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Impact of Economic Conditions on Working Capital Efficiency of Multinational Pharmaceutical Companies

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Abstract: *Tithe study investigated the impact of boom period, recession period and recovery period on the management of working capital efficiency and its relationship with profitability (ROA) using a sample of BSE Healthcare listed 25 pharmaceutical companies. The study period of 12-years period divided into 3 parts: i) boom period (2004-05 to 2007-08), ii) recession period (2008-09 to 2009-10) and iii) recovery period (2010-11 to 2015-16). Working capital efficiency has been measured in terms of Performance Index (PI), Utilization Index (UI) and Efficiency Index (EI) following the model suggested by Bhattacharya (1997).The study focused on the relationship of boom period, recession period and recovery period on the working capital efficiency. The efficiency index of 21, 19 and 22 of multinational pharmaceutical companies in the boom period, recession period and recovery period is greater than 1 which is normally considered as satisfactory. Though statistically, there is no difference in the management of working capital efficiency during the different economic situations but the comparative analysis of boom period to recession period and recession period to recovery period revealed that 92 percent (i.e. 23/25) of the companies has been affected either in recession period or recovery period. The result showed that the management of majority of the companies did not adapt to economic situations. Though the sales are influenced by situations of time the current assets is primarily a controllable factor should have been adjusted at least in recovery period.*

Keywords: *Boom Period, Pharmaceutical Companies, Recession Period, Recovery Period and Working Capital Efficiency.*

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I. Introduction

Working capital management involves the management and control of current assets collectively and individually i.e. inventories, accounts receivables, cash. It may be well said that the progress and prosperity, financial health and stability of an industrial or business enterprise largely depend upon the effective management of the various facets of the working capital' (Mathur, 2003).Perhaps due this reason 70 percent- 80 percent of the time of finance executives is consumed by the working capital decisions. A business mainly commits the funds in the fixed assets and currents assets. The investment in fixed assets is known as irreversible decisions or reversible at substantial loss (Pandey, 2011) and current assets decisions are swiftly changed (Chandra, 2017). Working capital management focuses on managing the current assets and current liabilities. Efficiency of working capital management is important for the manufacturing firm because large proportion of assets depends upon current assets.

The study by Rajan& Aniruddha (2013) studied the selected efficiency ratios of working capital management and found the relationship with return on capital employed. In an average company, reduction of working capital by 30percent results in 16 percent increase in after-tax returns on invested capital (Seifert & Seifert, 2008).An efficient working capital management is expected to enhance the value creation for the firms' owners (Mehtap Oner,2016)Firms can enhance their profitability by increasing working capital efficiency (Enqvist Julius,2014).

Firms' Performance & Economic Conditions: The management of a business is impacted by the economic situations of the domestic as well as global economy. The studies by Merville &Tavis (1973), Einarsson & Marquis (2001), Braun & Larrain (2005), Chiou et.al (2006) has studied the relationship between working capital and profitability. Increases in the variability suggest that during the crisis there are major differences in working capital management, Habrnal Marek, (2007). During the recession period some firms has to adopt lenient credit policy to sell the products and hence block more funds in working capital which

ultimately leads to the reduction of the profitability. The studies conducted by Deloof (2003), Laziridis and Tryfonidis (2006), Gill et. al (2010), Garcia-Teruel and Martinez- Solano (2007), Samiloglu and demirgunes (2008) and Mathuva (2010) therefore infer that there is negative relationship between accounts receivables and firm profitability.

Pharmaceutical Industry in India

India enjoys an important position in the global pharmaceuticals sector. The country has a large pool of scientists and engineers who have the potential to steer the industry ahead to an even higher level. (IBEF, 2016)

India's pharmaceutical sector is expected to touch US$ 55 billion by 2020 from US$ 6 billion in 2005. Indian pharmaceutical market is expected to grow at a compound annual growth rate (CAGR) of the 15 per cent per annum between 2015 and 2020. (IBEF, 2016)

The Indian pharmaceuticals market is the third largest in terms of volume and thirteenth largest in terms of value. Branded generics dominate the pharmaceuticals market, constituting nearly 70 to 80 per cent of the market. India is the largest provider of generic drugs globally with the Indian generics accounting for 20 per cent of global exports in terms of volume. (India Brand Equity Foundation, 2017)

Impact of Economic Condition on Pharma Industry

The Indian pharmaceutical sector is globally vibrant sector in terms of Cost-efficiency which leads to its prominence to set up manufacturing in emerging markets & Africa. The cost of setting up a manufacturing plant in India is 40 per cent lower than in Western countries. Because of the global nature of the Indian Pharma sector, its performance is influenced by the international events. The 2008 recession and 2016 Brexit has a bearing on this sector. There are divergent opinions regarding the impact of 2008 recession on the Pharmaceutical sector in India. Some of the authorities opine that the Indian pharmaceutical industry has been impacted by the 2008 recession while other express that Indian pharmaceutical sector being strong enough had a little effect. (IBEF, 2017)

During recession there was decline in growth projections due to fall in industrial production and slow economic growth. The Pharmaceutical Export Promotion Council of India determined that the global recession reduced India's pharmaceutical exports of 2008-09 to $8.25 billion, lower than the previous prediction of $8.97 billion with export growth of 13.89% as compared to the earlier estimated 23.87%.(Global Financial Crisis,2015). During the turbulent period, the pharmaceutical sector has gazed resilience and has been less impacted. The reasons cited for lesser impact of recession on this sector are: the domestic pharmaceutical market has registered a healthy growth rate. The growing incidence of lifestyle diseases, rising disposable incomes, greater penetration of health insurance and expanding medical infrastructure continues to foster growth in the domestic market. The prices of medicines that were produced by Indian pharmaceutical manufacturing companies are lesser than the prices of other nations, where the other nations' governments are claiming to cut down their cost of healthcare. The Pharmaceutical industry has made its position in international market as there is surging demand for generic medicines. (ibef.org, 2017)

Review of literature

Ghosh and Maji (2004) studied the working capital management efficiency of the Indian cement companies from 1992 to 2002 and measured the three index values-performance index, utilization index and efficiency index of working capital management. The result indicated that the Indian Cement Industry as a whole did not perform remarkably well during this period.

Sen and Oruc (2009) examined the relationship between efficiency level of working capital management and return on total assets of the Pakistani textile firms listed at ISE (Istanbul Stock Exchange). The result of the study portrayed that there is inverse association existed between return on total assets, current ratio, cash conversion cycle and net working capital at a significant level.

Kesimli & Gunay (2011) studied 45 companies of real sector listed under Istanbul Stock Exchange (ISE). In the study the period has been divided into two categories: i) pre-crisis era (2004-2007) ii) crisis era (2008 -2009). The result showed that the selected companies were affected due to two factors inflation and credit easing during global economic crisis. But these two factors does not affected the current ratio, liquidity ratio and cash ratio. Receivables turnover ratio was influenced a lot from all the ratios due to which sales declined.

Haron & Nomran (2015) examined the 57 Malaysian firms from the period 2002 to 2012 divided into three global financial crisis i.e. before crisis (2002 to 2006), during crisis (2007-2008) and after crisis (2009-2012). The result showed that four variables considered for the research i.e. Probability, sales growth, Free cash flow and firm size had the negative impact on working capital management during global financial crisis.

Kasiran et.al. (2016) analyzed the efficiency index of twenty four small and medium enterprise companies listed at SME Corporation of Malaysia from the 2009 to2013.The study focused on working capital indices: performance index, utilization index and efficiency index. The result reveled that in case of performance index the value wasn't up to expectation. Utilization index of 17 companies were up to expectation i.e. more than 1. It stated that companies have used their current assets efficiently.

Samilogl and Akgun (2016) studied 120 Turkish manufacturing firms for the period of 10 years (2003-2012) listed at Istanbul Stock Exchange. The result found that there was negative relationship between return on asset, return on equity, account receivables and the positive relationship between net profit margin and inventory conversion period.

Yahaya (2016) investigated the relation between the working capital management and the performance of 6 pharmaceutical listed at Nigeria stock exchange for a period of 8 years from 2006-2013. The study concluded that both account receivables and inventory has significantly, strongly and positively influenced the performance of Listed Pharmaceutical Firms in Nigeria.

Research Gap: The scanning of literature survey discloses that many studies have been conducted on the other various aspects of the working capital but very few studies has been carried on the efficiency of working capital which comparatively evaluate the efficiency of working capital during economic situations. So the present study plan to bridge up the prevalent gap.

Objective of study

The present study aims: to analyze the efficiency of working capital management of multinational pharmaceutical companies during the three economic conditions.

Period of the study

In this paper the period is 12 years which span from 2004-05 to 2015-16.The period of study is divided into 3 parts: i) boom period (2004-05 to 2007-08), ii) recession period (2008-09to2009-10) and iii) recovery period (2010-11 to 2015-16).

II. Research Methodology

Population & Sample Size

Population of the Study: The universe of the study comprises all the multinational pharmaceutical companies listed at BSE healthcare sector.

Sample Size: A sample of 25 multinational pharmaceutical companies has been selected on the basis of market capitalization from BSE listed companies.

The pharmaceutical companies having their manufacturing activities in India as well as in other countries are considered as multinational companies.

Tools of Analysis

Financial Tools: the following financial tools have been applied in this study

Utilization Index (UI): Utilization Index indicates the ability of the firm in utilizing its current assets as a whole for the purpose of generating sales. If an increase in total current assets in coupled with more than proportionate increase in sales , the degree of utilization of these assets with respect to sales is said to have improved and vice-versa (Bhattacharya, 1997) .

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

Where A = current assets/sales.

Performance Index (PI): Performance index depict the performance in managing the sales and current assets over the specified period of time. It is said that if performance index is more one then the firms have efficiently managed its working capital. If the proportionate rise in sales is more than the proportionate rise in current assets during a particular period (Bhattacharya, 1997).

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

Is - Sales index defined as S_t / S_{t-1}
Wi - Individual group of current assets
N - Number of current assets group, and
I = 1, 2, 3,…, N

Efficiency Index (EI): EI is the product of PI and UI. (Bhattacharya, 1997)
It is computed by multiplying the overall PI with UI. Thus the formula for calculating the EI is as follows:
EIwcm= PI wcm * UI wcm

Benchmark Indices: The few existing studies conducted by H. Bhattacharya (1981), Ghosh and Maji (2003 & 2004), Kaur & Singh (2013),Kasiran et.al (2015) and Sharma A.K. (2015) evaluated the performance index , utilization index and efficiency index satisfactory if the respective index is equal or greater than 1 (benchmark) and vice-versa.
The present study goes beyond the benchmark of 1 of these indices. In the present study, in order to know the impact of the economic situations, intra-period comparison has been made and any increase or decrease in indices has been considered as improvement and deterioration.

Statistical Tools
1. Arithmetic Mean 2. Range 3. t- test

Software used: Ms Excel-2010 and SPPS-21 has been used for statistical analysis.

Hypothesis of the Study
H_o**:** There is no difference in the management of Performance Index, Utilization Index and Efficiency Index during the boom period, recession period and recovery period
H_1: There is difference in the management of Performance Index, Utilization Index and Efficiency Index during the boom period, recession period and recovery period.

Analysis and Discussion

Table 1 showed that the average performance index of 23 multinational pharmaceutical companies in the boom period is greater than one which represented that multinational pharmaceutical companies have managed their current assets efficiently. The Bliss G V S Pharma Limited (BGVSPL) has the highest average performance index of 4.77and Merck Limited (ML) has the lowest average performance index of 0.79 in the boom period. The average performance index of multinational pharmaceutical companies during recession is greater than one depicted that 21 multinational companies managed their current assets efficiently. The Shilpa Medicare Limited (SML) has the highest average performance index of 1.91 and Biocon Limited (BL) & Lupin Limited (LUPL) has the lowest average performance index of 0.93. In recovery period the average performance index of 22 of multinational pharmaceutical companies was greater than one. The Sun Pharma Limited (SPL) has the highest value of 2.08 and Jagsonpal Pharmaceuticals Limited (JPL) has the lowest value of 0.96. The performance index of multinational pharmaceutical company Bliss G V S Pharma Limited (BGVSPL) has the maximum value of 14.60 and Vista Pharmaceuticals Limited (VPL) has 0.06 minimum values in the boom period. During recession period the Vista Pharmaceuticals Limited (VPL) has the maximum value of 3.22 and the Vista Pharmaceuticals Limited (VPL) minimum value of 0.02. In the recovery period Glen mark Pharma Limited (GPL) has maximum value of 4.43 and Vista Pharmaceuticals Limited (VPL) has minimum value of 0.18. The grand mean in three economic period of performance index of all the multinational pharmaceutical companies is greater than one. It revealed that multinational pharmaceutical under study have managed their current assets efficiently. The boom period's grand mean of performance index is a 1.68 highest value among the three economic periods

Table 2 revealed that the average utilization index of multinational pharmaceutical companies in the boom period is greater than one represented that 15 multinational pharmaceutical companies have managed their current assets efficiently. The Glenmark Pharma Limited (GPL) has the highest average utilization index of

1.37and The Vista Pharmaceuticals Limited (VPL) has the lowest average utilization index of 0.75 in the boom period. The average utilization index of multinational pharmaceutical companies during recession is greater than one depicted that 16 multinational companies managed their current assets efficiently. The Merck Limited (ML) & Shilpa Medicare Limited (SML) has the highest average utilization index of 1.22 and Biocon Limited (BL) has the lowest average utilization index of 0.80. In recovery period the average utilization index of 18 of multinational pharmaceutical companies was greater than one. The Vista Pharmaceuticals Limited (VPL) has the highest value of 1.59 and Merck Limited (ML) has the lowest value of 0.80. The average utilization index of multinational pharmaceutical company Glenmark Pharma Limited (GPL) has the maximum value of 3.75 and Vista Pharmaceuticals Limited (VPL) has 0.19 minimum values in the boom period. During recession period the Vista Pharmaceuticals Limited (VPL) has the maximum value of 2.06 and the Vista Pharmaceuticals Limited (VPL) minimum value of 0.11. In the recovery period Vista Pharmaceuticals Limited (VPL) has maximum value of 5.16 and Aurobindo Pharma Limited (ABPL) has minimum value of 0.09. The grand mean in three economic period of average utilization index of all the multinational pharmaceutical companies is greater than one. It revealed that multinational pharmaceutical under study have managed their current assets efficiently. The Recovery period's grand mean of utilization index is a 1.04 highest value among the three economic periods.

As shown in Table 3 that the average efficiency index of multinational pharmaceutical companies in the boom period is greater than one represented that 21 multinational pharmaceutical companies have managed their current assets efficiently. The Bliss G V S Pharma Limited (BGVSPL) has the highest average efficiency index of 6.33and Merck Limited (ML) has the lowest average efficiency index of 0.67 in the boom period. The average efficiency index of multinational pharmaceutical companies during recession is greater than one depicted that 19 multinational companies managed their current assets efficiently. The Vista Pharmaceuticals Limited (VPL) has the highest average efficiency index of 3.32 and Biocon Limited (BL) has the lowest average efficiency index of 0.76. In recovery period the efficiency index of 22 of multinational pharmaceutical companies was greater than one. The Glenmark Pharma Limited (GPL) has the highest efficiency index of 3.74 and Venus Remedies Limited (VRL) has the lowest efficiency index of 0.90. The efficiency index of multinational pharmaceutical company Vista Pharmaceuticals Limited (VPL) has the maximum value of 23.95 and Aurobindo Pharma Limited (ABPL) & Vista Pharmaceuticals Limited (VPL) has 0.01 minimum values in the boom period. During recession period the Vista Pharmaceuticals Limited (VPL) has the maximum value of 6.63 and the Vista Pharmaceuticals Limited (VPL) minimum value of.00. In the recovery period Sun Pharma Limited (SPL) has maximum value of 18.92 and Vista Pharmaceuticals Limited (VPL) has minimum value of 0.03. The grand mean in three economic period of efficiency index of all the multinational pharmaceutical companies is greater than one. It revealed that multinational pharmaceutical under study have managed their current assets efficiently. The boom period's grand mean of efficiency index is a 1.85 highest value among the three economic periods.

III. Conclusion

The comparison of performance index of boom and recession period reveals that in recession period 52 percent sample companies (10/25) recorded decline and amazingly the remaining 40 percent of the sample companies registered improvement in performance index. The comparative analysis of recession and recovery period reveals that 56(14/25) percent of the companies further registered deterioration in terms of performance index and the other 44 percent companies improved in the recovery period. Some of the companies which continuously lost in recession and recovery situations are: Jagsonpal Pharmaceuticals Limited (JPL), Bliss G V S Pharma Limited (BGVSPL) and Venus Remedies Limited (VRL). The other companies which could not sustain the pressure of recession in recovery period are: Lupin Limited (LUPL), Torrent Pharmaceuticals Limited (TPL), Ipca Laboratories Limited (ILL), Cadila Healthcare Limited (CHL) and Gufic Biosciences Limited (GBL). The performance index of 23, 21 and 22 of multinational pharmaceutical companies in the boom period, recession period and recovery period is greater than 1 which is normally considered as satisfactory. Further analysis reveals that 10 companies' performance index slided down from boom period to recession period and ten 13 companies performance index nosedived in recovery period. So this reveals that recession impacted the sales of some of the companies. The overall result emerges that 92 percent (i.e. 23/25) of the companies has been affected either in recession period or recovery period. The test of significance reveals that change in performance index from boom period to recession period to recovery period is not statistically significant as the respective P values 0.195 and 0.501 are greater than 5 percent significance .The utilization index of 15, 16 and 18 of multinational pharmaceutical in the boom period, recession period and recovery period is greater than 1 which is normally considered as benchmark satisfactory. Further analysis reveals that 14 companies' performance index nose divided from boom period to recession period and 14 companies' performance index nosedived in recovery period. So this reveals that recession impacted the sales of some of the sample companies. The test of significance reveals that change in utilization index from boom period to

recession period to recovery period is not statistically significant as the represents P values 0.763 and 0.828 are greater than 5 percent significance values. During the period of the study, it is observed that the finance managers of the 3 companies namely Ajanta Pharma Limited (AJPL), Bliss G V S Pharma Limited (BGVSPL) and Vista Pharmaceuticals Limited (VPL) did not deploy any strategy to cope up with the changing economic situations. The management of 9 companies and 11 companies burnt their fingers during recession and recovery period. Cipla Limited (CL) and Torrent Pharmaceuticals Limited (TPL) managed to balance the situation (recession) as their utilization index is consistent. The efficiency index of 21, 19 and 22 of multinational pharmaceutical companies in the boom period, recession period and recovery period is greater than 1 which is normally considered as satisfactory. Further scanning reveals that 10 companies' performance index plunged from boom period to recession period and 13 companies' performance index nosedived in recovery period. So this reveals that recession has influenced the sales of some of the sample companies. Only one company which didn't perform well in the all three economic period i.e. Bliss G V S Pharma Limited (BGVSPL).The companies which performed well in all three economic periods are: Torrent Pharmaceuticals Limited (TPL), Ipca Laboratories Limited (ILL) and Cadila Healthcare Limited (CHL). According to paired samples t-test, the comparison of the EI of boom period with the EI of recession period, H0 is accepted and H1 is rejected EI recession period and EI recovery period comparison implies us to accept H0 and reject Hypothesis H1. Since p value is above 0.05 meaning that there is no significant difference, it is interpreted that Efficiency index is not affected for 25 domestic pharmaceutical companies.

Limitations of the Study: The present study has the following limitations:

1. The study is based on the secondary data. So the inherent limitations of secondary data shall influence the study.
2. The study has the limited period of 12 years i.e. from 2004-05 to 2015-16.
3. The study is limited to the pharmaceutical sector.
4. The study is confined to the selected aspects of the working capital management.

Scope for Further Research

The study offers further scope for the study in the following dimensions: i) the study can be made a comparative study on the basis of domestic companies and multinational companies so that the better practices of the leading group can be a lesson for the laggard group , ii) the companies can be selected on the basis of market capitalization and the companies can be classified into large cap, mid cap and small cap, iii) the other study can be carried which can find the relationship between working capital efficiency and market capitalization, iv) another study should try to dig out the relationship between working capital efficiency and the strategies adopted by the respective companies under the changed economic situations.

Table No.2

Utilization Index of MNCs Pharmaceutical Companies

		BOOM PERIOD				RECESSION PERIOD				RECOVERY PERIOD			
S.No.	Abb.	Av.	Max.	Min.	RG.	Av.	Max.	Min.	RG.	Av.	Max.	Min.	RG.
1	CL	0.95	0.99	0.89	0.10	0.95	1.05	0.86	0.19	1.14	1.54	0.82	0.72
2	LUPL	0.97	1.11	0.70	0.40	1.02	1.08	0.97	0.11	1.00	1.15	0.86	0.30
3	JBCPL	0.97	1.02	0.90	0.11	0.98	1.08	0.88	0.20	1.09	1.57	0.69	0.88
4	ABPL	0.74	1.19	0.09	1.10	1.08	1.12	1.04	0.08	1.02	1.12	0.91	0.21
5	BL	1.30	2.51	0.85	1.65	0.80	0.89	0.70	0.19	1.00	1.14	0.78	0.35
6	AJPL	1.11	1.43	0.95	0.48	1.10	1.25	0.95	0.30	1.07	1.44	0.84	0.60
7	TPL	0.91	1.08	0.77	0.32	0.91	1.03	0.78	0.25	1.04	1.37	0.92	0.46
8	GPL	1.02	1.55	0.62	0.93	0.99	1.64	0.33	1.31	1.37	3.75	0.77	2.99
9	ILL	0.97	1.12	0.83	0.30	1.00	1.02	0.98	0.05	1.03	1.18	0.95	0.23
10	ML	0.80	1.10	0.60	0.50	1.22	1.58	0.85	0.72	1.02	1.13	0.92	0.22
11	DPCL	1.04	1.40	0.65	0.75	0.93	1.10	0.76	0.34	0.99	1.43	0.79	0.63
12	NPL	1.04	1.13	0.93	0.20	1.18	1.45	0.91	0.54	0.97	1.20	0.82	0.38
13	ADL	1.01	1.26	0.80	0.46	0.93	0.97	0.89	0.08	1.03	1.22	0.77	0.46
14	JPL	1.01	1.29	0.77	0.52	1.07	1.14	1.00	0.14	0.95	1.07	0.81	0.26
15	MPL	0.83	1.23	0.46	0.77	1.11	1.37	0.86	0.50	1.12	1.60	0.84	0.76
16	Dr. RL	0.98	1.16	0.63	0.52	1.11	1.14	1.08	0.06	0.96	1.17	0.87	0.31
17	SPL	0.93	1.31	0.32	0.99	1.16	1.24	1.07	0.17	1.23	2.62	0.38	2.23
18	CHL	0.91	0.95	0.87	0.09	0.96	0.98	0.94	0.05	1.06	1.25	0.95	0.30
19	GBL	1.00	1.12	0.91	0.21	0.98	1.00	0.96	0.04	1.02	1.16	0.90	0.26
20	BGVSPL	1.15	1.42	0.74	0.68	1.07	1.17	0.96	0.21	0.95	1.12	0.79	0.32
21	SML	0.85	1.19	0.63	0.55	1.22	1.39	1.06	0.33	1.05	1.30	0.77	0.53
22	HL	0.85	1.05	0.67	0.38	1.10	1.26	0.93	0.33	1.08	1.25	0.79	0.46
23	CPL	1.28	2.17	0.33	1.84	0.96	1.08	0.84	0.24	1.09	1.78	0.66	1.12
24	VPL	1.59	5.16	0.10	5.06	1.08	2.06	0.11	1.95	0.75	1.22	0.19	1.03
25	VRL	1.20	1.64	0.92	0.72	0.87	0.97	0.77	0.20	0.92	1.00	0.86	0.14
	$\bar{x}$	1.01				1.03				1.04			
Utilization Index greater than one(No. of companies)		15	23	0		16	21	5		18	25	0	
Utilization Index less than one(No. of companies)		10	2	25		9	4	20		7	0	25	

Source: Compiled and computed from the annual reports of the selected companies.

Table No.2

Utilization Index of MNCs Pharmaceutical Companies

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S.No.	Abb.	Av.	Max.	Min.	RG.	Av.	Max.	Min.	RG.	Av.	Max.	Min.	RG.
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2	LUPL	0.97	1.11	0.70	0.40	1.02	1.08	0.97	0.11	1.00	1.15	0.86	0.30
3	JBCPL	0.97	1.02	0.90	0.11	0.98	1.08	0.88	0.20	1.09	1.57	0.69	0.88
4	ABPL	0.74	1.19	0.09	1.10	1.08	1.12	1.04	0.08	1.02	1.12	0.91	0.21
5	BL	1.30	2.51	0.85	1.65	0.80	0.89	0.70	0.19	1.00	1.14	0.78	0.35
6	AJPL	1.11	1.43	0.95	0.48	1.10	1.25	0.95	0.30	1.07	1.44	0.84	0.60
7	TPL	0.91	1.08	0.77	0.32	0.91	1.03	0.78	0.25	1.04	1.37	0.92	0.46
8	GPL	1.02	1.55	0.62	0.93	0.99	1.64	0.33	1.31	1.37	3.75	0.77	2.99
9	ILL	0.97	1.12	0.83	0.30	1.00	1.02	0.98	0.05	1.03	1.18	0.95	0.23
10	ML	0.80	1.10	0.60	0.50	1.22	1.58	0.85	0.72	1.02	1.13	0.92	0.22
11	DPCL	1.04	1.40	0.65	0.75	0.93	1.10	0.76	0.34	0.99	1.43	0.79	0.63
12	NPL	1.04	1.13	0.93	0.20	1.18	1.45	0.91	0.54	0.97	1.20	0.82	0.38
13	ADL	1.01	1.26	0.80	0.46	0.93	0.97	0.89	0.08	1.03	1.22	0.77	0.46
14	JPL	1.01	1.29	0.77	0.52	1.07	1.14	1.00	0.14	0.95	1.07	0.81	0.26
15	MPL	0.83	1.23	0.46	0.77	1.11	1.37	0.86	0.50	1.12	1.60	0.84	0.76
16	Dr. RL	0.98	1.16	0.63	0.52	1.11	1.14	1.08	0.06	0.96	1.17	0.87	0.31
17	SPL	0.93	1.31	0.32	0.99	1.16	1.24	1.07	0.17	1.23	2.62	0.38	2.23
18	CHL	0.91	0.95	0.87	0.09	0.96	0.98	0.94	0.05	1.06	1.25	0.95	0.30
19	GBL	1.00	1.12	0.91	0.21	0.98	1.00	0.96	0.04	1.02	1.16	0.90	0.26
20	BGVSPL	1.15	1.42	0.74	0.68	1.07	1.17	0.96	0.21	0.95	1.12	0.79	0.32
21	SML	0.85	1.19	0.63	0.55	1.22	1.39	1.06	0.33	1.05	1.30	0.77	0.53
22	HL	0.85	1.05	0.67	0.38	1.10	1.26	0.93	0.33	1.08	1.25	0.79	0.46
23	CPL	1.28	2.17	0.33	1.84	0.96	1.08	0.84	0.24	1.09	1.78	0.66	1.12
24	VPL	1.59	5.16	0.10	5.06	1.08	2.06	0.11	1.95	0.75	1.22	0.19	1.03
25	VRL	1.20	1.64	0.92	0.72	0.87	0.97	0.77	0.20	0.92	1.00	0.86	0.14
	$\bar{x}$	1.01				1.03				1.04			
Utilization Index greater than one(No. of companies)		15	23	0		16	21	5		18	25	0	
Utilization Index less than one(No. of companies)		10	2	25		9	4	20		7	0	25	

Source: Compiled and computed from the annual reports of the selected companies.

Table No. 3													
Efficiency index of MNCs pharmaceutical companies													
		BOOM PERIOD				RECESSION PERIOD				RECOVERY PERIOD			
S.No.	Abb.	Av.	Max.	Min.	RG.	Av.	Max.	Min.	RG.	Av.	Max.	Min.	RG.
1	CL	1.08	1.26	0.93	0.33	1.08	1.36	0.79	0.56	1.55	2.75	0.74	2.01
2	LUPL	1.17	1.59	0.70	0.89	1.24	1.31	1.17	0.13	1.22	1.61	0.81	0.80
3	JBCPL	1.09	1.23	0.92	0.31	1.09	1.41	0.76	0.66	1.41	2.69	0.38	2.30
4	ABPL	0.83	1.72	0.01	1.71	1.36	1.44	1.29	0.16	1.23	1.42	0.93	0.49
5	BL	2.67	8.08	0.84	7.23	0.76	1.01	0.51	0.50	1.18	1.72	0.63	1.09
6	AJPL	1.65	3.04	1.05	1.99	1.42	1.86	0.99	0.87	1.52	2.48	0.93	1.55
7	TPL	1.01	1.41	0.65	0.76	1.01	1.29	0.73	0.56	1.43	2.94	1.07	1.88
8	GPL	1.73	4.03	0.54	3.49	1.63	3.18	0.07	3.12	3.74	16.65	0.70	15.94
9	ILL	1.08	1.41	0.82	0.59	1.20	1.26	1.15	0.10	1.20	1.65	0.83	0.81
10	ML	0.67	1.26	0.35	0.92	1.89	2.91	0.87	2.04	1.17	1.52	0.93	0.59
11	DPCL	1.50	2.53	0.58	1.94	0.95	1.40	0.49	0.91	1.11	2.42	0.65	1.77
12	NPL	1.23	1.50	1.02	0.49	1.68	2.42	0.94	1.48	1.17	1.85	0.86	0.99
13	ADL	1.15	1.75	0.57	1.18	0.96	1.06	0.87	0.19	1.18	1.73	0.59	1.14
14	JPL	1.11	1.81	0.50	1.30	1.08	1.16	1.00	0.16	0.92	1.31	0.56	0.75
15	MPL	1.17	2.41	0.25	2.16	1.15	1.56	0.73	0.83	1.44	2.25	0.86	1.38
16	Dr. RL	1.36	2.60	0.37	2.23	1.44	1.47	1.41	0.07	1.06	1.63	0.80	0.83
17	SPL	1.30	2.20	0.12	2.08	1.27	1.79	0.76	1.03	4.11	18.92	0.16	18.76
18	CHL	0.93	1.04	0.86	0.17	0.97	0.98	0.97	0.01	1.40	2.10	1.01	1.09
19	GBL	1.06	1.39	0.78	0.61	1.04	1.22	0.86	0.37	1.28	1.66	0.95	0.71
20	BGVSPL	6.33	20.30	0.89	19.41	1.48	1.79	1.18	0.61	1.05	1.62	0.52	1.10
21	SML	1.01	2.02	0.51	1.52	2.35	2.77	1.94	0.82	1.45	2.68	0.64	2.04
22	HL	0.88	1.15	0.57	0.58	1.72	2.47	0.98	1.49	1.34	2.12	0.59	1.53
23	CPL	5.07	14.78	0.13	14.65	0.91	1.15	0.66	0.49	1.63	3.54	0.43	3.11
24	VPL	6.16	23.95	0.01	23.94	3.32	6.63	0.00	6.63	0.97	3.36	0.03	3.33
25	VRL	3.05	7.24	1.27	5.97	0.93	1.12	0.74	0.37	0.90	1.15	0.68	0.47
$\bar{x}$		1.85				1.36				1.47			
Efficiency Index greater than one(No. of companies)		21	25	3		19	24	7		22	25	2	
Efficiency Index less than one(No. of companies)		4	0	22		6	1	18		3	0	23	

Source: Compiled and computed from the annual reports of the selected companies.

Table No. 4

Paired Samples Test of Multinational Pharmaceutical Companies

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Boom_Period_BI - Recession_Period_BI	.22	.85	.170	-.12	.57	1.334	24	.195
Pair 2	Recession_Period_BI - Recovery_Period_BI	-.049	.36	.072	-.19	.100	-.683	24	.501
Pair 3	Boom_Period_UI - Recession_Period_UI	-.014	.24	.048	-.11	.085	-.305	24	.763
Pair 4	Recession_Period_UI – Recovery_Period_UI	-.006	.155	.031	-.07	.057	-.219	24	.828
Pair 5	Boom_Period_EI - Recession_Period_EI	.49	1.52	.30	-.13	1.12	1.621	24	.118
Pair 6	Recession_Period_EI – Recovery_Period_EI	-.10	.945	.18	-.49	.28	-.578	24	.569

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