Chapter - 3

Review of Literature

<table>
<thead>
<tr>
<th>No.</th>
<th>Particulars</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>Introduction</td>
<td>60</td>
</tr>
<tr>
<td>3.1</td>
<td>Review of Related Literature</td>
<td>60</td>
</tr>
<tr>
<td>3.2</td>
<td>Research Gap</td>
<td>76</td>
</tr>
</tbody>
</table>
Chapter - 3
Review of Literature

3.0 Introduction:

The review of literature is a critical analysis of a portion of the published body of knowledge available through the summary, classification and the use of comparison of previous research studies or journal articles. A literature review examines the scholarly research work available on a particular subject for a particular time period. It is not merely the summation of the existing literature but it is the analysis of the existing body of the knowledge on the related knowledge. The review of the literature is not a survey but it is the analysis of the various sources of relevant knowledge. It is the summary or synthesis of knowledge on a particular topic gathered from various sources. This gathered knowledge is organized to address a particular research issue. A well written review of literature states that what kind of research has been completed until now and what is still lacking in the existing research work.

A well written literature review must be well organized and it must be directly related to the thesis or research issue. A literature review must synthesis what is and what is not. It must identify the controversy, if any, in the existing literature. A literature review must give the overview of the specified field of inquiry. A literature review is an essay itself. It gives the descriptive analysis of certain topic. It summarizes and evaluates already published arguments about certain topic. A literature review is a “descriptive prose” and not a list describing or summarizing the literature one after another.

Thus, to make the research purposive and objective, the researcher should present the review of previous literature for a particular topic of research. Here, the researcher has provided the review of literature for the studies done in the pharmaceutical industry.

3.1 Review of Related Literature:

Dubey, N., (2011) has studied Quality Management System in pharmaceutical industry. He says that Quality management system is applicable to drug products, and other products that include biotechnology and biological products, throughout the product lifecycle. These systems support the development and manufacturing of
pharmaceutical drug substances. It includes pharmaceutical development like research and development of Active Pharmaceutical Ingredients, medical devices for accurate dosing, medical delivery systems and type of formulations. Quality management system also plays an important role in analysis of various aspects such as analysis of raw products, finished products, packing and labeling of products, and observation of storage systems.¹

Shah, V., G., (2012), presented an empirical study which examined the profitability from different perspectives of Pharmaceutical industries in India with a data of 10 years from 2002 to 2011 and 07 major pharmaceutical companies have been considered as sample units. For this analytical study, the researcher has used Ratio Techniques for analysis and to test hypothesis Single Factor ANOVA (F-test) has been applied. The study revealed that Glaxosmithkline remained an outperforming player over the last decade in the pharmaceutical industry with leading in the profitability from the different perspectives and Ranbaxy could not match the pace of the profitability with that of the industry average.²

Gill, A., Biger, N. and Mathur, N., (2010), undertook the study under the title "The Relationship between Working Capital Management and Profitability: Evidence from the United States", the aim of this paper is to find the relationship between working capital management and profitability. A sample of 88 American firms listed on New York Stock Exchange for a period of 3 years from 2005 to 2007 was selected. There was found statistically significant relationship between the cash conversion cycle and profitability, measured through gross operating profit.³

ICRA, (2004), presented that the pharmaceutical industry is the world’s largest industry due to worldwide revenues of approximately US$2.8 trillion. The report by ICRA says that Pharma industry has seen major changes in the recent years that place

---

new demands on payers, providers and manufacturers. Customers now demand the same choice and convenience from pharma industry that they find in other segment.\textsuperscript{4}

**ICRA, (2005),** presented a report on Indian Pharmaceutical Industry. Indian Pharmaceutical Industry is poised for high consistent growth over the next few years, driven by a multitude of factors. Top Indian Companies like Ranbaxy, DRL, CIPLA and Dabur have already established their presence. Indian companies have only recently entered the area. The Indian pharmaceutical industry came into existence in 1901, when Bengal Chemical & Pharmaceutical Company started its maiden operation in Calcutta. The next few decades saw the pharmaceutical industry moving through several phases, largely in accordance with government policies. Commencing with repackaging and preparation of formulations from imported bulk drugs, the Indian industry has moved on to become a net foreign exchange earner, and has been able to underline its presence in the global pharmaceutical arena as one of the top 35 drug producers worldwide.\textsuperscript{5}

**Agarwal, S., Desai, S., Holcomb, M. and Oberoi, A., (2001),** presented the study on pharmaceutical industry. They say that India is the world’s fourth largest producer of pharmaceuticals by volume, accounting for around 8\% of global production. In value terms, production accounts for around 1.5\% of the world total. The Indian pharmaceutical industry directly employs around 500,000 people and is highly fragmented. While there are around 270 large R&D based pharmaceutical companies in India, including multinationals, government owned and private companies, there are also around 5,600 smaller licensed generics manufacturers, although in reality only around 3,000 companies are involved in pharmaceutical production. Most small firms do not have their own production facilities, but operate using the spare capacity of other drug manufacturers.\textsuperscript{6}

**Kumar, N., and Pradhan, J., P., (2003),** have studied the Indian biotech sector. They say that the Indian biotech sector parallels that of the U.S. in many ways. Both are filled with small start-ups while the majority of the market is controlled by a few powerful companies. Both are dependent upon government grants and venture capitalists for funding because neither will be commercially viable for years.


\textsuperscript{5} ICRA, 2005, “Pharmaceuticals: The Indian Pharmaceutical Industry”

Pharmaceutical companies in both countries have recognized the potential effect that biotechnology could have on their pipelines and have responded by either investing in existing start-ups or venturing into the field themselves. In both India and the U.S., as well as in much of the globe, biotech is seen as a hot field with a lot of growth potential.  

Fink, C., (2000), has analysed that even after the increased investment, market leaders such as Ranbaxy and Dr. Reddy’s Laboratories spent only 5-10% of their revenues on R&D, lagging behind Western pharmaceuticals like Pfizer, whose research budget last year was greater than the combined revenues of the entire Indian pharmaceutical industry. This disparity is too great to be explained by cost differentials, and it comes when advances in genomics have made research equipment more expensive than ever. The drug discovery process is further hindered by a dearth of qualified molecular biologists. Due to the disconnection between curriculum and industry, pharmas in India also lack the academic collaboration that is crucial to drug development in the West.  

Baisiwal, S., Baum, A., Goodman, M., and Rubin, J., (2003), have made inquiry into the drug business in India. They say that thirty five per cent of business is in the field of new drug discovery and the rest 65 per cent of business is in the clinical trials arena. India offers a huge cost advantage in the clinical trials domain compared to Western countries. India got a major boost with the signing of Trade Related Intellectual Property Rights (TRIPS) under the General Agreement on Tariffs and Trade (GATT) in January 2005 with which it began recognizing global patents. 

Wood, A., (2004), has made a survey of the international pharmaceutical market. According to them, The United States is the world’s largest single market for pharmaceutical products accounting for nearly 50 percent of the value of the total world market. According to the Generic Pharmaceutical Association, U.S. retail drug

---

sales for 2006 totaled $221 billion and generic pharmaceutical sales totaled $54.1 billion. U.S. pharmaceutical sales grew by 73 percent from $128.1 billion to $221 billion. France is next spending $457 per capita followed by Japan at $339.

Ashok R., K., (2004), studied the impact of TRIPs on Indian Pharmaceutical business. India got a major boost with the signing of Trade Related Intellectual Property Rights (TRIPS) under the General Agreement on Tariffs and Trade (GATT) in January 2005 with which it began recognizing global patents. Exports constitute a substantial part of the total production of Pharmaceutical in India. The formulations contribute nearly 55% of the total exports and the rest 45% comes from bulk drugs. Pharmaceutical exports clocked $7.2 billion in 2007-08, accounting for six per cent of the country’s total exports.

Harris, G., and Slater, J., (2003), studied the pharmaceutical market. They studied that leading Indian companies are moving away from a reliance on the domestic market to the development new drugs, exports to regulated markets, and cooperative agreements with MNCs. Facing lagging sales of patented drugs by MNCs in their home markets, declining R&D revenues, and rising costs, many MNCs have turned to contract manufacturing and research services (CRAMS), co-marketing alliances, outsourcing of research and clinical trials to reduce costs, increase development capacity, and trim the ‘time to market’ for new drugs.

Karnani, N., (2005), has studied the pharmaceutical industry of Gujarat in his project report. They surveyed that according to industry estimates, a great chunk --almost 40 per cent --of machinery used in the pharmaceutical manufacturing in India is produced in Gujarat. This creates a very good local and global opportunity for Gujarat in the manufacturing of pharmaceutical machinery, given its strong and well established engineering sector, points out a recent study titled Gujarat Pharma Industry-striding into the Future, KPMG, India The strong growth prospects of the pharmaceutical exports segment and growing demand from the domestic market, will further fuel growth in the pharmaceutical machinery sector.

---

13 Karnani, N., 2005, “A project report on the pharmaceutical industry”
Corporate Catalyst Report, (2012), says that Indian Pharmaceutical Sector has come a long way, being almost a small sector before 1970 to a vital supplier of healthcare products, serving almost 95% of the country’s pharmaceuticals need. It ranks 3rd in the world of production volume and 13th in the domestic consumption value. The Industry is on the front rank of India’s science based industries with wide ranging capabilities in the field of drug manufacturing and technology.14

Makundi, E., A, (2005), has studied the implications of Health Sector Reforms in Tanzania. He says that Since its independence in 1961, Tanzania has recognized the importance of improving the health status of its people as a means of combating poverty. The government evolved policies and mapped out strategies of ensuring the improvement of the public health. Improving public health was among the strategies of the health sector reform of 1994. The main purpose of this reform was to improve health services through partnership between the public sector and private institutions. As a result number of legislative reforms and amendments were instigated, among which was the amendment of the Pharmaceuticals and Poisons Act No. 9 of 1978. This act was made as a means to improve the availability, accessibility and affordability of essential medications in Tanzania.15

Mhamba, R., M., and Shukurani, M., (2010), presented a discussion paper on pharmaceutical industry in Tanzania. They argued that a variety of strategies to lower prices of medicines for developing have been implemented over the recent years. These included having competitive and efficient drug procurement practices which encouraged more companies to produce copies of innovator products and increasing drug supply, thus driving prices down. It has also involved amending International Intellectual Property Regulations, such as Trade Related Aspects of Intellectual Property Rights (TRIPS), which in the past allowed multi-national pharmaceutical companies to block production of generics of drug innovators for a period twenty years.16

15 Makundi, E., A, 2005, “The Implications of Health Sector Reforms on Reproductive Health Services”, The Case of Bukoba District – Kagera Region, Tanzania Study
16 Mhamba, R., M., and Shukurani, M., 2010 “The pharmaceutical industry and access to essential medicines in Tanzania”, EQUINET DISCUSSION PAPER 83
Mohamed, N., (2009), has studied the role of local manufacturers of medicines in Tanzania. He is of the view that the capability of local manufacturing industries to manufacture essential medicines is a hotly debated issue in many developing countries. Increased manufacturing capacity of local manufacturers is a key in ensuring the quality, availability and pricing of medicines within the country. It is therefore imperative that the challenges that affect production are identified and addressed, to improve the health services in Tanzania.\\(^{17}\)

Taylor, J., Bate, R., Putze, E., and Tren, R., (2009), studied the pricing policy of the pharmaceutical companies of the developing countries. Low price of imported medicinal products from abroad was also perceived by most of the manufacturers to be a challenge to their development. They found that medicines produced by smaller companies were more expensive than those produced by transnational companies because they cannot benefit from economies of scale and that local industries face unfair competition particularly with regard to when comparing the price from imported pharmaceutical products from countries such as India and China respectively.\\(^{18}\)

Report of MOH & SW, (2004), the report compared average rural selling prices of medicines by country of origin in rural areas of Tanzania. It was found that there was no significant difference in the average price of medicines for medicines made in India compared to the same medicines made by African and European manufacturers; even though Indian firms are internationally regarded as low cost suppliers of essential medicines.\\(^{19}\)

Shaji, U., and Ganesan, G., (2012), has made a study of financial performance of Indian Pharmaceutical sector. They say that The Indian pharmaceutical industry is one of the world’s largest, ranking 4th in terms of volume and 13th in terms of value in the global pharmaceutical market. In 2005, domestic pharmaceutical sales were US$4.5 billion, growing at CAGR of 8.59%. According to them, The Indian pharmaceutical industry is characterized by a multitude of manufacturers (over 20,000

---

\\(^{17}\) Mohamed, N., 2009, “The role of local manufacturers in improving access to essential medicines”, Creating opportunities for the scale up of local pharmaceutical production, [www.medicinetransparency.org](http://www.medicinetransparency.org)


\\(^{19}\) Ministry of Health and Social Welfare (MOH &SW), 2004, “Medicine Prices in Tanzania”
registered, as of 2003). These are predominantly small manufacturers, focusing on either Active Pharmaceutical Ingredients (APIs) or formulations.\textsuperscript{20}

\textbf{Biswanath, S., R., (2008),} has studied the financial performance of pharmaceutical companies in India. He says that The Indian Pharmaceutical sector is highly fragmented with more than 20,000 registered units. It has grown drastically during the last two decades. The 250 pharmaceutical leading companies control 70\% of the market with market leader holding nearly 7\% of the market share. It is an extremely fragmented market with severe price competition and government price control. Due to the de-licensing policy, most of the drugs and pharmaceutical products got exemption. Manufacturers are free to produce any drug duly approved by the Drug Control Authority.\textsuperscript{21}

\textbf{Chaudhuri, S., (2005),} has made a study on India’s pharmaceutical industry. He says that the Indian pharmaceutical market reached US$ 10.04 billion in size in July 2010. There are about 250 large units and about 8000 Small Scale Units, which form the major empire of pharmaceutical industry in India (including 5 Central Public Sector Units). These units produce the large range of pharmaceutical formulations, like medicines ready for consumption by patients and about 350 bulk drugs, including chemicals having therapeutic value and used for production of pharmaceutical formulations. The Indian pharmaceutical industry meets around 70\% of the domestic demand for bulk drugs, drug intermediates, and pharmaceutical formulations.\textsuperscript{22}

\textbf{Agrawal, A., Dua, K., Garg, V., Sara, U., V., S., and Taneja, A., (2006),} have made study on the opportunities and challenges for the Indian Pharmaceutical sector. According to the study, the pharmaceutical sector plays an important role in promoting and sustaining development in the vital field of medicines. Indian Pharmacy Industry boasts of quality producers and many units are approved by regulatory authorities in USA and UK. International companies associated with this sector have stimulated, assisted and spearheaded this dynamic development in the past

\textsuperscript{22} Chaudhuri, S., 2005, “The WTO and India’s Pharmaceuticals Industry: Patent Protection TRIPS and Developing Countries”, Oxford University Press, New Delhi, p.65
53 years and helped to put India on the pharmaceutical map of the world. Besides
that, there are certain challenges also for the Indian Pharmaceutical sector.\textsuperscript{23}

Agarwal, S., Michele, H., Oberoi, A., (2010), have made an analysis of Indian
Pharmaceutical sector. They have reported that The Indian pharmaceutical sector has
come a long way, being almost non-existent before 1970 to a prominent provider of
healthcare products, meeting almost 95 per cent of the country's pharmaceuticals
needs. The Industry today is in the front rank of India’s science-based industries with
wide ranging capabilities in the complex field of drug manufacture and technology. It
ranks very high in the third world, in terms of technology, quality and range of
medicines manufactured. From simple headache pills to sophisticated antibiotics and
complex cardiac compounds, almost every type of medicine is now made
indigenously.\textsuperscript{24}

ICRA Industry Watch Series, (2002), the report says that currently the main
activities of Indian pharmaceutical industry are broadly restricted to producing (i)
bulk drugs and (ii) formulations with very few companies risking investing in primary
research aimed at developing and patenting new drugs. The bulk drug business is
essentially a commodity business, where as the formulation business is primarily a
market driven and brand oriented business. Multinational companies which have
entered the Indian market have mostly restricted themselves to formulation segment
till date. The domestic pharmaceutical industry (MNC’s and Domestic) meets about
90% of the country's bulk drug requirement and almost the entire demand for
formulations.\textsuperscript{25}

Rastogi, R., Alam, T., and Malki, S., (2011), have made an empirical analysis of the
Indian Pharmaceutical sector. Their paper aimed at accessing the growth of Indian
pharmaceutical industry, after the process of economic liberation in India and more
particularly after the change in patent laws in India. In the process patent regime era
Indian pharmaceutical companies were able to supply the cheapest generic drugs in
the world but the advantage of process patent laws is not available to the industry

and Opportunities for the Indian Pharma Industry”, Health Administrator, Vol., XX
Number 1&2

\textsuperscript{24} Agarwal, S., Michele, H., and Oberoi, A., 2010, “Unlocking the Value in Big
Pharma”, The McKinsey Quarterly, No., 2

\textsuperscript{25} ICRA Industry Watch series, 2002, “The Indian Pharmaceutical Industry” ICRA
Limited
after 1’st January 2005. They suggest that the pharmaceutical industry has to evolve to confront the current situation and if possible new avenues for growth have to be explored.\(^\text{26}\)

**Chadda, A., (2006),** have argued for the Indian pharmaceutical industry favourably. Indian pharmaceutical industry has benefited tremendously from the liberal patent law of 1970. It ranks very high in the third world, in terms of technology, quality and range of medicines manufactured. From simple pills to complex medicines requiring complex steps to manufacture, medicines for almost all type of ailments are manufactured in India. India today is considered to be global powerhouse of generic drugs. It enabled India to supply cheapest generic drugs. Authors have also discussed TRIPS declaration to meet public health in least developed countries and countries with insufficient manufacturing capacity like Mail Box Provision, Bolar Provision, and Parallel importation.\(^\text{27}\)

**Chaturvedi, K., and Chataway, J., (2006),** explored that R&D expenditure has dramatically increased for a segment of the Indian pharmaceutical industry after TRIPS came into effect. It is not only that the amount of R&D expenditure has increased, but there has been a drastic shift in the structure of R&D activities of the Indian companies. Earlier they were primarily engaged with the development of new processes for manufacturing drugs, now they are also involved in R&D for new chemical entities (NCE). It is concluded by the author that; although, the Research and Development activities have diversified, the Indian pharmaceutical industry has yet to prove their competence in innovating new products.\(^\text{28}\)

**Gupta, D., (2007),** surveyed the pharmaceutical sector of India. The Indian pharmaceutical sector has expanded drastically in the last two decades. The Pharmaceutical industry in India is an extremely fragmented market with severe price competition and government price control. The Pharmaceutical industry in India meets around 90% of the country’s demand for bulk drugs, drug intermediates,


pharmaceutical formulations, chemicals, tablets, capsules, orals and injectables. There are approximately 300 big and medium scale Pharmaceutical companies and about 8000 Small scale units, which form the core of the pharmaceutical industry in India.\(^{29}\)

**Lanjouw, J. O., and Cockburn, I. M., (2001),** say that The Indian pharmaceutical industry currently tops the chart amongst India’s science based industries with wide ranging capabilities in the complex field of drug manufacture and technology. A highly organized sector, the Indian pharmaceutical industry is estimated to be worth $6 billion, growing at about 10 percent annually. It ranks very high amongst all the third world countries, in terms of technology, quality and the vast range of medicines that are manufactured. It ranges from simple headache pills to sophisticated antibiotics and complex cardiac compounds; almost every type of medicine is now made in the Indian pharmaceutical industry.\(^{30}\)

**Qaiser, M., and Mohan Chandran, P.,** talk about the present and future growth of the Indian Pharmaceutical market. Increasing industrialization, literacy levels and urbanization are likely to increase the health awareness of the general public. Consequently the demand for preventive medicine in general and immunological like tetanus toxoid, triple antigen (DPT), measles vaccine, Hepatitis vaccine, anti-rabies vaccine, polio vaccine and typhoid vaccine are likely to increase. Companies are likely to pay greater attention to their human resources development effort in general and management developmental programs in particular.\(^ {31}\)

**Mishra P., and Chandra, T., (2010),** have studied the effect of merger and acquisition in Indian Pharmaceutical Industry. The industry will continue to be in consolidation mode and mood. The last few years have seen a spate of mergers and acquisitions of brands as well as companies. Indian companies continue to be aggressive in pursuing merger and acquisition strategies to gain access to international markets and to reinforce their position. Strategic alliances too will be on the rise

particularly in the areas of contract research, contract manufacturing and product licensing.\textsuperscript{32}

\textbf{Ravi, K., and Mishra, S., (2010),} have discussed about the IPR in the pharmaceutical industry. In the pharmaceutical, chemical and biotechnology industries the patent normally equals the product, and protects the extensive investment in research and clinical testing required before placing it on the market. Patent protection for chemical and pharmaceutical products is especially important compared with other industries because the actual manufacturing process is often easy to replicate and can be copied with a fraction of the investment of that required for the research and clinical testing.\textsuperscript{33}

\textbf{Ravi, K., and Mishra, S., (2009),} has studied the effects of TRIPS on pharmaceutical sector. Until the TRIPS Agreement in 1994 many developing countries provided no patent protection for pharmaceutical products. And, while countries that have joined the WTO have obligated themselves to provide such protection, least developed countries are not required to meet this obligation until 2016. The continuing lack of patent protection for pharmaceutical products makes it very difficult to establish research based industries in most developing countries. Most medical research in these countries takes place in the public sector.\textsuperscript{34}

\textbf{Ravi, K., and Mishra, S., (2009),} has studied the performance of Indian Pharmaceutical Sector after patent rights. The Indian Council for Scientific and Industrial Research (CSIR) has established an aggressive program to commercialize the research of the scientists working in its laboratories. This program involves identifying useful inventions and patenting them not only in India, but in big markets like the United States as well. In 1991 CISR received 6 patents from the United States


Patent & Trademark Office. In 2002 the number of U.S. patents granted to CISR had risen to 145.\textsuperscript{35}

Singh, S., K., and Venkatesh, A., (2004), In this paper, they analyzed the level as well as growth of productivity and economic profitability of Seagate depot of MSRTC using its monthly data from April, 1995 to March, 2001. Seagate depot, located in Pune city, operates with 130 buses and is usually considered as a representative depot of Maharashtra State Road Transport Corporation (MSRTC). They found that productivity of the depot has declined by around 15\% over the sample period. Although, on an average, there is a marginal increase in output prices in comparison to input factor prices, productivity decline has resulted into a significant fall of around 12\% in its economic profitability over the sample period.\textsuperscript{36}

Tyagi, S., and Nauriyal, D., K., (2013), have made study on the research and development in pharmaceutical sector of India. They say that Low R&D intensity in Indian D&P industry can be attributed to the fact that until 2005 Indian leading pharmaceutical firms were into production of generic drugs through non-infringing processes which required a low level of investment as compared to development, testing, producing and marketing of new drugs and novel drug delivery systems (NDDS) Since 1999, a noticeable shift in the attitude towards The most remarkable change, nevertheless, is evident during 2004-09 when the firms started investing far more resources towards R&D activities, as part of the strategic shift, induced by changed business environment.\textsuperscript{37}

Abrol, D., Prajapathi, P., and Singh, N., (2011), say that in this industry, the firms need to continuously innovate by developing and marketing new products, drug delivery systems, and product attributes, based on cutting-edge scientific advances, as part of survival and growth strategies at national and global levels. Understanding that product life cycles have become shorter and numerous regulatory challenges are

\begin{footnotesize}
\textsuperscript{36} Singh, S., K., and Venkatesh, A., 2004, “Productivity and Profitability Analysis of Swargate Depot of MSRTC”
\end{footnotesize}
emerging faster, this industry spends far more on R&D, relative to its sales revenue, as compared to almost all other industries.\textsuperscript{38}

\textbf{Jacques, M., (2007),} in his paper on Pharmaceutical Industry, says that today nearly 50\% of the drugs marketed by large pharmaceutical companies were developed by companies or institutions other than themselves. Pharmaceutical companies also are increasingly sharing the risk of developing new drugs through the use of joint ventures and research consortiums. These partnerships involve other companies, universities, government agencies and not-for-profit entities.\textsuperscript{39}

\textbf{Kulshrestha, R., S.,} in his thesis on profitability analysis, says that analysis of profitability describes the conceptual framework of financial efficiency and profitability. Financial efficiency is the ability of a given investment to earn a return from its use. It’s vital instrument to measure not only the business performance but also overall efficiency in its concerned.\textsuperscript{40}

\textbf{Ghosh, T., P.,} (1984), has presented paper on the financial health of the business. He says that the investment of an enterprise comprises of the investment of shareholders, debenture holders, creditors, financial institutions etc. According to him, if an enterprise fails to generate growth or add anything as value added, it would simply mean that the enterprise is misusing public funds. He says that this concept represents the wealth distribution in a proper manner besides suggesting how productivity can be increased when reducing the consumption of resources produces same or better outputs.\textsuperscript{41}

\textbf{Kenneth, R., R.,} (1982), points out, "With all the profitability ratios, comparison of a company with similar companies is extremely valuable. Only by comparison we can judge whether the profitability of a particular company is good or bad and why.

\begin{itemize}
\item \textsuperscript{39} Jacques, M., 2007, “Bolstering pipelines: Why big Pharma and Biotechs need each other,” Deloitte & Touche Development, \url{http://www.deloitte.com}
\item \textsuperscript{40} Kulshrestha, R., S., “Profitability in India’s Steel Industry during the Decade 1960-70”, A Thesis Submitted to University of Rajasthan, P., 83
\end{itemize}
Absolute figures give some insight, but it is relative performance which is most important." This statement clearly emphasizes the importance of profitability.42

**Raheman, and Mohamed, N., (2007),** in his paper on working capital management and profitability analysis of Pakistani firms, has identified that the firms that are better in managing the working capital, can perform better. According to him, for improving the profitability, the firms should manage working capital effectively.43

**Gill, A., Nahum, B., Mathur, N., (2010),** under the title "The Relationship between Working Capital Management and Profitability: Evidence from the United States", the aim of this paper is to find the relationship between working capital management and profitability. A sample of 88 American firms listed on New York Stock Exchange for a period of 3 years from 2005 to 2007 was selected. We found statistically significant relationship between the cash conversion cycle and profitability, measured through gross operating profit. It follows that managers can create profits for their companies by handling correctly the cash conversion cycle and by keeping accounts receivables at an optimal level. The study contributes to the literature on the relationship between the working capital management and the firm’s profitability.44

**Bhattacharya, A., K., (2007),** says that there are several methods of financial statement analysis. Out of all these methods, the ratio analysis is widely used method. Ratio is the relationship between two variables. It provides guidance about the financial health of the organization.45

**De, A., Bandyopadhyay, G., and Chakraborty, B., N., (2011),** presented paper on the factor analysis on the financial ratios and validation of results through cluster analysis for the cement industry in India. He says that for the analysis of financial health of the firms, ratio analysis is useful, but for the validation of the results of ratio

---

analysis, factor analysis can be used. The researcher has used the cluster analysis for evaluating the health of the cement industry of India.\textsuperscript{46}

\textbf{De, A., Bandyopadhyay, G., and Chakraborty, B., N., (2010),} presented paper on the factor analysis on the financial ratios and validation of results through cluster analysis for the iron and steel industry in India. He says that for the analysis of financial health of the firms, ratio analysis is useful, but for the validation of the results of ratio analysis, factor analysis can be used. The researcher has used the cluster analysis for evaluating the health of the iron and steel industry of India.\textsuperscript{47}

\textbf{Sharma, A.,} has undertaken the profitability analysis on pharmaceutical firms. He says that liquidity and profitability are the two vital aspects of business life. Inadequate and excess working capital is the two extreme on the continuum of liquidity management. Inadequate working capital results in the risk of inability in meeting payments, schedules, while excess working capital adversely affects the profitability. A sound and systematic approach to the working capital management should ensure tradeoff between liquidity and profitability.\textsuperscript{48}

\textbf{Om, P., (1987),} has given the explanation of the ratio analysis. The technique of ratio analysis involves four steps viz. determining the accounting ratio to be used, comparison of ratio with the standard set and interpretation. An analyst has to determine which ratio is to be used, and then he computes it and compares it with the standards but no such standards have been setup by the Indian Industries till today. The interpretation of ratio requires careful & detailed study and sound judgment on the part of the analyst.\textsuperscript{49}

\textbf{Shah, V., G., (2012),} says that the Indian Pharmaceutical industry is highly fragmented with about 24,000 players (around 330 in the organized sector). The top


\textsuperscript{48} Sharma, A., Profitability Analysis of Drugs and Pharmaceutical Companies in India, A Thesis Submitted to Saurashtra University, Rajkot for the Degree of Ph.D.

\textsuperscript{49} Om, P., 1987, “Ratio Analysis for Management in New Perspective, Himalaya Publishing House, Bombay
ten companies make up for more than a third of the market. The Indian pharma industry grew by a robust 18% YoY in 2011 to 565 bn (approx. US$ 12.5 bn). It accounts for about 1.4% of the world's pharma industry in value terms and 10% in volume terms. Besides the domestic market, Indian pharma companies also have a large chunk of their revenues coming from exports.  

3.2 Research Gap:
The research gap gives an idea about the gap between the existing research done in the field of profitability and the present research work. The existing research work is somewhat addition to the existing research work. In the existing research work the researchers have just done the ratio analysis on the profitability ratios, while this research work goes one step ahead by making the comparison of the performance of the of the sampled companies and giving rank to the companies on the basis of their performance in terms of profitability.

Another gap is that the existing research work does not make the co-relation analysis of the performance of the sampled companies, whereas in this research work the researcher has established co-relation between one profitability ratios with other profitability ratios.

Another gap is that the present research work has taken a large sample into consideration, whereas other existing researches are based on the small number of sample of around four or five companies only.