Influence of Working Capital on Profitability of Select Pharmaceutical Firms in India

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***Abstract*—The aim of the study was to assess the influence of working capital on profitability of select pharmaceutical firms in India. The period of the study was from 2019 to 2023. Data were taken from the annual report of the firms. Return on total assets was taken as dependent variable and inventory days, receivable days, payable days, and cash conversion cycle were taken as independent variable. Current ratio, firm size and log of sales were taken as a control variable. Descriptive statistics, Correlation, VIF and Regression were used for data analysis. The result of the study was inventory days, receivable days and payable days were having a significant influence on working capital. Cash conversion cycle does not have a significant influence on profitability**

***Index Terms*—Working capital, Profitability, Inventory days, Receivable days, Payable days and Cash conversion cycle.**

I. INTRODUCTION

The Indian pharmaceutical industry is well-known throughout the world for producing inexpensive vaccines and generic medications. Over the years, Indian Pharma has developed into a thriving industry that currently ranks third in terms of volume of pharmaceutical production. India's pharmaceutical sector ranks third globally in terms of volume and fourteenth globally in terms of value. Currently, the pharmaceutical industry accounts for about 1.72% of the national GDP. By the end of 2030, the Indian pharmaceutical market is expected to reach a value of US$130 billion. In the meantime, it was predicted that the pharmaceutical industry would surpass $1 trillion in global sales by 2023. Before understanding the working capital as researcher, we should be aware of the inherent nature of the business operation. It helps to understand the working capital analysis. Working capital is an amount needed to be funded in ordered to run the day-to-day business operations(Balasubramanian & Sandhiya, 2024). Positive working capital indicates receivables and inventories are high compared to payables and too much of current assets shows most of the sales are in credit or inventories are piled up. Either too much of current assets or current liabilities will affect the firm in long term, to solve this firm required adequate working capital. If the firm used their own cash, they lose their interest or if the company opt for the short-term loan company must pay interest to lenders.

II. REVIEW OF THE LITERATURE

(Charitou et al., 2010) attempted to examine the effect of working capital management on firms' profitability in emerging markets. The purpose of the study was to investigate the effect of working capital management on firms' profitability. Sample consists of listed companies' data from 1998-2007. Multivariate analyses were used. The outcome of the study was that inventory days, receivable days, and payable days have a relationship with profitability.

(Kušter, 2022) attempted to investigate the impact of working capital management on the profitability of Serbian listed manufacturing companies. The aim of the study was to examine how working capital affects the profitability of listed Serbian companies. Samples for the study were 79 companies. Correlation and multiple regression were used in this study. There is a significant relationship between profitability and inventory days, receivable days, and payable days.

(Aravind, 2016) attempted to assess the influence of working capital metrics on profitability in the Indian manufacturing sector. The purpose of the study was to investigate how working capital influences the profitability. A sample of 100 Indian manufacturing companies was taken from 2005-06 to 2014-15.

Descriptive statistics and inferential statistics were used for data analysis. The study concluded that the influence of working capital on profitability was consistent.

(Ganesan, 2007) attempted to examine working capital management efficiency in the telecommunication equipment industry. The objective of the study was to analyse the working capital management efficiency of the firms. A sample of 349 companies was taken for the study from 2001 to 2007. Correlation regression and ANOVA were used for analysis. The study found that working capital is not influencing the profitability.

(Bagchi et al., 2012) attempted to investigate the influence of working capital on the profitability of Indian FMCG companies. The aim of the study was to explore the effects of working capital management on profitability. Data were taken from 2000-01 to 2009-10 for the period of ten years. Correlation and panel data regression analysis were used. The results of the study were that there is a negative relationship between working capital and profitability.

(Syeda, 2021) attempted to analyse the impact of working capital management on the profitability of trading companies. The purpose of the study was to explore the impact of working capital on profitability. 15 American companies were taken as a sample for the period 2015-2019. The outcome of the study was that there is a negative relationship between profitability and receivable days and the cash conversion cycle.

(Enqvist et al., 2014) attempted to assess the impact of working capital management on firm profitability in different business cycles. The aim of the study was to examine the business cycle on the working capital-profitability relationship. Samples were taken from Finnish listed companies. The results of the study were that efficient working capital management increases profitability even during the economic downturn.

(Aldubhani et al., 2022) attempted to examine the impact of working capital management on the profitability of listed companies in Qatar. The objectives of the study were to find out how working capital management policies affect the profitability of the listed companies from the period of 2015 to 2019, which were taken as a sample for the study. Multiple regression was used for data analysis. The outcome of the study was that there is no significant effect on profitability

III. OBJECTIVE OF THE STUDY

i) To assess the influence of working capital on profitability of the pharmaceutical companies.
ii) To evaluate the impact of different components of cash conversion cycle on the performance of the company

IV. RESEARCH METHODOLOGY

The study sample collected based on the sales of the companies. The period of the study was from 2019 to 2023 and data were taken from the annual report of the companies. Descriptive statistics were used to find the mean, minimum, maximum and standard deviation value of the variables, Spearman correlation was used to find the correlation between dependent and independent variables, variation inflation factor was used to test the multi collinearity between independent variables(Aldubhani et al., 2022).

V. HYPOTHESIS

H1: There is no significant relationship between Inventory days and return on total asset.
H2: There is no significant relationship between receivable days and return on total asset.
H3: There is no significant relationship between payable days and return on total asset.
H4: There is no significant relationship between cash conversion cycle and return on long term asset.

Table No:1 Showing key research variable

Variables	Type	Measured	Abbreviation used
Return on Total Assets	Dependent variable	(EBIT/Total Assets)*100	ROTA
Inventory days	Independent variable	(Inventory/sales)*365	ID
Receiveable days	Independent variable	(Receivable/sales)*365	RD
Payable days	Independent variable	(Payable/sales)*365	PD
Cash Conversion Cycle	Independent variable	ID+RD-PD	CCC
Current Ratio	Control Variable	Current asset/ Current Liabilities	CR
Firm size	Control Variable	Log of sales	FS
Debt-equity	Control Variable	Total debt / Total equity	DER

Analysis and Interpretation

Table no: 2 Descriptive statistics

	Mean	Minimum	Maximum	S.D
ITD	83.10	64.69	106.18	13.43
RD	91.43	68.27	118.37	15.57
PD	52.17	39.33	72.14	10.13
CCC	117.37	87.51	141.66	17.62
CS	12.02	11.36	12.55	0.39
CR	1.90	1.10	2.64	0.47
DER	0.32	0.07	0.58	0.18

Table no: 2 shows that descriptive statistics of the sample firms. Average inventory days was 85.28, minimum day was 72.25 and maximum day was 97.62. Average CCC was 125.75 it reveals that firm take 125 days to receive their cash. Firms average current ratio was 1.79 indicates that current asset of the firm is greater than current liabilities. Mean value of DER was 0.32 it shows that firm has a lower debt than equity.

Table no 3: Test of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Return on total assets	.146	60	.003	.940	60	.006
Inventory days	.079	60	.200*	.960	60	.046
Receivable days	.065	60	.200*	.982	60	.515
Payable days	.200	60	.000	.771	60	.000
Cash conversion cycle	.099	60	.200*	.961	60	.051
Current ratio	.098	60	.200*	.977	60	.305
Debt equity ratio	.067	60	.200*	.971	60	.156
Firm size	.197	60	.000	.899	60	.000

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

It shows the test results of normal distribution of data. Kolmogorov-Smirnov and Shapiro-Wilk test were used to test the normal distribution of the data. ROTA, PD and FS are not normally distributed in Kolmogorov-Smirnov test. PD and FS are not normally distributed in Shapiro-Wilk test.

Table no: 4 Correlation

			Return on total assets	Inventory days	Receivable days	Payable days	Cash conversion cycle	Current ratio	Debt equity ratio	Firm size
Spearman's rho	Return on total assets	Correlation Coefficient	1.000	-.380**	-.307*	-.490**	-.013	.336**	-.404**	-.238
		Sig. (2-tailed)	.	.003	.017	.000	.924	.009	.001	.067
		N	60	60	60	60	60	60	60	60
	Inventory days	Correlation Coefficient	-.380**	1.000	.138	.131	.381**	.078	.011	.110
		Sig. (2-tailed)	.003	.	.294	.319	.003	.556	.935	.403
		N	60	60	60	60	60	60	60	60
	Receivable days	Correlation Coefficient	-.307*	.138	1.000	.026	.545**	-.159	.199	.594**
		Sig. (2-tailed)	.017	.294	.	.844	.000	.225	.128	.000
		N	60	60	60	60	60	60	60	60
	Payable days	Correlation Coefficient	-.490**	.131	.026	1.000	-.531**	-.247	.499**	.057
		Sig. (2-tailed)	.000	.319	.844	.	.000	.057	.000	.663
		N	60	60	60	60	60	60	60	60
	Cash conversion cycle	Correlation Coefficient	-.013	.381**	.545**	-.531**	1.000	.068	-.242	.353**
		Sig. (2-tailed)	.924	.003	.000	.000	.	.608	.062	.006
		N	60	60	60	60	60	60	60	60
	Current ratio	Correlation Coefficient	.336**	.078	-.159	-.247	.068	1.000	-.480**	-.173
		Sig. (2-tailed)	.009	.556	.225	.057	.608	.	.000	.186
		N	60	60	60	60	60	60	60	60
	Debt equity ratio	Correlation Coefficient	-.404**	.011	.199	.499**	-.242	-.480**	1.000	-.111
		Sig. (2-tailed)	.001	.935	.128	.000	.062	.000	.	.400
		N	60	60	60	60	60	60	60	60
	Firm size	Correlation Coefficient	-.238	.110	.594**	.057	.353**	-.173	-.111	1.000
		Sig. (2-tailed)	.067	.403	.000	.663	.006	.186	.400	.
		N	60	60	60	60	60	60	60	60

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Data are not normally distributed therefore spearman rank correlation used to assess the relationship between the variables. Relationship between ROTA and ID were negatively correlated (-0.38), it indicates the when inventory days increase it reduce the profitability of the firm. ROTA and RD were

negatively correlated (-0.307) it indicates that when receivable days increase it decrease the profitability of the firm. ROTA and PD were negatively correlated (-0.490) it shows that firm reduced the payable days to increase the profitability of the firm. ROTA and CCC were negatively correlated (-0.13) it shows that CCC days increase it affect the profitability of the firm

VI. RESULTS OF HYPOTHESIS TESTING

i) The p-value of the inventory days was 0.03 less than significant value (0.05). Therefore, reject the null hypothesis.
ii) The p-value of receivable days was 0.017 less than the significant value (0.05). Therefore, reject the null hypothesis.
iii) The p-value of payable days was 0.00 less than the significant value (0.05). Therefore, reject the null hypothesis.
iv) The p-value of cash conversion cycle was 0.924 greater than the significant value (0.05). Therefore, fail to reject the null hypothesis.

Table no: 5 Multicollinearity Test

Independent variable	Variance Inflation Factor
Inventory days	2.813
Receiveable days	3.382
Payable days	3.834
Cash Conversion Cycle	4.649
Current Ratio	1.811
Firm Size	2.049
Debt-Equity	2.055

It reveals the results of multicollinearity test. Variation inflation factors were used to assess the independent variables. For all the independent variable VIF value was less than 10 it indicates that there is no close relationship among the independent variable

Table no: 6 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.066	7	.009	3.206	.007[a]
	Residual	.154	52	.003		
	Total	.220	59			

a. Predictors: (Constant), Firm size, Inventory days , Debt equity ratio, Cash conversion cycle , Current ratio, Receivable days , Payable days

b. Dependent Variable: Return on total assets

The significant value is 0.007, which is less than the significance level of 0.05. This shows that the overall regression model is statistically significant. In other words, the independent variables as a group have a significant influence on the return on total assets.

Table no: 7 Regression analysis

Mode	R	R square	Adjusted R square	Std error of the estimate
1	0.549	0.301	0.207	0.5441

The regression analysis shows the value for the r squared in the model is 30.1% of the variation in the dependent variable is explained by the independent variables

VII. CONCLUSION

The purpose of the paper is to assess the influence of the working capital on the profitability of pharmaceutical companies. The results of the study were: 1) The relationship between returns on assets and inventory days was negative. It shows that when the inventory days increase, it decreases the profitability of firms; 2) the relationship between return on asset and receivable days was negative; it reveals that when receivable days increase, it decreases the profitability of the firms;3) the relationship between return on asset and payable days was negative; it indicates that when payable days increase, it decreases the profitability of the firm; 4) the relationship between return on asset and cash conversion cycle was negative. It depicts that when the cash conversion cycle increases, it decreases the profitability of the firms. The outcome of the study

was receivable, inventory, and payable have a significant influence on profitability, but the cash conversion cycle was not influencing the profitability, so we concluded that in this study working capital is not influencing the profitability of the pharmaceutical firms.(Aldubhani et al., 2022)

VIII. LIMITATION OF THE STUDY

- The period of the study included the pandemic era so that it might have a chance of influencing the result.
- Due to the unavailability of data for some companies, we are unable to include them in the study.

IX. FURTHER SCOPE OF THE STUDY

- In future studies, more variables can be used for enhancing the research.
- Furthermore, we can do the research on the influence of capital structure on the profitability of pharmaceutical companies in India.
- We can use more years to deeply understand the role of working capital and profitability in pharma industries.

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