

Report On
Mergers & Acquisitions
- Abnormal returns in the pharmaceutical industry

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DECLARATION

I Abhilasha Kishore, student of MBA 2015-2017 of Delhi School of Management, Delhi Technological University , Bawana Road, Delhi-42 declare that the Report on “Mergers & Acquisitions - Abnormal returns in the pharmaceutical industry“ submitted in partial fulfilment of Degree of Masters of Business Administration is the original work conducted by me.

The information and data given in this report is authentic to the best of my knowledge.

This report is not being submitted to any other University for award of any other Degree, Diploma and Fellowship.

Name of the student :

Place:

Date:

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ABSTRACT

In this thesis we will analyse the long-term effect on the share prices of the public traded company when one large pharmaceutical enterprise acquires or merges with another pharmaceutical company in seek of amplifying their business. Now a day M&A has become a phenomenon, an integral part of commercial activities. This form of inorganic growth for many reasons, which will be discussed later on in this report, has been the choice of many in this day and era. This as a result has had a great impact on the financial markets, with M&A having larger deal values today than ever before.

Being a highly developing industry, the pharmaceutical industry forms an interesting case study, with several substantial acquisitions in the past and present decade. The need to analyse this phenomenon is to enable us to understand and confirm whether or not in the long run abnormal returns are generated in such large acquisitions in the pharmaceutical world. Empirical findings show as will be investigated and demonstrated for the pharmaceutical industry in this report as well, that the bidder firm often generate low, zero or even negative abnormal returns.

Many debate, whether or not a pharmaceutical company's vested interest in developing new medicines is intervened by any company's ultimate goal of maximizing shareholder wealth. Similar questions have been raised on acquisitions as well, whether they are made to improve research, expand and develop the business or to maximize shareholder's wealth. Some investigations imply that large mergers or acquisitions in the past have not brought forth any or few new drugs, since a consolidation may disrupt

perdurable research, and only resulted in reducing costs (Chemical & Engineering news,2002).

The focus of this thesis is on the abnormal returns to the shareholders after an M&A. By abnormal returns we want to imply the case when the stock beats a chosen benchmark. The benchmark chosen could be either the industry or the firm's expected returns or even any of the general market indexes. Taking that the company opts for an M&A for the purpose of maximization of its shareholder's wealth, we would like to investigate the chances for abnormal return for a few large M&A's.

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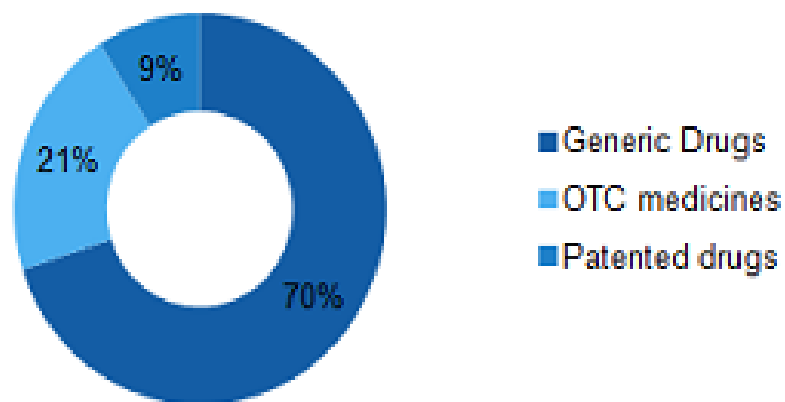
1. INTRODUCTION

1.1 INDUSTRY PROFILE

As per the latest stats published on IBEF (India Brand Equity Foundation) website, the Indian pharmaceutical sector accounts for about 2.4 per cent of the global pharmaceutical industry in value terms and 10 per cent in volume terms and is expected to expand at a Compound Annual Growth Rate (CAGR) of 15.92 per cent.

By 2020, India is probably going to be among the main three pharmaceutical markets by incremental development and 6th biggest market all-inclusive in supreme size. India's cost of generation is essentially lower than that of the US and half of that of Europe. It gives a focused edge to India over others.

Revenue share of Indian pharmaceutical sub-segments in 2015 (%)



Source: Business Monitor International, FCCI Indian Pharma Summit 2014-15, TechSci Research

India enjoys this pivotal position in the global pharmaceuticals sector because of the large pool of scientists and engineers it has horned over the years. This pool has the potential to boost the pharma industry ahead to even greater heights with India having an edge over its competition.

Generic drugs form the largest segment of the Indian pharmaceutical sector with about 70% of the market share. In terms of volume, India accounts for 20 percent export market of the global generic medicines. These exports go out to 200 countries, with US leading the pack. This makes the country the largest provider of generic medicines globally. Over 80% of the Antiretroviral drugs used globally to fight AIDS are supplied from India. The country has the second largest number of Abbreviated New Drug Applications (ANDAs) and in Drug Master Files (DMFs) applications it is the world's leader sharing the stage with the US.

As per IBEF, of total market revenues of US\$ 20 billion, Over the Counter (OTC) medicines and patented drugs make 21 per cent and 9 per cent respectively.

In the aim of making India a global leader in end to end drug manufacturing and processing, the Government of India has recently unveiled 'Pharma Vision 2020' with the approval time substantially reduced for a new facility, to boost investments in this sector. Further, to deal with the issue of affordability and availability of medicines, mechanisms such as the Drug Price Control Order and the National Pharmaceutical Pricing Authority have been the introduced by the government.

In the look-out for ways to reduce costs and bring down healthcare expenses, the Government of India has taken many steps in an expectation of benefitting

the Indian pharmaceutical companies. The focus area of these initiatives is fast introduction of generic drugs into the market. Additionally, the boost given to rural health programmes, making preventive vaccines and lifesaving drugs available to all concerns of the country has also worked wonders for the pharmaceutical companies. Driven by the rapid urbanisation, raising healthcare insurance and increased consumer spending, the Indian pharma market is foreseen to expand to US\$ 55 billion by 2020 from US\$ 20 billion in 2015.

To better the domestic sales, the need of the hour for any pharma company is to align its product portfolio towards chronic therapies for diseases that are currently on a rise such as cardiovascular, anti-diabetes, anti-depressants and anti-cancers.

1.1.1 Mergers and Acquisitions in Indian Pharmaceutical Industry

Liberalization facilitated Indian firms to market generic drugs to the Western European countries and the US. Indian drug manufacturers currently export their products to more than 65 countries worldwide; the US being the largest customer. At the same time around \$80 billion worth of drugs are moving towards generic way by 2012. Many large economies are curbing their health care expenses. R&D pipeline has been growing weak for the past several years of these large pharmaceutical firms. For example firms like GSK and Pfizer alone faced seven patent expirations each in 2010.

Indian pharmaceutical market is changing under the light of the below three arguments:

1. Implementation of cost effective manufacturing by the developed economies
2. Increasing importance of the emerging markets
3. The changing domestic market in India and its significance.

Even after these bright opportunities, challenges in terms of non-tariff barriers, decreasing profits in the generics market, competition from the big established pharmaceutical MNEs and fierce competition from China and Eastern European manufacturers are staring right at the Indian pharma sector. In the want to move up the value chain, Indian firms are aiming to develop capabilities in super generics and branded generics production.

New strategies and more innovation are required in the Indian companies for them to be able to compete with the global pharmaceutical companies, even domestically. To take advantage of a large domestic market and the highest number of US FDA approved plants outside of the US (offering a low cost manufacturing base), India is looking for opportunities for strategic alliances and M&A. These M&A are mostly forming a means for expanding of their manufacturing capacities in the aim of fulfilling the growing domestic and foreign demand. At the same time, with an aim to gain competitive advantages, R&D expenditure has been increased many folds by the Indian companies in a focus to strengthen the product pipeline.

In short through M&A activities Indian Pharmaceutical industries are wanting to compliment the strengths of two entities so as to get the desired enlarged market access along with new technologies as well as new products. Attaining

SWOT Analysis Of Indian Pharmaceutical Industry

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> •Low cost of skilled manpower •Access to large pool of highly trained scientists •Strong marketing and distribution network •Proven track record in design of high technology manufacturing devices •Low cost of innovation, manufacturing and operations 	<ul style="list-style-type: none"> •Stringent pricing regulations •Poor transport and medical infrastructure •Lack of data protection •Very competitive environment •Poor health insurance coverage •Production of low quality drugs tarnishes image of industry abroad •Low investment in innovative R&D 	<ul style="list-style-type: none"> •Increase in per capita income •Global demand for generics rising •Increasing population with more sedentary lifestyle •Increasing health insurance sector •Significant investment from MNCs •Medical tourism •Cheap, diverse clinical trials •Global outsourcing hub due to low cost of skilled labor 	<ul style="list-style-type: none"> •Other low cost countries affecting demand •Government regulations changing •Expanding of Drugs Price Control Order •Lack of investment in infrastructure •Wage inflation •R&D restricted by lack of animal testing and outdated patient office •Counterfeiting threat

higher economies of scale by enhancing their size could also be considered as key motivations for M&A in pharmaceutical sector.

According a KPMG, 2006 report, Indian pharmaceutical firms are going in for foreign acquisitions to achieve the following goals:

- Global competitiveness improvement
- Upward movement in the value chain
- New markets Creation and entry
- Enhancement in the product portfolio
- New products and assets acquisition (including research and contract manufacturing firms, in order to boost their outsourcing capabilities)

- Market shares Consolidation
- Compensate for continued home market slowness

For the time period of 2001-2010, the Indian pharmaceutical industry saw 264 M&A deals undertaken. Out of the total deals, 99 (37.5 per cent) were mergers and 165 (62.5 per cent) were the count of acquisitions. The pharmaceutical industry took the highest slot in the manufacturing sector when compared to other industries participating in M&A during this period. When analysing year to year fluctuations in number of M&A deals for the period of 2001-2010, it was seen that the fluctuations were more for acquisitions as compared to mergers. The highest number of acquisitions, amounting to 29 deals was in 2008 and the number of mergers were the highest in 2004 (16 deals)

S. N.	Company (Acquirer)	Company (Target)	For Amount
1	Biocon	Axicorp (German)	\$ 30 million
2	Dr. Reddy's Labs	Trigenesis Therapeutics (USA)	\$ 11 million
3	Wockhardt	Esparma (German)	\$ 11million
4	Wockhardt	C P Pharmaceuticals (UK)	Rs 83 crore
5	Wockhardt	Negma Laboratories (France)	\$ 265 million
6	Wockhardt	Morton Grove Pharma (USA)	\$ 38 million
7	Zydus Cadilla	Alpharma (France)	EUR 5.5 million
8	Ranbaxy	RPG Aventis (France)	\$ 70 million
9	Nicholas Piramal	Biosyntech (Canada)	\$ 4.85mn
10	Sun Pharma	Taro (Israel)	\$ 500mn
11	Cadilla Healthcare	Quimica E Farmaceutica Nikkh	-

M&As Deals (Inbound)

Company (Acquirer)	Company (Target)	For Amount
Daiichi Sankyo (Japan)	Ranbaxy (India)	\$4.2 billion
Abbott (USA)	Piramal (India)	\$3.72 billion
Sanofi Aventis	Shantha (India)	\$783 million
Mylan (USA)	Matrix (India)	\$736 million
Reckitt Benckiser	Paras (India)	\$724 million
Hospira	Orchid (India)	\$400 million
Fresenius Kabi (German)	Dabur Pharma (India)	\$219 million
Abbott (USA)	Wockhardt (India)	\$22.5 million

1.2 RELEVANT CASE STUDIES

Many studies have been made on short-run effects of acquisitions on stock returns. Abnormal returns is the excess return generated over an assumed benchmark constructed to estimate the return if the merger had not taken place. These tests often considered the abnormal returns to the shareholders for both the target firm and the buying firm.

CASE 1:

Sun Pharmaceutical Industries Ltd, together with its subsidiaries, signed a definitive agreement to acquire Taro Pharmaceutical Industries Ltd.

Acquirer (Buying Firm): Sun Pharma Laboratories Limited ("SPLL")

Acquirer's Registered Office: Mumbai, Maharashtra

Acquirer's then Market Share: 5.6% as per AIOCD AWACS -October 2015.

Acquirer Company Overview: Incorporated on January 17, 1997, Sun Pharma Laboratories Limited manufactures and markets Branded Generic pharmaceutical products in India. On March 9, 2012, it became a wholly owned subsidiary of Sun Pharmaceutical Industries Limited (SPIL). As per the Scheme of Arrangement between Sun Pharmaceutical Industries Limited and the Company, the Domestic Formulation Undertaking of SPIL was transferred to the Company with effect from March 31, 2012 and the shares of the Company are not listed on any of the Stock Exchanges.

Target Firm: TarTaro

Target's Registered Office: Haifa, Israel

Target Company Overview: TarTaro a multinational generic manufacturer was established in 1959 and is listed since 1961 in the US. It has established subsidiaries, manufacturing and products across the U.S., Israel, Canada. It operates through three entities: Taro Pharmaceutical Industries Ltd., or Taro Israel, and two of its subsidiaries, Taro Pharmaceuticals Inc., or Taro Canada, and Taro U.S.A. Taro.

Target's then Market Share: In 2005, Taro reported sales of USD 298 million and profit of USD 5.7 million

CASE 2:

Cadila Healthcare Limited (CHL) acquired US based speciality formulations maker Alparma Inc's French subsidiary Alparma SAS France for Euro 5.5 million, making it the first overseas acquisition for the Ahmedabad-based pharmaceutical major. CHL took 100% stake in Alparma France through Zydus International Pvt Ltd, an overseas wholly owned subsidiary of Cadila Healthcare Ltd. The acquisition enabled CHL to have a foothold in the European generics market, the second largest generics market after US.

Acquirer (Buying Firm): Cadila Healthcare

Acquirer's Registered Office: Ahmedabad, Gujarat, India

Acquirer's then Market Share: INR 54.7 Billion Revenue (2015)

Acquirer Company Overview: The Fourth Largest Pharmaceutical Company in India, Cadila was incorporated in May 1995. It is a top manufacturer of Generic drugs in the country well known for being research-oriented, technology-driven with a focus on Biotechnology, Formulations and Active Pharmaceutical Ingredients. Company's operation includes pharmaceuticals,

including Human Formulations, Veterinary Formulations, Diagnostics, Herbal Products, Skin Care Products and OTC Products with manufacturing facilities spread across Gujarat, Goa, Maharashtra and Himachal Pradesh.

Target Firm: Alpharma SAS France

Target's Registered Office: Aubervilliers, France

Target Company Overview: Alpharma SAS manufactures and distributes generic pharmaceuticals in the European generics market

CASE 3

Dr. Reddy became the first pharmaceutical company from Asia Pacific to be listed on Newyork stock exchange by acquiring Betapharm on 11 April 2001. With the 3.5% share of the German Pharma Market that “Betapharma” owned, Dr Reddy aims to take advantage of its strong manufacturing infrastructure, well-established distribution channels and relationships with doctors, pharmacists in Europe.

Acquirer (Buying Firm): Dr Reddy's

Acquirer's Market Share: In 2006 – 2007, its revenue amounted to \$ 1.5 billion, an increase of 24.3% of the previous year. Its net income amounts to \$ 216 million.

Acquirer Company Overview: Dr Reddy's began as an active pharmaceutical ingredients (API) manufacturer in 1984, producing high-quality APIs for the Indian domestic market. In 1987, the company started its formulations operations and went international in 1991 in the formulations market. Dr

Reddy's is present in almost all major therapeutic areas, marketing its product today in about 100 countries with a focus on Europe, India, US and Russia.

Target Firm: Betapharm

Target Company Overview: Fourth largest generic pharma company in Germany, the company conducts research and development in diabetes, cancer, cardiovascular diseases and bacterial infections. With a portfolio of over 145 products, Betapharm has over 120 medications and 60 active pharmaceutical ingredients for drug manufacture.

2. OBJECTIVE OF THE STUDY

This study aims to examine and test the hypothesis against the claim that acquisitions do not generate abnormal returns in the long run. This objective would be achieved through study of existing theories and constructed empirical findings.

Major acquisitions made over the last few years by three pharmaceutical companies listed on the National Stock Exchange of India Limited will be considered.

As the long-run results paint the whole picture, revealing the actual impact of mergers in the long run, only the long term performance will form the area of focus in this study.

2.1 PROBLEM DEFINITION

With expanding competition in today's global markets, many enterprises choose to merge with one-another to have the capacity to compete and grow internationally. Mergers & acquisitions happen in all business sectors and in a wide range of ventures. Historically, we can see that in merger activity regardless of the business sector, the stockholders of the target firm earn high abnormal returns while the stockholders of the acquirer firm earn abnormal returns of just a couple of per cent, or even zero or negative returns. The question is whether post acquisition acquired and acquirer firms together grow and achieve synergies or not.

With the knowledge that earlier empirical work has demonstrated that the acquirer do not generate abnormal returns in the long run, we characterize and define the problem with the following hypothesis:

H0: In the long run, acquisitions do not generate abnormal returns

H1: In the long run, acquisitions do generate abnormal returns

2.2 LIMITATIONS

The constraints in the study are listed below for reference:

- We are taking only three key M&A's as a representation for the industry behaviour.
- Time frame of the study forms a constraint as we are considering 48 months of monitoring of a company's return as long-run results
- The benchmark to measure the M&A performance of the whole organisation ideally constitutes of multiple components such as the increased market share, increased revenues or even improved organization of resources. In this study all of these components have not been considered when measuring abnormal returns. The stocks are the only variable being monitored as an estimate of the abnormal returns.

2.3 DISPOSITION

The report begins by explaining methods that were used to develop this thesis as well as describes other relevant studies within our field. The chapter three narrates the historical foundation of the field of mergers & acquisitions and clarifies what the reasons for mergers have been through time. In the following chapter prior significant case studies are discussed. In chapter five a theoretical framework is presented as a base to the review and covers the applicable relevant theories used. Later on, in chapter six we proceed with a more profound investigation into the pharmaceutical industry and analysis of three chosen companies. In chapter seven statistical and factual data are assembled and used to measure expected returns on each stock with the APT model(Multifactor Model) containing macroeconomic variables that will surely influence the result. In the last two chapters the result is analysed and concluded. The proposition is ended by giving some recommendations to interesting future research areas.

This chapter recognizes the methods used to be able to answer the questions to the thesis, and what approach is being utilized to reach the purpose. Described is also how methods have been chosen and how data have been accumulated.

3. LITERATURE REVIEW

3.1 HISTORICAL BACKGROUND OF MERGERS AND ACQUISITIONS

A merger or acquisition happens when at least two organizations combine together. The incentive of this coming together lies in the expected sharing of costs, increase in efficiency or an opportunity to gain market control.

In addition of being the preferred tool for expanding ones business inorganically, M&A's are also used to get around different laws or regulations such as tax laws or monopoly regulations. It enables fast creation of world leading multinational partnerships through large, often complicated consolidations of colossal companies. Few examples could include the much talked about merger of German Daimler and American Chrysler, forming the giant automobile firm Daimler-Chrysler.

Though M&A have recently come into the limelight, it surely is not a new phenomenon. It is not even a phenomenon of the 20th century. The first mergers can be dated back to the second half of the 19th century, used as a technique to expand market share and exercise monopolistic market control.

It is common that the mergers occur within different industry clusters as different variables influence different industries over the years.

When it comes to the pharmaceutical industry, the first vastly recognised M&A as per the deal value was the acquiring of the Philadelphia-based SmithKline Beckman by the British Beecham Group in July 1989,

consolidating to form SmithKline Beecham. The aggregate deal value of this merger was \$8.9 billion setting a trend for future massive mergers in the industry. It was also a tremendous merger which consolidated the two world-leading pharmaceutical forces; United States and Europe, in the search for generic drugs (GSK, 2005).

After this merger between the two giants, a row of mergers followed during the 90s and went well into the 21st century. Many renowned corporations today such as Pfizer, AstraZeneca and Novartis have been formed in the last 15 years through enormous mergers intended to direct the research and development in the pharmaceutical industry.

3.2 THEORETICAL FRAMEWORK

As mentioned earlier the purpose is to analyse the effect of acquisitions in the Pharmaceutical industry on stock returns. To measure the effect, assessments are made on Future stock returns of the included companies. These estimates are then compared and correlated with the actual returns recorded 48 months after the acquisitions. The documented returns are likewise compared with both an industry related index as well as a more general market index. The pharmaceutical business is unique in the sense that it is influenced strongly by R&D and other closely related industries, for example, bio-tech and healthcare. One perceived conduct of firms and M&A is that the number of M&A's increments when firms are highly esteemed and valued and there is large activity on the stock market (Mueller, 2003). To be able to capture the impact of several factors on the stock returns a multifactor model is chosen, which can be modified to fit the problem. One commonly used theory developed just for this purpose is the Arbitrage Pricing Theory that will be investigated after a brief discussion of what many see as the fundamental valuation method of an investment.

3.1.1 Multiple Earning Factor Model

Efficient market hypothesis proposes that returns are affected by the level of risk. This risk in turn is caused by multiple factors. In the case where the stock is affected by more than one factor we use a multiple-factor model denoted below:

$$R(i) = \alpha(i) + \beta(1) F(1) + \beta(2) F(2) + \beta(3) F(3) + \beta(4) + \varepsilon(i)$$

where:

$R(i)$ = return of stock i

$\alpha(i)$ = the intercept term

$\beta(i)$ = the sensitivity of stock i to the factor

$F(i)$ = the value of the factor

$\varepsilon(i)$ = a random error term

The extended factor model demonstrates a linear relationship with the stock simply having more than one beta. The formula can be rewritten with lambda representing a constant for the factor value and alpha as a risk-free rate:

$$r = r(f) + \lambda \beta + \lambda \beta + \lambda \beta + \lambda \beta + \varepsilon$$

We can compute the estimated future stock return, on estimating the future change in the factors and the risk-free rate.

The major unanswered question of the above theory are the factors that are to be considered that impact the price of a stock. Prior research has shown that there are generally three to five factors. In one paper by Chen, Roll and Ross (Sharpe, Alexander & Bailey, 1999), the following factor were identified:

- (1) Growth rate in the industry,
- (2) Rate of inflation,
- (3) Spread between long-term and short-term interest rates and
- (4) Spread between low-grade and high-grade bonds.

3.1.2 Post-M&A Performance Index Selection

As specified in the start of this section the aim is to compare the documented stock returns with relevant indices. There is a motivation why the author has chosen to compare the data with two different indices. This is because the company has different sensitivities towards different indices. This tells us that a firm has a different sensitivity towards an index more related to the firm's own industry than towards a general index. What have been done in this case is that sensitivity toward a pharmaceutical industry index has been ascertained as well as toward the general Nifty 500. By doing this one gets both the sensitivity of very particular changes in the pharmaceutical industry and the sensitivity of changes on the Indian market, which captures changes in the related ventures, mentioned earlier as well as general fluctuations that affects the whole Indian economy.

3.1.3 Nifty 500

From the eligible universe, the NIFTY 500 as the name suggests, represents the top 500 companies based on full market capitalisation.

By the eligible universe we mean:

- Based on both average daily turnover and average daily full market capitalisation as per the previous six months period data, all companies ranked within top 800
- During the previous six months period, companies traded for at least 90% of days

A few facts about NIFTY 500 -

- Of the stocks listed on NSE, the Index represents about 95.2% of the free float market capitalization as on March 31, 2017.
- For the last six months ending March 2017, the total traded value of all companies constituting the Index, is approximately 91.7% of the traded value of all stocks on NSE.
- NIFTY indices are reviewed twice every year based on six month data ending January 31 and July 31.
- An eligibility criterion for newly listed security is checked based on the data for a three-month period instead of a six-month period.

3.1.4 BSE SENSEX

A free-float market-weighted stock market index of 30 well-established and financially sound companies listed on Bombay Stock Exchange forms the S&P BSE SENSEX (S&P Bombay Stock Exchange Sensitive Index) index.

It is considered to be the pulse of the Indian domestic stock markets, first published on 1 January 1986. The constituting 30 companies are some of the largest and most actively traded stocks in India. They represent various industrial sectors of the Indian economy.

3.2 THE FINANCE STRATEGY PERSPECTIVE

When building up a methodology for an acquisition one must concentrate on a variety of aspects such as economic aspects, strategic aspects and of course financial aspects. What is different with the financial aspect is that it relies on internal matters and its consequences on the firm's stakeholders. Finance theory considers merger decisions of firms inside the structure of interests among different financial claim holders of the firm. The financial theory does not vary between shares held by the general public and shares held by the management. There is no separation amongst ownership and control. In this proposition, the focus will not lie on all stakeholders to the company but the concentration is on returns to shareholders and the corporate motivating incentive to maximize shareholder wealth.

3.2.1 Shareholder Wealth Maximization

A standout amongst the most important stakeholder groups are the shareholders which is one of the pillars of the firm's financial security. The expectations of the impacts of a merger or acquisition will influence the value of the firm's shares and the willingness of the general public to hold these shares. It is therefore vital for the firm to come up to the expectations of the public. A broad objective among large international corporations is to maximize its shareholder's wealth (Madura, 2003). Consolidating these interests with the driving forces on the pharmaceutical industry can of course be hard and when attempting to keep up with competition a firm might have to take measures that are not in accordance with shareholder wealth maximization. One could in any case assert that the response of any corporate change on the stock market is the true effect and is in line with what the

public expects and thinks of the new circumstance. So by measuring the effect of an acquisition on stock returns it ought to be possible to consolidate every single other effect, whether it comes from an attempt to increase market share, an endeavour to gain valuable R&D, increase its product portfolio or that the firm basically needs to lower its costs. All acclimatization to the current situation will affect the market value of the firm which in turn will be affecting the stock that the general population is holding, that is affect shareholder wealth.

In this proposal three M&A's will be examined, and their effect on shareholder wealth. The focus will lie on measuring the abnormal returns after the acquisition and comparing these numbers with a calculated estimated return that would have been if the two firms had not merged. It is then possible to isolate the impact of the merger on shareholder wealth. An expected result is to notice small or no abnormal returns for the buying firm. Earlier research in the field of mergers & acquisitions demonstrate that the target firm gains quite large abnormal returns on the average and that the buying firm gains close to nothing, in few cases even has a negative return (Sudarsanam, 2003). Noteworthy is to see if these findings are true in the pharmaceutical industry as well as over the M&A activity in general. In our chosen sample of companies we have three major M&A's on the Indian-market, all in the last few years.

4. RESEARCH METHODOLOGY

To answer the question asked in the said hypothesis we will first decide on a method of analysis, as per our needs, which will be used to investigate the available research data. This selection of the method will enable us to reach the best possible conclusion to our intended study.

The choices to be made are whether to take a qualitative or quantitative, inductive or deductive approach towards our analysis. Also critical is to identify whether to use primary or secondary sources of data.

4.1 CHOICE OF METHOD

4.1.1 Qualitative vs. Quantitative

Of the two, the quantitative approach is apt method to carry out our analysis and report our findings as this method takes into account the measurements and interpretation of numerical data.

To quantitatively research for the hypothesis we will gather financial data from Yahoo Finance. Later on in the report we will interpret this gathered data pictorially in the form of graphs and diagrams.

4.1.2 Inductive vs. Deductive

When a researcher draws in conclusions from already existing theories, it is referred to as the deductive method of research. The researcher comes out with his own hypothesis based on the research of these existing studies and then moves on to prove it through empirical tests. Many debate that the

deductive approach hinders the researcher's ability to think beyond a certain horizon and come out with new solutions to any problem. It can also be said that this approach helps the researcher stay focussed and steer his objective in the right direction by learning from earlier researches.

This report will use the deductive approach as it takes inputs from the existing theories. Share prices of companies will be calculated and compared to infer whether the theory of diminishing returns holds or there are chances of abnormal returns for the acquiring enterprise after an acquisition.

4.2 DATA COLLECTION

Secondary data will be used in this analysis to understand the impact an M&A has on the share price of the bidding company. We would be focusing on investigating the long term impact of the M&A. As mentioned in the limitations of this study, the financial data of the acquiring company for 48 months before and after the acquisition will only be considered. This span is chosen to give a level of reliability to research. The financial data, share prices in this case from widely acclaimed indices and from different databases will be used and compared.

4.3 CRITIQUE OF CHOSEN METHOD

There are a number of ways of critiquing the methods chosen, or the conclusions drawn. In our thesis we use three important measures listed below, to inculcate the desired trust and legality to our thesis.

4.3.1 Validity

Validity of a thesis is the degree to which it examines what it had set out to do, the intended claim that is wanted to research. To reach a level of validity, share prices of six pharmaceutical companies taking part in three different M&A is being used in this study. 48 months' worth of data both before and after the acquisition is being used in regression analysis. Over and above that two indices are being compared.

4.3.2 Generalization

Generalization is another quality measure which determines how well a thesis infers observations made on particular data points and comes out with a generalised research result apt for wider acknowledgement. It examines if the observations can be applied to other groups, situations, contexts not looked into particularly by the research. The conclusions' trustworthiness and inferences from the analysis of six companies involved in three big M&A deals will be applied and limited to only the pharmaceutical industry.

4.3.3 Reliability

Reliability is a measure of how trustworthy the authors' conclusions are . According to authors Saunders, Lewis and Thornhill (2003), there are three questions that can measure or estimate reliability in a research.

1. Will the estimates give the same results on a different occasion?
2. Will comparable observations be reached by other observers?
3. Is it easy for another observer to understand how sense was made from the raw data?

The conclusion found in this thesis will be found by other researchers, given that they use same data sets and use same variables while estimating the data. The authors fully consider that there is transparency in how sense was made from the raw data and that the thesis proves a high reliability.

Our assumptions for the three acquisitions we have investigated when measuring the expected future performance were that the historical recorded pattern would repeat itself. The concentration of proposition was not to conduct scenario analyses of the market situation as a factor for our estimate. This was only an estimate for the stock if it was not influenced by any factors other than the ones incorporated in our model. This gave us an estimate of the stocks returns as if nothing had happened. By doing this we could utilize both the claim stock and market indexes as benchmark for the post-M&A results. In the segment where we compared the post-acquisition performance we utilized two distinctive indices to measure or analyse each individual company's performance towards these indices and see whether they have beaten, taken after or lost ground compared with each index. In this part we can explore and attempt to analyse whether our hypothesis holds or not against the two indices.

5.1 EMPIRICAL FINDINGS

In this thesis the long-run effect of M&A's is examined in the pharmaceutical industry in relevance to stock returns by using the APT-model. That will give an estimate that will be compared with the actual stock value 48 months after the consolidation. The estimate will also compare the stock price with both an industry index, BSE pharmaceutical index, as well as with the general index, which will represent the Indian market. These comparisons will be used to test the hypothesis if M&A's generate abnormal returns or not. The data for

share prices and indices are gathered from finance.yahoo.com and the inflation data is gathered from inflationdata.com.

5.2 FUTURE RETURNS ESTIMATION

Factor based model with four factors has been used for estimating stock returns for the six companies:

$$r = \alpha + \beta(1) F(1) + \beta(2) F(2) + \beta(3) F(3) + \varepsilon$$

where the multiplying factors are a value of risk premium associated with the macroeconomic factors that we have included.

For indices, the risk premium is $R(m) - R(f)$. For inflation, it is the change in inflation per cent for that month of the event .

The relevance of the variables in the regressions is valued at a 95% confidence level throughout the empirical testing.

Beside the two indices discussed in the earlier segment, one more variables have been added to the equation. By looking at the paper published by Chen, Roll & Ross regarding important pricing variables to the stock, rate of inflation has been added to the model. The changes were also to include a general market index. The percentage changes of the factors in our equation are based on our own calculations from monthly data recovered from financial data bases.

Variable	Variable Name	Explanation
α		The risk free rate of a 10 year treasury bond
F(1)	BSE Sensex	Monthly returns from the BSE Sensex
F(2)	BSE Healthcare	Monthly returns from the BSE Healthcare index
F(3)	Inflation	Monthly changes of India Inflation rate
β	Beta	The stock sensitivity to changes in factor

To estimate the stock returns we have to rearrange the equation and change the factors to constants, λ . These constants represent an estimate of the future growth of this factor. The estimate is based in the simple assumption that we will have a similar development in the future as in the past that is the development during the 48 months after the merger will roughly be the same as for the 48 months prior to the merger. The betas used in the equation is calculated as a historical relationship between the stock and the factor under a given time period.

CASES:

Sun Pharmaceuticals

Historical growth rates and historical relationships with our factors have been used to estimate future stock returns for Sun Pharmaceuticals.

Calculations have been made for 48 months prior to the acquisition with the 10-year Treasury bond’s risk-free rate considered. The regression analysis gave us the following beta values.

Model		Unstandardized Coefficients		Standardized	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Coefficients			Lower Bound	Upper Bound
1	(Constant)	2.559	1.029		2.486	.015	.515	4.604
	BSE(MR)	.095	.116	.077	.818	.415	-.136	.326
	inflation %	.281	.885	.030	.317	.752	-1.477	2.038
	nifty 500 MR	.436	.097	.424	4.497	.000	.243	.628

The equation to calculate expected return is:

$$E(r) = R(f) + \beta F(1) + \beta F(2) + \beta F(3)$$

$$E(r) = 8.06 + (0.077 * 2.89) + (0.030 * 1.56) + (0.424 * 0.48)$$

$$E(r) = 8.4998\%$$

Cadila Healthcare

		Coefficients ^a						
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	1.788	2.534		.706	.485	-3.367	6.942
	BSE MR(*)	.201	.399	.089	.505	.617	-.609	1.012
	NIFTY500 MR(%)	.109	.286	.066	.380	.706	-.474	.691
	V18	-2.805	3.925	-.127	-.715	.480	-10.789	5.180

a. Dependent Variable: cadila MR(%)

Expected return calculation for Cadila Healthcare is:

$$E(r) = R(f) + \beta F(1) + \beta F(2) + \beta F(3)$$

$$E(r) = 5.71 + (0.089 * 7.08) + (0.066 * -0.79) + (-0.127 * 0.8)$$

$$E(r) = 6.186\%$$

Dr. Reddy

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	8.580	6.122		1.402	.168
	inflation %	-16.692	9.322	-.282	-1.791	.080
	bse MR	-.433	.698	-.092	-.621	.538
	nifty 500 MR	.660	.706	.142	.935	.355

Similarly, calculations for Dr Reddy's:

$$E(r) = R(f) + \beta F(1) + \beta F(2) + \beta F(3)$$

$$E(r) = 7.33 + (3.32 * -0.92) + (0) + (-4.51 * 0.142)$$

$$E(r) = 3.635\%$$

With the possibility of a potential multicollinearity problem, created below is a correlation matrix showing the correlation between the four variables for all our three cases.

Sun Pharmaceuticals

	BSE Healthcare(Sig.)	Inflation(Sig.)	Nifty 500(Sig.)
BSE Healthcare(Sig.)	1	0.559	0.763
Inflation(Sig.)	0.559	1	0.989
Nifty 500(Sig.)	0.763	0.989	1

Cadila Healthcare

	BSE Healthcare(Sig.)	Inflation(Sig.)	Nifty 500(Sig.)
BSE Healthcare(Sig.)	1	0.192	0.999
Inflation(Sig.)	0.192	1	
Nifty 500(Sig.)	0.999	0.302	1

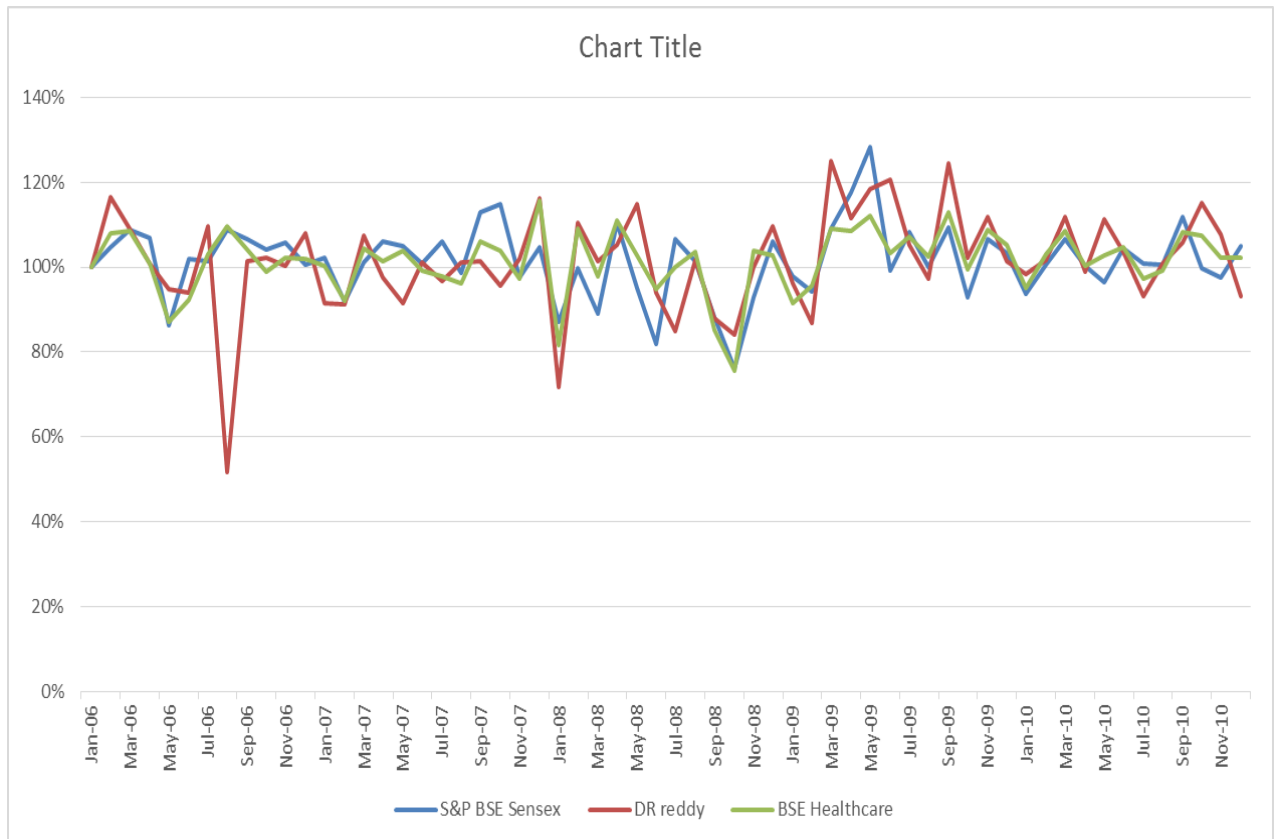
Dr.Reddy

	BSE Healthcare(Sig.)	Inflation(Sig.)	Nifty 500(Sig.)
BSE Healthcare(Sig.)	1	0.061	0.515
Inflation (Sig.)	0.061	1	0.014
Nifty 500(Sig.)	0.515	0.014	1

5.3 POST M&A PERFORMANCE

Dr Reddy

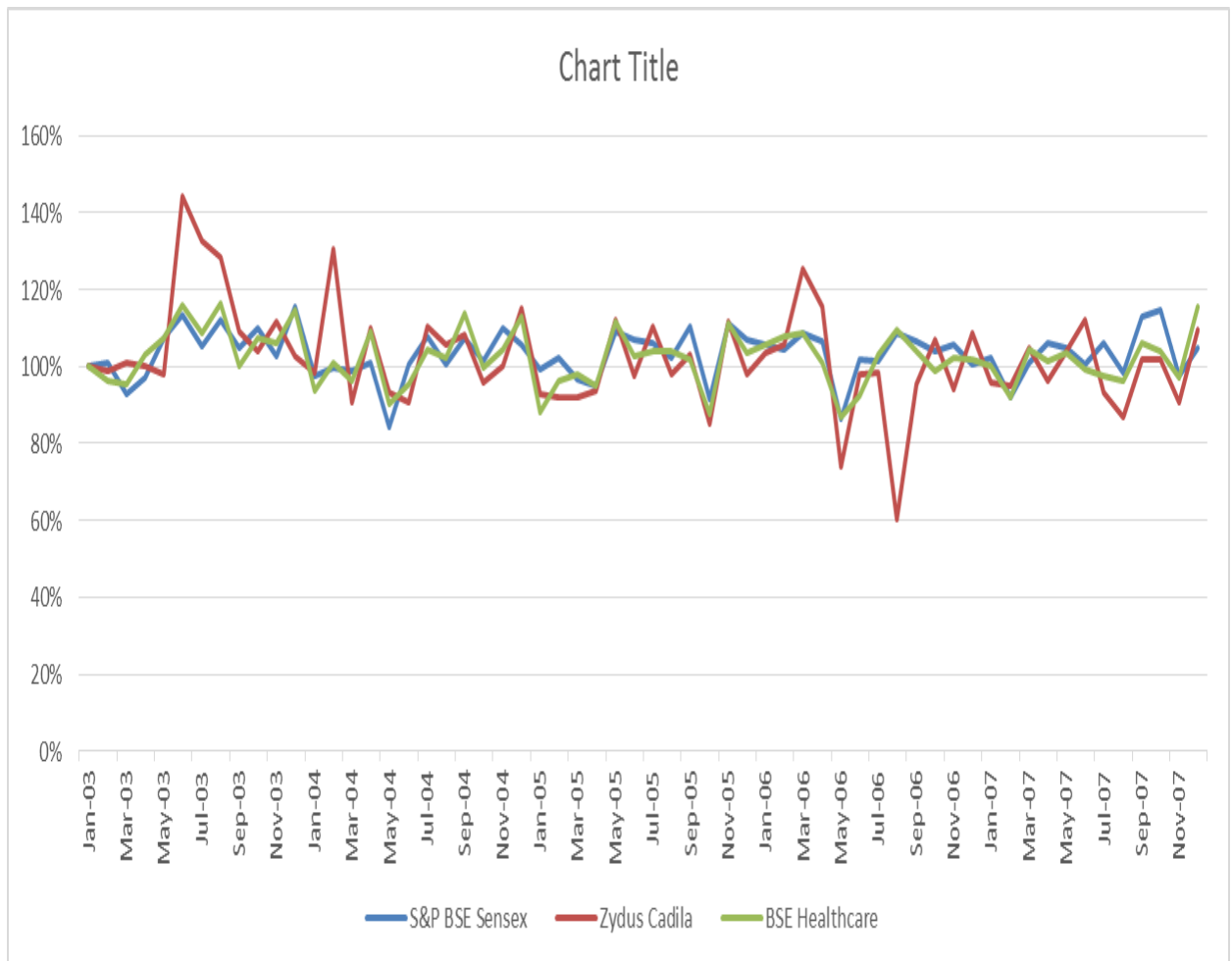
For Betapharm acquisition by Dr Reddy's, a clear negative trend is seen over the entire observation period of 48 months. Dr Reddy stock suffered a loss of 7% over this said period. With the Index at 100, the stock behaved similar to the industry index. There are not any great deviations from the industry average.



Zydus Cadila

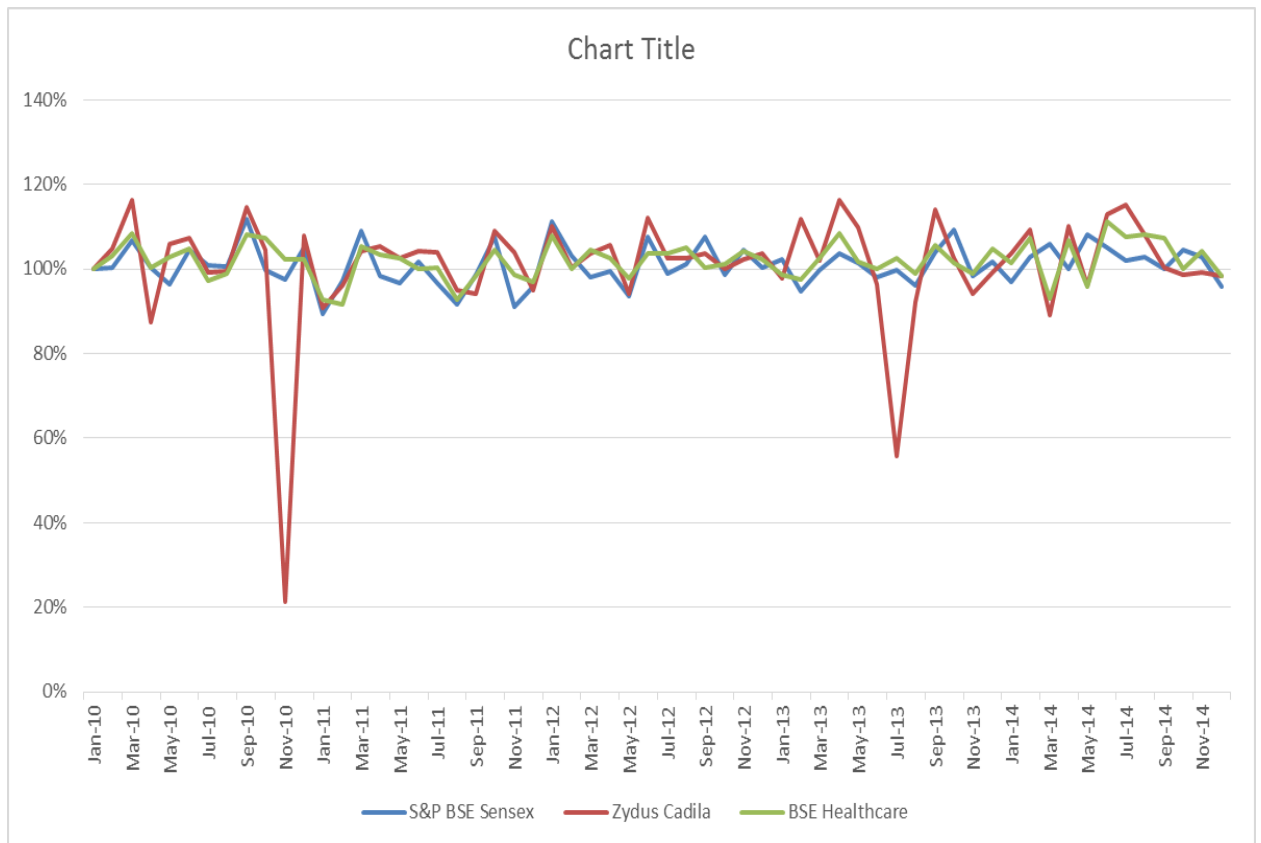
The story is opposite for the merger of Cadila Healthcare and Alpharma.

Though the stock fluctuated continuously just after the merger, over the monitored span of 48 month, the Cadila company stock gained 7 % of its stock value with Index = 100.



Sun Pharmaceuticals

After analysing the post-acquisition data for Sun Pharmaceutical's acquisition of Taro, we saw that the stock was more or less remained stable for the maximum duration with sudden drops in the value only twice in the course of 48 months. Overall the stock lost only 2% of its value after the acquisition.



Our assumptions for the three acquisitions we have investigated when measuring the expected future performance were that the historical pattern would repeat itself. The focus of this thesis was not to conduct scenario analyses of the market situation as a factor for our estimate. This was only an estimate for the stock if it was not affected by any factors other than the ones incorporated in our model. This gave us an estimate of the stocks returns as if nothing had happened. By doing this we could use both the own stock and market indexes as benchmark for the post-M&A results.

In the section where we compared the post-acquisition performance we used two different indices to measure or compare each individual company's performance towards these indices and see whether they have beaten, followed or lost ground compared with each index. In this part we can investigate and try to analyze whether our hypothesis holds or not against the two indices.

We chose indices that we saw as proper measurements to our three companies, they are; BSE Healthcare and Nifty 500. We think of this as a straightforward comparison to represent the outcome and measurement for our three stocks, and also show the differences in two different markets.

The acquisition of Taro was not an upward swing for Sun Pharmaceutical stock value, which one would want by making an acquisition to extend one's business. Neither can we assume that the acquisition had a negative impact on Sun Pharmaceutical, since there is no concrete evidence of that. By comparing Sun Pharmaceuticals with our indices, we can only assume that Sun Pharmaceuticals along with many other companies lost value by factors that are not directly related to the acquisition but come from events and coincidences occurring around the world that everyday guides or even controls the stock markets around the world. Our hypothesis of no abnormal returns in the long-run can be accepted for Sun Pharmaceuticals against both indices. Our empirical findings show that Sun Pharmaceuticals gained returns in comparison to the industry with approximately only.

In the second case of Cadila Healthcare acquisition of Alpharma, we can clearly see a drop in share price when looking at the chart in figure. It seems that an over 44% increase in share price over the five months after the acquisition is an immediate result of the event. The two indices increased in five months only by about 13% and 16%. The shares of Cadila had a gradual drop the next coming 42 months. The gradual drop in the long-run may not have anything to do with the acquisition, but we can almost be certain that the early rise must have had something to do with the acquisition. One can ponder upon if the acquisition of Alpharma was a good supplement to the existing direction of Cadila, or did the acquisition interfere with existing research or direction of business development. In the case of Cadila Healthcare our hypothesis is true and holds since the value of the Cadila stock received returns in coherence with industry indices.

In the last case of the merger between Dr. Reddy and Betapharm we can see an almost identical pattern between the three curves in figure. Along with other companies the stock value declined. The consolidation between the two companies started off with a gradual drop along with the market but has had a

slight upward slope since the beginning of 2006, and within our time frame of 48 months the share price has generated abnormal returns and has proved our hypothesis wrong. It is impossible to know whether the effect comes from the merger or not, but with all certainty we know that there are several other effects that have impact on stock value.

To sum up this comparison, we can see that the market has grown more than the pharmaceutical industry over the period and Dr.Reddy's stock value has been situated in between the two indices .

Regarding the hypothesis stated in the first chapter, we found that it holds true in the three cases taken into context.

Finally we used estimated courses based on historical performance as a benchmark for future development. The predictions were a strong development for all stocks over a future of 48 months. We found out that neither of the stocks ended up at a positive value, compared to the value of each stock at the time of the M&A, four years after the acquisition. All companies lost stock value over the period and from a shareholder wealth maximization point of view the strategic move of merging with another firm were not successful.

5.4 FURTHER RESEARCH

The work of this proposal has covered an intriguing field of research and there is a lot more we wish we had time to dig deeper into. We have comprehended the intricate nature of mergers and acquisitions and that there is an expansive portion of aspects and angles to consider when trying understanding the underlying forces behind M&A activity. The work and time we have put down in this proposal have completely offered ascend to more ideas for further research subjects, possibly for ourselves at a master thesis level or for fellow students interested in this field of study.

Prior observational reviews have shown that the methods of payment have an important role in the post-acquisition performance. Cash payments have generated positive effects on the stock performance while payments with the company's own stock have had negative effects on the stock's execution. Interesting would be to additionally see a study in this area. Further studies that could be interesting are to focus more on the R&D part of stock behaviour in the pharmaceutical industry. The pharmaceutical industry is special in the sense that no other industry invest as much on R&D. To research for new possible medicines and develop new drugs are a foundation of the industry and would have an impact on the behaviour of companies and its stock.

6.1 LITERATURE

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REGRESSIONS

SUN PHARMACEUTICALS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.559	1.029		2.486	.015	.515	4.604
	BSE(MR)	.095	.116	.077	.818	.415	-.136	.326
	inflation %	.281	.885	.030	.317	.752	-1.477	2.038
	nifty 500 MR	.436	.097	.424	4.497	.000	.243	.628

CADILA HEALTHCARE LTD.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.788	2.534		.706	.485	-3.367	6.942
	BSE MR(*)	.201	.399	.089	.505	.617	-.609	1.012
	NIFTY500 MR(%)	.109	.286	.066	.380	.706	-.474	.691
	V18	-2.805	3.925	-.127	-7.15	.480	-10.789	5.180

DR REDDY

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
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1	(Constant)	8.580	6.122		1.402	.168
	inflation %	-16.692	9.322	-.282	-1.791	.080
	bse MR	-.433	.698	-.092	-.621	.538
	nifty 500 MR	.660	.706	.142	.935	.355

CORRELATIONS

SUN PHARMACEUTICALS

		BSE(MR)	inflation %	nifty 500 MR
BSE(MR)	Pearson Correlation	1	.060	-.031
	Sig. (2-tailed)		.559	.763
	N	97	97	97
inflation %	Pearson Correlation	.060	1	-.001
	Sig. (2-tailed)	.559		.989
	N	97	97	97
nifty 500 MR	Pearson Correlation	-.031	-.001	1
	Sig. (2-tailed)	.763	.989	
	N	97	97	97

CADILA HEALTHCARE

		BSE MR(*)	NIFTY500 MR(%)	V18
BSE MR(*)	Pearson Correlation	1	.000	-.219
	Sig. (2-tailed)		.999	.192
	N	37	37	37
NIFTY500 MR(%)	Pearson Correlation	.000	1	-.174
	Sig. (2-tailed)	.999		.302
	N	37	37	37
V18	Pearson Correlation	-.219	-.174	1
	Sig. (2-tailed)	.192	.302	
	N	37	37	37

DR. REDDY

		inflation %	bse MR	nifty 500 MR
inflation %	Pearson Correlation	1	-.269	-.349*
	Sig. (2-tailed)		.061	.014
	N	49	49	49
bse MR	Pearson Correlation	-.269	1	-.095
	Sig. (2-tailed)	.061		.515
	N	49	49	49
nifty 500 MR	Pearson Correlation	-.349*	-.095	1
	Sig. (2-tailed)	.014	.515	
	N	49	49	49

ANOVA TABLES

SUN PHARMACEUTICALS

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1173.436	3	391.145	6.932	.000 ^b
	Residual	5191.366	92	56.428		
	Total	6364.802	95			

CADILA HEALTHCARE

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	223.264	3	74.421	.414	.744 ^b
	Residual	5932.236	33	179.765		
	Total	6155.500	36			

DR. REDDY

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4761.414	1	4761.414	4.880	.032 ^b
	Residual	45857.244	47	975.686		
	Total	50618.658	48			