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Working Capital of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Working Capital of Automobile Companies differ over years)

Exhibit – 8: working capital: ANOVA

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	15318.25	2553.0	53200770.3
BAJAJ	6	237628.3	39604.7	690114472
HERO MOTOR	6	179438.5	29906.4	154699254.1
MAHINDRA & MAHINDRA	6	548655.2	91442.5	492305542.6
MARUTI	6	-102172	-17028.7	2222757457
TATA MOTORS	6	-222558	-37093	9516357730

ANOVA: variation

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	6.3017E+10	5	12603440601	5.7596	0.000768	2.53355
Within Groups	6.5647E+10	30	2188239204			
Total	1.2866E+11	35				

Above analysis shows that the F value (5.7596) is more than the table value (2.53355) therefore null hypothesis is rejected. Therefore it is concluded that Working Capital of the Automobile Companies differs over the years.

Liquidity & cash flows

It refers to the ability of a firm to honour its short term obligations. Here short term generally means one year or within the working capital cycle. The important Liquidity ratios are as follows.

Current Ratio: It represents the excess of Current assets over the Current Liabilities in form of ratio. High Current Ratio indicates that a firm can easily meet up its short term obligations. Current Ratio also depends on the operating cycle of a firm. Longer the operating cycle, higher the Current ratio and vice versa. Normally a Current Ratio of 2:1 is acceptable

Exhibit – 9: Current Ratio

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	0.92	1.19	1.26	1.44	1.77	1.04
2015	0.96	2.14	1.35	1.18	0.97	1.01
2016	1.08	1.70	1.76	1.20	0.72	1.03
2017	1.07	2.95	1.81	1.22	0.66	1.00
2018	1.02	2.25	2.01	1.20	0.51	0.95
2019	1.08	1.45	1.91	1.18	0.87	0.85
Mean	1.02	1.95	1.68	1.24	0.92	0.98
SD	0.07	0.64	0.31	0.10	0.45	0.07
COV	0.067	0.326	0.182	0.081	0.489	0.072
CAGR (%)	3.26	4.03	8.68	-3.90	-13.24	-3.95

Bajaj depicted the maximum mean in terms of Current Ratio followed by Hero Motors & Mahindra & Mahindra. Hero Motors reported the Maximum CAGR of 8.68% indicating the maximum growth in Current Ratio over the period.

Hypothesis

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Current Ratio of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Current Ratio of Automobile Companies differ over years)

Exhibit – 10: Current Ratio: ANOVA

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	6.13	1.0217	0.0047
BAJAJ	6	11.68	1.9467	0.4032
HERO MOTOR	6	10.1	1.6833	0.0941
MAHINDRA & MAHINDRA	6	7.42	1.2367	0.0101
MARUTI	6	5.5	0.9167	0.2006
TATA MOTORS	6	5.88	0.980	0.005

ANOVA: Variation

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	5.37546	5	1.07509	8.98702	2.6471E-05	2.53355
Within Groups	3.58882	30	0.11963			
Total	8.96428	35				

Above analysis shows that the F value (8.98702) is more than the table value (2.53355) therefore null hypothesis is rejected. Therefore it is concluded that Current Ratio of the Automobile Companies differs over the years

Liquid Ratio: It should be noted that a firm with high proportion of Current Assets in the form of Cash and Debtors is more liquid than a firm with its maximum Current Assets in the form of Inventories, even though both have the same Current Ratio. Liquid Ratio refers to the ability of a firm to meet its short term obligations. **Liquid Ratio= (Current Assets–Stock) / Current Liabilities**

Exhibit – 11: Liquid Ratio

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	0.92	1.05	1.11	1.13	1.55	0.74
2015	0.76	1.96	1.13	0.93	0.67	0.72
2016	0.84	1.44	1.55	0.95	0.44	0.72
2017	0.79	2.72	1.64	1.00	0.42	0.70
2018	0.86	2.07	1.79	1.01	0.31	0.66
2019	0.88	1.25	1.62	0.97	0.64	0.58
Mean	0.84	1.75	1.48	1.0	0.67	0.69
SD	0.06	0.62	0.29	0.07	0.45	0.06
COV	0.068	0.355	0.194	0.071	0.673	0.086
CAGR (%)	-0.99	3.55	8.01	-3.01	-16.21	-4.76

Bajaj depicted the maximum mean in terms of Liquid Ratio Hero Motors. Hero Motors reported the Maximum CAGR of 8.01% indicating the maximum growth in Liquid Ratio over the period.

Hypothesis

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Liquid Ratio of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Liquid Ratio of Automobile Companies differ over years)

Exhibit – 12: Liquid Ratio: Anova

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	5.0580	0.8430	0.0033
BAJAJ	6	10.49	1.7483	0.3847
HERO MOTOR	6	8.8518	1.4753	0.0823
MAHINDRA & MAHINDRA	6	5.99	0.9983	0.0051
MARUTI	6	4.03	0.6717	0.2041
TATA MOTORS	6	4.12	0.6867	0.0035

ANOVA: variation

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	5.9201	5	1.18402	10.403	7.3712E-06	2.53355
Within Groups	3.4145	30	0.11382			
Total	9.3346	35				

Above analysis shows that the F value (10.403) is more than the table value (2.53355) therefore null hypothesis is rejected. Therefore it is concluded that Liquid Ratio of the Automobile Companies differs over the years

Operating Cash Flow Margin: It is a metric of a Company's Profitability, Efficiency & Earnings Quality. It reveals how effectively a Company is able to convert its revenue into Cash. **Operating Cash Flow Margin = Cash from Operations / Revenue.**

Exhibit – 13: Operating Cash Flow Margin (%)

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	-0.06	23.89	14.29	1.39	13.18	17.38
2015	1.32	15.73	11.57	3.86	14.81	15.10
2016	-3.37	24.39	16.96	3.97	18.05	14.63

2017	3.20	21.91	18.15	5.20	18.51	11.90
2018	6.82	23.84	17.04	3.63	18.60	9.22
2019	8.90	14.71	9.13	-1.35	11.32	7.14
Mean	2.80	20.75	14.52	2.79	15.75	12.56
SD	4.52	4.37	3.56	2.37	3.10	3.87
COV	1.613	0.21	0.245	0.851	0.197	0.31
CAGR (%)	-369.9	-9.24	-8.57	-199.32	-3.0	-16.3

Bajaj depicted the maximum mean in terms of Operating Cash Flow Margin followed by Maruti, Hero Motor & Tata Motors**.**

Hypothesis:

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Operating Cash Flow Margin of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Operating Cash Flow Margin of Automobile Companies differ over years)

Exhibit – 14: Operating Cash Flow Margin: ANOVA

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	16.801	2.800	20.394
BAJAJ	6	124.478	20.746	19.140
HERO MOTOR	6	87.144	14.524	12.656
MAHINDRA & MAHINDRA	6	16.713	2.785	5.625
MARUTI	6	94.478	15.746	9.624
TATA MOTORS	6	75.357	12.559	14.982

ANOVA: Variation

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1592.51148	5	318.50230	23.18589	1.7691E-09	2.53355
Within Groups	412.10700	30	13.73690			
Total	2004.61849	35				

Above analysis shows that the F value (23.18589) is more than the table value (2.53355) therefore null hypothesis is rejected. Therefore it is concluded that Operating Cash Flow Margin of the Automobile Companies differs over the years.

Turnover Ratios

Turnover ratios are also known as Activity Ratios or Asset Management Ratios. It helps to measure, how well the Assets are employed by a firm.

Working Capital Turnover: It reflects the efficiency of WCM management by a firm during a financial period. Higher the Working Capital Turnover ratio indicates that the inventories have been managed more efficiently and vice versa.

Working Capital Turnover = Net Sales / (Current Assets – Current Liabilities)

Exhibit – 15: working capital turnover

Millions	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	1.06	22.08	22.25	5.56	6.84	66.1
2015	-49.72	4.15	19.71	10.61	-172.4	175.4
2016	33.28	11.35	10.33	10.29	-18.25	93.8
2017	29.46	3.42	8.33	9.16	-15.08	541.6
2018	126.28	4.81	7.04	9.14	-10.39	-39.8
2019	27.96	13.44	8.35	9.66	-46.45	-13.6
Mean	28.05	9.87	12.67	9.07	-42.61	137.25
SD	57.37	7.27	6.57	1.82	65.86	212.60
COV	2.045	0.736	0.519	0.200	-1.545	1.549
CAGR (%)	92.37	-9.44	-17.80	11.68	-246.67	-172.87

Tata Motors reported the maximum mean in terms of Working Capital Turnover followed by Ashok Leyland. Ashok Leyland reported the Maximum CAGR of 92.37% indicating the maximum growth in Working Capital Turnover over the period.

Hypothesis:

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Working Capital Turnover of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Working Capital Turnover of Automobile Companies differ over years)

Exhibit – 16: working capital turnover: ANOVA

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	168.319	28.053	3291.116
BAJAJ	6	59.237	9.873	52.796
HERO MOTOR	6	76.011	12.668	43.218
MAHINDRA & MAHINDRA	6	54.431	9.072	3.308
MARUTI	6	-255.683	-42.614	4337.003
TATA MOTORS	6	823.481	137.247	45198.957

ANOVA: variation

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	106870.91	5	21374.18	2.42308	0.05852	2.53355
Within Groups	264631.99	30	8821.07			
Total	371502.90	35				

Above analysis shows that the F value (2.42038) is less than the table value (2.53355) therefore null hypothesis is accepted. Therefore, it is concluded that Working Capital Turnover of the Automobile Companies does not differs over the years

Inventory Turnover: It reflects the efficiency of Inventory management by a firm during a financial period. High Inventory Turnover ratio indicates that the inventories have been managed efficiently. Inventory includes Raw Materials, Work-in-Progress and Finished Goods. **Inventory Turnover Ratio = Cost of Goods Sold (COGS) / Average Inventory**

Exhibit – 17: Inventory Turnover

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	7.44	31.44	37.75	8.86	25.21	8.54
2015	9.79	26.55	31.97	8.51	19.00	8.98
2016	11.06	31.41	37.35	8.32	18.38	8.36
2017	7.88	29.88	40.38	9.43	20.86	7.69
2018	13.42	33.96	33.72	9.86	25.25	6.99
2019	10.84	31.46	27.19	8.58	25.90	7.74
Mean	10.07	30.78	34.73	8.93	22.43	8.05
SD	2.22	2.45	4.76	0.60	3.42	0.71
COV	0.22	0.080	0.14	0.067	0.152	0.089
CAGR (%)	7.82	0.01	-6.35	-0.64	0.54	-1.95

Hero Motors depicted the maximum mean in terms of Inventory Turnover followed by Bajaj & Maruti. Ashok Leyland had the Maximum CAGR of 7.82% indicating the maximum growth in Inventory Turnover over the period.

Hypothesis:

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Inventory Turnover of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Inventory Turnover of Automobile Companies differ over years)

Exhibit – 18: inventory turnover: ANOVA

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	60.43	10.07167	4.91738
BAJAJ	6	184.7	30.78333	6.02203
HERO MOTOR	6	208.36	34.72667	22.67931
MAHINDRA & MAHINDRA	6	53.56	8.92667	0.35815
MARUTI	6	134.6	22.43333	11.67079
TATA MOTORS	6	48.3	8.05	0.51008

ANOVA: variation

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	4193.331	5	838.6663	109.0175	2.6343E-18	2.53355
Within Groups	230.789	30	7.6930			
Total	4424.120	35				

Above analysis shows that the F value (109.0175) is more than the table value (2.53355) therefore null hypothesis is rejected. Therefore it is concluded that Inventory Turnover of the Automobile Companies differs over the years

Receivables Turnover: It measures the liquidity of a firm in relation to its Debtors. It reflects the efficiency of management of Receivables by a firm during a financial period. **Receivables Turnover Ratio = Net Sales/ Accounts Receivable**

Exhibit – 19: Receivables Turnover

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	40.38	24.78	20.03	11.69	29.06	21.8
2015	29.82	29.44	22.01	11.66	43.08	20.7
2016	22.42	30.85	18.23	12.85	42.66	19.9
2017	20.04	22.42	22.29	11.40	55.65	12.7
2018	14.52	16.56	12.18	10.69	53.31	10.2
2019	21.13	11.55	11.55	11.09	35.90	15.8
Mean	24.72	22.60	17.71	11.56	43.28	16.84
SD	9.11	7.46	4.77	0.73	10.11	4.72
COV	0.369	0.33	0.269	0.064	0.234	0.28
CAGR (%)	-12.14	-14.15	-10.42	-1.05	4.32	-6.31

Maruti depicted the maximum mean in terms of Receivables Turnover followed by Ashok Leyland & Bajaj. Except Maruti all the companied had a negative CAGR in terms of Receivables Turnover over the period

Hypothesis:

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Receivables Turnover of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Receivables Turnover of Automobile Companies differ over years)

Exhibit – 20: Receivables Turnover: Anova

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	148.3198	24.72	83.0166
BAJAJ	6	135.5971	22.5995	55.6545
HERO MOTOR	6	106.2791	17.7132	22.7242
MAHINDRA & MAHINDRA	6	69.3828	11.5638	0.5392
MARUTI	6	259.6568	43.2761	102.1286
TATA MOTORS	6	101.0671	16.8445	22.2651

ANOVA: VARIATION

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	3663.5567	5	732.7113	15.3539	1.6731E-07	2.53355
Within Groups	1431.6415	30	47.7214			
Total	5095.1982	35				

Above analysis shows that the F value (15.3539) is more than the table value (2.53355) therefore null hypothesis is rejected. Therefore it is concluded that Receivables Turnover of the Automobile Companies differs over the years

Payables Turnover Ratio: It measures the time taken by a firm to pay off its Creditors or Suppliers. This ratio depends on Inventory and Debtors Turnover Ratio. **Payables Turnover Ratio = Cost of Goods Sold / Accounts Payable**

Exhibit – 21: Payables Turnover

Year	Ashok Leyland	Bajaj	Hero Motor	Mahindra & Mahindra	Maruti	Tata Motors
2014	7.44	8.48	7.95	3.67	5.87	2.36
2015	9.79	6.35	6.93	3.56	5.90	2.61
2016	11.06	5.89	7.24	3.11	4.79	2.66
2017	7.88	4.21	5.82	3.10	5.09	2.76

2018	13.42	2.24	6.52	2.65	4.28	2.39
2019	10.84	1.62	6.84	2.67	4.67	2.64
Mean	10.07	4.80	6.88	3.12	5.10	2.57
SD	2.22	2.61	0.71	0.43	0.66	0.16
COV	0.22	0.545	0.103	0.137	0.129	0.062
CAGR (%)	7.82	-28.19	-2.98	-6.12	-4.46	2.24

Ashok Leyland depicted the maximum mean in terms of Payables Turnover which indicates the minimum time taken to clear off the dues of the Creditors. It is followed by Hero Motor, Maruti &b Bajaj.

Hypothesis:

H_0: $\mu_1=\mu_2=\mu_3=\mu_4=\mu_5=\mu_6$ (Payables Turnover of Automobile Companies doesn't differ over years)

H_1: $\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5\neq\mu_6$ (Payables Turnover of Automobile Companies differ over years)

Exhibit – 22: payables turnover: ANOVA

ANOVA: Single Factor

Groups	*Count*	*Sum*	*Average*	*Variance*
ASHOK LEYLAND	6	60.43	10.0717	4.9174
BAJAJ	6	28.8004	4.8001	6.8331
HERO MOTOR	6	41.2970	6.8828	0.5065
MAHINDRA & MAHINDRA	6	18.7474	3.1246	0.1821
MARUTI	6	30.6019	5.1003	0.4358
TATA MOTORS	6	15.4309	2.5718	0.0255

ANOVA: variation

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	225.87235	5	45.17447	21.01073	5.4912E-09	2.53355
Within Groups	64.50199	30	2.15007			
Total	290.37433	35				

Above analysis shows that the F value (21.01073) is more than the table value (2.53355) therefore null hypothesis is rejected. Therefore it is concluded that Payables Turnover of the Automobile Companies differs over the years

T-Test: It is used to test the null hypothesis that the variances of two populations are not equal. If t Stat value lies between - t Critical two tail and + t Critical two test we don't reject Null Hypothesis.

Working Capital Management is an essential ingredient for every organisation. Working Capital Turnover measures how efficiently a business uses its working capital to generate sales. High WC Turnover ratio increases organisations efficiency and helps it to manage its operations smoothly. Moreover, Working Capital Management has an impact on Profitability as well as Liquidity and also helps to maximise Shareholders' wealth.

Exhibit –23: T-Test: Two-Sample Assuming Unequal Variances -Ashok Leyland

	ROCE	**ROE**	**OP CF/T/O**	**EPS**	**P/E**	**WC T/O**
Mean	11.06616	13.00963	2.80019	3.491667	-4.83031	28.05315
Variance	24.50015	220.6729	20.394	10.12538	1766.824	3291.116
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	5	6	5	5	9	
t Stat	**-0.72262**	**-0.62181**	**-1.07492**	**-1.04711**	**-1.13257**	
P(T<=t) one-tail	0.251144	0.278469	0.165762	0.171502	0.143332	
t Critical one-tail	2.015048	1.94318	2.015048	2.015048	1.833113	
P(T<=t) two-tail	0.502288	0.556937	0.331524	0.343005	0.286664	
t Critical two-tail	**2.570582**	**2.446912**	**2.570582**	**2.570582**	**2.262157**	

ROCE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.570582 & +2.570582. Therefore, we reject Null Hypothesis stating that variances are equal.

ROE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.446912 & +2.446912. Therefore, we reject Null Hypothesis stating that variances are equal.

Operating Cash Flow Margin & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.570582 & +2.570582. Therefore, we reject Null Hypothesis stating that variances are equal.

EPS & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & Working Capital Turnover, 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 & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & Working Capital Turnover Variance is Equal)

Here, t Stat value lies between -2.262157 & +2.262157. Therefore, we reject Null Hypothesis stating that variances are equal.

Exhibit –24: t-test: two-sample assuming unequal variances - bajaj

	ROCE	**ROE**	**OP CF/T/O**	**EPS**	**P/E**	**WC T/O**
Mean	34.95594	25.13866	20.74636	130.04	18.96667	9.8729
Variance	40.42908	20.00578	19.14015	762.1389	5.098667	52.79588
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	10	8	8	6	6	
t Stat	**6.363407**	**4.382515**	**3.140294**	**10.31098**	**2.927525**	
P(T<=t) one-tail	4.1E-05	0.00117	0.0069	2.43E-05	0.013186	
t Critical one-tail	1.812461	1.859548	1.859548	1.94318	1.94318	
P(T<=t) two-tail	8.21E-05	0.002341	0.013799	4.86E-05	0.026372	
t Critical two-tail	**2.228139**	**2.306004**	**2.306004**	**2.446912**	**2.446912**	

ROCE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.228139 & +2.228139. So, we accept Null Hypothesis stating that variances are unequal.

ROE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.306004 & +2.306004. So, we accept Null Hypothesis stating that variances are unequal.

Operating Cash Flow Margin & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.306004 & +2.306004. So, we accept Null Hypothesis stating that variances are unequal.

EPS & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.446912 & +2.446912. So, we accept Null Hypothesis stating that variances are unequal.

P/E & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & Working Capital Turnover Variance is Equal)

Here, t Stat value doesn't lie between -2.446912 & +2.446912. So, we accept Null Hypothesis stating that variances are unequal.

Exhibit –25: t-test: two-sample assuming unequal variances – hero motor

	ROCE	**ROE**	**OP CF/T/O**	**EPS**	**P/E**	**WC T/O**
Mean	45.24667	33.31186	14.524	147.1217	19.18333	12.66845
Variance	33.72007	17.07187	12.65649	1525.747	3.501667	43.2176
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	10	8	8	5	6	
t Stat	**9.097739**	**6.512329**	**0.608058**	**8.31458**	**2.334718**	
P(T<=t) one-tail	1.88E-06	9.28E-05	0.280006	0.000206	0.029132	
t Critical one-tail	1.812461	1.859548	1.859548	2.015048	1.94318	
P(T<=t) two-tail	3.75E-06	0.000186	0.560011	0.000411	0.058263	
t Critical two-tail	**2.228139**	**2.306004**	**2.306004**	**2.570582**	**2.446912**	

ROCE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.228139 & +2.228139. So, we accept Null Hypothesis stating that variances are unequal.

ROE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.306004 & +2.306004. So, we accept Null Hypothesis stating that variances are unequal.

Operating Cash Flow Margin & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.306004 & +2.306004. So, we reject Null Hypothesis stating that variances are equal.

EPS & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.570582 & +2.570582. So, we accept Null Hypothesis stating that variances are unequal.

P/E & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & Working Capital Turnover Variance is Equal)

Here, t Stat value lies between -2.446912 & +2.446912. So, we reject Null Hypothesis stating that variances are equal.

Exhibit –26: T-Test: Two-Sample Assuming Unequal Variances – Mahindra & Mahindra

	ROCE	ROE	OP CF/T/O	EPS	P/E	WC T/O
Mean	17.10725	15.10272	2.7855	60.73167	18.43667	9.071821
Variance	7.558963	19.37453	5.625499	116.4532	5.829667	3.308077
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	9	7	9	5	9	
t Stat	**5.970755**	**3.101779**	**-5.15181**	**11.563**	**7.588514**	
P(T<=t) one-tail	0.000105	0.00864	0.000301	4.24E-05	1.68E-05	
t Critical one-tail	1.833113	1.894579	1.833113	2.015048	1.833113	
P(T<=t) two-tail	0.00021	0.017279	0.000602	8.49E-05	3.37E-05	
t Critical two-tail	**2.262157**	**2.364624**	**2.262157**	**2.570582**	**2.262157**	

ROCE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.262157 & +2.262157. So, we accept Null Hypothesis stating that variances are unequal.

ROE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.364624 & +2.364624. So, we accept Null Hypothesis stating that variances are unequal.

Operating Cash Flow Margin & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.262157 & +2.262157. So, we accept Null Hypothesis stating that variances are unequal.

EPS & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.570582 & +2.570582. So, we accept Null Hypothesis stating that variances are unequal.

P/E & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & Working Capital Turnover Variance is Equal)

Here, t Stat value doesn't lie between -2.262157 & +2.262157. So, we accept Null Hypothesis stating that variances are unequal.

Exhibit –27: T-Test: Two-Sample Assuming Unequal Variances – Maruti

	ROCE	**ROE**	**OP CF/T/O**	**EPS**	**P/E**	**WC T/O**
Mean	22.51038	16.95617	15.74635	193.0533	24.98333	-42.6138
Variance	14.57437	6.207344	9.623564	5353.768	26.53367	4337.003
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	5	5	5	10	5	
t Stat	**2.418211**	**2.2141**	**2.168281**	**5.864019**	**2.506596**	
P(T<=t) one-tail	0.030125	0.038851	0.041161	7.93E-05	0.027026	
t Critical one-tail	2.015048	2.015048	2.015048	1.812461	2.015048	
P(T<=t) two-tail	0.06025	0.077703	0.082322	0.000159	0.054052	
t Critical two-tail	**2.570582**	**2.570582**	**2.570582**	**2.228139**	**2.570582**	

ROCE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.570582 & +2.570582. So, we reject Null Hypothesis stating that variances are equal.

ROE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.570582 & +2.570582. So, we reject Null Hypothesis stating that variances are equal.

Operating Cash Flow Margin & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.570582 & +2.570582. So, we reject Null Hypothesis stating that variances are equal.

EPS & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & Working Capital Turnover, Variance is Equal)

Here, t Stat value doesn't lie between -2.228139 & +2.228139. So, we accept Null Hypothesis stating that variances are unequal.

P/E & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between P/E & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between P/E & Working Capital Turnover Variance is Equal)

Here, t Stat value lies between -2.570582 & +2.570582. So, we reject Null Hypothesis stating that variances are equal.

Exhibit –28: t-test: two-sample assuming unequal variances – TATA motors

	ROCE	**ROE**	**OP CF/T/O**	**EPS**	**P/E**	**WC T/O**
Mean	7.828926	5.008774	12.55945	13.99833	9.7	137.2468
Variance	122.7774	721.0945	14.98169	2420.981	47.096	45198.96
Observations	6	6	6	6	6	6
Hypothesized Mean Difference	0	0	0	0	0	
df	5	5	5	6	5	
t Stat	**-1.48908**	**-1.51158**	**-1.43636**	**-1.38345**	**-1.46877**	
P(T<=t) one-tail	0.098321	0.09552	0.105196	0.1079	0.100916	
t Critical one-tail	2.015048	2.015048	2.015048	1.94318	2.015048	
P(T<=t) two-tail	0.196643	0.191041	0.210393	0.215801	0.201832	
t Critical two-tail	**2.570582**	**2.570582**	**2.570582**	**2.446912**	**2.570582**	

ROCE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROCE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROCE & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.570582 & +2.570582. So, we reject Null Hypothesis stating that variances are equal.

ROE & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROE & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROE & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.570582 & +2.570582. So, we reject Null Hypothesis stating that variances are equal.

Operating Cash Flow Margin & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between ROTA & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between ROTA & Working Capital Turnover, Variance is Equal)

Here, t Stat value lies between -2.570582 & +2.570582. So, we reject Null Hypothesis stating that variances are equal.

EPS & Working Capital Turnover

H_0: $\mu_1^2 = \mu_2^2$ (There is significant relationship between EPS & Working Capital Turnover, Variance is not Equal)

H_1: $\mu_1^2 \neq \mu_2^2$ (There is significant no relationship between EPS & Working Capital Turnover, Variance is Equal)
Here, t Stat value lies between -2.446912 & +2.446912. So, we reject Null Hypothesis stating that variances are equal.

P/E & Working Capital Turnover

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

Conclusion

Management of working capital is a component of Financial Management. Since, Working capital is the amount of capital required for running the operating activities hence, it is also be called operating capital, capital required to manage the daily operations. It measures efficiency, profitability and liquidity of a firm.
Working capital requirement is based on several factors like: size and nature of the business, credit policy: credit allowed and credit availed, length of operating cycle, operating efficiencies, sources & cost of procuring short term loans, business cycle, level of competition, seasonal variations etc. The objective behind working capital management is to ensure continuity in the operations of a firm and ensure that a firm has sufficient fund to manage its daily operations and repay its short term debts in time.

The study reveals that

1. Ashok Leyland reported maximum CAGR of 23.2% followed by Maruti, indicating the maximum growth in Revenue. F value (300.3469) is more than the table value (2.53355) so; null hypothesis is rejected indicating Revenue differs over the years.
2. Ashok Leyland reported maximum CAGR of 25% followed by Maruti, indicating the maximum growth in Operating Profit Margin. F value (16.135) is more than the table value (2.53355) therefore null hypothesis is rejected indicating Operating Profit Margin Revenue differs over the years.
3. Maruti reported the Maximum CAGR of 6.9% followed by Hero Motors, indicating the maximum growth in Net Profit Margin. F value (16.882) is more than the table value (2.53355) therefore null hypothesis is rejected indicating Net Profit Margin Revenue differs over the years.
4. Hero Motor reported the Maximum CAGR of 28.7% indicating the maximum growth in Working Capital. F value (5.7596) is more than the table value (2.53355) therefore null hypothesis is rejected indicating, Working Capital of the Automobile Companies differs over the years.
5. Bajaj depicted the maximum mean in terms of Current Ratio followed by Hero Motors & Mahindra & Mahindra. F value (8.98702) is more than the table value (2.53355) therefore null hypothesis is rejected indicating, Current Ratio of the Automobile Companies differs over the years.
6. Bajaj depicted the maximum mean in terms of Liquid Ratio Hero Motors. F value (10.403) is more than the table value (2.53355) therefore null hypothesis is rejected indicating Liquid Ratio of the Automobile Companies differs over the years.
7. Bajaj depicted the maximum mean in terms of Operating Cash Flow Margin followed by Maruti, Hero Motor & Tata Motors. F value (23.18589) is more than the table value (2.53355) therefore null hypothesis is rejected indicating Operating Cash Flow Margin of the Automobile Companies differs over the years.
8. Ashok Leyland reported the Maximum CAGR of 92.37% indicating the maximum growth in Working Capital Turnover. F value (2.42038) is less than the table value (2.53355) therefore null hypothesis is accepted indicating Working Capital Turnover of the Automobile Companies does not differ over the years.
9. Ashok Leyland had the Maximum CAGR of 7.82% indicating the maximum growth in Inventory Turnover over the period. F value (109.0175) is more than the table value (2.53355) therefore null hypothesis is rejected indicating Inventory Capital Turnover of the Automobile Companies does not differ over the years

10. Maruti depicted the maximum mean in terms of Receivables Turnover followed by Ashok Leyland & Bajaj. F value (15.3539) is more than the table value (2.53355) therefore null hypothesis is rejected; indicating Receivables Turnover of the Automobile Companies differs over the years.
11. Ashok Leyland depicted the maximum mean in terms of Payables Turnover which indicates the minimum time taken to clear off the dues of the Creditors. It is followed by Hero Motor, Maruti &b Bajaj. F value (21.01073) is more than the table value (2.53355) therefore null hypothesis is rejected: indicating Payables Turnover of the Automobile Companies differs over the years.

T-Test conducted revealed that

1. **ROCE & Working Capital Turnover:** Ashok Leyland, Maruti, Tata Motors: Null Hypothesis is rejected stating that variances are equal. Bajaj, Hero Motor, Mahindra & Mahindra: Null Hypothesis is accepted stating that variances are unequal
2. **ROE & Working Capital Turnover:** Ashok Leyland, Maruti, Tata Motors: Null Hypothesis is rejected stating that variances are equal. Bajaj, Hero Motor, Mahindra & Mahindra: Null Hypothesis is accepted stating that variances are unequal
3. **Operating C/F Margin & Working CAP T/O:** Ashok Leyland, Hero Motor, Maruti, Tata Motors: Null Hypothesis is rejected stating that variances are equal. Bajaj, Mahindra & Mahindra: Null Hypothesis is accepted stating that variances are unequal
4. **EPS & Working Capital Turnover:** Ashok Leyland, Tata Motors: Null Hypothesis is rejected stating that variances are equal. Bajaj, Hero Motor, Mahindra & Mahindra, Maruti: Null Hypothesis is accepted stating that variances are unequal
5. **P/E & Working Capital Turnover:** Ashok Leyland, Hero Motor, Maruti, Tata Motors: Null Hypothesis is rejected stating that variances are equal. Bajaj, Mahindra & Mahindra: Null Hypothesis is accepted stating that variances are unequal

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