Relationship between Working Capital Management and Profitability – A Study of Selected Pharmaceutical Companies in India

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Abstract: This study examines the relationship between working capital management and profitability of selected pharmaceutical companies in India. The pharmaceutical industry is turning into a most important exporter of generic medicine and vaccines. It is one of the top 5 sectors contributing to foreign exchange earnings and playing a major role in the Indian economy in terms of employment. This study is based on 48 Indian pharmaceutical companies obtained from CMIE Prowess database for the period from 2001 to 2023. While analyse the data, panel data regression analysis has been used. The results show that the profitability is negatively associated with liquidity, leverage, inventory and payables.

Keywords: Working capital management, profitability, pharmaceutical companies, India, panel data regression analysis.

1. Introduction

Working capital management needs estimate and devious of current assets and current liabilities in an approach that eliminates the risk of failure to assemble competent short-term obligations and avoid needless investment in current assets (Eljelly, 2004). There is a combination of tactics and techniques for a company's working capital management. These tactics involve inventory management, receivables management, and cash management, which can be concluded through diverse conventional techniques of working capital management.

As India completes 75 years of Independence, the country's pharmaceutical industry can look back with pride on its journey thus far. After independence, for more than two decades, India relied heavily on imports. The sector has grown exponentially to produce close to 85% of the domestic needs. Over the last two decades particularly, the pharmaceutical industry has grown from strength to strength, turning into a major exporter of generic medicine and vaccines. The industry has contributed immensely in increasing life expectancy, improved cures for many diseases, increased access to affordable medicines, and overall, a better life for patients. It is one of the top 5 sectors contributing to foreign exchange earnings and playing a major role in the Indian economy.

The India pharmaceutical market is growing at a CAGR of 10.70% over the next 5 years. Overall, the pharma market grew at 9.3% in fiscal 2023, according to India ratings. The Indian pharmaceutical market reported double-digit growth rate for the second straight month in March, albeit on a low base, due to robust performance in top three therapies has. The market experienced significant growth during the past two decades, and pharma revenues worldwide totalled 1.48 trillion US dollar in 2022. Market size of Indian pharmaceuticals industries is expected to reach US$65 Billion by 2024, and US$ 130 Billion by 2030.According to the government data, Indian pharmaceutical industry is worth approximately US$ 50 Billion with over US$ 25 Billion of the value coming from exports. According to the annual report 2021, the Indian pharma sector has contributed 1.72% of the country's GDP. In 2021, the pharma industry in India was estimated to generate revenue of US$42 billion domestically.

In August 2021, the Indian pharmaceutical market augmented at 17.70 percent yearly, awake from 13.70 percent in July 2020. Consistent with India ratings and research, the Indian pharmaceutical market revenue anticipated to be over 12 percent in the year 2022. The Indian pharmaceutical sector is valued at 42 billion US dollar and ranked 3rd and 13th in terms of volume and value worldwide (Sanghvi, 2021). Working capital management is a measurement of effectiveness and in the end its accomplishment or crash. Sound working capital management help to increase profitability of the companies and net profit margin, return on capital employed, and return on assets indicators rise up over the year. The outlook of Indian pharmaceutical industry is extremely sinning. In the 2020-2030 periods, we expect Indian pharma industry to grow at a compounded annual growth rate of 12 percent to achieve at 130 billion US dollar by 2030 from 41.70 billion US dollar in 2020.

This study recommends the optimal level of working capital and signifying the relationship so that survive between the reachable level of working capital and the level of profit. A number of management policies of working capital to facilitate diverse manufacturing firms can take on is also dealt with. This is for the reason that pharmaceutical companies need to settle in to the

altering necessitates of the current business arrangement and precondition of an assortment of suppliers and service providers. As a result, pharmaceutical companies in India can obtain immense gain from the research work.

2. Literature review

The association between working capital management and profitability is accomplished by decaying elements of working capital management. A lot of investigations have been carried out in both the developing and developed economies. Numerous studies have handled the how working capital management impact on firm's profitability. The word profitability denotes the capability of a firm to make the profit. Profit is finding out by contesting revenue against cost connected with it (Salauddin, 2001). According to Walker, "A firm's profitability is determined in part by the way its working capital is managed." Again, the profitability of a firm is the return on total investment. If the investment made in a company is not reasonable in that case the return on investment will be pessimistically exaggerated (Vishnani & Shah, 2007). Chakraborty (2008) investigated the relationship between working capital management and profitability of Indian pharmaceutical companies. He showed that working capital is not an issue of recovering profitability. Samiloglu and Demirgunes (2008) examined the relationship between working capital management and profitability of Istanbul firms and showed that sales growth influenced the firms' profitability positively. Bhunia & Khan (2011) examined liquidity management effectiveness of selected Indian steel companies based on secondary data with 230 companies for 9 years period between 2002 and 2010 using statistical techniques. They established a very small relationship between the liquidity indicators and profitability. Again, Bhunia et al. (2011) furthermore initiated that working capital in terms of liquidity is responsible for under-utilisation of production capacity and poor consumption of steel in India. Agha (2014) examined the influence of working capital management on the profitability of selected pharmaceutical companies and established that three important activity ratios creditors' turnover ratio, debtors' turnover ratio and stock turnover ratio have a positive impact on profitability but there was no significant impact of current ratio on profitability. Hulia (2014) explored the shock of working capital management on the profitability of leading pharmaceutical firms using correlation and multiple regressions.

The convincing sum of this literature review produced till date on the obtainable subject discloses wide room for the validity and reproduces a few important support that assert its viability, as may be marked here it. The causal relationship between working capital management and profitability of the pharmaceutical companies in India is hardly available.

3. Data and methodology

This study is based on secondary data collected from the CMIE Prowess database. The study has considered financial ratios relating to working capital management and profitability analysis. The period of the study has been has been taken for the study from the year 2001 to 2023. 48 pharmaceutical companies have been selected conveniently as sample. Eight working capital management indicators as independent variables, to be exact, current ratio (CR), quick ratio (QR), cash to current liabilities (CC:), debt-equity ratio (DER), interest coverage ratio (ICR), stock turnover ratio (STR), debtors' turnover ratio (DTR) and creditors' turnover ratio (CTR) and one profitability indicators as dependent variables, that is to say, return on capital employed (ROCE) based on earlier literature. To observe the fundamental association between working capital management and profitability of pharmaceutical companies in India, panel data methodology (correlation statistics on panel data, panel unit root tests, panel regression analysis under ordinary least squares method) have been used. As the data is pooled time series and cross sectional, panel data methodology is helpful to explain the fundamental association between working capital management and profitability. By and large, panel data advocates that companies are heterogeneous. Time series and cross-section analysis are not managing the heterogeneity. As the purpose of the study is to examine the fundamental association between working capital management and profitability, panel regression analysis can identify the cause and affect of the association between working capital management and profitability through fixed effects and random effects models in conjunction with responds to the problems of heteroskedasticity and autocorrelation.

4. Empirical results and analysis

4.1 Correlation statistics

It is necessary to establish the association between the various variables included in the analysis prior to performing a panel regression test. Correlation statistics is used to determine whether there is a relationship between profitability indicator (ROCE) and working capital management indicators (CR, QR, CCL, DER, ICR, STR, and CTR).

Table – 1: Correlation Statistics

	ROCE	CCL	CR	CTR	DER	DTR	ICR	QR	STR
ROCE	1.00	0.34	0.38	0.08	-0.31	0.24	0.14	0.38	0.02

ROCE is positively associated with CCL, CR, CTR, DTR, ICR, QR, STR, and QR. But ROCE is negatively associated with DER.

4.2 Panel unit root test results

Panel unit root test results of selected pharmaceutical companies in India are abridged below.
Levin, Lin and Chu and Im, Pesaran and Shin panel unit root tests have been used to test the stationarity of the panel data series. The null hypothesis of Levin, Lin and Chu panel unit root test mechanism is that every individual time series holds a unit root or non-stationary and the alternative hypothesis that each time series is stationary or no unit root. Levin, Lin and Chu demonstrate that panel unit root test for multiplication data have additional influence than panel unit root test independently for every cross section. Again, the null hypothesis of Im, Pesaran and Shin panel unit root test mechanism is that every time series holds a unit root or non-

stationary and the alternative hypothesis that each time series is stationary or no unit root. Im, Pesaran and Shin panel unit root test is very useful to examine long-term relationships in panel data.

Table – 2: Panel Unit Root Test (At Level)

	ROCE		CCL	
Method	Statistic	Prob.**	Statistic	Prob.**
Levin, Lin & Chu t*	-7.19173	0.0000	-3.71269	0.0001
Im, Pesaran and Shin W-stat	-7.82934	0.0000	-6.28562	0.0000
Method	CR		CTR	
Levin, Lin & Chu t*	-5.14845	0.0000	-8.98430	0.0000
Im, Pesaran and Shin W-stat	-5.22468	0.0000	-8.97281	0.0000
	DER		DTR	
Method	Statistic	Prob.**		
Levin, Lin & Chu t*	-8.62591	0.0000	-7.29329	0.0000
Im, Pesaran and Shin W-stat	-6.70519	0.0000	-5.76075	0.0000
Method	ICR		QR	
Levin, Lin & Chu t*	-16.2876	0.0000	-3.24096	0.0006
Im, Pesaran and Shin W-stat	-18.1012	0.0000	-4.22235	0.0000
Method	STR			
Levin, Lin & Chu t*	-2.12665	0.0167		
Im, Pesaran and Shin W-stat	-3.70564	0.0001		

The analysis starts by examining the stationary of all the particular working capital management indicators in the study; to observe the order of integration of the selected variables, we have applied LLC test and IPS test. For estimating reasons, we have selected a maximum lag length 2 according to Schwarz info criterion, a Bartlett kernel and we indicate the exogenous variables as individual effects.

Table 2 shows the unit root tests results at level. Both LLC test and IPS test results corroborate that all the variables under study are stationary at level. This indicates that since all the variables are stationary at level, this means there's no long-run relationship exist between working capital management indicators and profitability indicator; but a short run association may exist there. As all the variables under study are stationary at level, panel regression analysis has been used.

4.3 Panel regression test results

This study talks about the answer of the panel regression analysis where fixed and random effects model have been used. One profitability indicator (ROCE) has been considered as dependent variable and eight working capital management indicators (CCL, CR, CTR, DTR, ICR, QR, STR, and QR) have been considered as independent variables.

Two panel regression models, that is, fixed effects model and random effects model have been presented in table 3.

Table – 3: Panel Regression Test Results

Variable	Fixed Effects		Random Effects	
	Coefficient	t-statistic	Coefficient	t-statistic
Intercept	3.80	9.44	1.58	4.23 (0.00)
CCL	0.13	0.35 (0.72)	-0.44	-1.98 (0.04)
CR	-0.41	-0.96 (0.33)	-1.32	-5.44 (0.00)
CTR	-0.16	-3.82 (0.00)	-0.07	-3.02 (0.00)
DER	-0.60	-7.62 (0.00)	-0.16	-3.54 (0.16)
DTR	-0.03	-0.82 (0.41)	0.03	1.38 (0.16)
ICR	0.01	0.74 (0.45)	-0.01	-1.66 (0.09)
QR	1.09	1.86 (0.06)	1.06	3.14 (0.00)
STR	-0.01	-1.33 (0.18)	-0.00	-0.76 (0.44)
R^2	0.88		0.98	
Adjusted R^2	0.87		0.97	
F-stat (prob.)	0.00		0.00	

Hausman specification test has been used to observe which panel model (fixed effects model and random effects model) among the three panel regression models should be used. In connection with this, H_0 hypothesis asserts that "random effects model is suitable" and H_1 hypothesis asserts that "random effects model is not suitable". The Hausman specification test results are given in table 3.

Table – 3: Hausman Specification Test Results

Test Summary	Chi-Sq. Statistic	Prob.
Cross-section random	2.11	0.94

Table 3 shows that null hypothesis is not rejected because the probability is 0.94; therefore all of the individual effects in these models are random. Specifically, the null hypothesis tells that random effects model is more useful than fixed effects model. Accordingly, the panel data regression has been described by the random effects model in the present research work.

Panel regression analysis based on random effects model illustrates that working capital management indicators are associated positively and negatively with ROCE (profitability), which is statistically insignificant. R^2, adjusted R^2 and F-statistics also can explain the relationship.

Panel regression analysis based on random effects model exemplifies that ROCE is positively related to DTR and QR. When DTR is increased by one unit, ROCE is increased by 0.03 units that are not significant statistically. This indicates that the pharmaceutical companies used its economic resources inefficiently. When QR is increased by one unit, ROCE is increased by 1.06 units that are also not significant statistically. This indicates that pharmaceutical companies cannot manage their short-term commitments well. ROCE is negatively related to CCL, CR, CTR, DER, ICR, and STR. When CCL is increased by one unit, ROCE is decreased by 0.44 units that are significant statistically at 5% level of significance. This indicates that pharmaceutical companies manage their short-term needs in terms of cash incompetently. When CR is increased by one unit, ROCE is decreased by 1.32 units that are significant statistically at 1% level of significance. This indicates that pharmaceutical companies cannot manage their overall short-term commitments poorly. When CTR is increased by one unit, ROCE is decreased by 0.07 units that are significant statistically at 1% level of significance. This indicates that the payment policy of the sampled pharmaceutical companies is good and managing ineffectively. Nevertheless, when DER is increased by one unit, ROCE is decreased by 0.16 units, which is also significant statistically at 1% level. This indicates that the pharmaceutical companies are being financed by insiders. When ICR is increased by one unit, ROCE is decreased by 0.01 units, which is insignificant statistically. This indicates that the financial risk of pharmaceutical companies is being doubtful. When STR is increased by one unit, ROCE is decreased by 0.00 units that are not significant statistically. The inventory management is also doubtful.

R^2 is a goodness-of-fit measure and it indicates the percentage of variation explained by the panel regression line out of the total variation. It also gives the percentage of explained variation as if all working capital management indicators in the model influence the ROCE. Since the value of R^2 is 0.98, therefore, the model is very well-fitted for explaining the variation. Adjusted R^2 evaluates the descriptive power of regression models that hold diverse numbers of predictors. Adjusted R^2 provides the percentage of variation described by only those working capital management indicators that in reality influence the ROCE. Since the value of Adjusted R^2 is 0.97, therefore, the model is good for explaining the particular working capital management indicators that influences ROCE. Since the P value for the F-test of the significance test is less than 5%, we can reject the null-hypothesis and conclude that our model gives a better fit of the model and working capital management indicators jointly affecting the ROCE significantly.

5. Conclusions

Panel data regression analysis illustrate that profitability of Indian pharmaceutical companies is negatively related to liquidity, leverage, inventory and payables. Pharmaceutical companies cannot manage their short-term needs competently. Pharmaceutical companies in India are being financed mostly by insiders; however, the payment policy of the sampled pharmaceutical companies is good and managing ineffectively and the inventory management is also doubtful. These results suggest that the manager needs to attention on core business theory to maximise shareholders wealth. Also managers can elevate its profitability level by not adopting the aggressive working capital policy. The results are not shocking as it does not contradict the previous research studies.

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