

# Working Capital Structure and Liquidity Analysis: An Empirical Research on Andhra Pradesh Pharmaceutical Industry

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## Abstract

Working capital management is important part in firm financial management decision. Improper Management of Working capital, that is, too much or too low may suffer firms, so an optimum level of working capital is the key to a smooth inflow of profit. In this paper I investigate the relationship between liquidity and working capital structure. I used a sample of five Pharma companies listed at Bombay stock Exchange (BSE) for the period of 2007-2011. The results are obtained by using Canonical Correlation Analysis for identifying the relationship between working capital management and firms' performance. The findings show that working capital management has significant impact on firms' performance and it is concluded that managers can increase value of share holder and return on asset by reducing their inventory size, cash conversion cycle and net trading cycle. Increase in liquidity and time period to supplier will also lead firms' overall performance

Key words: Liquidity, working capital structure, profitability and trade cycle.

## 1. Introduction:

Thousands of companies fail each year due to poor working capital management practices. Entrepreneurs often don't account for short term disruptions to cash flow and are forced to close their operations. Many of these companies have viable business models, and would have otherwise succeeded had they better managed their working capital. The prime objective of any management is to make maximum profit. For attaining maximum profit which enables the organization to accomplish to other objectives of the business firms. Working capital management involves the administration of current assets of a firm namely cash, receivables, and inventory. An economic recession affects how organizations manage their liquidity in business. Two kinds of liquidity are market liquidity and funding liquidity.

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Market liquidity is the risks that market liquidity worse by that time want to sell or buy it. Market liquidity has ability to convert financial assets into cash at current market prices. Next, funding liquidity is the risk when a dealer cannot support their position and it required to unwind. This risk has ability to convert assets into cash. Liquidity risk also can happen from the failure to identify changes in market conditions will affect the capability to liquidate assets quickly with minimum loss. The amount of current assets that is in excess of current liabilities. Working capital is frequently used to measure a firm's ability to meet current obligations.

## 2. Review of literature:

The importance of good management of working capital for the company's health is not a new idea (Collins, 1946; Park, 1951). More than a numerical curiosity, the working capital is important as "a figure which can be put to dynamic use in the hands of capable managers" (Park, 1951). A. Danulețiu (2010) examined the relationship between working capital management and profitability of companies from Alba County. They used Pearson correlation model and sample of 20 company's financial statement from period of 2004-08. They used different variables of working capital and divide firms on the basis of offensive and defensive policy. They conclude that there is negative relationship between working indicators and profitability. A. Gill et al., (2010) seek the relationship of working capital management on gross operating profit of 88 American firms listed on New York stock exchange for a period of three years from 2005-07. They use regression analysis and cash conversion cycle as a proxy of working capital and concluded that a firm with slow collection of account receivable is negatively correlated with profitability. However they found that account payable in days and inventory turnover in days has no significant affect on firm's profitability. Phuong et al: (2010) made an attempt to show the significance relationship between firm's profitability, cash conversion cycle and its components. For this purpose they collect secondary data from Vietnam stock market for a period of 2006-2008. They use correlation analysis and multiple regression analysis. Their study also revealed negative relationship as many before. They found that there is negative relationship between firms profitability with cash conversion cycle, number of days account receivable and number of days inventory handled. Shin and Soenen (1998) researched the relationship between working capital management and value creation for shareholders. The standard measure for working capital management is the cash conversion cycle. Cash conversion period reflects the time

span between disbursements and collection of cash. Shin and Soenen used the net trading cycle (inventory conversion period and receivable conversion period less payable conversion period) as a conversion cycle where all three components are expressed as a percentage of sales. Net trading cycle as a proxy for additional working capital needs as a function of the projected sales growth. They examined the relationship by using correlation and regression analysis, by industry and working capital intensity. Using a COMPUSTAT sample of 58985 firm years covering the period 1975-1994, they found a strong negative relationship between the lengths of the firm's net trading cycle and its profitability. Based on the findings, they suggest that one possible way to create shareholder value is to reduce firm's net trading cycle. Shin and Soenen (1998) use Net Trade Cycle (NTC) as a measure of working capital management in order to investigate the relationship between working capital management and corporate profitability. The NTC is calculated as  $(\text{inventory} + \text{accounts receivable} - \text{accounts payable}) * 365 / \text{Sales}$  and Represents the number of "days sales" that the company has to finance its working capital under ceteris paribus conditions. Additionally it can provide an easy estimate for additional financing needs with regard to working capital as a function of the sales growth. For these reasons they use the NTC as a measure of working capital management and found a negative relation between the length of the firm's trade cycle and its profitability (Shin and Soenen, 1998). Dong (2010) reported that the firms' profitability and liquidity are affected by working capital management in his analysis. Pooled data are selected for carrying out the research for the era of 2006-2008 for assessing the companies listed in stock market of Vietnam. He focused on the variables that include profitability, conversion cycle and its related elements and the relationship that exists between them. From his research it was found that the relationships among these variables are strongly negative. This denote that decrease in the profitability occur due to increase in cash conversion cycle. It is also found that if the profitability occur due to increase in cash conversion cycle. It is also found that if the number of days of account receivable and inventories are diminished then the profitability will increase numbers of days of accounts receivable and inventories.

### 3. Statement of the problem:

Many researchers have found that working capital plays vital role in the success of any business organization. The business has to monitor the management of working capital constantly to maximize the profits. Thus, keeping the importance of working capital in view, the present study has been carried out.

#### 4. Objectives of the Study:

- ❖ To find out working capital structure of Andhra Pradesh pharmaceutical industry.
- ❖ To find out liquidity position of Andhra Pradesh pharmaceutical industry.
- ❖ To know working capital turnover of Andhra Pradesh pharmaceutical industry.

#### 5. Hypotheses of the study:

The present study has been testing the following null hypotheses:

H0<sub>1</sub>: the average current ratio of sample companies does not differ significantly.

H0<sub>2</sub>: the average quick ratio of sample companies do not differ significantly

H0<sub>3</sub>: the average ratio of current assets to total assets of sample companies does not differ significantly.

H0<sub>4</sub> the average ratio of current assets to total sales of sample companies do not differ significantly.

H0<sub>5</sub> the average working capital turnover of sample companies do not differ significantly.

#### 6. Methodology of the study:

The present study has conducted among five Andhra Pradesh pharmaceutical companies, which constitute five Andhra Pradesh pharmaceutical industries. The companies have taken for the study purpose are: Dr.reddys laboratoriesLtd ,divis laboratories Ltd,Natco pharma Ltd, Granules india Ltd,and Aurobindo pharma Ltd. The data of five years {from 2007-20011} required for the analysis part was collected from the money control .com. The analysis part has carried out with the help of the following variables ; current ratio,quick ratio , current assets turnover ratio,ratio of current assets to total assets and working capital turnover ratio,which measure the efficiency of working capital mamagement.Apart from these ratios, the study also used statistical tools like average and one-way Anova.MS Excel software was used to derive results.

**6. Analysis and discussion of results:**

Particulars	Dr.Rsddys Laboraratories limites	Divis Laboratories	Natco pharma limited	Granules india limited	Aurobindo laboratories
Inventory	1461.76	490.37	87.74	73.21	1155.99
% TCA	32.18	53.88	34.99	39.6	42.42
Trade receivable	1488.03	312.33	62.63	66.62	998.84
%TCA	32.76	34.32	24.97	36.02	36.67
Loans and advances	761.812	88.47	14.31	28.89	420.72
%TCA	16.77	9.72	5.70	15.6	15.44
Cash and bank balances	373.14	15.228	73.74	10.02	61.42
TCA%	8.21	1.67	29.41	5.41	2.25
Fixed deposits	456.61	3.582	12.31	6.20	87.02
TCA%	10.05	0.39	4.91	3.35	3.19
Total current assets	4541.36	909.99	250.74	184.95	2723.19
Current Liabilities	1715.42	258.69	32.32	70.51	841.97
TCL%	80.01	70.02	23.21	94.75	94.89
Provisions	428.49	110.72	6.96	3.95	45.33
TCL%	19.99	29.97	4.99	5.30	5.10
TCL	2143.90	369.41	139.27	74.41	887.31
Net Working capital	2397.46	540.58	111.47	110.54	1835.88

The working capital structure of Andhra Pradesh pharamasutical industry is presented in the table 1. Of all the current assets across Andhra Pradesh pharmaceutical industry, as it can be observed inventories alone constituted the highest percentage of 40.61, followed by trade receivable 32.94, loans and advances 12.64 cash & bank balances .9.39 and fixed deposits,4.37. in the case of divis laboratories Ltd and Aurobondo laboratories Ltd, the average inventories were more than the industry aggregate; where as in the case of Dr.reddys laboratories Ltd,Nacto pharma Ltd and Granules India Ltd ,it was below the industry aggregate.

As for as trade receivables concerned, Aurobindo laboratories Ltd,Granules india Ltd and divis laboratories had more than the industry aggregate. Where as in the case of Dr.reddys laboratories and Natco pharma ,it had below industry aggregate. The Average composition of loans and advances was more than the industry aggregate in the case of Dr.reddys laboratories, Granules India Ltd and aurobindo laboratories Ltd.Where as in the case of divis laboratories and Natco pharma ,it was below the industry aggregate. Regarding cash and bank balances, natco had highest industry aggregate.where as Dr.reddys laboratories,Divis laboratories Ltd, Granules india Ltd and Aurobindo laboratories,it was below the industry aggregate. As per as fixed deposits concerned Dr.reddys laboratories and Natco pharma Ltd had more than the industry aggregate. Where as in the case of divis laboratories ,Granules india Ltd,and Aurobindo laboratories,it was below the industry aggregate. As far as concerned current liabilities, in the case of Dr.reddys laboratories Ltd.Granules india Ltd and Aurobindo Laboratories Ltd had above industry aggragate.,where as in the case of divis laboratories and Natco pharama Ltd ,it was below the Industry aggregate. The Average composition of provisions in the case of Dr.reddys laboratories Ltd, and Divis Laboratories Ltd had height percentage than industry aggregate,where as in the case of other sample companies ,it was below the industry aggregate .As far as concerned net working capital .in the case of Dr.reddys laboratories Ltd,Aurobondo Laboratories Ltd and Nacto pharma Ltd had high percentage of net working capital than industry aggregate, where as in the case of Divis laboratories Ltd and Granules india Ltd ,it was below the industry aggregate.

Table 2. Current ratio; current ratio of Andhra Pradesh pharmaceutical companies [ In times]						
Year	Dr.Rsddys Laboraratories limited	Divis Laboratorie	Natco Pharma limited	Granules India limited	Aurobindo	Mean
2007	2.42	1.52	0.95	0.82	1.25	1.39
2008	1.74	2.08	0.92	0.78	1.14	1.33
2009	1.70	2.92	1.15	0.79	0.90	1.49
2010	1.50	2.98	0.95	0.93	0.92	1.45
2011	1.13	2.41	1.09	0.89	1.21	1.59
Mean	1.70	2.38	1.01	0.84	1.08	1.40
Source; computed from the Annual reports of all five pharmaceutical companies from 2007 to2011						

Ratios of Andhra Pradesh pharmaceutical industry varied between the highest of 1.59 times in 2011 and the lowest of 1.33 times in 2008, with five years average of 1.40 times. The data in the table 2 reveals that the aurobindo Pharma, granules India Ltd and natco pharma Ltd could not maintain its current ratio above the industry average in any year. The five years average current ratio of Dr.reddys laboratories Ltd and divis laboratories Ltd were much higher than industry average of 1.40. The average current ratio of sample companies were compared using one-way ANOVA and were tested by the following hypothesis [  $H_0$  ] the results are shown in the table3.

Table 3. ANOVA results for the Average current ratios of sample companies						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	9.6926	4	2.42315	23.91896	3.1E-08	2.75871
Within Groups	2.532667	25	0.101307			
Total	12.22527	29				
Source; NOVA is performed by using MS excel software						

H<sub>01</sub>: The average current ratios of Dr.reddys laboratoriesLtd, divis laboratories Ltd, Natco pharma Ltd, Granules India Ltd, and Aurobindo pharma Ltd do not differ significantly. It means during survey period of (2007-2011) the sample companies performances are differed

Inference;  $F_{cal} > F_{crit}$ . We reject H<sub>01</sub> and conclude that the average current ratio of sample companies differ significantly.

Year	Dr.Reddys Laboraratories limited	Divis Laboratorie	Natco pharma limited	Granules india limited	Aurobindo pharma Ltd	Mean
2007	2.44	1.34	1.32	3.02	2.75	2.17
2008	1.55	1.20	1.10	1.24	1.91	1.40
2009	1.49	1.33	1.67	2.03	2.17	1.74
2010	1.73	1.17	1.19	2.14	1.98	1.64
2011	1.28	1.13	1.60	1.95	2.19	1.63
Mean	1.70	1.23	1.37	2.07	2.22	1.71

Source;computed from the Annual reports of all five pharmaceutical companies from 2007 to2011

The quick ratio of Andhra Pradesh pharamasuitacable industry is depicted in the above table. The mean quick ratio of Andhra Pradesh pharamasuitacable industry varied between the highest of 2.17 times in 2007 and the lowest of 1.40 in 2008.in the case of Aurobindo pharma it was high in all the years than industry average 1.71. In the case of Dr.reddys laboratories Ltd, it was 2.44 and 1.73 in the year 2007 and 2010.in other years it was below the industry average. In case of divis laboratories and natco pharma, it was below the industry aggregate in all the years. In the case of granules India limited, it was very high in all the years except in the year 2008. The average current ratio of sample companies were compared using one-way ANOVA and were tested by the following hypothesis [ H<sub>01</sub>] the results are shown in the below table.



Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3.560504	4	0.890126	5.693818	0.003158	2.866081
Within Groups	3.12664	20	0.156332			
Total	6.687144	24				

ANOVA is performed by using MS excel software

H<sub>02</sub>: The average quick ratios of Dr.reddys laboratoriesLtd ,divis laboratories Ltd,Natco pharma Ltd, Granules india Ltd,and Aurobindo pharma Ltd do not differ significantly. It means during survey period of (2007-2011) the sample companies performances are differed Inference;  $F_{cal} > F_{crit}$ . We reject H<sub>02</sub> and conclude that the average quick ratio of sample companies differ significantly.

Year	Dr.Rsddys	Divis	Natco pharma	Granules	Aurobindo lab	Mean
2007	57	61	63	40	72	58
2008	47	59	56	38	69	53
2009	70	59	63	33	57	56
2010	74	52	43	50	51	54
2011	76	57	48	52	69	60
Mean	65	57	61	42	63	57

computed from the Annual reports of all five pharmaceutical companies from 2007 to2011

The ratio of current assets to total assets of Andhra Pradesh pharmaceutical industry is depicts in the above table. The current assets of Andhra Pradesh pharmaceutical industry Constituted the highest percentage of total assets by 60%in 2011, and the lowest of 53% in 2008, with an average of 57%. The above table shows that, of the companies, Dr.reddys laboratories Ltd blocked more funds in current assests by an average of 65%,followed by Aurobindo laboratories Ltd 63%, Natco pharma Ltd 61%, and divis laboratories Ltd 57%.Granules India Ltd invested the least amount of funds an average of 42% in currents as compared to the industry average..

Table 7. ANOVA results for the Average current assets to Total assets of sample companies						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.164536	4	0.041134	2.766241	0.055813	2.866081
Within Groups	0.2974	20	0.01487			
Total	0.461936	24				
Source; ANOVA is performed by using MS excel software						

H<sub>03</sub>: The average currents to total assets ratios of Dr.reddys laboratories Ltd, Davis laboratories Ltd, Natco pharma Ltd, Granules India Ltd, and Aurobindo pharma Ltd do not differ significantly. It means during survey period of (2007-2011) the sample companies performances are differed.

Inference;  $F_{cal} < F_{crit}$ . We accept H<sub>03</sub> and conclude that the average ratio of sample companies do not differ significantly.

Table 8 Ratio of current assets to sales of AP Pharama cutical companies. [ In times]						
Year	Dr.Rsddys	Divis	Natco	Granules india	Aurobindo laboratories	Mean
2007	0.66	0.58	0.67	0.64	1.01	0.71
2008	0.56	0.54	0.53	0.47	0.84	0.58
2009	0.58	0.65	0.55	0.54	0.74	0.61
2010	0.61	0.85	0.41	0.38	0.69	0.58
2011	0.57	0.79	0.60	0.39	0.77	0.62
Mean	0.59	0.68	0.55	0.48	0.81	0.62
Source; computed from the Annual reports of all five pharmaceutical companies from 2007 to2011						

The ratio of current assets to sales of Andhra Pradesh pharmaceutical industry is presented in the above table. In the case of

Aurobindo laboratories Ltd, the current assets as percentage of sales were higher than the industry aggregate in every year. In the case of davis laboratories, it was higher in 2007 and 2008, and low in 2009, 2010 and 2011. In the case of Natco pharma and granules india Ltd. it was high in 2007 year and below in other years.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.317624	4	0.079406	7.089821	0.001005	2.866081
Within Groups	0.224	20	0.0112			
Total	0.541624	24				

Source; ANOVA is performed by using MS excel software

H<sub>04</sub>: The average currents to total sales ratios of Dr.reddys laboratories Ltd, divis laboratories Ltd, Natco pharma Ltd, Granules India Ltd, and Aurobindo pharma Ltd do not differ significantly. It means during survey period of (2007-2011) the sample companies performances are differed.

Inference;  $F_{cal} < F_{crit}$ . We reject H<sub>04</sub> and conclude that the average current assets to total sales ratio of sample companies differ significantly

Year	Dr.Rsddys Laboraratories limites	Divis Laboratorie	Natco pharma limited	Granules india limited	Aurobindo laboratories	Mean
2007	2.72	1.35	3.03	1.70	1.15	1.99
2008	2.07	1.91	3.03	2.32	1.32	2.13
2009	2.78	2.18	4.04	2.62	1.67	2.65
2010	2.91	1.74	4.11	4.22	1.96	2.98
2011	3.06	2.42	4.11	4.31	2.38	3.25
Mean	2.70	1.92	3.66	3.03	1.69	2.60

The working capital turnover ratio of Andhra Pradesh pharmaceutical industry is presented in the above table. It was ranged between the highest 3.25 times in 2011, and the lowest 1.99 times in 2007, with an average of 2.60 times. Dr.reddys laboratories varied between the highest 3.06 times in 2011 and the lowest 2.07 times in 2008 with an aggregate of 2.70 times. In the case of divis laboratories Ltd between the highest 2.42 times in 2011 and the lowest in 1.35 times in 2007 with in average of 1.92. in the case of Nacto pharma limited it was between the highest 4.11 times in 2011,2010 and it was lowest in 3.03 times in 2007,2008 with an aggregate of 3.66 times. In the case of granules India ltd it varied between 4.31 times in 2011 and 1.70 times in 2007 with an average of 3.03 times. in the case of Aurobindo pharma Ltd the average capital turnover ratio varied between highest 2.38 times in 2011 and the lowest I 1.32 times in 2008 with an average working capital turnover ratio of 1.69 times.

Table 11. ANOVA results for the Average Working capital ratio of Andhra Pradesh pharmaceutical companies						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	13.05818	4	3.264544	7.199792	0.000923	2.866081
Within Groups	9.06844	20	0.453422			
Total	22.12662	24				
Source; ANOVA is performed by using MS excel software						

H<sub>05</sub>: The average working capital turn over ratios of Dr.reddys laboratories Ltd ,divis laboratories Ltd, Natco pharma Ltd, Granules India Ltd, and Aurobindo pharma Ltd do not differ significantly. It means during survey period of (2007-2011) the sample companies performances are differed.

Inference;  $F_{cal} < F_{crit}$ . We reject H<sub>05</sub> and conclude that the average working capital turnover ratio of sample companies differ significantly.

### Conclusion

The structure of working capital and liquidity was analyzed by taking five years annual reports of Andhra Pradesh Pharmaceutical companies. The study revealed that of all the current assets across the industry, inventories, and formed the highest percentage, followed by trade receivables. Whereas fixed deposits formed negligible part. The study also indicated that Dr.reddys laboratoriesLtd; divis laboratories Ltd, Natco pharma Ltd, and Aurobindo

pharma Ltd invested more in currents than industry average. The study also revealed that Dr.reddys laboratoriesLtd, Natco pharma Ltd, and Granules India Ltd, had lower sales over their working capital and current assets as compared to other companies. However the sample companies had good current assets, which also imply sound liquidity position of sample companies.

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