

INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, ECONOMICS AND MANAGEMENT

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JUDGING THE SHORT TERM SOLVENCY OF SELECTED INDIAN AUTOMOBILE SECTOR COMPANIES

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ABSTRACT

This empirical study of ten auto mobile companies in India demonstrates the significance of inferential statistics in analyzing and solving complex business problems. The accounting techniques of ratio analysis have been used in conjunction with the techniques of inferential statistics to draw the inferences regarding short-term solvency of the company selected for the study. Decide the main liquidity ratios, the relevant turnover ratios have also been used to know how quickly different components of current assets are converted into cash so as to maintain liquidity in the business. In addition, statistical tools like mean, Standard Deviation, Coefficient of Variance (CV), Analysis of Variance (ANOVA) and Student's T—test of hypothesis testing has been applied. Thus, this study focuses on the pertinence of statistical tools in evaluating the short-term financial strength of the selected companies in conjunction with the relevant liquidity and turnover ratio. In the end, study offers some meaningful suggestions in order to improve the short-term solvency of the automobile companies selected for this study.

KEYWORDS

Automobile Sector, Liquidity Ratios, Short Term Financial Strength, Short Term Solvency Ratios, Turnover Ratios

INTRODUCTION

Inferential statistics cover those methods which help in drawing inferences on the characteristics of the population, on the basis of a sample (Sancheti and Kapoor, 2007). It is an applied branch of statistics that helps in generalization of facts representing the population. These inferences are drawn for specific purposes, e.g., efficiency of management, strengths and weaknesses of the firm, cost and profit relationship, etc. with inferential statistics, we try to reach conclusion that extended beyond the immediate data alone. For instance, we use inferential statistics to infer from the sample data what the population might think. Or, we use inferential statistics to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. Thus, we use inferential statistics to make inferences from data of more general conditions (William, 2006). Liquidity is a prerequisite for the very survival of a business unit. Liquidity represents the ability of the business concern to meet the short-term obligation when they fall due for payment (Vinayakam and Sinha, 2000). The term 'liquidity' implies conversion of assets into cash without much loss (Rao and Subbarayudu, 2000). The creditors of the firm are interested in short-term solvency or liquidity of a firm (Khan and Jain, 2007). The short term debt paying capacity of the firm would be satisfactory, if it is in a position to meet its short-term debts when they fall due. Ratio analysis, ratios are of crucial significance. The importance of ratio analysis lies in the fact that it enables in drawing inferences regarding performance of a company as it shows facts logically on a company in respect of different aspects such as liquidity position, long –term, solvency, profitability, operating efficiency, etc. (Khan & Jain, 2007). Thus, it is used to interpret the financial statements in order to ascertain the strengths and weakness of a firm. The present study analyzes the short-term debt

OBJECTIVES OF THE STUDY

Following are the major objectives of the study:

- To get overview of Indian auto sector and selected ten leading auto sector companies of India.
- To work out the overall quantum of liquidity maintained and to compare it among the selected companies.
- To evaluate the short-term solvency position of the selected companies.
- To determine the relative position (rank) of the sample companies in order of liquidity maintained by them.
- To find out how quickly different current assets are converted into cash by the selected companies using relevant turnover ratio.
- To infer whether the difference in diverse liquidity ratio between and within the selected sample companies is significant or not by applying the statistical technique of Analysis of Variance (ANOVA)
- To test the significance of the difference in the mean liquidity ratios between two sample companies by employing the student's t-test.

SAMPLE DESIGN

The current study has been carried out by taking a sample of ten leading auto companies in India, viz., Tata Motors, Mahindra & Mahindra, Bajaj Auto, Maruti Suzuki, Hero Honda Motors, Cummins India Ltd., Exide Industries, Bharat Forge, Ashok Leyland, Apollo Tyre. The reason for selecting these companies is that they all maintain their accounts financial year-wise and leading companies in auto sector. On 31st December, 2010 researchers selected companies on the basis of his market capitalization. The relevant data have been mainly gathered from the published annual reports and accounts of the selected auto companies. The other sources which have been used are technical and trade journals, newspapers and other published information. The study covers a period of five years, from 2005-06 to 2009-10.

RESEARCH METHODOLOGY

- The researchers have used a descriptive statistic during the research process to calculate the various ratio analyses.
- The researchers have applied the influential statistic method in the study, i.e. Mean, SD, Coefficient, ANOVA and T-test etc.
- The study is broadly devoted to the application of different techniques of inferential statistics in the analysis of liquidity position of ten auto companies in India.
- Liquidity Ratios used for the study: Current ratio and Quick ratio
- Turnover ratios used for the study: Debtor turnover ratio, Stock turnover ratio, Current assets turnover ratio and Net working capital turnover ratio
- Statistical tools used for the study: Mean, SD, Coefficient of variance, ANOVA and T-test

HYPOTHESIS

In present era of science, logic and technology, it is not possible to draw any conclusion accurately without proving it objectively. To test the validity of the inferences draw on the basis of liquidity ratios and the relevant turnover ratios used in this research study, statistical technique of hypothesis testing has been applied to determine whether the inferences drawn on the basis of liquidity ratio are true or false at a specified level of significance (Levin I Richard, 1995) Hypothesis testing enable a decision maker to draw inferences more precisely (Elhance, 2007) testing hypothesis and essential part of the study of inferential statistics because it enables the research's to confidently examine the accuracy of their results (Sadhu A N, 1996). Several hypotheses have been formulated and tested statistically to draw conclusion on the liquidity of the selected companies. The following hypothesis has been set and tested in the present research.

HO: There is no significance difference between the diverse liquidity aspects of the selected auto companies.

H1: There is significance difference between the diverse liquidity aspects of the selected auto companies.

LIQUIDITY RATIO AND TURNOVER RATIO

Ratio analysis is an important technique of financial analysis. It is the process of determining and interpreting numerical relationship between figures of the financial statement (Guthman H G, 1995). All the current and quick ratio are the tools for examining the liquidity position of a firm as a whole, another aspect of evaluating the liquidity is to see how quickly different current Asset are converted in to cash. The ratio which measures this aspect are referred to as turn over ratios. As a matter of fact, liquidity ratios are not independent of the relevant turnover ratios. In the present study, liquidity ratios have been calculated along with the relevant turnover ratios to assess the short term financial position of selected companies. Table 1 also present four important turnover ratios - STR, DTR, CATR and NWCTR - to examine the liquidity position of the selected auto companies with respect to the speed with which current assets and its components are converted into cash.

TAB	TABLE 1: MEAN LIQUIDITY AND TURNOVER RATIOS									
COMPANY	CR	QR	ITR	DTR	CATR	NWCTR				
APOLLO	0.976	0.874	8.91	26.506	2.5991	9.183				
ASHOK	1.166	0.716	6.258	12.436	2.3954	9.2771				
BAJAJ	0.808	0.674	31.572	27.3625	3.4801	-16.2929				
BHARAT	1.186	1.336	10.022	7.674	1.109	0.3554				
CUMMINS	1.782	1.232	7.608	4.88	2.1155	2.4963				
EXIDE	1.108	0.492	7.144	14.396	4.0148	11.6299				
HERO HONDA	0.516	0.374	41.628	64.16	9.99	-9.4242				
MARUTI	1.3	1.008	23.856	25.316	4.7763	108.867				
M&M	1.078	0.856	13.232	14.22	2.7893	17.0825				
TATA MOTORS	0.69	0.714	12.464	25.824	2.5446	-2.3257				

Source: calculated from the Annual reports of all the selected companies, from 2006 to 2010

- It is clear from Table 1 that the current ratio in Cummins is highest, followed by those of Maruti, Bharat forge, Ashok Leyland, Exide, M&M, Apollo, Bajaj, Tata Motors and Hero Honda during the period of the study. It is around 1:1 in all the ten auto companies selected for this study. Thus, it can be conclude that the liquidity condition of all sample companies is quite satisfactory.
- It is also evident from Table 1 that the quick ratio in Bharat forge highest, followed by those of Cummins, Maruti, Apollo, M&M, Ashok Leyland, Tata Motors, Bajaj, Exide and Hero Honda during the study period. It is around 1:1 in all the ten auto companies selected for this study. It is thus, quit clear that the short term financial strength of all the sample companies is very good.
- It is, however, important to note here that very high liquidity ratios (current and quick) may be considered to be good from the point of view of the creditors, but it may be indicative of slack management practices of a company, as it singles excessive inventories, poor credit standards and lenient collection policies pursued by company and company may not be making full use of its borrowing capacities (Spiller E A, 1977). Thus, a company should always maintain reasonable level of current/liquid assets in respect to its current liabilities.
- It is evident from Table 1 that Hero Honda quite efficiently converts its current assets into cash as, all the four turnover ratios of this company are more than the corresponding turnover ratios of other four sample companies during the period of study. It is thus clear that inventory management, receivables management and overall current assets management of Hero Honda are quite effective and help the company in maintaining a good quantum of liquidity.
- Table 1 also reveals that Bharat Forge is inefficient in converting current assets into cash as all the four turnover ratios of this company are lower than the corresponding turnover ratios of the other nine auto companies. It is therefore concluded that the inventory management, credit management, collection policy and overall current assets management of Hero Honda are quite sloppy and as a result the speed with which the current assets and its component are rotated is slow.
- It can also be observed from Table 1 that the performance of Maruti, Exide, Bajaj, M&M, Apollo, Tata Motors, Ashok Leyland and Cummins in respect of ability to convert current assets into cash is reasonably good, as is clear from the four turnover ratios used for this purpose.

RANKING OF THE SELECTED COMPANIES

In the paper an attempt has been made to evaluate the relative short financial position of the selected ten auto companies. For this purpose, ranks have been provided on the basis of mean liquidity and turnover ratios in descending order. Then, all the ranks given to each company are added and final ranks have been

worked out on the basis of total ranks indicating the relative liquidity positions of the selected sample companies.

It is evident from Table 2 that Maruti occupies the first position, followed by M&M, Hero Honda, Apollo, Bajaj, Exide, Bharat Forge, Cummins, Ashok Leyland and Tata Motors, in maintaining their short-term solvency position during the period under reference.

TABLE 2: OVERALL RANKING OF SELECTED COMPANIES ON THE BASIS OF THE CALCULATED MEAN RATIO

COMPANY	CR	QR	STR	DTR	CATR	NWCTR	TOTAL RANKS	RANKS
APOLLO	7	4	7	3	6	5	32	3.5
ASHOK	4	6	10	8	8	4	40	9.5
BAJAJ	8	8	2	2	4	10	34	5
BHARAT	3	1	6	9	10	7	36	7.5
CUMMINS	1	2	8	10	9	6	36	7.5
EXIDE	5	9	9	6	3	3	35	6
HERO HONDA	10	10	1	1	1	9	32	3.5
MARUTI	2	3	3	5	2	1	16	1
M&M	6	5	4	7	5	2	29	2
TATA MOTORS	9	7	5	4	7	8	40	9.5

Source: calculated from the annual reports of all the selected companies, from 2006 to 2010

TWO - WAY ANALYSIS OF VARIANCE

Two – way ANOVA is used to test the significance of difference in the liquidity ratios within a sample company during the study period and also to examine the significance of difference in the liquidity ratios between selected sample companies simultaneously. With two – factor ANOVA, two sets of hypotheses can be tested with the same data at the same time (Gupta S P, 2008). The following hypotheses have been formulated for the purpose:

- H01: There is no significant difference in the liquidity ratios within a sample company during the previous years of study.
- H11: There is significant difference in the liquidity ratios within a sample company during the previous years of study
- H02: There is no significant difference between the liquidity ratios of different companies selected for this study.
- H12: There is significant difference between the liquidity ratios of different companies selected for this study.

INTRA - FIRM COMPARISON (WITHIN SAMPLE)

Intra-firm comparison involves comparing the ratios of a company over a period of time. It reflects the relative performance of a company from year to year. Table presents the results of ANOVA along with the conclusion whether the null hypotheses are accepted or rejected. Table show that the calculated-ratios are lower than the critical F-ratios in case of debtor turnover ratio, thus null hypothesis (H01) is accepted at 5% level of significance, which implies that there is no significance difference in debtor turnover ratio during study period in all selected companies. However, the calculated F-ratios are higher than the critical F-ratios in case of current ratio, quick ratio, inventory turnover ratio, current assets turnover ratio and net working capital turnover ratios of all the companies. Thus null hypothesis (H01) is rejected at 5% level of significance, which implies that there is significance difference in current ratio, quick ratio, inventory turnover ratio, current assets turnover ratio and net working capital turnover ratios of all selected companies over the study period.

INTER - FIRM COMPARISON (BETWEEN SAMPLE)

Inter-firm comparison involves comparing the ratios of a company with those of others in same industries. It reflects a company's performance relative to its competitor. It is evident from Table that that calculated F-ratios are lower than the critical F-ratios in case of current ratio, , debtor turnover, current assets turnover ratio and net working capital turnover ratios, thus null hypothesis (H02) is accepted at 5% level of significance, which implies that there is no significance difference between the liquidity position of all the selected companies in term of current ratio, , debtor turnover, current assets turnover ratio and net working capital turnover ratios that used in during study period. However, the calculated F-ratios are higher than the critical F-ratios in case of quick ratio and inventory turnover ratio of all the companies. Thus, the null hypothesis (H02) is rejected at 5% level of significance, which implies that there is significance difference between the liquidity position of all companies in term of quick ratio and inventory turnover ratio, of liquidity used in this study.

TABLE 3: RESULTS OF TWO-WAY ANOVA

Ratios	Source of Variation	SS	Df	MS	F	F crit	Result h0 is
CR	Rows	5.56005	9	0.6177833	16.438423	2.152607472	Rejected
	Columns	0.26226	4	0.065565	1.74460065	2.633532094	Accepted
	Error	1.35294	36	0.0375817			
	Total	7.17525	49				
QR	Source of Variation	SS	Df	MS	F	F crit	Result h0 is
	Rows	4.124232	9	0.458248	26.5220512	2.152607472	Rejected
	Columns	0.422272	4	0.105568	6.10996643	2.633532094	Rejected
	Error	0.622008	36	0.017278			
	Total	5.168512	49				
ITR	Source of Variation	SS	Df	MS	F	F crit	Result h0 is
	Rows	6550.83396	9	727.87044	77.5479633	2.152607472	Rejected
	Columns	131.8556	4	32.9639	3.51200319	2.633532094	Rejected
	Error	337.89844	36	9.3860678			
	Total	7020.588	49				
DTR	Source of Variation	SS	Df	MS	F	F crit	Result h0 is
	Rows	12801.56736	9	1422.3964	9.51836566	2.152607472	Accepted
	Columns	966.9782155	4	241.74455	1.61770172	2.633532094	Accepted
	Error	5379.733379	36	149.43704			
	Total	19148.27896	49				
CATR	Source of Variation	SS	Df	MS	F	F crit	Result h0 is
	Rows	275.2470771	9	30.583009	24.3624814	2.152607472	Rejected
	Columns	3.253999509	4	0.8134999	0.64803551	2.633532094	Accepted
	Error	45.19196094	36	1.2553322			
	Total	323.6930376	49				
NWCTR	Source of Variation	SS	Df	MS	F	F crit	Result h0 is
	Rows	76708.33961	9	8523.1488	2.43536531	2.152607472	Rejected
	Columns	15828.12419	4	3957.031	1.13066383	2.633532094	Accepted
	Error	125990.6912	36	3499.7414			
	Total	218527.155	49				

Note: SS: Sum of squares; MS: Mean Square; and SSE: Sum of squares of Errors

Sources: calculated from the Annual Reports of all the selected companies, from 2005-06 to 2009-10

STUDENT T-TEST LIQUIDITY RATIOS

The student's t-test has also been applied on both the liquidity ratios (current and quick ratios) by making 45 different combinations of two companies from the selected 10 sample companies, for examining the intercompany liquidity position s and also to determine the significance of difference in current ratio and quick ratio of the companies. For this purpose, total 90 different hypotheses (45 current ratio and 45 quick ratios) have been formulated and statistically tested at 5% level of significance. Table presents the results of this test along with the conclusion whether the null hypotheses have been accepted or rejected.

TABLE 4: RESULTS OF STUDENT'S T-TEST (LIQUIDITY RATIOS)

	AP-AS	AP-BJ	AP-BH	AP-CU	AP-EX	AP-HO	AP-MA	AP-MM	AP-TM
НО	μa=μas	μa=μb	μa=μbh	μа=μс	μа=μе	μa=μh	μа=μт	μа=μтт	μa=μt
H1	μα-μας μα>μαs	μα-μb μα>μb	μα-μυπ μα>μbh	µа-µс µа>µс	µа-µе µа>µе	μα-μπ μα>μh	μα-μιιι μα>μm	μα-μιιιιι μα>μmm	μα-μτ μα>μt
Critical Value	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
CV CR	1.370850	1.324666	1.124122	1.768363	0.844736	1.790789	1.027803	0.637763	1.148593
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV QR	1.281315	1.411706	1.583561	1.603861	1.718293	1.792792	0.570520	0.177791	0.846889
	AS-BJ	AS-BH	AS-CU	AS-EX	AS-HO	AS-MA	AS-MM	AS-TM	BJ-BH
НО	μas=μb	μas=μbh	μas=μc	μas=μe	μas=μh	μas=μm	μas=μmm	μas=μt	μb=μbh
H1	μas<μb	μas<μbh	μas<μc	μas<μe	μas<μh	μas<μm	μas<μmm	μas>μt	μb>μbh
Critical Value	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
CV CR	1.761342	0.140627	1.707426	0.432560	1.860699	0.497089	0.589204	1.507625	1.557948
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Rejected	Accepted	Accepted	Accepted	Accepted
CV QR	0.548085	1.726044	1.773998	1.614527	1.771997	1.101421	1.276602	0.012648	1.740465
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
	BJ-CU	BJ-EX	ВЈ-НО	BJ-MA	BJ-MM	BJ-TM	BH-CU	BH-EX	вн-но
но	μb=μc	μb=μe	μb=μh	μb=μm	μb=μmm	μb=μt	μbh=μc	μbh=μe	μbh=μh
H1	μb>μc	μb>μe	μb<μh	μb<μm	μb<μmm	μb <mark>>μt</mark>	μbh<μc	μbh<μe	μbh<μh
CV	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
CV CR	1.817029	1.479671	1.763465	1.344131	1.359072	0.592399	1.610850	0.434670	1.772808
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV QR	3.158828	0.450278	3.120001	0.839416	0.776710	0.221899	0.588742	1.796404	1.820014
Result: H0 is	Rejected	Accepted	Rejected	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
	BH-MA	вн-мм	BH-TM	CU-EX	CU-HH	CU-MA	CU-MM	CU-TM	EX-HH
НО	μbh=μm	μbh=μmm	μbh=μt	μс=μе	μc=μh	μс=μm	μс=μmm	μc=μt	μe=μh
H1	μbh<μm	μbh<μmm	μbh>μt	μс<μе	μc<μh	μс<μт	μc<μmm	μc>μt	μe<μh
Critical Value	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
CV CR	0.391578	0.562514	1.440552	1.677994	1.850617	1.243189	1.678412	1.757424	1.765648
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV QR	1.069590	1.616814	1.605848	1.830801	1.849546	0.868707	1.651978	1.594866	1.227200
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
	EX-MA	EX-MM	EX-TM	НН-МА	HH-MM	HH-TM	MA-MM	MA-TM	MM-TM
но	μе=μm	μе=μтт	μe=μt	μh=μm	μh>μmm	μh>μt	μm>μmm	μm>μt	μmm>μt
H1	μe<μm	μe<μmm	μe>μt	μh<μm	μh<μmm	μh<μt	μm<μmm	μm<μt	μmm<μt
Critical Value	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
CV CR	0.646075	0.170938	1.351367	1.612336	1.726884	0.837363	0.720731	1.360134	1.278704
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV QR	1.482307	1.735214	1.119668	1.593382	1.806583	1.421832	0.648681	0.975023	0.787742
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted

Note: S ignificance Level 5%; Degree of Freedom (n-1): and Type of test: One Tailed

Source: Calculated From the Annual Report and Account of the Selected Companies, from 2005-06 to 2009-10

It is evident from Table 4 that out of 45 different combinations made for the intercompany comparison of current ratio, in 44 combinations the null hypotheses of no significant difference have been accepted, which implies that the difference in mean current ratio is insignificant at 5% level of significance. In rest of the one combination, the null hypotheses are rejected, which reveals that there is a significant difference in the mean current ratio at 5% level of significance. It can also be seen from that out of 45 different combinations made for the intercompany comparison of quick ratio, in 43 combinations the null hypotheses of no significant difference are accepted, which reveals that the difference in mean quick ratio is insignificant at 5% level of significance. In rest of the two combinations, the null hypotheses are rejected, which implies that there is a significant difference in the mean quick ratio at 5% level of significance.

TURNOVER RATIOS

The Student's t-test has also been applied on four turnover ratios by making 45 different combinations of two companies, for examining inter companies, for examining intercompany liquidity positions and the significance of difference in the turnover ratios of each combination at 5% level of significance. For this purpose, total 180 different hypotheses (45 for each of the four turnover ratios) have been formulated and statistically tested Table present the conclusion whether the null hypotheses have been accepted or rejected.

TABLE 5: RESULTS OF STUDENT'S T-TEST (TURNOVER RATIOS)

	AP-AS	AP-BJ	AP-BH	AP-CU	AP-EX	AP-HO	AP-MA	AP-MM	AP-TM
НО	µа=µas	μа=μb	μa=μbh	μа=μс	μа=μе	μа=μh	μа=μm	μа=μmm	µа=µt
H1	μa>μas	μa>μb	μa>μbh	μа>μс	μа>μе	μa>μh	μa>μm	μa>μmm	μa>μt
Critical Value	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
CV ITR	1.211943	1.843680	0.373386	0.746632	0.832003	1.864541	1.618232	1.252471	1.335767
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Rejected	Accepted	Accepted	Accepted
CV DTR	1.224124	0.092226	0.066017	1.532846	1.139768	1.173095	0.130131	1.162037	0.070473
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV CA T/O	0.501390	1.040235	1.829192	1.494291	1.583261	1.733655	1.286465	0.730944	0.173888
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV NWA T/O	0.012864	1.529788	1.329292	1.133108	0.480988	1.691174	0.832468	0.897817	1.167339
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
itesuiti iio is	AS-BJ	AS-BH	AS-CU	AS-EX	AS-HO	AS-MA	AS-MM	AS-TM	ВЈ-ВН
но	μas=μb	μas=μbh	μas=μc	μas=μe	μas=μh	μas=μm	μas=μmm	μas=μt	μb=μbh
H1	μας-μυ μας<μb	μας-μυτί μας<μbh	μαs-μc μas<μc	μas-μe μas<μe	μας-μη μας<μh	μas<μm	μas<μmm	μας-μτ μας>μt	μb>μbh
Critical Value	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
CV ITR	1.862222	1.144594	1.129260	0.595993	1.873488	1.696270	1.617404	1.746836	1.811795
Result: H0 is	Rejected	Accepted	Accepted	Accepted	Rejected	Accepted	Accepted	Accepted	Accepted
CV DTR	1.601458	1.227542	1.544493	0.535880	1.424444	6.260818	0.573425	1.476191	1.758528
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV CA T/O	1.137864	1.679365	3.416531	1.579233	1.737620	1.330481	0.925865	0.348393	1.661365
Result: H0 is	Accepted	Accepted	Rejected	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV NWA T/O	1.508047	1.220930	1.022149	0.400077	1.634797	0.831578	0.842487	1.123606	1.350884
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
Result. 110 is	BJ-CU	BJ-EX	ВЈ-НО	BJ-MA	BJ-MM	BJ-TM	BH-CU	BH-EX	ВН-НО
но	μb=μc	μb=μe	μb=μh	μb=μm	μb=μmm	μb=μt	μbh=μc	μbh=μe	μbh=μh
H1	μb-μc μb>μc	μb-μe μb>μe	μb<μh	μb<μm	μb<μmm	μb-μt	μbh<μc	μbh<μe	μbh<μh
Critical Value	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
CV ITR	1.859756	1.855383	1.540723	0.713138	2.432109	7.805515	0.841321	0.910834	1.849318
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Rejected	Rejected	Accepted	Accepted	Accepted
CV DTR	1.791990	1.582234	1.187367	0.360321	1.621442	0.237269	1.631511	1.630450	1.481165
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV CA T/O	1.374645	0.617169	1.669683	0.829396	0.878310	1.066990	1.854099	1.815487	1.780352
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
CV NWA T/O	1.428900	1.630622	0.722328	0.990019	1.624807	1.080703	1.734807	1.844302	1.806910
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
itesuit. Ho is	BH-MA	ВН-ММ	BH-TM	CU-EX	CU-HH	CU-MA	CU-MM	CU-TM	EX-HH
НО	μbh=μm	μbh=μmm	μbh=μt	μс=μе	μc=μh	μc=μm			
H1	μbh<μm	μbh<μmm	μbh>μt	μс-μе μс<μе	μc-μπ μc<μh	μc-μm	μc=μmm μc<μmm	μc=μt μc>μt	μe=μh μe<μh
Critical Value	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
CV ITR	1.542279	0.870309	0.802014	0.347092	1.872344	1.669878	1.524930	1.694872	1.870053
Result: H0 is	Accepted		Accepted	Accepted	Rejected	Accepted	Accepted	Accepted	Rejected
CV DTR	1.752700	1.789063	1.680416	1.770194	1.508861	1.791020	1.866449	1.731409	1.403184
Result: H0 is	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Rejected	Accepted	Accepted
CV CA T/O	1.599494	1.860730	1.790067	1.725696	1.752403	1.426209	1.738373	1.266605	1.651639
CV CA 1/O								1.200003	1.031033
						_		Accented	Accented
Result: H0 is	Accepted	Rejected	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
Result: H0 is CV NWA T/O	Accepted 0.891140	Rejected 1.555443	Accepted 0.422622	Accepted 1.820015	Accepted 1.836121	Accepted 0.877349	Accepted 1.481197	0.721539	1.863703
Result: H0 is	Accepted 0.891140 Accepted	Rejected 1.555443 Accepted	Accepted 0.422622 Accepted	Accepted 1.820015 Accepted	Accepted 1.836121 Accepted	Accepted 0.877349 Accepted	Accepted 1.481197 Accepted	0.721539 Accepted	1.863703 Rejected
Result: H0 is CV NWA T/O Result: H0 is	Accepted 0.891140 Accepted EX-MA	Rejected 1.555443 Accepted EX-MM	Accepted 0.422622 Accepted EX-TM	Accepted 1.820015 Accepted HH-MA	Accepted 1.836121 Accepted HH-MM	Accepted 0.877349 Accepted HH-TM	Accepted 1.481197 Accepted MA-MM	0.721539 Accepted MA-TM	1.863703 Rejected MM-TM
Result: H0 is CV NWA T/O Result: H0 is	Accepted 0.891140 Accepted EX-MA μe=μm	Rejected 1.555443 Accepted EX-MM µe=µmm	Accepted 0.422622 Accepted EX-TM µe=µt	Accepted 1.820015 Accepted HH-MA µh=µm	Accepted 1.836121 Accepted HH-MM μh>μmm	Accepted 0.877349 Accepted HH-TM μh>μt	Accepted 1.481197 Accepted MA-MM µm>µmm	0.721539 Accepted MA-TM µm>µt	1.863703 Rejected MM-TM µmm>µt
Result: H0 is CV NWA T/O Result: H0 is HO	Accepted 0.891140 Accepted EX-MA μe=μm μe<μm	Rejected 1.555443 Accepted EX-MM μe=μmm μe<μmm	Accepted 0.422622 Accepted EX-TM µe=µt µe>µt	Accepted 1.820015 Accepted HH-MA μh=μm μh<μm	Accepted 1.836121 Accepted HH-MM μh>μmm	Accepted 0.877349 Accepted HH-TM μh>μt μh<μt	Accepted 1.481197 Accepted MA-MM μm>μmm	0.721539 Accepted MA-TM	1.863703 Rejected MM-TM µmm>µt µmm<µt
Result: H0 is CV NWA T/O Result: H0 is HO H1 Critical Value	Accepted 0.891140 Accepted EX-MA μe=μm μe<μm 1.86	Rejected 1.555443 Accepted EX-MM µe=µmm µe<µmm 1.86	Accepted 0.422622 Accepted EX-TM µe=µt µe>µt 1.86	Accepted 1.820015 Accepted HH-MA μh=μm μh<μm 1.86	Accepted 1.836121 Accepted HH-MM μh>μmm μ1.86	Accepted 0.877349 Accepted HH-TM μh>μt μh<μt 1.86	Accepted 1.481197 Accepted MA-MM μm>μmm μm<μmm 1.86	0.721539 Accepted MA-TM μm>μt μm<μt 1.86	1.863703 Rejected MM-TM μmm>μt μmm<μt 1.86
Result: H0 is CV NWA T/O Result: H0 is HO H1 Critical Value CV ITR	Accepted 0.891140 Accepted EX-MA μe=μm μe<μm 1.86 1.671274	Rejected 1.555443 Accepted EX-MM μe=μmm μe<μmm 1.86 1.513564	Accepted 0.422622 Accepted EX-TM μe=μt μe>μt 1.86 1.634839	Accepted 1.820015 Accepted HH-MA μh=μm μh<μm 1.86 1.642546	Accepted 1.836121 Accepted HH-MM μh>μmm μ1.86 1.155135	Accepted 0.877349 Accepted HH-TM μh>μt μh<μt 1.86 1.859763	Accepted 1.481197 Accepted MA-MM μm>μmm μm<μmm 1.86 1.408538	0.721539 Accepted MA-TM µm>µt µm<µt 1.86 1.490826	1.863703 Rejected MM-TM µmm>µt µmm<µt 1.86 0.316175
Result: H0 is CV NWA T/O Result: H0 is HO H1 Critical Value CV ITR Result: H0 is	Accepted 0.891140 Accepted EX-MA μe=μm μe<μm 1.86 1.671274 Accepted	Rejected 1.555443 Accepted EX-MM μe=μmm μe<μmm 1.86 1.513564 Accepted	Accepted 0.422622 Accepted EX-TM μe=μt μe>μt 1.86 1.634839 Accepted	Accepted 1.820015 Accepted HH-MA μh=μm μh<μm 1.86 1.642546 Accepted	Accepted 1.836121 Accepted HH-MM μh>μmm μh<μmm 1.86 1.155135 Accepted	Accepted 0.877349 Accepted HH-TM μh>μt μh<μt 1.86 1.859763 Accepted	Accepted 1.481197 Accepted MA-MM μm>μmm μπ<μmm 1.86 1.408538 Accepted	0.721539 Accepted MA-TM μm>μt μm<μt 1.86 1.490826 Accepted	1.863703 Rejected MM-TM µmm>µt µmm<µt 1.86 0.316175 Accepted
Result: H0 is CV NWA T/O Result: H0 is HO H1 Critical Value CV ITR Result: H0 is CV DTR	Accepted 0.891140 Accepted EX-MA μe=μm μe<μm 1.86 1.671274 Accepted 1.532663	Rejected 1.555443 Accepted EX-MM μe=μmm μe<μmm 1.86 1.513564 Accepted 0.059867	Accepted 0.422622 Accepted EX-TM μe=μt μe>μt 1.86 1.634839 Accepted 1.427086	Accepted 1.820015 Accepted HH-MA μh=μm μh<μm 1.86 1.642546 Accepted 1.227975	Accepted 1.836121 Accepted HH-MM μh>μmm μs-μmm 1.86 1.155135 Accepted 1.406400	Accepted 0.877349 Accepted HH-TM μh>μt μh<μt 1.86 1.859763 Accepted 1.212278	Accepted 1.481197 Accepted MA-MM μm>μmm μπ<μmm 1.86 1.408538 Accepted 1.583424	0.721539 Accepted MA-TM μm>μt μm<μt 1.86 1.490826 Accepted 0.081717	1.863703 Rejected MM-TM μmm>μt μmm<μt 1.86 0.316175 Accepted 1.466608
Result: H0 is CV NWA T/O Result: H0 is HO H1 Critical Value CV ITR Result: H0 is CV DTR Result: H0 is	Accepted 0.891140 Accepted EX-MA μe=μm μe<μm 1.86 1.671274 Accepted 1.532663 Accepted	Rejected 1.555443 Accepted EX-MM μe=μmm μe<μmm 1.86 1.513564 Accepted 0.059867 Accepted	Accepted 0.422622 Accepted EX-TM μe=μt μe>μt 1.86 1.634839 Accepted 1.427086 Accepted	Accepted 1.820015 Accepted HH-MA μh=μm μh<μm 1.86 1.642546 Accepted 1.227975 Accepted	Accepted 1.836121 Accepted HH-MM μh>μmm μ<μmm 1.86 1.155135 Accepted 1.406400 Accepted	Accepted 0.877349 Accepted HH-TM μh>μt μh<μt 1.86 1.859763 Accepted 1.212278 Accepted	Accepted 1.481197 Accepted MA-MM μm>μmm μπ<μmm 1.86 1.408538 Accepted 1.583424 Accepted	0.721539 Accepted MA-TM μη»μt μα<μt 1.86 1.490826 Accepted 0.081717 Accepted	1.863703 Rejected MM-TM μmm>μt μmm<μt 1.86 0.316175 Accepted 1.466608 Accepted
Result: H0 is CV NWA T/O Result: H0 is H0 H1 Critical Value CV ITR Result: H0 is CV DTR Result: H0 is CV CA T/O	Accepted 0.891140 Accepted EX-MA μe=μm μe<μm 1.86 1.671274 Accepted 1.532663 Accepted 0.555704	Rejected 1.555443 Accepted EX-MM μe=μmm μe<μmm 1.86 1.513564 Accepted 0.059867 Accepted 1.526697	Accepted 0.422622 Accepted EX-TM μe=μt μe>μt 1.86 1.634839 Accepted 1.427086 Accepted 1.578843	Accepted 1.820015 Accepted HH-MA μh=μm μh<μm 1.86 1.642546 Accepted 1.227975 Accepted 1.503432	Accepted 1.836121 Accepted HH-MM μh>μmm μ<μmm 1.86 1.155135 Accepted 1.406400 Accepted 1.726820	Accepted 0.877349 Accepted HH-TM μh>μt μh<μt 1.86 1.859763 Accepted 1.212278 Accepted 1.734620	Accepted 1.481197 Accepted MA-MM μm>μmm μπ<μmm 1.86 1.408538 Accepted 1.583424 Accepted 1.225580	0.721539 Accepted MA-TM μπ>μt μπ<μt 1.86 1.490826 Accepted 0.081717 Accepted 1.298271	1.863703 Rejected MM-TM μmm>μt μmm<μt 1.86 0.316175 Accepted 1.466608 Accepted 0.780866
Result: H0 is CV NWA T/O Result: H0 is HO H1 Critical Value CV ITR Result: H0 is CV DTR Result: H0 is CV CA T/O Result: H0 is	Accepted 0.891140 Accepted EX-MA μe=μm μe<μm 1.86 1.671274 Accepted 1.532663 Accepted 0.555704 Accepted	Rejected 1.555443 Accepted EX-MM με=μmm με<μmm 1.86 1.513564 Accepted 0.059867 Accepted 1.526697 Accepted	Accepted 0.422622 Accepted EX-TM μe=μt μe>μt 1.86 1.634839 Accepted 1.427086 Accepted 1.578843 Accepted	Accepted 1.820015 Accepted HH-MA μh=μm μh<μm 1.86 1.642546 Accepted 1.227975 Accepted 1.503432 Accepted	Accepted 1.836121 Accepted HH-MM μh>μmm μ<μmm 1.86 1.155135 Accepted 1.406400 Accepted 1.726820 Accepted	Accepted 0.877349 Accepted HH-TM μh>μt μh<μt 1.86 1.859763 Accepted 1.212278 Accepted 1.734620 Accepted	Accepted 1.481197 Accepted MA-MM μm>μmm μπ<μmm 1.86 1.408538 Accepted 1.583424 Accepted 1.225580 Accepted	0.721539 Accepted MA-TM μπ>μt μπ<μt 1.86 1.490826 Accepted 0.081717 Accepted 1.298271 Accepted	1.863703 Rejected MM-TM µmm>µt 1.86 0.316175 Accepted 1.466608 Accepted 0.780866 Accepted
Result: H0 is CV NWA T/O Result: H0 is H0 H1 Critical Value CV ITR Result: H0 is CV DTR Result: H0 is CV CA T/O	Accepted 0.891140 Accepted EX-MA μe=μm μe<μm 1.86 1.671274 Accepted 1.532663 Accepted 0.555704	Rejected 1.555443 Accepted EX-MM μe=μmm μe<μmm 1.86 1.513564 Accepted 0.059867 Accepted 1.526697	Accepted 0.422622 Accepted EX-TM μe=μt μe>μt 1.86 1.634839 Accepted 1.427086 Accepted 1.578843	Accepted 1.820015 Accepted HH-MA μh=μm μh<μm 1.86 1.642546 Accepted 1.227975 Accepted 1.503432	Accepted 1.836121 Accepted HH-MM μh>μmm μ<μmm 1.86 1.155135 Accepted 1.406400 Accepted 1.726820	Accepted 0.877349 Accepted HH-TM μh>μt μh<μt 1.86 1.859763 Accepted 1.212278 Accepted 1.734620	Accepted 1.481197 Accepted MA-MM μm>μmm μπ<μmm 1.86 1.408538 Accepted 1.583424 Accepted 1.225580	0.721539 Accepted MA-TM μπ>μt μπ<μt 1.86 1.490826 Accepted 0.081717 Accepted 1.298271	1.863703 Rejected MM-TM μmm>μt μmm<μt 1.86 0.316175 Accepted 1.466608 Accepted 0.780866

Note: S ignificance Level 5%; Degree of Freedom (n-1): and Type of test: One Tailed

Source: Calculated From the Annual Report and Account of the Selected Companies, from 2005-06 to 2009-10

It can be seen from Table 5 that out of total 180 hypotheses, in 10 cases the null hypotheses of no significant difference have been rejected, and it has been proved that the speed with which the different components of current assets are converted into cash is not equal. In other words, the inventory control, credit standards and collection policies of the companies are not equally efficient. It is, therefore, concluded that out of the selected companies some companies are more efficient than others. In the remaining 170 cases, the null hypotheses of no significant difference have been accepted at 5%level of significance, implying that they are at par and the difference is due to sample fluctuations only. The results of student's t-test are in line with our earlier conclusion drawn on the basis of ANOVA that liquidity management of the ten selected auto companies differs significantly.

CONCLUSION & SUGGESTIONS

Following are the major conclusion & suggestion:

- The mean current and quick ratios obtained are above 1:1, which reveals good liquidity position of all the companies selected for the study. However, it may be a signal of excessive inventories, poor credit standards and lax collection policies followed by the companies. It also indicates that the selected companies did not make good use of their borrowing capacities. It is, therefore, suggested that the sample companies should always keep reasonable level of current/liquid assets in respect to their current liabilities.
- All the mean turnover ratios of Maruti are highest among the selected auto companies, which exhibits the ability of Maruti to efficiently employ its
 different current assets in order to generate larger amount of sales and also to convert them into cash speedily. The mean turnover of the Cummins is
 lowest among the selected companies, which proves that the company failed in using its current assets in an efficient manner. It is, therefore, suggested
 the company should immediately review its inventory policy, credit standards and collections are managing their investments in different current assets
 satisfactorily.
- It is further clear from the ranking of the companies where Maruti occupies the first position in maintaining short-term solvency, followed by Mahindra and Mahindra, Apollo tyres, Hero Honda, Bajaj auto, Exide, Bharat forge, Cummins India, Ashok Leyland and Tata motors.
- The result of ANOVA make it clear that there are significance differences within a company's accounts and liquidity management practices followed by sample companies over the study period. However there are no significance differences between companies and liquidity management policies pursued by the selected companies. So, we can conclude that all the selected companies manage their liquidity position in different ways and means but use to manage it with Sample Company.
- The results of student's t-test of selected auto companies are managing their short term solvency position in different ways but there liquidity management is somewhat equally efficient.

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