Evaluating the profitability of Biopharmaceutical firms: A comparative study between process and Product Patent Period

[1]Ms.Shivani Bector, [2]Dr. Harpreet Singh

[1]Research Scholar , I K Gujral Punjab Technical University, Jalandhar, Punjab, India.

[2]Director A S Group of Instituions, Khanna, Punjab, India.

Abstract - Introduction of product patents in 2005 brings the opportunities for the biopharmaceutical industry making it competitive in business environment. Evaluating the profitability of biopharmaceutical firms represents the key element to determine their financial performance. Measuring the performance of firms operating in Biopharma industry is of keen importance for various stakeholders such as management, investors, suppliers, customers and creditors. The main purpose of this study is to examine and analyze the profitability position from financial statements of 50 biopharmaceutical firms in India. Data relating to period 1996-2018 was used for this study. It was concluded from the study that Leverage, Marketing Expenditure, Minority Shareholders Ownership, Size, working capital ratio and Age have significant effect on the Profitability of the selected biopharmaceutical companies during the Post product patent period (2006 to 2015) as compared to pre Product patent period (1996 to 2005). The findings are very important for different parties such as policy maker, investors, and stakeholders.

Key-words: Financial performance, Profitability, Biopharmaceutical industry

I. INTRODUCTION

According to IBEF, the Biopharmaceutical Industry in India is growing at 15% CAGR. The Government of India encouraged the growth of Biopharmaceutical sector in the 1960s; with the coming of Patent Act 1970.Biopharmaceutical industry in India is at boom, because as the population is increasing the need for health care is also increasing. This sector is the main focus of the policy makers because it has huge potential. The Biopharmaceutical industry discovers, develops, manufactures and markets pharmaceutical drugs for use as medications. Healthcare has become the basic necessity of every human being like other needs –food, clothing, hygiene and education etc. The healthcare sector also provides a broad range of career opportunities for young innovators in the form of start ups in Biopharma segment thereby providing direct benefits to the society. By agreeing to TRIPS Agreement of the WTO, India had replaced process patents with product patents from January 2005. In the patent amendment act, India implemented product patent protection for biopharmaceutical and pharmaceutical products, because article 27.1 of the TRIPs agreement requires product patent protection for biopharmaceutical products. Earlier the industry had been enjoying its core competence in reverse engineering by making some changes in processes to manufacture drugs and thereby concentrating on marketing drugs in Indian market only. However, with the arrival of product patent from 2005, the major players in this industry are making strategic shift in their business models. After realizing the importance of original R&D work and to become globally competitive, firms are now moving from generic drug manufacturers to innovative drug firms. Biopharmaceutical sector is contributing significantly in the growth of the Indian economy. As per the report of Indian Brand Equity Foundation, currently market size of Indian Biopharmaceutical industry is approximately $27.57 billion which is expected to reach a mark of $55 billion at a CAGR of 15.92% by 2020. In the years to come, India is expected to be at 3rd rank in terms of growth rate of biopharmaceutical sector and in absolute terms it is expected to be at the sixth place. Current growth rate of industry is around 9-10%. The industry provides better production services due to well equipped infrastructure facilities for manufacturing biopharmaceuticals in accordance to global standards. Being cost competitive in terms of low cost of research, cost of research in India is only about one fifth of the western countries. This is a primary advantage of an rising market economy like India. India has access to huge resources in the form of well educated, talented and innovative young scientists and a fleet of research centres and laboratory facilities in line with global standards. Indian biopharmaceutical companies have started strategic alliances with global companies in the field of R&D, formulation and manufacture of medicines. In the

 DOI : 10.35291/2454-9150.2019.0050

area of contract research in recombinant techniques, enzymes formulation, protein reengineering and diagnostics, India is also emerging as most favored nation. The term Profitability refers to the income realized by the firm during a given period after covering all expenses incurred during that time period. Profit is the main aim of every firm, without profits the firms are not able to survive. Profitability of the firm can be assessed by various factors like:-Size of the firm, Leverage, Return on Assets and Return on Capital Employed of the firms. It is the level of profit in relation to the volume of activities.

II. LITERATURE REVIEW

Nagarajan and Barthwal (1990) studied the relationship between profitability and market structure of 38 Indian pharmacy firms from 1970-82. To study profitability ratio of net profits to total sales and ratio of net profits to total assets was used as dependent variable. To study market structure vertical integration, size, advertising intensity, growth, rate of sales, R & D intensity, market share and P/V ratio was employed as independent variables. By using multivariate regression the results depicted the most significant determinants were size, growth rate of sales and R&D

Kaur Kuldeep (1997) measured the factors affecting profitability of 235 Indian firms from period 1971- 90. She assessed the impact of independent variables namely, size (total assets), age, growth rate of sales, past profitability, advertising intensity, diversification, retention ratio, liquidity ratio, turnover ratio, valuation ratio, long term finance, market share & capacity utilization on dependent factor profitability (operating net profits as percentage of net sales). Analysis tools used correlation, regression and chi square. She analyzed that past profitability, advertising intensity, diversification, valuation ratio, market share and growth were significantly affecting profitability.

Bowman, Navissi and Burgess (2000) evaluated the performance of pharmaceutical companies in response to political regulatory requirements. He found that after three announcements in 1992 and 1993 by policy changes in the form of strict regulations returns of companies were negatively affected. He also witnessed those pharmaceutical companies with higher advertising expense being more susceptible to political regulation experience more negative abnormal returns and those firms with higher R&D expense being less susceptible to political regulation experience less negative abnormal returns..

Ito and Fukao (2006) assessed the performance of Japanese manufacturing affiliates in china and regions from period 1989-2002. They took sample of more than 2000 Japanese firms and their overseas affiliates. They used the dependent variable: return on sales, profit before taxes. Independent variables used were total sales, age, local procurement ratio, equity ownership ratio, WTO affiliation, joint venture and wholly owned affiliate. By using regression analysis it was concluded that total sales, age and local procurement ratio had positive and significant effect with performance whereas WTO affiliation showed significantly negative effect on return on sales.

U. Shaji and Dr. G. Ganesan (2012) evaluated the liquidity and profitability position of two public sector pharmaceutical companies listed on BSE namely Karnataka Antibiotics and Pharmaceuticals Ltd (KAPL) and Rajasthan Drugs and Pharmaceuticals Ltd (RDPL). The study was conducted for the period of twelve years from 1998-1999 to 2009-2010. To measure the financial performance from various perspectives such as liquidity, solvency, profitability and financial efficiency, various accounting ratios were calculated. Linear multiple regression and T-test was employed to analyze the results. The study witnessed that debt to total asset ratio, debt to net worth ratio, net worth to total asset ratio and the total liabilities to total worth ratio in case of both the selected companies followed downward trend. The analysis showed that financial stability of the selected pharmaceutical companies had been decreasing at severe rate. They further suggested that the management of the companies should concentrate on maximizing assets and reducing their liabilities, so that the company's financial position could be stabilized.

Ed Miseta(2016) depicted that entire biopharmaceutical industry is expecting to realize ample gains in 2016. He witnessed that merger and acquisition and R&D spending will drive the performance of biopharmaceutical companies. These will create outsourcing by global firms from Indian Biopharma firms due to edge over low cost. Start ups in the area of Contact Research Organizations are gaining impetus. Small and medium-sized enterprises (SMEs) are also emerging in response to new R&D strategy adopted by firms.

Matar Ali and Eneizan Bilal Mohammad (2018) studied the determinants of Financial Performance in the Industrial Firms of Jordan by using the secondary data taken from the Amman stock exchange annual publication for the period 2005-2015. The sample firms consisted of 23 industrial firms. Data was analyzed by employing the regression. The dependent variable chosen was Return on Assets, the independent variables selected were Leverage, Firm size, Liquidity and Revenue. The findings depicted that the variables of liquidity, profitability, and revenues are positively related with the return on assets (ROA). On the other hand, the variables of leverage and firm size are negatively related with it. In totality the regression results showed that all variables have significant impact on the financial performance.

III. OBJECTIVE OF THE STUDY

The main objective of the present work is to study the Profitability as a determinant of financial performance on the basis Leverage, Marketing Expenditure, Minority Shareholders Ownership, Size, working capital ratio and Age.

 DOI : 10.35291/2454-9150.2019.0050

IV. METHODOLOGY

STATEMENT OF THE PROBLEM

In the case of India, only a few attempts had been made in the past to understand how Indian pharmaceutical companies are competing in for financial performance. But very little had been reported on financial performance of biopharmaceutical companies after the implementation of product patent in India. As the sector is growing tremendously and ample opportunities are existing in this sector. So there is a strong need to study the Profitability as a determinant of financial performance of biopharmaceutical companies.

DATA TYPE AND SOURCE OF DATA COLLECTION

The study has been undertaken for process patent period from (1996-2005) and product patent period from (2006 to 2018).In order to analyze to profitability Leverage, Marketing Expenditure, Minority Shareholders Ownership, Size, working capital ratio and Age are used. Out of 886 pharmaceutical companies in database of Prowess, 100 Biopharmaceutical companies were identified based on use of biotechnology either in their processes or type of product they were manufacturing. Out of these, the companies which were incorporated before 1995 were not considered for the sample. Sample size has been taken as 50 biopharmaceutical firms. Secondary data was collected from financial statements from PROWESS (CMIE's software database package). Various statistical measures mean, median and standard deviation have been used.

V. RESULTS AND DISCUSSIONS

Analysis of Descriptive Statistics of selected variables in pre Patent and Post Patent Periods

The descriptive statistics of selected variables namely Leverage, Marketing Expenditure, Minority Shareholders Ownership, Size, working capital ratio and Age are shown in the following table. This depicts the variance among the performance of selected variables with mean, median and standard Deviation. These statistics shows the strength of each variable.

Outcome of leverage during Pre product Patent and Post product Patent Periods

Table No 1.1 Descriptive Statistics for Leverage

	Years	N	Mean	Median	Standard Deviation	Minimum	Maximum
Leverage	1996-2005	50	.82	.61	.77	0.00	3.14
Leverage	2006-2018	50	.95	.37	1.64	0.00	8.37

Table 1.1 shows the basic statistics of leverage in pre and post product patent period. From the analysis it is shown that mean statistics during 1996 to 2005 is .82 it is increased to .95 during 2006 to 2018.The standard deviation is increased from .77 to 1.64. Both mean and standard deviation shows the increased return before and after the launch of product patent. Whereas median value showed declining trend in post product patent regime. It is interpreted from the analysis that companies had increased the use of leverage in post product patent period to decrease their cost of capital and to achieve cost efficiency.

Outcome of Marketing Expenditure during Pre product Patent and Post product Patent Periods

Table No 1.2 Descriptive Statistics for Marketing Expenditure

Marketing Expenditure

	Years	N	Mean	Median	Standard Deviation	Minimum	Maximum
Marketing Expenditure	1996-2005	50	107.30	19.72	205.91	0.00	903.73
Marketing Expenditure	2006-2018	50	535.56	45.91	1112.34	0.00	4532.80

Table 1.2 shows the basic statistics of marketing expenditure in pre and post product patent period. From the analysis it is shown that mean statistics of marketing expenditure during 1996 to 2005 is 107.30 and it is increased to 535.56 during 2006 to 2018.The standard deviation is increased from 205.91 to 1112.34. Median value also showed increasing trend in post product patent regime. All the three statistics mean, median and standard deviation shows the increased return before and after the launch of product patent. It is interpreted from the analysis that companies had mounted up their marketing expenditure to generate more sales in post product patent period to increase their bottom line and to capture more market.

Outcome of Minority Shareholders Ownership during Pre product Patent and Post product Patent Periods

 DOI : 10.35291/2454-9150.2019.0050

Table No 1.2 Descriptive Statistics for Minority Shareholders Ownership

Minority Shareholders Ownership

	Years	N	Mean	Median	Standard Deviation	Minimum	Maximum
Minority Shareholders Ownership	1996-2005	50	71.08	55.24	59.17	0.00	192.94
Minority Shareholders Ownership	2006-2018	50	62.10	49.81	51.53	0.00	176.95

Table 1.3 shows the basic statistics of Minority Shareholders Ownership in pre and post product patent period. From the analysis it is shown that mean statistics of Minority Shareholders Ownership during 1996 to 2005 is 71.08 and it is decreased to 62.10 during 2006 to 2018.The standard deviation is decreased from 59.17 to 51.53. Median value also showed decreasing trend in post product patent regime. All the three statistics mean, median and standard deviation shows the decreased return before and after the launch of product patent. It is interpreted from the analysis that stake held by minority shareholders in Biopharma companies had decreased in post product patent period making the governance better as they do not have the formal authority, expertise and incentives to monitor performance of company.

Outcome of Size during Pre product Patent and Post product Patent Periods

Table No 1.4 Descriptive Statistics for Size

Size

	Years	N	Mean	Median	Standard Deviation	Minimum	Maximum
Size	1996-2005	50	5127.47	194.71	11571.97	0.00	52685.78
Size	2006-2018	50	59929.34	609.52	146812.31	0.00	688024.94

Table 1.4 shows the basic statistics of Size in pre and post product patent period. From the analysis it is shown that mean statistics of size during 1996 to 2005 is 5127.47 and it is increased to 59929.34 during 2006 to 2018.The standard deviation is increased from 11571.97 to 146812.31. Median value also showed increasing trend in post product patent regime. All the three statistics mean, median and standard deviation shows the increasing return before and after the launch of product patent. It is interpreted from the analysis that size had increased in post product patent period which is a signal for better performance as large firms get access to economical financial resources and can get better deals in financial as well as product market.

Outcome of Working capital ratio during Pre product Patent and Post product Patent Periods

Table No 1.5 Descriptive Statistics for Working capital ratio

Working capital ratio

	Years	N	Mean	Median	Standard Deviation	Minimum	Maximum
Working capital ratio	1996-2005	50	545.05	68.47	1496.42	-383.15	8278.25
Working capital ratio	2006-2018	50	4912.57	417.96	9957.35	-384.83	45157.24

Table 1.5 shows the basic statistics of Working capital ratio in pre and post product patent period. From the analysis it is shown that mean statistics of size during 1996 to 2005 is 545.05 and it is increased to 4912.57 during 2006 to 2018.The standard deviation is increased from 1496.42 to 9957.35. Median value also showed increasing trend in post product patent regime. All the three statistics mean, median and standard deviation shows the increasing return before and after the launch of product patent. It is interpreted from the analysis that increased ratio of working capital depicts that faster a firm grows, the more cash it will need for working capital, thus signaling growth in product patent period.

Outcome of Age during Pre product Patent and Post product Patent Periods

Table No 1.6 Descriptive Statistics for Age

Age

	Years	N	Mean	Median	Standard Deviation	Minimum	Maximum
Age	1996-2005	50	24.98	18.50	18.23	9.00	104.00

 DOI : 10.35291/2454-9150.2019.0050

Age	2006-2018	50	37.98	31.50	18.23	22.00	117.00

Table 1.6 shows the basic statistics of age in pre and post product patent period. From the analysis it is shown that mean statistics of size during 1996 to 2005 is 24.98 and it is increased to 37.98 during 2006 to 2018.The standard deviation did not show any fluctuation whereas median value increased from18.50 to 31.50. The two statistics mean and median shows the increasing return before and after the launch of product patent. It is interpreted from the analysis that age had increased in post product patent period helping the firm to use its experience curve to reap benefits of economies of scale.

VI. CONCLUSION

The Profitability of the firms plays a significant role in the successful management of a company. The analysis of the selected companies reveal that Leverage, Marketing Expenditure, Minority Shareholders Ownership, Size, working capital ratio and Age have significant effect on the Profitability of the selected biopharmaceutical companies during the study period. Out of the above mentioned variables; mean statistics of Leverage, Marketing Expenditure, Size, working capital ratio and Age had increased in product patent period which shows improvement in profitability position. Mean statistics of minority shareholders'' stake had been decreasing in product patent period depicting the better governance which compels the Biopharma companies to adopt measures to improve its profitability position. To improve its profitability position Biopharmaceutical Industry has to invest more funds on R & D, broaden product range in the form of innovative products and do efforts to generate more sales. Biopharmaceutical Sector has enormous opportunities of growth; this sector is on its boom stage, because the need for healthcare drugs is increasing day by day.

VII. SUGGESTIONS

The companies should concentrate on innovation to capture more number of patents, investment in fixed facilities and increased sales turnover to improve their profitability. They should utilize innovative technology to broaden their product range and to increase the export sales. The management of selected companies should emphasize on maximizing assets and minimizing liabilities, so that the company's financial position could be improved. Increased use of leverage can improve the profitability position by reducing the overall cost of capital. Companies should invest on marketing activities to increase their value addition. Government should provide Tax benefits to start ups in the area of R&D to flourish the Biopharmaceutical industry, liberal policy should be followed to provide patent rights. To generate more revenues, companies should start capturing the outsourcing contracts from global players.

REFERENCES

[1] Nagarajan, M. and R.R.Barthwal (1990), "Profitability and Structure: A Firm level study of Indian pharmaceutical Industry," the Indian Economic Journal, 38(2), pp 70-84.
[2] Kaur, Kuldip (1997), "Size, Growth and Profitability of Firms" New Delhi: Gyan Publishing House, Mumbai
[3] Bowman, Robert, Navissi, Farshid, and Burgess, Richard (2000), "Regulatory Threats and Political Vulnerability." Journal of Financial Research, 6.(1)
[4] Ito, Keiko and Kyoji Fukao (2006), "Determinants of the Profitability of the Japanese Manufacturing Affiliates in China and Regions: Does localization of Procurement, Sales and Management Matters", RIETE Discussion Paper Series, 01-E-001.
[5] Illaboya J.Ofuan et al. (2016), "Firm Age, Size and Profitability Dynamics: A Test for Learning By doing and Structural Inertia Hypotheses.", Journal of Business and Management Research; .5(1)
[6] Matar Ali and Bilal Mohammad(2018), "Determinants of Financial Performance in the Industrial Firms: Evidence from Jordan", Asian Journal of Agriculture Extension,Economics and Sociology;. 37476
[7] Tyagi Shilpa,Nauryal D.K(2016)"Determinants of Profitability in Indian Biopharmaceutical firms in the New Intellectual Property Rights Regime", International Journal of Economics and Management Engineering Vol:10, No:7, 2016
[8] U. Shaji and G. Ganesan, "Financial Performance of Indian Pharmaceutical Industry", Namex International Journal of Management Research, 2(1), Jan-June 2012, pp. 67-81.
[9] Ed Miseta(2016) , "Biopharma Trends That Will Impact The Industry In 2016", Magazine clinical leader.
[10] Matar Ali and Eneizan Bilal Mohammad (2018), "Determinants of Financial Performance in the Industrial Firms: Evidence from Jordan", Asian Journal of Agricultural Extension, Economics & Sociology 22(1): 1-10, 2018.

 DOI : 10.35291/2454-9150.2019.0050