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Effect of Working Capital Management on the Profitability of the Indian Pharmaceutical Sector

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Abstract: The aim of the research is to study the working capital management in the area of pharmaceutical industry. Since the study is associated with the pharmaceutical sector of India, the main reason to choose this sector for the research is that in the case of pharmaceutical firms, the market leadership is not based on product innovation, rather on new product development. Thus these firms of pharmaceutical sector, in search of new drugs and processed are bearing high costs of research and development. The average cost in discovering and developing a new drug is more than $1 billion dollar and this process of new product development in case of pharmaceutical firms takes near about twelve years (Garnier, 2008). For this purpose they might need high liquidity to finance these costs at different occasions in the due course of business. Thus, this might be having an effect on the working capital management of the pharmaceutical firms, as it is concerned with the adequate liquid assets of the firms. Thus, an attempt is made through this research to study the relationship of working capital management with its important components such as profitability, liquidity and debt used by these Indian pharmaceutical firms. The other reason of this research is that during the review of literature part of the research, not a single research paper was found on the pharmaceutical sector of any country. This helped in selecting the pharmaceutical sector in India as the research area. Also the research on the working capital management is almost untouched in India, because there is not any research paper found on this topic of working capital management in India.

Keywords: Net Operating Profit, Inventory Turnover in Days, Cash Conversion Cycle, Earnings Before Interest and Tax, Working Capital Management.

1.1. INTRODUCTION

Capital required for a business can be classified under two main categories viz. Fixed Capital and Working capital. Every business needs funds for two purposes- for its establishment and to carry out its day to day operations. Long term funds are required to create production facilities through purchase of fixed assets such as plant and machinery, land, building, furniture etc. Investments in these assets represent that part of firm's capital which is blocked on a permanent or fixed basis and is called Fixed Capital. Funds are also needed for short term purposes for the purchase of raw materials, payment of wages and other day to day expenses, etc. These funds are known as Working Capital. In simple words, working capital refers to that part of the firm's capital which is required for financing short term or current assets such as cash, marketable securities, debtors and inventories. Funds, thus invested in current assets keep revolving fast and are being constantly converted into cash and this cash flow out again in exchange for other current assets. Hence it is known as revolving or circulating capital or short term capital.

"Working capital is the amount of funds necessary to cover the cost of operating the enterprise" (Gupta, 2008). "Circulating capital means current assets of a company that are changed in the ordinary course of business from one form to another, as for example, from cash to inventories, inventories to receivables, receivables to cash" (Sharma, 2008).

1.2. THE CASH CONVERSION CYCLE MODEL

Firms typically follow a cycle in which they purchase inventory, sell goods on credit, and then collect accounts receivable. This cycle is referred to as the Cash Conversion Cycle. This Cash Conversion Cycle is used as a proxy for the measurement of Working Capital. Sound working capital policy is designed to minimize the time between cash expenditures on materials and the collection of cash on sales. The Cash Conversion Cycle model, which focuses on the length of time between when the company makes payments and when it receives cash flows, is the primary measure of working capital (Brigham, 2010). The following terms are used in the model:

1.2.1. Inventory Conversion Period

It is the average time required to convert materials into finished goods and then to sell those goods. It should be noted that the inventory conversion period is calculated by dividing inventory by sales per day. For example if average inventories are Rs two million and the sales are Rs ten million, then the inventory conversion period will be 73 days [(2,000,000/10,000,000)*365)].

Thus it takes an average of 73 days to convert materials into finished goods and then to sell those goods. Some analysts define the inventory conversion period as inventory divided by daily cost of goods sold, however most published sources use the formula as discussed above. In addition some analysts use a 360 day year, however we will base all calculations on a 365 day year.

1.2.2 Receivables Collection Period

It is the average length of time, required to convert the firm's receivables into cash that is to collect cash following a scale. The receivables collection period is also called the days sales outstanding (DSO) and it is calculated by dividing accounts receivable by the average credit sales per day.

1.2.3 Payables Deferral Period

It is the average length of time between the purchase of materials and labor and the payment of cash for them.

1.2.4 Cash Conversion Cycle

It includes all the three periods which are defined above and which therefore equals the length of time between the firms actual cash expenditures to pay for productive resources (materials and labor) and its own cash receipts from the sale of products, (that is the length of time between paying for labor and materials and collecting on receivables). The Cash Conversion Cycle thus equals the average length of time a dollar is tied up in the current assets. Thus we can say that, Cash Conversion Cycle = Inventory conversion period + Receivables collection period – Payables deferrals period (Brigham, 2010).

From the above discussion of Working Capital Management, it can be concluded that the firm's goal should be to shorten its Cash Conversion Cycle as much as possible without hurting operations of the firm. Thus in a firm if the cash conversion cycle increases it will lead to decreasing profitability of the firm. The decrease in the cash conversion cycle of a firm will increase the firm's value, because shorter the cash conversion cycle, the lower the required net operating working capital, and the higher the resulting free cash flow which will ultimately increase the profitability of the firm.

In a firm the cash conversion cycle can be shortened by:

1. Reducing the inventory conversion period by processing and selling goods more quickly.
2. Reducing the receivables collection period by speeding up collections, or
3. Lengthening the payables deferral period by slowing down the firm's own payment.

To the extent that these actions can be taken without increasing costs or depressing sales, they should be carried out. Thus it can be said that the working capital management is one of the most important components of the corporate finance because working capital is directly related with liquidity and profitability of any company. As we know that working capital deals with current assets and current liabilities, it should be given due consideration during the different course of operations of the business. It is important due to a number of reasons associated with it. One reason among them is that the current assets of a manufacturing concern accounts for over half of its total assets, while as for a distribution firm, the current assets account for even more. Excessive levels of current assets can easily result in firms realizing a substantial return on investments. However a firm with too little current assets may incur shortages and may face difficulties in conducting steadily the different business operations. Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and avoid excessive investment in these assets on the other hand.

1.3. INDIAN PHARMACEUTICAL INDUSTRY

The pharmaceutical industry is one of the success stories of India ensuring that good quality essential drugs are made available at affordable prices to the vast population of the country as well as competing with some of the best names in the global markets. The industry is an intellectual industry and is in the front rank of India's science-based industries with investment in research and development and wide ranging capabilities in the complex field of drug manufacture and technology. It has grown from a mere $0.3 billion turnover in 1980 to about $19 billion in 2008 (combined sales in domestic and export markets). The country now ranks 3rd in terms of volume of production (10% of global share) and 14th largest by value. One reason for lower value share is the lower cost of drugs in India ranging from 5% to 50% less as compared to developed countries. The accelerated growth has been fuelled by exports to more than 200 countries with a sizeable share in the advanced regulated markets of U.S. and Western Europe. 40% of the world's bulk drug requirement is met by India. It ranks very high 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 (Aurobindo, 2008-09).

The industry has made significant progress in creation of required infrastructure, meeting global needs for supply of quality medicines and active pharmaceuticals ingredients (APIs), as also entering into the highly attractive area of contract research and manufacturing (CRAM) and clinical trials.

Domestic investment in the pharmaceuticals sector is estimated at Rs.314.30 billion (approximately $6.55 billion). The pharmaceuticals sector has been able to attract FDI amounting to $1.40 billion in the sector during 2000-01 to 2008-09 of which, there has been an inflow of $334.09 million in 2007-08 and $125.30 million during the first half of 2008-09.

The sector is estimated to have so far created 4.2 million employment opportunities with more than 20,000 registered units. Despite the fragmentation and price competition, the leading 250 pharmaceutical companies control 70% of the market with the leader holding nearly 7% of the market share. While pharmaceutical products are exported primarily to U.S.A., Germany, Russia, UK and Brazil amongst a large basket of countries, India's imports emanate mainly from China, Switzerland, U.S.A. and Italy. India currently exports drug intermediates, APIs, finished dosage formulations (FDFs), bio-pharmaceuticals, and clinical services to various parts of the world. Exports of pharmaceuticals have consistently outstripped the value of corresponding imports between 1996-97 and 2008-09. The trade balance increased from Rs.21.57 billion in 1996-97 to Rs.298.81 billion in 2008-09. Exports of pharmaceuticals at Rs.384.33 billion registered a growth rate of 25% in 2008-09. This is quite impressive, seen in the context of the growth in the country's total exports of all commodities was at 16.9% in the corresponding period. The share of exports of pharmaceuticals products to the total national exports have been in excess of 2% during each of last 12 years ending 2007-08. It has exhibited a long term upward trend from 2.01% in 1996-97 to 2.55% in 2008-09. In 2008-09, there was a sharp growth at 40% in exports to Brazil, and exports to Asian countries was $1 .38 billion (approximately 19% of India's total pharmaceutical exports). In 2002, over 20,000 registered drug manufacturers in India sold $9 billion worth of formulations and bulk drugs. 85% of these formulations were sold in India while over 60% of the bulk drugs were exported, mostly to the United States and Russia. Most of the players in the market are small-to-medium enterprises; 250 of the largest companies control 70% of the Indian market. Thanks to the 1970 Patent Act, multinationals represent only 35% of the market, down from 70% thirty years ago (Aurobindo, 2008-09).

Most pharmaceutical companies operating in India, even the multinationals, employ Indians almost exclusively from the lowest ranks to high level management. Mirroring the social structure, firms are very hierarchical. Homegrown pharmaceuticals, like many other businesses in India, are often a mix of public and private enterprise. Although many of these companies are publicly owned, leadership passes from father to son and the founding family holds a majority share. In terms of the global market, India currently holds a modest 1-2% share, but it has been growing at approximately 10% per year. India gained its foothold on the global scene with its innovatively-engineered generic drugs and active pharmaceutical ingredients (API), and it is now seeking to become a major player in outsourced clinical research as well as contract manufacturing and research. There are 74 U.S. FDA-approved manufacturing facilities in India, more than in any other country outside the U.S, and in 2005, almost 20% of all Abbreviated New Drug Applications (ANDA) to the FDA are expected to be filed by Indian companies. Growths in other fields notwithstanding, generics are still a large part of the picture. London research company Global Insight estimates that India’s share of the global generics market will have risen from 4% to 33% by 2007.

1.3.1 Pharmaceutical Industry Perspective

1.3.1.1 Adoption of Patents

As the Indian Pharmaceutical Industry expands its core business, the industry is being forced to adapt its business model to recent changes in the operating environment. The first and most significant change was the amendment to India’s patent law on January 1, 2005 that restored the product patents for the first time. The legislation took effect on the deadline set by the World Trade Organization’s Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement, which mandated patent protection on both products and processes for a period of 20 years. Indian companies achieved their status in the domestic market by breaking these product patents, and it is estimated that within the next few years, they will lose $650 million of the local generics market to patent-holders. In the domestic market, this new patent legislation has resulted in fairly clear segmentation. The multinationals narrowed their focus and make up only 12% of the market, taking advantage of their newly-bestowed patent protection. Meanwhile, Indian firms have chosen to take their existing product portfolios and target semiurban and rural populations.

1.3.1.2 New Product Development Processes

Indian pharmaceutical firms also started to adapt their product development processes to the new environment. The old practices have become obsolete and outdated, so in the Indian pharmaceutical industry the competition is high enough in the industry indigenously as well as globally. This is kept in mind by the pharmaceutical industry like other Indian industries, so they also incorporated the latest techniques in their drug manufacturing processes. The research and development costs have been increased in search of the new drugs. The industry is totally based on the new product development rather than on the product innovation. The average cost in discovering and developing a new drug in pharmaceutical industry is more than one billion dollars and the process takes near about twelve years

(Garnier, 2008). In this regard the local firms have slowly started investing more money into their research and development programs or have formed alliances to tap into these opportunities.

1.3.1.3 Small and Medium Pharmaceutical Enterprises

As promising as the future is for a whole, the outlook for small and medium enterprises (SME) is not as bright. The excise structure changed so that companies now have to pay a 16% tax on the maximum retail price (MRP) of their products. Consequently, larger companies are cutting back on outsourcing and business is shifted to the four tax-free states - Himachal Pradesh, Jammu & Kashmir, Uttaranchal and Jharkhand. While this should be beneficial to consumers and the industry at large, small and medium enterprises (SMEs) have been finding it difficult to find the funds to upgrade their manufacturing plants, resulting in the closure of many facilities. Others invested the money to bring their facilities to compliance, but these operations were located in non-tax-free states, making it difficult to compete in the wake of the new excise tax.

1.3.1.4 Challenges to the Industry

All of these changes are ultimately good for the Indian pharmaceutical industry, which suffered in the past from inadequate regulation and large quantities of spurious drugs. These changes in the Indian pharmaceutical industry force it to reach a level necessary for global competitiveness. However, they have also exposed some of the inadequacies in the industry today. Its main weakness is an underdeveloped new molecule discovery program, on which the new drug development depends. Even after the increased investment, market leaders such as Ranbaxy and Dr. Reddy's Laboratories spent only 5-10% of their revenue on research and development, 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 differences. The drug discovery process is further hindered by a dearth of qualified molecular biologists. Due to the disconnection between curriculum and industry, pharmaceuticals in India also lack the academic collaboration that is crucial to drug development in the West.

1.3.1.5 Research and Development

Both the Indian central and state governments have recognized research and development as an important driver in the growth of their pharmaceutical businesses and conferred tax deductions for expenses related to research and development. They have granted other concessions as well, such as reduced interest rates for export financing and a cut in the number of drugs under price control. Government support is not the only thing in Indian pharmaceutical industry's favor, though; companies also have access to a highly-developed IT industry that can partner with them in new molecule discovery.

1.3.1.6 Availability of Efficient Labour Force

Indian pharmaceutical industry's greatest strengths lie in its people. India also boasts a cheap, well-educated, english speaking labor force that is the base of its competitive advantage. Although molecular biologists are in short supply, there are a number of talented chemists who are equally as important in the discovery process. In addition, there has been a reverse brain drain effect in which scientists are returning from abroad to accept positions at lower salaries in Indian companies. Once there, these foreign-trained scientists can transfer the benefits of their knowledge and experience to all of those who work with them. With one of the largest and most genetically diverse populations in any single country, India can recruit for clinical trials more quickly and perform them more cheaply than countries in the West. Indian firms have just recently started to leverage.

1.3.1.7 Pharmaceuticals and Biotechnology

Unlike in other countries, the difference between biotechnology and pharmaceuticals remain fairly defined in India. In the west the biotech plays the role of pharmaceuticals little sister, but many outsiders in India market have high expectations for the future that biotech will boost the sales of pharmaceutical firms. India accounted for 2% of the $41 billion global biotech market and in 2003 was ranked 3rd in the Asia-Pacific region and 11th in the world in number of biotechnology market. In 2004-05, the Indian biotech industry's revenues grew from 37% to $1.1 billion. The Indian biotech market is dominated by biopharmaceuticals; 75% of 2004-05 revenues came from biopharmaceuticals, which saw 30% growth last year. Of the revenues from biopharmaceuticals, vaccines led the revenue by comprising 47% of sales. In the present day context of rising capital needs for different purposes of the business concern, the importance of working capital needs special emphasis, because it is the management of this working capital, which makes the firms a cash rich concern. It has also been widely accepted that the profitability of a business firm depends upon the manner in which its working capital is managed. The inefficient working capital management not only reduces profitability of the firms, but also leads to financial crisis.

On the other hand, proper working capital management leads to smooth functioning of a business concern and also ensures optimum financial returns even on the minimum level of capital employed. Also in a business firm, the excessive as well as inadequate working

capital is harmful. The excessive working capital leads to unproductive use of scare funds, while as on the other hand the inadequate working capital interrupts the normal operations of a business, which ultimately affects the profitability.

Further in case of pharmaceutical industry, there are high costs of research and development of new drugs which requires new scientific and technological developments, therefore the working capital has to play an important role to keep pace with these scientific developments and innovations. If in the concerned area, the new processes, methods, tools, techniques and developments are not given due consideration, it is quite probable that the firm will not be able to survive in the competitive world. Thus in the context of pharmaceutical industry, the working capital management has a crucial role and its examination is of great importance. Thus through this research an attempt has been made to analyze the effect of this working capital management on the profitability of the Indian pharmaceutical sector.

1.4. RESULT AND DISCUSSION

In this research, two types of data analysis tools are used and the analysis is done through the use of SPSS and Gretl softwares. The results of this descriptive type of analysis are discussed in this research paper. The descriptive analysis shows the average, standard deviation, minimum and maximum values of the variables. It gives a clear picture about these values, which help in understanding the different dimensions of a variable. Table 1 represents the descriptive statistics for a sample of twenty Indian pharmaceutical firms for a period of five years from 2008 to 2012 and for a total 100 firms year observations. The table represents that the mean value of net operating profitability is 22.12% of total assets and the standard deviation is 16.76%. From this, it can be interpreted that the value of profitability can deviate from mean to both sides by 16.76%. The minimum and maximum values of the profitability are -63.71% and 64.83% respectively. Since the standard deviation is small than the mean, it indicates that the pharmaceutical sector is quite enough effective in maintaining its profitability. The cash conversion cycle, which is used as a proxy of the working capital management, is on an average of 76 days with a standard deviation of 75 days. The minimum and the maximum limits of the time period of cash conversion cycle are -35 days and 377 days respectively. Since the value of standard deviation is not much larger than its mean, it indicates that the pharmaceutical firms cash conversion cycle doesn't deviate too much, thus these pharmaceutical firms are quite effective while dealing with the cash conversion cycle. From their cash conversion cycle it can also be interpreted that the sector is trying to keep it short enough so that their profitability will be maintained. While dealing with the collection policy, the firms receive payment against sales after an average of 66 days with a standard deviation of 36 days. The minimum time taken by a company to collect cash from the receivables is 7 days, while the maximum time take is 180 days. In this way the pharmaceutical sector realizes cash from the sales immediately as shown by their collection policy.

Table 1. Descriptive Statistics, 20 Indian pharmaceutical firms 100 firms, 2008-2012 year observations

	N	Maximum	Minimum	Mean	Std Deviation
Net operating profit	**100**	**-63.71**	**64.83**	**22.1221**	**16.76291**
Cash conversion cycle	**100**	**-35.21**	**377.12**	**76.3402**	**74.52340**
Average collection period	**100**	**7.00**	**180.00**	**65.5300**	**35.80516**
Inventory turnover in days	**100**	**20.28**	**341.12**	**74.2002**	**47.52713**
Average payment period	**100**	**17.00**	**110.00**	**63.3900**	**22.24650**
Current ratio	**100**	**0.67**	**5.46**	**1.9651**	**1.02830**
Debt ratio	**100**	**0.00**	**0.80**	**0.3005**	**0.25174**

The table also shows that the firms take an average of 74 days to sell their inventory with a standard deviation of 48 days. The minimum and maximum time taken by a firm in this regard is 20 days and 341 days respectively. In order to make the payments to their purchases the firms wait on an average of 63 days with a standard deviation of 22 days. Here the minimum time taken by a firm to pay its purchases is 17 days while the maximum time taken is 110 days. From this inventory turnover it can be concluded that the pharmaceutical firms process and sell their goods immediately. To check the liquidity of the pharmaceutical firms, the traditional measure of the liquidity i.e. current ratio is used for this purpose. The average current ratio of the firms is 1.96. The standard deviation is 1.02 while the minimum and the maximum current ratio for a company in a year is 0.67 and 5.46 respectively. This shows that the pharmaceutical firms' current assets exceed their current liabilities. The debt ratio is used to check the relationship of debt financing with the profitability and the firms average debt ratio is 30% with a standard deviation of 25%. The maximum debt financing used by the firms is 80% while as the minimum level is 0%. The deviation of the debt ratio from the mean is significant, which means that these pharmaceutical firms usually use debt in their financing, which is the cheaper source of finance because it has the advantage of tax exemption.

1.5. CONCLUSION

I. From descriptive analysis the mean value of net operating profitability is 22.12% of total assets and the standard deviation is 16.76%. From the standard deviation it can be interpreted that the value of profitability can deviate from mean to both sides by 16.76%. The minimum and maximum values of the profitability are -63.71% and 64.83% respectively. It shows that the pharmaceutical firms are quiet efficient in managing their profitability.

II. The cash conversion cycle which is used as a proxy of the working capital management is on an average of 76 days with a standard deviation of 75 days. The minimum and the maximum limits of the time period of cash conversion cycle are -35 days and 377 days respectively. Thus the firm's cash conversion cycle is good enough, because it is not too long.

III. The firms receive payment against sales after an average of 66 days while the standard deviation is 36 days. This indicates that the pharmaceutical firm's collection policy is good enough to realize cash immediately from the sales. The minimum time taken by a company to collect cash from the receivables is 7 days while the maximum time take is 180 days.

IV. The analysis also shows that the firms take an average of 74 days to sell their inventory with a standard deviation of 48 days. The minimum and maximum time take by a firm in this regard is 20 days and 341 days respectively. It indicates that the firms process and sell their products immediately. In this way these firms try to shorten the cash conversion cycle, which leads to increased profitability.

V. In order to make the payments to their purchases the firms wait on an average of 63 days with a standard deviation of 22 days. Here the minimum time taken by a firm to pay its purchases is 17 days while the maximum time taken is 11 days. Thus it shows that the firms make payments immediately, because their liquidity is very good. It also indicates that the less profitable firms wait longer to pay their different charges and bills.

VI. The average current ratio of the firms is 1.96. The standard deviation is 1.02 while the minimum and the maximum current ratio for a company in a year is 0.67 and 5.46 respectively. It indicates that the Indian pharmaceutical firm's current assets exceed their current liabilities. Thus shows that the firms maintain liquidity very effectively and properly.

VII. The average debt ratio of the firms is 30% with a standard deviation of 25%. The maximum debt financing used by the firms is 80% while as the minimum level is 0%. It depicts that the pharmaceutical firms don't depend much on the debt source of finance. It can also be interpreted that the pharmaceutical firms use optimal level of debt financing in their capital structure.

VIII. In general practice the relationship between working capital management and the profitability should be negative, because efficient working capital management increases the profitability of a firm. The analysis of correlation also shows that there is a negative correlation between the working capital management and the profitability of the pharmaceutical firms. This is consistent with the view that the time gap between the payment for purchases of raw material and the collection of the sales of finished goods can be too long and if this time lag between these two policies of the pharmaceutical firm is decreased, it can increase the profitability of the firms.

It can be concluded that the firms can increase their profitability by reducing the cash conversion cycle which is used as a proxy of the working capital management in this research. This cash conversion cycle can be reduced by reducing the inventory conversion period and receivables collection period to a reasonable minimum possible extent. The negative relationship between the average payment period and the net operating profitability is consistent with the view that less profitable firms wait longer to pay their different charges and bills. There is also a positive relationship between the current ratio, which is used as a proxy for the liquidity of the firms. It indicates that in order to increase the profitability, the pharmaceutical firm's current assets should exceed the current liabilities. The leverage of the pharmaceutical firms, which in this research is expressed in the form of debt ratio, has a negative relationship with the profitability of the firms. Thus more the use of debt by the pharmaceutical firms, lesser will be the profitability.

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