

Enhancing Working Capital Efficiency of Pharmaceutical Industry Through Working Capital Financing Strategies

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Abstract

The study attempts to analyze the working capital efficiency of the domestic and multinational pharmaceutical companies during the boom, recession and recovery period. The study also explored the impact of working capital financing policies on the working capital efficiency of the domestic and multinational pharma companies during the boom, recession and recovery periods. Financial tools like utilization index, performance index, efficiency index, ratios and statistical tools like mean, grand mean, t-test, ANOVA and regression analysis have been deployed to draw inferences. The study found that the working capital efficiency index of the boom, recession and recovery period of the domestic pharmaceutical companies do not depict statistically significant difference and similar results are revealed by the study for the multinational pharma companies. Even the analysis shows that statistically the working capital management practices of the domestic pharmaceutical companies are at par with their counterparts i.e. multinational pharmaceutical companies as there is no significant difference in the working capital efficiency index. Even the practices regarding the financing policies are parallel as majority of both the set of pharma companies have followed conservative financing policy during the boom and recovery period and aggressive financing policy in the recession period. Further, it is found that in all the economic situations the working capital efficiency is not varying significantly because of working capital financing policies. The regression analysis suggests to tilt the working capital financing policies towards aggressive financing policy for the enhancement of the working capital efficiency.

Key Words

Aggressive Financing Policy, Conservative Financing Policy, Working Capital Efficiency, Boom Period, Recession Period, Recovery Period

PHARMACEUTICAL INDUSTRY

The Indian pharma sector grew at 9.4% year-on-year basis in 2018 (Business Standard, Jan 10, 2019). In terms of volume of business, it is rated as third largest and in terms of value, tenth largest (PWC, 2018-19). Despite demonetisation, GST implementation and capping of prices – all of which were perceived to impact the pharma sector unfavourably, this industry continues to grow & major growth engines are domestic sales, exports, medical tourism, health insurance coverage, an ageing population, and increase in per capita spending etc. The retail market is dominated by the branded generics, capturing 70% to 80% of the share (McKinsey & Company). India is the largest supplier of generic drugs worldwide with the Indian generics accounting for 20% of world exports in terms of volume. (India Brand Equity Foundation). India's pharma sector is expected to touch US\$ 55 billion by 2020 from US\$ 6 billion in 2005. Indian pharma market is expected to increase at a compound annual growth rate (CAGR) of the 15% annually between 2015 and 2020. (IBEF, 2016).

WORKING CAPITAL MANAGEMENT

Working capital management has been recognized as grey area of corporate finance (Jain & Godha, 2014). WCM involves the management and control of current assets individually i.e. inventories, accounts receivables, cash and collectively. It may be well-said that the prosperity and progress, stability and financial health of a business or industrial organization largely depend upon the efficient management of the various facets of the WC (Mathur, 2003). Ali & Ali (2012) also state that WCM refers to applying investment and financing decisions to current assets. Ray (2014), in his study, mentions that the share of current assets to total assets varied from 40% to 83%. So, another study specified that over 75% of the companies that are incurring loss or struggling financially can be profitable and liquid if the WC blocked in current assets is released. Chiou *et al.* (2006) demonstrated that many businesses closed due to bad WC management. Perhaps due to these reasons 70%-80% of the time of finance executives' time is consumed by the WC decisions.

Working Capital Financing Policy

Working Capital investment relates to the decision of the management regarding the funds to be invested in the current assets. The working capital investment policy is further categorized into two types :

I. Aggressive Financing Policy

In the aggressive financing policy, the firm finances part of fixed current assets from short-term sources of finance (Pandey, 2011). The relative use of more short-term finance makes the firm more risky. The use of higher amount of short-term debt in contrast to long-term debt is likely to result in higher profits because debt will be paid off in due course and debt being economical source of finance (Vanhorne *et al.*, 2008).

II. Conservative Financing Policy

In this policy, investment in current assets is funded from the long-term funds and the short-term sources of finance are used to fund the emergency requirements (Bose Chandra, 2012). The relative low proportion of short-term debt in this policy reduces the risk as the long-term debts do not mature within the operating cycle (Bhalla V. K., 2008). This policy affects the long-run profitability of the company as the interest cost is incurred for the longer period.

Efficiency in Working Capital Management

The resources available with every economy and identity are always scarce and costly. Therefore, they must be efficiently utilized to accomplish the objectives of the concern. There are various alternatives to enhance the efficiency of the business. Among these alternatives is to improve the turnover of all the components of the current assets, increase the sales with the available current assets or proportionately reduce all the components of current assets if the sales targets are unachievable because of the changed business environment. Efficient WCM is very important to create value for the shareholders (Abdul *et al.*, 2011). Efficient management is also said to be conducive for avoiding the financial difficulties (Ramiah *et al.*, 2014). Besides enhancing profitability and improving firm value, the efficient management of working capital also helps to avoid financial crises (Kaur & Singh, 2013).

REVIEW OF LITERATURE

Nazir and Afza (2009) analyzed 132 manufacturing companies covering 14 industrial groups that were listed at Karachi Stock Exchange (KSE). The period of the study spanned from 2004 to 2007 and the tool used was regression analysis. The study inferred that operating cycle, Tobin's q and ROA were factors influencing working capital.

Ramachandaran and Janakiraman (2009) studied the relationship between profitability measured by EBIT and WCM efficiency of Indian paper companies

for the period of ten years. The study concluded that working WCM was satisfactory in paper industry. Cash conversion cycle, average payment period were negatively associated with profitability.

Ashok (2013) determined the relationship between inventory conversion period and firm's profitability. In this study the different dependent variable and control variable were deployed and the data of top five sample Indian cement companies was taken for 10 years i.e. 2001-2011. The result found that cash conversion cycle has positive relationship with Return on Asset (ROA) & Return on Equity (ROE).

Kaur and Singh (2013) studied "Managing WC efficiency in Capital Goods Sector" and deployed performance index, utilization index and efficiency index, correlation, coefficient of determination and regression analysis as tools of analysis. The study also measured efficiency of the selected firms in terms of target level of efficiency (i.e. average of the industry was taken as target level of efficiency). The study found that 50% of the companies were not able to efficiently utilise the current assets for sales.

Panda and Nanda (2018) conducted empirical study on the relationship between WC financing & firm's profitability. For this purpose, the sample size of 1,211 Indian firms was taken for the period of 16 years which spanned from 2000 to 2016. It was revealed that firms in construction, chemical and consumer goods sectors could finance major portion of their WC needs through short-term debt without adversely impacting profitability. The study also found that firms with high price margin & high financial flexibility could enhance profitability. The study proposes that by financing major portion of WC requirements via short-term debts and the practicing with risky WC financing could surge profitability.

RESEARCH GAP

The survey of the literature reveals that WCM had not been much focused in the past. Numerous research studies recognize that the research on WCM is relatively neglected (Pass & Pike, 1987; Kwenda & Holden, 2014). Only few dimensions are focused as the study by Singh & Kumar (2014) stated that WCM activities, relating to debtors inventory and creditors management, are routine and inevitable. Aileman and Folashede (2014) also stated that before the occurrence of crisis of 2007-08, WC was just a concern for business survival and operational stability and was not focused as a measure that could provide liquidity in the form of free cash flows. The study by Simon Sunday *et al.* (2017) also mentions that host of the studies have already recognized WC as a

non-focus area. Fewer studies have been carried on the WCM of pharma industry in India especially during different economic situations. The study by Enqvist *et al.* (2014) states that a narrow number of studies link business cycles to working capital. So, this type of research gap has prompted the researcher to pursue the present study.

OBJECTIVES OF STUDY

The study has been carried out with the following objectives :

1. To study the efficiency of working capital of domestic and multinational pharma companies during boom, recession and recovery periods.
2. To analyze the working capital financing policies of the domestic and multinational pharmaceutical companies during boom, recession and recovery periods.
3. To examine the impact of working capital financing policies on the working capital efficiency of the domestic and multinational pharmaceutical companies during boom, recession and recovery periods.

RESEARCH METHODOLOGY

Universe & Sample Size : The universe of the study consists of all the pharma companies listed at BSE healthcare sector. A sample of top 50 pharma companies listed at BSE consisting of 25 domestic and 25 multinational pharma companies has been selected on the basis of market capitalization.

Data Base : This study depends upon the secondary data that has been collected from Prowess Database and Annual Reports of the respective pharma companies.

Test of Normality of the Data : The entire secondary data is tested for normality by applying :

- (a) **Kolmogorov-Smirnov (KS) Test :** The result showed that the values of data of some of the companies justified test of normality while the data of some of the other companies did not show bell-shaped curve.
- (b) **Logarithm :** So, in this study, the values of the entire data was converted into log values so as to normalize the data of the all the companies.

Period of the Study : The study covers a period of 12 years consisting of three economic situations : (i) Boom Period (2004-05 to 2007-08), (ii) Recession

Period (2008-09 to 2009-10), (iii) Recovery Period (2010-11 to 2015-16).

Hamel & Vlikangas (2003), in their article, mention that no company can afford to view current strategy as valid for all the times. The quest for corporate resilience demands a strategy that is forever latching on the emerging environmental challenges. The study by Chiou, Cheng and Wu (2006) discloses that during the recession firms may face problem in arranging external finance for their operating activities. The study further adds that because of constrained sales, the level of inventories may increase. The global financial crisis directed the researchers and practitioners to focus on the studies of the WCM (Enqvist *et al.*, 2014). The study by Baker Kent H. *et al.* (2017) in their study mentions that there is a paradigm shift in the studies of WCM after the global financial crisis of 2007-08. Another study by Ramiah *et al.* (2014) states that little effort has been made to assess the impact of 2007-08 crisis by especially dividing the period into two phases i.e. during the crisis and after the crisis. Simon Sunday *et al.* (2017) in their study sums up that the crisis directly affected the financial sector which tightened the credit standard and this indirectly led to recessionary effect rippling across the global economy.

So, the present study has examined separately for three periods WC efficiency as it is perceived that the change in the economic scenario might have affected the WC efficiency.

TOOLS OF ANALYSIS

A. Financial Tools

Utilization Index (UI) : Utilization Index measures the skill of a concern to employ its current assets for the purpose of generating sales. If the increase in all current assets is accompanied by more than proportionate increase in sales, the degree of utilization of current assets with respect to sales stands improved and vice-versa [Bhattacharya (1997), Ghosh and Maji (2003 & 2004), Kaur & Singh (2013), Kasiran *et al.* (2015)].

$$UI_{WCM} = \frac{A_{t-1}}{A_t}$$

Where A = Current Assets/Sales.

Performance Index (PI) : Performance index reveals the performance in the managing the sales and current assets over the specified period. If performance index is more than one, then it is said that the company has efficiently managed its working capital. It means that the proportionate increase in sales is more than the proportionate increase in current assets during a

specified period [Bhattacharya (1997), Ghosh and Maji (2003 & 2004), Kaur and Singh (2013), Kasiran *et al.* (2015)].

I_s - Sales index defined as S_t / S_{t-1} , W_i - Individual group of current assets - Number of current assets group, and $I = 1, 2, 3 \dots N$

Efficiency Index (EI) : EI is the product of PI and UI [Bhattacharya (1997), Ghosh and Maji (2003 & 2004), Kaur & Singh (2013), Kasiran *et al.* (2015)]. It is computed by multiplying the PI with UI. Thus, the formula for calculating the EI is as follows :

$$EI_{wcm} = PI_{wcm} * UI_{wcm}$$

Classification of Companies on the Basis of Efficiency Indices

The efficiency index is calculated for each company for each year and then arithmetic mean is computed for boom, recession and recovery period. Further, companies whose index is more than one are classified as efficient companies and vice-versa.

$$PI_{wcm} = \frac{I_s \sum_{i=1}^n \frac{W_{i(t-1)}}{W_i}}{N}$$

Working Capital Financing Policy

The degree of WC financing policy (WCFP) is measured as :

$$WC \text{ Financing Policy} = \text{Total Current Liabilities (TCL)} / \text{Total Assets (TA)}$$

Classification of Companies on the Basis of Financing Policy

The mean of the ratio of current liabilities to total assets is computed for each domestic and multinational pharma company for each year and mean is calculated for each economic situation for each company. On the basis of the mean of each company for different economic situations, grand mean (benchmark mean) is calculated. The pharma companies which have higher ratio as compared to benchmark mean are relatively considered as firms' practicing aggressive financing policy and the companies having the lower ratio than grand mean are taken as companies following conservative financing policy. This methodology has been used by [Amiri Esmail (2014), Afza and Nazir (2007), Nasif and Shubiri (2011), Taani, K. (2012), Temtime ZT (2016), Mbawuni, J. *et al.* (2016) and Ahmed Z. (2016)] in their studies.

B. Statistical Tools

The following statistical tools have been applied to analyze the data obtained from the financial tools : (i) Arithmetic Mean, (ii) Grand

Mean, (iii) F-test, (iv) ANOVA, (v) t-test, (vi) Correlation, (vii) R- Square, (viii) Regression Analysis.

Software Used : The following software has been used for the analysis of data :

1. MS-Excel
2. XI Stat
3. NCSS

HYPOTHESES OF STUDY

- H_{01} : There is statistically no significant difference between the efficiency index of domestic pharma companies in the boom period, recession period and recovery period.
- H_{02} : There is statistically no significant difference between the efficiency index of multinational companies in the boom period, recession period and recovery period.
- H_{03} : There is statistically no significant difference in the working capital financing policies of domestic pharma companies in different economic situations.
- H_{04} : There is statistically no significant difference the working capital financing policies of multinational pharma companies in different economic situations.
- H_{05} : There is statistically no significant difference in the working capital financing policies of domestic and multinational pharma companies in different economic situations.
- H_{06} : There is statistically no significant impact of aggressive financing policy of working capital on the efficiency index of domestic pharma companies in different economic situations. In other words, $\beta = .0$.
- H_{07} : There is statistically no significant impact of conservative financing policy of working capital on the efficiency index of domestic pharma companies in different economic situations. In other words, $\beta = .0$
- H_{08} : There is statistically no significant impact of aggressive investment policy of working capital on the efficiency index of multinational pharma companies in different economic situations. In other words, $\beta = .0$
- H_{09} : There is statistically no significant impact of conservative financing policy of working capital on the efficiency index of multinational pharma companies in different economic situations. In other words, $\beta = .0$

ANALYSIS & FINDINGS

Efficiency Index of Domestic Pharma Companies

As depicted by Table 1, in terms of efficiency index the percentage of domestic pharma companies slid from 84% (i.e. $21/25 \times 100$) to 76% ($19/25 \times 100$) from boom period to the recession period. If four companies' respective efficiency indices during the recession 0.98, 0.97, 0.95 and .98 are taken as nearest to figure one, then the efficiency index becomes highly impressive i.e. 100% of the companies. In the recovery period, the efficiency index of 72% ($18/25 \times 100$) of the companies' registered efficiency of more than one and the efficiency index of the remaining 28% of the companies is in the range of 0.94 to 0.99 which is also a good indicator of the efficiency.

Table 1

Efficiency Index of Domestic & Multinational Pharmaceutical Companies

	Boom Period		Recession Period		Recovery Period	
	DPCs	MNPCs	DPCs	MNPCs	DPCs	MNPCs
Efficiency Index >1 (Number of Companies)	21(84%)	17(68%)	19(76%)	17(68%)	18(72%)	22(88%)
Efficiency Index <1 (Number of Companies)	4(16%)	8(32%)	6(24%)	8(32%)	7(28%)	3(12%)
Total	25 (100%)	25 (100%)	25 (100%)	25 (100%)	25 (100%)	25 (100%)

Source : Compiled on the basis of data collected from Prowess Database

ANOVA : Efficiency Index of Domestic Pharmaceutical Companies						
Variation Source	SS	d.f.	MS	F	P-value	F Crit
Between Groups	0.002	2	0.001067	0.160733	0.851824	3.124
Within Groups	0.478	72	0.006639			
Total	0.48	74				
ANOVA : Efficiency Index of Multinational Pharmaceutical Companies						
Variation Source	SS	d.f.	MS	F	p-value	F Crit
Between Groups	0.01	2.00	0.01	1.07	0.35	3.12
Within Groups	0.38	72.00	0.01			
Total	0.40	74				

The variations in the efficiency index of the domestic pharma companies have not been proved to be statistically significantly different between the boom, recession and recovery periods as explained by the ANOVA values. As the p value 0.85 is more than $\alpha = .05$, so H_{01} is accepted.

Efficiency Index of Multinational Pharma Companies

As shown in Table 1, the average efficiency index of .68% (i.e. 17) multinational pharma companies in the boom period is greater than one which reveals that these companies have managed their current assets efficiently. During recession period, the average efficiency index of 17 multinational pharma companies is also greater than one depicting that multinational pharma companies were able to withstand in such an economic situation by managing their current assets as efficiently as in the boom period. In recovery period the efficiency index of 88% of 22 multinational pharma companies was greater than one reflecting that the multinational not only recovered but scaled up the situation.

The variations in the efficiency index of the multinational pharma companies have not been proved to be significantly different statistically between the boom, recession and recovery period as explained by the ANOVA values. As the value of p 0.35 is higher than $\alpha = .05$, so H_{02} is accepted.

WC Financing Policies of Domestic Pharma Companies

The WC financing policies of the domestic pharma companies are presented in Table 2

On the whole, the position regarding WC financing policy varied from one economic period to another period. During boom and recovery period, conservative financing policy remained the favorite of 64% and 52% of the companies respectively. During the recession period 52% of the companies pursued aggressive financing policy in contrast to 48% of the companies which followed conservative financing policy. This finding is similar to the finding made by Baker K. H. *et al.* (2017) which states that mixed policies are followed by the companies.

In respect of the financing policy of the domestic pharma companies, the p value of 0.82 as ANOVA is greater than $\alpha = 0.05$ which means that statistically there is no significant difference in the financing policies followed by the companies. So, null hypothesis H_{03} is accepted.

WC Financing Policies of Multinational Pharma Companies

The WC financing policies of the multinational pharma companies are presented in Table 2

In brief it can be inferred that by and large, the conservative financing policy is dominantly followed by the multinational pharma companies. This is evident as the percentage of the companies practicing the conservative financing policy in the respective periods are 68%, 92% and 88% in contrast to the companies following the aggressive financing policy which in the respective periods are 32%, 8% and 12%.

Table 2

Working Capital Financing Policies of Domestic & Multinational Pharmaceutical Companies

		Boom Period	Recession Period	Recovery Period
Domestic Pharmaceutical Companies	Aggressive Financing Policies	36%(9)	52%(13)	40%(10)
	Conservative Financing Policies	64%(16)	48%(12)	60%(15)
	Total	100%(25)	100%(25)	100%(25)
Multinational Pharmaceutical Companies	Aggressive Financing Policies	32%(8)	8%(2)	12%(3)
	Conservative Financing Policies	68%(17)	92%(23)	88%(22)
	Total	100%(25)	100%(25)	100%(25)

ANOVA : Working Capital Financing Policies of Domestic Pharmaceutical Companies

Variation Source	SS	d.f.	MS	F	P-value	F Crit
Between Groups	0.01	2	0.01	0.20	0.82	3.12
Within Groups	2.54	72	0.04			
Total	2.56	74				

ANOVA : Working Capital Financing Policies of Multinational Pharmaceutical Companies

Variation Source	SS	d.f.	MS	F	p-value	F Crit
Between Groups	5.99	2	3	0.73	0.48	3.12
Within Groups	295.21	72	4.10			
Total	301.21	74				

Source : Compiled on the basis of data collected from Prowess Database

Though mathematically the number of the companies following the financing policies differ but statistically there is no significant difference as p value .48 is greater than $\alpha = .05$. So null hypothesis H_{04} is accepted. It means the managers have not changed the financing policy under the different economic situations.

Comparison of Domestic and Multinational Pharma Companies Financing Policy

In order to know whether the domestic pharma companies and multinational pharma companies differ in practice in respect of WC financing policies, the figures of the ratio of total current liabilities to total assets are summarized in the Table 3.

Table 3

Comparison of WC Financing Policies Between Domestic and Multinational Pharma Companies

Periods	Mean Difference	Standard Error	t-statistic	d.f.	p-value	Reject H0 at $\alpha = .050?$
Boom	.0268	.0565	.4736	48	0.64	No
Recession	-0.66	.662	-1.01	48	.32	No
Recovery	-0.198	.233	-0.8477	48	.40	No

Source : Compiled on the basis of data collected from Prowess Database

Table 3 presents that in all the periods, both domestic and multinational pharma companies, the companies following the conservative financing policy outnumber the companies following the aggressive financing policy except for the domestic pharma companies which during recession period where the companies adopting the aggressive financing policy to the conservative financing policy are in the ratio of 13 to 12.

The p values in the respective periods of the boom, recession and recovery are .63, .31 and .40 in comparison the value $\alpha = 0.05$. As the value of the p in all the periods is more than the value of $\alpha = 0.05$, so the null hypothesis H_{05} is accepted. This states that all the pharma companies are following the similar financing policies in respect of WC financing policy.

Impact of Aggressive Financing Policy on WC Efficiency of Domestic Companies

In Table 4, the effect of the aggressive financing policy on the efficiency of WC has been summarized during the different economic situations.

Table 4
Impact of Aggressive Financing on Efficiency Index of Domestic Pharma Companies

Variables	Boom Period			Recession Period			Recovery Period		
	β	t-statistic	Sig.	β	t-statistic	Sig.	β	t-statistic	Sig.
Constant	1.0642	29.36	0.00	.9943	27.76	0.00	1.12	16.20	0.00
TCL/TA	.075	-1.23	.25	.0864	1.1365	.3006	-0.19	-1.3853	.20
r	0.77			0.76			0.80		
R-Square	0.60			0.58			0.64		
Estimated Equation of EI	= (1.0642) + (.075) * Ratio of Aggressive Financing Policy			= (.9943) + (.0864) * Ratio of Aggressive Financing Policy			= (1.12) + (-0.19) * Ratio of Aggressive Financing Policy		

Source : Compiled on the basis of data collected from Prowess Database

a. Impact on WC Efficiency During Boom Period

Table 4 reveals that during the boom period, 9 domestic pharma companies are practicing aggressive financing policy. The regression equation of the straight line relating to the efficiency index and aggressive financing policy in the boom period is estimated as:

$$\text{Efficiency Index} = (1.0642) + (0.075) * \text{Ratio of Aggressive Financing Policy}$$

As the value of the p 0.25 is higher than the value of $\alpha = .05$, the hypothesis H_{06} that the slope is zero is not rejected. The analysis of the behavior of the aggressive financing policy of the domestic pharma companies during the boom period reveals that the policy has not statistically significant bearing on the on the efficiency index. The coefficient of correlation 0.77 between the ratio of aggressive financing policy and the efficiency index is positive. This provides direction to the management that the degree of aggressiveness should be optimized to enhance the value of the efficiency index. The value of the R-square shows that 40% of the variations in the efficiency index are explained by the aggressive financing policy. It means that the management of these companies should identify and focus on the other 40% of the variables which influence the efficiency of the working capital.

b. Impact on WC Efficiency During Recession Period

The regression equation of the straight line relating to the efficiency index and aggressive financing policy during recession period is estimated as :

$$\text{Efficiency Index} = (.9943) + (.0864) * \text{Ratio of Aggressive Financing Policy}$$

Because the p value .2776 is higher than the value of $\alpha = .05$, the hypothesis H_{06} that the slope is zero is not rejected. The analysis of the regression equation during the recession period provides clue to the managers that they should identify and focus on the other variables as the value of the $\beta = .0864$ is not statistically significant. The coefficient of correlation 0.76 provides positive direction to the managers regarding the enhancement of the degree of aggressiveness. The value of the R-Square directs that only 58% of the variations in the efficiency are explained by the variations in the ratio of aggressive financing policy. So, study explores scope for the identification of the other reasons for improving the efficiency index.

c. Impact on WC Efficiency During Recovery Period

The regression equation of the straight line relating efficiency index and aggressive financing policy in the recovery period is estimated as :

$$\text{Efficiency Index} = 1.12 + (-0.19) * \text{Ratio of Aggressive Financing Policy}$$

As the p value .2033 is greater than the value of $\alpha = .05$, the hypothesis H_{06} that the slope is zero is not rejected. The analysis is useful for the managers of the corporate world in the sense that aggressive financing policy does not significantly impact the efficiency index of the working capital. Though aggressive financing policy do not significantly influence the efficiency still the managers should endeavor to focus on the improvement of the efficiency index by focusing on the other dimensions of the working capital. The direction of the correlation's coefficient reveals that there is positive correlation i.e.0.80. It stands that 64% of the variations in the efficiency are explained by the ratio of the aggressive financing policy.

Impact of Conservative Financing Policy on WC Efficiency of Domestic Companies

In the following Table 5, the effect of the conservative financing policy on the efficiency of WC has been summarized during the different economic situations.

a. Impact on WC Efficiency During Boom Period

The equation of the straight line relating efficiency index and conservative financing policy in the boom period is estimated as :

$$\text{Efficiency Index} = (.92) + (-0.46) * \text{Ratio of Conservative Financing Policy}$$

As the p value .045 is lesser than the value of $\alpha = .05$, the hypothesis H_{07} that the slope is zero is rejected. It is inferred that during the boom period

Table 5
Impact of Conservative Financing on Efficiency Index of Domestic Pharma Companies

Variables	Boom Period			Recession Period			Recovery Period		
	β	t-statistic	Sig.	β	t-statistic	Sig.	β	t-statistic	Sig.
Constant	0.92	18.27	0.00	1.12	27.7	0.00	1.10	7.3	0.00
TCL/TA	-0.46	2.21	.045	-0.37	1.13	.27	-0.18	-0.37	.71
r	-0.52		-0.36	-0.10					
R-Square	0.27			.13			.01		
Estimated Equation of EI	= (.92) + (-0.46) * Ratio of Conservative Financing Policy			= (.1.12) + (-0.37) * Ratio of Conservative Financing Policy			= (1.10) + (-0.18) * Ratio of Conservative Financing Policy		

Source : Compiled on the basis of data collected from Prowess Database

conservative financing policy significantly influence the value of the efficiency index. The analysis of the regression equation provides useful strategy to the corporate finance managers regarding the management of the conservative financing policy during the boom period. As the value of β coefficient -0.46 is statistically significant so the managers of the domestic pharma companies should try to reduce the ratio. The proposed action to reduce this ratio is to increase the proportion of the short-term sources of finance. This proposal is supplemented by the coefficient of the correlation's coefficient which is .52. The coefficient of determination explains that 27% of the variations in the efficiency index because of the conservative financing policy during the boom period.

b. Impact on WC Efficiency During Recession Period

The regression equation of the straight line relating efficiency index and conservative financing policy during recession period is estimated as :

$$\text{Efficiency Index} = (.1.12) + (-0.37) * \text{Ratio of Conservative Financing Policy}$$

As the value of the $p = 1.13$ is more than the value of $\alpha = .05$, the hypothesis H_{07} that the slope is zero is not rejected. The managers of the domestic pharma companies are suggested to cut the ratio of conservativeness financing during the recession period. Though the result is not statistically significant, but mathematically the equation suggests to lower the funding of the assets from the long-term sources of finance. The higher the ratio the lower

is efficiency of the WC because the value of the β coefficient is minus .37. The negative value of the coefficient of correlation -0.36 also support this direction. As just 13% of the variations in the efficiency index are caused by the conservative financing policy so the management's should trace out and manage the other factors influencing the value of the efficiency index.

c. Impact on WC Efficiency During Recovery Period

The regression equation of the straight line relating to efficiency index and conservative financing policy in the recovery period is estimated as :

$$\text{Efficiency Index} = (1.10) + (-0.18) * \text{Ratio of Conservative Financing Policy}$$

The correlation's coefficient between efficiency index and conservative financing policy is -0.10. Because the p value 0.71 is greater than the value of $\alpha = .05$, the hypothesis H_{07} that the slope is zero is not rejected. The finding which emerges from the analysis of the regression proves that the conservative financing policy do not significantly influence efficiency index during the recovery period. So, the finance managers need to identify and concentrate on the other factors. The analysis of the coefficient of correlation directs that higher the ratio of the degree of conservativeness lesser the efficiency index. So, though the results are not statistically significant but still the managers should reduce the degree of conservativeness in financing the working capital. The coefficient of determination reveals that hardly 1% of the variations are explained by the conservative policy during the recovery period.

Impact of Aggressive Financing Policy on WC Efficiency of Multinational Companies

In the following Table 6 the effect of the aggressive financing policy on the efficiency of WC has been summarized during the different economic situations.

a. Impact on WC Efficiency During Boom Period

The equation of the straight line relating to the efficiency index and aggressive financing policy is estimated as :

$$\text{Efficiency Index} = 1.016 + (.082) * \text{Ratio of Aggressive Financing Policy}$$

As the p value .78 is greater than the value of $\alpha = 0.05$, the hypothesis H_{08} that the slope is zero is not rejected. So, from the regression equation it is inferred that the aggressive financing policy do not significantly affect the WC efficiency index. Though statistically there is no significant influence of the WC policy, but mathematically the study suggest to increase the ratio of

Table 6
Impact of Aggressive Financing on Efficiency Index of Multinational Pharma Companies

Variables	Boom Period			Recession Period			Recovery Period		
	β	t-statistic	Sig.	β	t-statistic	Sig.	β	t-statistic	Sig.
Constant	1.016	6.96	0.00	1.0290			1.0367	176.6	0.0036
TCL/TA	.082	.29	.78	0.0007			-0.0027	-1.6519	.35
r	0.76			0.77			0.78		
R-Square	0.59			0.60			0.61		
Estimated Equation of EI	= (1.016) + (.082) * Ratio of Aggressive Financing Policy			= (1.0290) + (0.0007) * Ratio of Aggressive Financing Policy			= (1.0367) + (-0.0027) * Ratio of Aggressive Financing Policy		

Source : Compiled on the basis of data collected from Prowess Database

aggressive financing policy as the value of the $\beta = .082$ is positive. It means the multinational pharma companies can enhance the proportion of the current liabilities in order to optimize the value of the efficiency index. The positive coefficient of correlation 0.76 discloses the direction for the enhancement of the efficiency index. As the value of the R-square reveals that only 59% change in the efficiency index occurs because of the financing policy, so, the managements of the concerned pharma companies should locate and manage the other variables which influence the efficiency of the working capital to the extent of 41%.

b. Impact on WC Efficiency During Recession Period

The regression equation of the straight line relating to the efficiency index and aggressive financing policy during recession period is estimated as :

$$\text{Efficiency Index} = (1.0290) + (0.0007) * \text{Ratio of Aggressive Financing Policy}$$

Since, p value is equal to zero as compared to the value of $\alpha = 0.05$, the hypothesis H_{08} that the slope is zero is rejected. So, it means that the value of the efficiency index is influenced by the value of $\beta = 0.0007$ which is multiple of the ratio of financing policy. So, the regression equation proposes to enhance the proportion of current liabilities in the total assets of the company. The perfect positive correlation 0.77 between efficiency index and ratio of aggressive financing policy also strengthens this proposed action. This strategy is further supported by the value of the R-square which explains 60% variations in the efficiency index arise because of the ratio of current liabilities to total assets.

c. Impact on WC Efficiency During Recovery Period

The regression equation of the straight line relating to efficiency index and aggressive financing policy in recovery period is estimated as :

$$\text{Efficiency Index} = (1.0367) + (-0.0027) * \text{Ratio of Aggressive Financing Policy}$$

As the p value .35 is greater than the value of $\alpha = 0.05$, the hypothesis H_{08} that the slope is zero is not rejected. The analysis of the regression equation reveals that during the recovery period the efficiency index of WC is not significantly impacted by the financing policy of the multinational pharma companies. Though statistically there is no significant effect, but mathematically the regression equation suggest because of the negative value of the β which is -0.0027 to reduce the degree of aggressiveness during the recovery period. So, it is concluded and proposed that in the recovery period, the finance managers should minimize the degree of aggressiveness and cut the value of the current liabilities. This inference is further supported by the negative value -0.78 of the correlation's coefficient between the aggressive financing policy and efficiency index. The value of the R-square confirms that 61% of the variations in the efficiency index happen due to aggressive financing policy.

Impact of Conservative Financing Policy on WC Efficiency of Multinational Companies

In the following Table 7, the effect of the conservative financing policy on the efficiency of WC has been summarized during the different economic situations.

a. Impact on WC Efficiency During Boom Period

The regression equation of the straight line relating to the efficiency index and conservative financing policy during the boom period is estimated as :

$$\text{Efficiency Index} = (1.22) + (-0.75) * \text{Ratio of Conservative Financing Policy}$$

Because the p value.0887 is more than the value of $\alpha = 0.05$ so null hypothesis H_{09} that the slope is zero is not rejected. The regression analysis of the boom period proposes in sight to the finance managers regarding the behavior of the ratio of the conservative financing policy to influence the efficiency index. Though statistically the value is not significant, but the value of β i.e. -0.75 reveals that higher the content of long-term sources of finance (or lesser the proportion of short-term sources of finance) the lesser the value of the efficiency index. So, the finance managers of the multinational pharma companies should increase the proportion of the current liabilities to reduce the

Table 7
Impact of Conservative Financing on Efficiency Index of Multinational Pharma Companies

Variables	Boom Period			Recession Period			Recovery Period		
	β	t-statistic	Sig.	β	t-statistic	Sig.	β	t-statistic	Sig.
Constant	1.22	11.44	0.00	1.022	54.99	0.00	1.0168	66.4	0.00
TCL/TA	-0.75	-1.82	.088	-0.038	-0.68	.5	-0.0127	-0.29	.76
r	-0.43			-0.15			-0.07		
R-Square	.18			.022			0.0044		
Estimated Equation of EI	= (1.22) + (-0.75) * Ratio of Conservative Financing Policy			= (1.022) + (-0.038) * Ratio of Conservative Financing Policy			= (1.0168) + (-0.0127) * Ratio of Conservative Financing Policy		

Source : Compiled on the basis of data collected from Prowess Database

degree of conservativeness. This finding is confirmed by the coefficient of correlation which is -0.43. The value of R-Square states that 18% of the change in the efficiency index takes place due to the conservative financing policy. So there is need for tracing and correcting the out the other variables which influence the conservative financing policy.

b. Impact on WC Efficiency During Recession Period

The regression equation of the straight line relating efficiency index and conservative financing policy is estimated as :

$$\text{Efficiency Index} = (1.022) + (-0.038) * \text{Ratio of Conservative Financing Policy}$$

As the p value .5 is more than the value of $\alpha = 0.05$ the hypothesis H_{09} that the slope is zero is not rejected. The analysis of the conservative financing policy followed during the recession period by the multinational pharma companies proposes direction to the finance managers regarding the degree of ratio of conservative policy of financing. As the value of the $\beta = -0.0379$ is negative which is though not statistically significant but mathematically it means as long as the ratio of long-term sources of finance in financing the total assets is more, the value of the efficiency index shall decline. So, it is suggested that the pharma companies should reduce the degree of conservativeness in financing. The negative coefficient of correlation (-0.15) also provide clue in this regard, i.e., higher the ratio of conservative financing lesser the value of the efficiency index. The value of the R- Square explains only 2.2% of the variations in the efficiency index because of conservative financing policy. It means the

management of the companies should also endeavor to locate and manage the other impacting factors.

c. Impact on WC Efficiency During Recovery Period

The regression equation of the straight line relating to the efficiency index and conservative financing policy in the recovery period is estimated as :

$$\text{Efficiency Index} = (1.0168) + (-0.0127) * \text{Ratio Conservative Financing Policy}$$

Because the p value .7698 is more than the value of $\alpha = 0.05$, the hypothesis H_{09} that the slope is zero is not rejected. The analysis shows that degree of the ratio of conservative financing policy is not statistically significant for influencing the efficiency of the multinational pharma companies during the recovery period. It means the analysis finds that the managers should focus on the other factors for enhancing the efficiency of the working capital. Even the coefficient of correlation is just -0.07 which is very low. The coefficient of determination .044% i.e. being very low explains meager variations in the efficiency index due to the ratio of conservative financing policy.

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Source : Compiled on the basis of data collected from Prowess Database

List of Abbreviation

Name of Company / Items / Term	Abbreviation
Aarti Drugs Limited	AADL
Ajanta Pharma Ltd.	AJPL
Albert David Ltd.	ADL
Alembic Limited	AL
Alpha	α
Anuh Pharma Limited	APL
Aurobindo Pharma Ltd	ABPL
Beta	β
Between the group	BG
Biocon Ltd.	BL
Bliss G V S Pharma Ltd.	B GV SPL
Cadila Healthcare Ltd.	CHL
Caplin Point Laboratories Ltd.	CPL
Cipla Ltd	CL
Coral Laboratories Limited	CLL
Degree of freedom	<i>d.f.</i>
Dishman Pharmaceuticals & Chemicals Ltd.	DPCL
Domestic Pharma Companies	DPCs
DrReddys Laboratories Ltd.	Dr. RL
Efficiency Index	EI
F Critical Value	<i>F crit.</i>
FDC Limited	FDCL
Glenmark Pharma Ltd.	GPL
Godavari Drugs Limited	GDL
Granules India Limited	GIL
Gufic Biosciences Ltd.	GBL
Hester Biosciences Limited	HBL
Hikal Ltd.	HL
Indoco Remedies Limited	IRL
IOL Chemicals and Pharmaceuticals Limited	IOLCPL
Ipca Laboratories Ltd.	ILL
J B Chemicals & Pharmaceuticals Ltd.	JBCPL
Jagsonpal Pharmaceuticals Ltd.	JPL
Jenburkt Pharmaceuticals Limited	JBPL

Lactose (India) Limited	LL
Lincoln Pharmaceuticals Limited	LPL
Lupin Ltd	LUPL
Marksans Pharma Ltd.	MPL
Mean squares	MS
Merck Ltd.	ML
Morepen Laboratories Limited	MLL
Multinational Pharma Companies	MNPCs
Natco Pharma Ltd.	NPL
Nectar Lifescience Limited	NLL
Neuland Laboratories Limited	NLLL
NGL Fine-Chem Limited	NFCL
Null Hypothesis	H_0
Performance Index	PI
Pharmaceutical	pharma
Pharmaids Pharmaceuticals Limited	PPL
R-Square	R^2
Roopa Industries Limited	RIL
Shilpa Medicare Ltd.	SML
Significance	Sig.
Smruthi Organics Limited	SOL
Sum of Square	SS
Sun Pharma Ltd.	SPL
Suven Life Sciences Limited	SLSL
Themis Medicare Limited	TML
Torrent Pharmaceuticals Ltd.	TPL
TTK Healthcare Limited	TTKHL
Utilization Index	UI
Venus Remedies Ltd.	VRL
Vistas pharma Ltd.	VPL
Wanbury Limited	WL
Wintac Limited	WTL
Within the group	WG
Working Capital	WC
Working Capital Management	WCM