Major Project Report

On

IMPACT OF EPS, DPS & P/E ON MARKET PRICE OF SHARE

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CERTIFICATE

This is to certify that the project report titled **"Impact of EPS, DPS & PE on Market price of share"** is a bonafide work carries out by **Mr. Akshit Khera** of **MBA Business Analytics 2018-20** & submitted to University School of Management & Entrepreneurship, Delhi Technological University, Bawana Road, Delhi in partial fulfillment of the requirement for the award of the Degree of Masters of Business Administration.

Signature of Guide   Signature of Head (USME)

Place: Delhi   Seal Head

Date: 21st May 2020

DECLARATION

I, **AKSHIT KHERA**, student of **MBA Business Analytics, University School of Management & Entrepreneurship, Delhi Technological University** hereby declare that the project titled "**Impact of EPS, DPS & PE on Market price of share**" which is submitted by me to **University School of Management & Entrepreneurship, Delhi Technological University** in partial fulfillment of requirement for the award of the degree of Master of Business Administration in 2018-20, has not been previously formed the basis for the award of any degree, diploma or other similar title or recognition. The Author attests that permission has been obtained for the use of any copy righted material appearing in the Dissertation / Project report other than brief excerpts requiring only proper acknowledgement in scholarly writing & all such use is acknowledged.

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ACKNOWLEDGEMENT

EXECUTIVE SUMMARY

Capital market comprises of primary market & secondary market. Primary market is where a company issues new shares through underwriting which involves a deep analysis of market, sentiment, price, etc. in order to issue new shares in the market. On the other hand, secondary market comprises of trading of these equity shares when they get listed on a stock exchange such as BSE, NSE, etc. Companies undergo a rigorous process in order to issue new shares. They are done basically to raise funds for the company rather than raising their debt. For trading in secondary market, one must do so through a broker such as Zerodha, Axis Direct, Fidelity Investments, etc. The problem statement before us is to understand the impact of earning per share, dividend per share & price to earnings ratio on the market price of the share.

Market price of the share in India is mostly effected by the economic & international activities that go on. For example: during this current pandemic, our stock market has faced huge decline in the price of the share as the market sentiment is not right. People are rushing towards panic selling which has caused decline in the valuation of billion dollar's company. These situation keep coming for example there have been multiple scenarios post the great depression where the market declined drastically because of some political, international or national dispute, etc. The data for market price, EPS & DPS has been obtained from the annual reports of the selected companies whose market price is under the analysis.

Market price monthly highs & lows are collected from annual reports for a particular year. Average of that months high & low constitute the average price for that month. This average for all months of that particular year constitutes to that year's annual average price. EPS (consolidated) and DPS can be traced from their annual report as well which are shown in detail in the report as well as in the excel file attached. The data is taken from 2010 to 2019. Our aim is to understand whether the above described variables can be used as a significant variables for predicting the market price of the shares. The collected data is explanatory data whose impact on market price is measured through various methods such as correlation analysis, multiple regression, analysis of variance, multi collinearity, autocorrelation, etc.

In order to measure the impact, Null & alternate hypothesis have been formulated which states; Null Hypothesis: No significant impact of EPS, DPS & PE on market

price of the share. Alternate Hypothesis: Significant impact of EPS, DPS & PE on market price of the share. Various tools & software's such as:

- MS EXCEL 2016
- IBM SPSS 26
- MINITAB

Have been used in order to analyze & study various factors & the extent to which they impact the market price of the shares. The report also comprises of application of data analytics in capital market in trading, market research, surveillance, risk management, etc.

Results & findings describe my individual findings of this study after the analysis of data using various methods & tools. Some limitations have been mentioned in the report that might have hindered the study but not having a major impact on the study or distort the study in any way. These are basically on why data post 2010 have been taken & why not previous year's data is used for this study. All the company's data used in the study are obtained solely from their annual reports & all of them are listed on BSE & their shares are heavily traded. The companies are Cipla, Torrent, Sun Pharma, Aurobindo Pharma & Dr. Reddy laboratories.

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INTRODUCTION

1.1   Industry Profile

For the purpose to allow people to exchange the funds various institutions have been established which come together and comprise the financial system. Major emphasis is laid down on the accumulation of investment and savings for stimulating the capital formation which would eventually lead to the acceleration of the economic growth in the country. This entire process serves as a connecting path. It consist of various intermediaries, finance markets as well as assets.

Entities facilitating the financial transactions between two parties have been termed as Financial intermediaries, major examples incudes pension funds, banks, insurance companies etc.

Financial markets are components acting as a link between the savers & investors. Markets can be divided into Money as well as Capital Market which are explained below as well as we will see the difference between them on various basis.
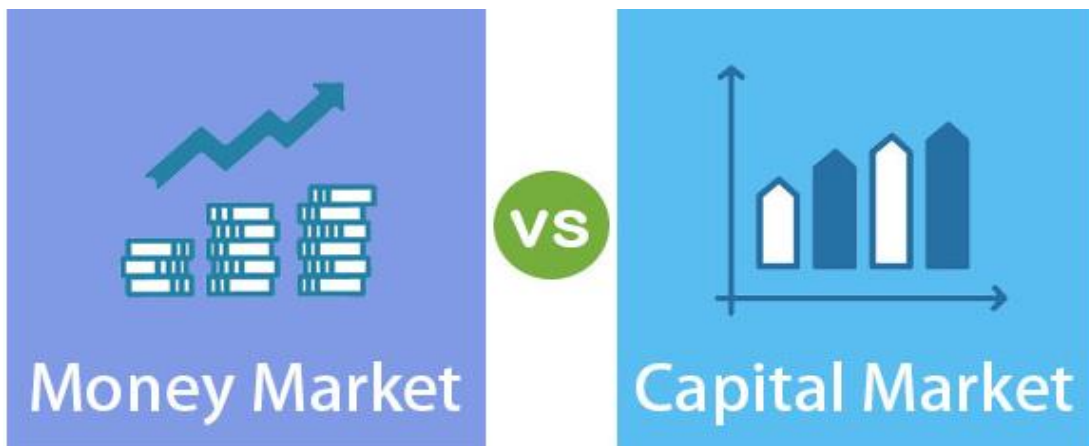
Figure 1.1 Capital Market vs Money Market

Money market is a place for transactions in short term assets take place such as commercial bills, treasury bills with a duration of usually up to one year.

Capital market, however, is a place where transactions are in accordance for long term funds such as stocks, bonds, etc. one of the major aspect of the capital markets is that it is a place where it simplifies the exchanges for all the concerned parties which majorly include the financial specialist and the organizations. It comprises of:

BASIS	CAPITAL MARKET	MONEY MARKET
Definition	Marketplace where lending and borrowing of securities are for medium and longer period of time	Marketplace where lending and borrowing of securities takes place for shorter period of time up to 1 year.
Instruments traded	Treasury bills, commercial papers, call money etc.	Shares, Debentures, Bonds etc.
Market Nature	Informal	Formal
Liquidity	High	Comparatively Low
Risk	Very Low	Comparatively High
ROI	Low due to shorter duration	High due to longer duration
Parties involved	RBI, Commercial banks, Finance companies etc.	Stockbrokers, retail investors, underwriters, mutual fund houses etc.

Figure 1.2 Basis of difference between Capital & Money market

A **primary market** or NIM deals in new securities which are made available to public at large for the first time. A primary market sustains no structure and can only be marked by the services it offers to the parties. The facility of providing uninterrupted transactions between the savers and the investor's id the stand out feature as provided by the money market. Origination, Underwriting & Distribution together comprises of all the other important features that are undertaken by the primary market.

Origination is a process undertaken before the issuance of shares. Origination majorly refers to analysis of market and for the technical aspects along with the investigation. It includes a detailed study about the economic and financial scenarios/atmosphere of the country also the impacting legality. Companies usually hires analysts and advisers who can provide assistance in the origination before the issue of shares with the hope of improving the numbers of shares issued.

Underwriting refers to a mutual understanding between two parties i.e. the company issuing share and the underwriter that benefits the company if in any case the total number of shares issued for any matter of case is less than the total number of the shares offered. Underwriter usually guarantees to buy to a certain number of securities keeping in mind the worst case scenario that the shares are not completely bought by the general public for whom it was launched in the market.

Distribution can be understood as simply sale of security to buyers.

Various ways of issuance of the security are defined below:

Public Issue When a company want to invite general public to invest in their company, they go for IPO or Initial Public offering, inviting applications from general public with the amount of security they want to buy. Through this process a company gets listed on stock exchange that can be BSE or NSE or any other foreign stock exchange.

Placement These companies which are unlisted can sell their shares through this process to various financial institutions or to various banks such as SBI or PNB, etc. Public cannot buy these and the transaction is a private matter and company do not advertise about it.

Offer for Sale Shares are sold not to public directly but via brokers. Company will ask broker to buy from them at the negotiated price, and broker then sell these shares to general public at a price they want in order to make profit.

Right Issues Offering the new shares to be bought to their existing shareholders such as Reliance did today i.e on 19th May 2020. They announced Right Issues today that those who own any share of reliance till 18th May can apply for this. They will be offering shares worth Rs 55,000 crores.

There are various primary market intermediaries as well which can be Portfolio managers, underwriters, etc. that help in the financial transaction to occur or design marketing strategy for the shares and much more.
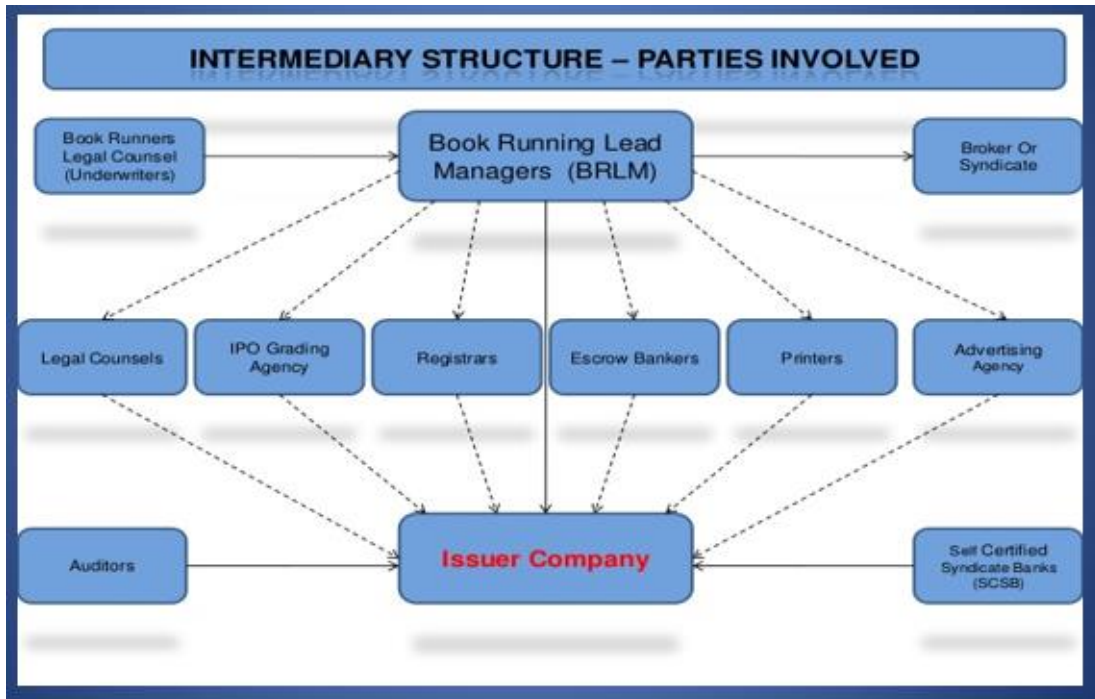
Figure 1.3 Intermediary Structure

Secondary Market is a place where the securities which have been already issued are again brought into the market for being purchased or sold. Liquidity and marketability of securities is given higher emphasis in the secondary market. BSE and NSE are the secondary market places where these shares can be sold and bought or in other terms, people can easily trade the shares which results into the overall performance of the stock market.

SENSEX and NIFTY 50 are the indices with NIFT Bank, NIFTY Automobiles, etc. that can tell performance of various sectors in the secondary marketplace. Various trade broker are also present so order to make this process efficient and transparent. A lot of banking applications or independent NBFC application acts as an intermediary between them. They in turn help people to buy and sell without actually meeting at a physical location.

1.2 Organization Profile

Business Analytics Industry has been booming for the last 5 years and is finding its application in each and every sector be it banking, defence, marketing, airlines, sales, etc. Use of various statistical software's such as Minitab, Eviews, SPSS, etc. has been rising and more and more companies are adopting a data oriented approach. The expenditure on infrastructure to accommodate big data has been growing tremendously. More and more startups focused in analytics are proving to be a helpline for many MNC's which have been seeing a decline in their profits. Through a data oriented approach, MNC's are able to target their weak points and make more profits out of existing infrastructure.

This Industry accounts for almost 3 Billion Dollars in revenue and is supposed to grow upto 6 Billion Dollars in the next five years. As more and more business are becoming online, there has been exponential rise in the amount of data generated by the users on the Internet. This data is being utilised by marketing companies, ecommerce, Online movie platforms, etc. to better target their customers with what they actually are interested in. Analytics market has been seeing an annual growth rate of approximately 12 percent and will keep growing in the next five years. Zomato, Swiggy, Ola, Uber, etc. have also been investing hugely in data in order to better serve their customers worldwide.

	Business Intelligence	Data Science
Perspective	Looking backwards	Looking forwards
Actions	Slice and Dice	Interact
Expertise	Business User	Data Scientist
Data	Warehoused, Siloed	Distributed, real-time
Scope	Unlimited	Specific business question
Questions	What happened?	What will happen? What if?
Output	Table	Answer
Applicability	Historic, possible confounding factors	Future, correcting for influences
Tools	SAP, Cognos, Microstrategy, SAS	Revolution R Enterprise QlikView, Tableau, Jaspersoft
Hot or not?	*So* 1997	Transformational

Figure 1.4 Business Intelligence vs Data Science

Demystifying the Analytics Market

- The cumulative analytics market in India stands at $30 Billion
- Outsourcing is the main driver of revenue for Indian vendors accounting for $27 billion in revenue
- The domestic analytics market stands at $3.03 billion in size & is expected to double by 2025

If we look at the percentage wise adoption and use of business analytics in various sectors, we can clearly see that Financial & Banking sectors use is more widely as compared to any sector. This come with a fact that these sectors usually deal with number and money and have to assess associated risk with any kind of investment they make. Followed by Marketing & Advertisements, Business Analytics is also widely used for designing ad campaigns, analyzing click through rates, website visits, customer requirements, etc. in order to design an efficient marketing plan. Ecommerce make use of recommendation system that work on the historical data in order to recommend products to customer based on their previous buying history.

PERCENTAGE OF ANALYTICS ADOPTION ACROSS INDUSTRIES
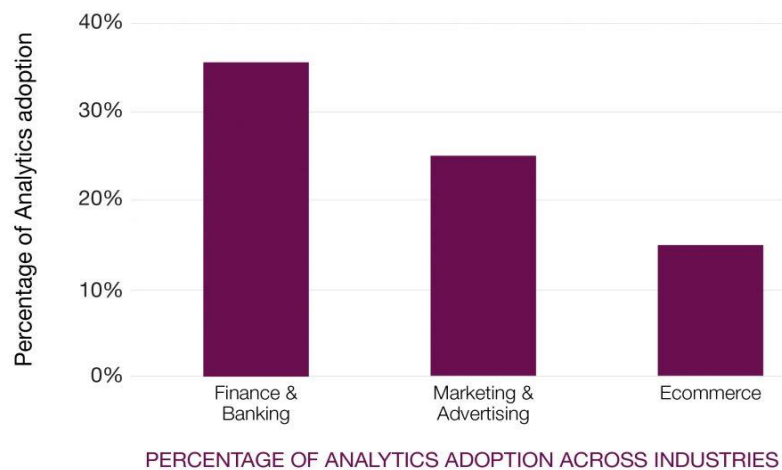
Figure 1.5 Analytics in various sectors

It is expected that by 2025, the Business Analytics market will grow twofold with an annual growth rate of 7.3% with Asia Pacific being the fastest growing market because of their strong economic growth (China, japan, India, South Korea, etc.).
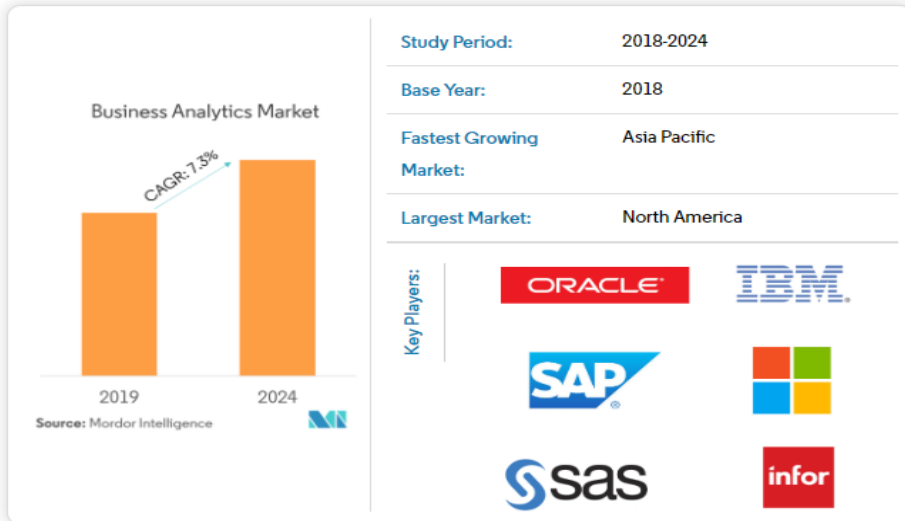
Figure 1.6 CAGR

1.3 Scope of the Study

Our scope is to underline the impact of EPS, DPS & PE ratio on the market price of the share i.e. how do these factors affect the price of the stocks in secondary market. Thus, our major points under study are:

- Measuring the impact of EPS, DPS & PE ratio on the market price of the share and how it changes based on the above factors.
- Identifying the extent and magnitude of change that comes in market price of the share due to EPS, DPS & PE ratio.

Independent Variables: All those variables that helps us to predict the target or the dependent variables.

Following are the Independent variables:

- Dividend Per Share
- Earnings Per Share
- Price to Earnings Ratio

Dependent Variable: It is the variables which we are analysing and predicting in this study which is the market price of the share.

CHAPTER 2

LITERATURE REVIEW

2.1 Literature Review

Analytics Industry has been booming for the last 5 years and is finding its application in each and every sector be it banking, defence, marketing, airlines, sales, etc. Use of various statistical software's such as Minitab, Eviews, SPSS, etc. has been rising and more and more companies are adopting a data oriented approach. The expenditure on infrastructure to accommodate big data has been growing tremendously. More and more startups focused in analytics are proving to be a helpline for many MNC's which have been seeing a decline in their profits. Through a data oriented approach, MNC's are able to target their weak points and make more profits out of existing infrastructure. This data is being utilised by marketing companies, ecommerce, Online movie platforms, etc. to better target their customers with what they actually are interested in. Analytics market has been seeing an annual growth rate of approximately 12 percent and will keep growing in the next five years. Zomato, Swiggy, Ola, Uber, etc. have also been investing hugely in data in order to better serve their customers worldwide.


Figure 2.1 Difference between Big Data-Analytics-Decisions

Capital market deal with trading and securities, market price forecasting from collected price data over time, relation with clients, research, etc. Huge amount and variety of data is available from the capital markets that a good research on the price movement

can be done which may not be exact but is as close as 95%. Most of the companies in the domain such as Share Khan focus on analysing such data in order to obtain useful information from chunks of data that may be meaningless without proper analysis. It always helps in surveillance i.e. in order detect an abnormal activity such as that of fraud transactions of money and security. It helps to keep a track on the people or entities that are blacklisted their database.

Various trade broking website also use this huge data in order to target the right set of customer and have a good client relationship. Its helps to solve their grievances as well and focus more on adopting a client specific environment.

Figure 2.2 Capital Markets

Business Analytics in Stock Markets

Huge amount of data is recorded by the firms who then focus and research on the following aspects of their customers:

- Continuous monitoring and surveillance of the trading is done in order to detect any fraudulent transaction that make take place or artificial pumping of any share if done can be detected and measures can be taken.

- It generated huge amount of data pertaining to the buying habits of a customer. In this way, companies utilize this market data to better target and segment their customers and offer them the best deals possible.

- Huge data of transaction is processed after the trade is close just to detect any abnormality in the data or any transaction that seem to be suspicious. The processing also helps to sort out the amount bought by each individual or entity and keep a track record.

- Companies can better serve to their customer and manage good understanding and relationship with their customers as well as offer them a good trading experience in order to improve their retention rate.

- The overall transaction and customer experience help the companies to improve their infrastructure if it lacks anywhere and provide them with better functionality so that their trading become lag free and no technical error occurs while trading.

Data Source	Big Data Platform	Analytics	Users	Application
Structured & Unstructured Data	ETL – Integrated Data Warehouse	• Statistical Analysis	• Regulatory Authority	• Trade and Risk Management
• Market Reference Data	• MapReduce	• Rule Based Classification	• Trading Desks	• Regulation and Compliance
• Exchange Data	• ETL & Data Integration products	• Time Series	• Research Agencies	• Fraud Detection
• Government Data	• SciPy	• NLP	• Financial & Risk Controllers	• Anti Money Laundering
• Fundamental, Corporate Data	• Hive	• Regression	• Senior Managers	• Algorithmic Trading
• Transaction Data	• HDFS	• ANN	• Compliance Officers	• Fiduciary Management
• News Feed	• Mahout	• Simulation		• Trading Strategies
• Social Media	• MATLAB	• Predictive Modelling		

Figure 2.3 Business Analytics in Capital Markets

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Overview

Research methodology can be understood as a way following which the scientists, researcher, statistician, etc. conduct their research work. The important aspect for the researcher is to identify their problems, define their research objectives and find the results of the study in order to compare the results obtained in the research work with the real life scenario. Various steps which are involved are:
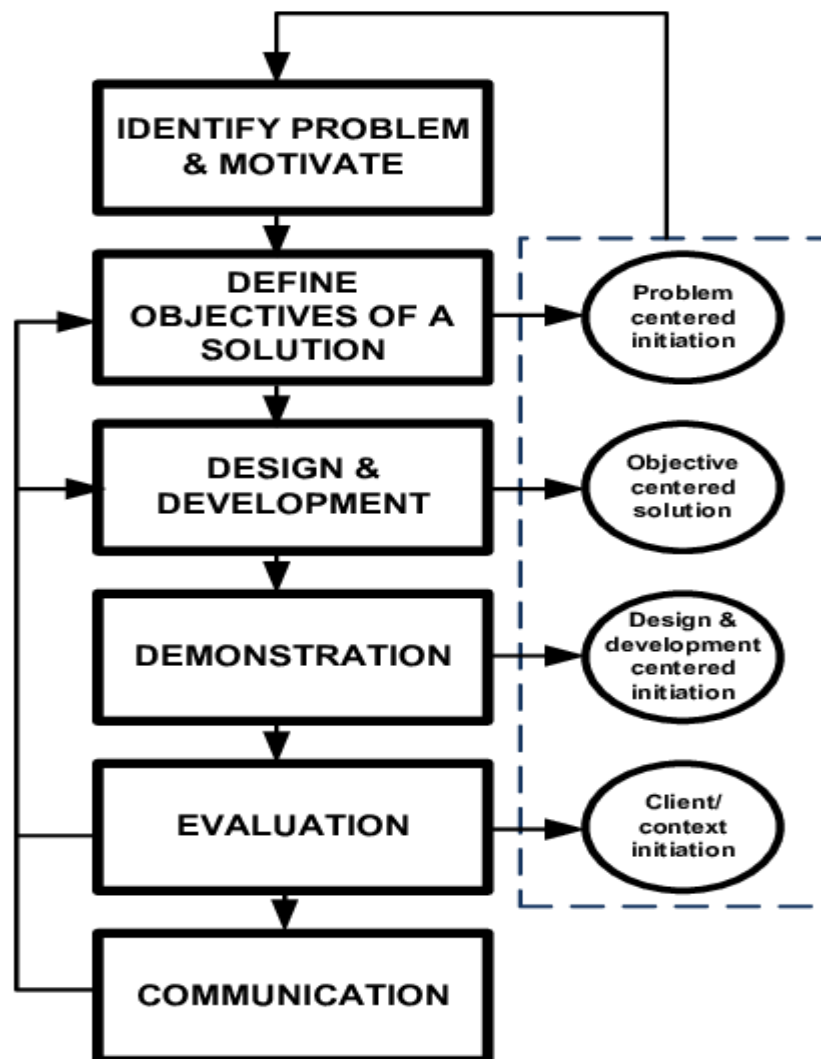
Figure 3.1 Flowchart of Research

3.2 Research Problem

The problem that we are trying to solve is to understand what is the degree of impact of our independent variables i.e. EPS/DPS/PE on the market price of the share.

3.3 Objective of the Research Study

Our aim is to study the impact of EPS, DPS & PE ratio on the market price of the share i.e. how do these factors affect the price of the stocks in secondary market. Thus, our major points under study are:

- Measuring the impact of EPS, DPS & PE ratio on the market price of the share and how it changes based on the above factors.
- Identifying the extent and magnitude of change that comes in market price of the share due to EPS, DPS & PE ratio.

3.4 Design & Development of the Research

It relates to way we conduct our research and study which would involve analysis of data, the source from where we obtain the data, the method and techniques to be used, and also the results which will be obtained keeping in mind the core objectives of our study. Based on the research design we begin our study on the topic and follow all the steps in an ordered manner. Our research basically is exploratory research which makes use of the secondary data that we have obtained from the annual reports of the companies.

3.4.1 Data Population

Only the companies listed on stock exchange have been selected for the study so that we can easily obtain the data required from our study from various source such as BSE website, annual reports, etc.

3.4.2 Source of Data

There are basically three major source of data which are stated below:

- Primary data
- Secondary data

- Tertiary data

Primary data is the data that you have collected on your own such as through market survey, google forms, interviews, etc.

Secondary data comprises of data that has been published such as BSE data, annual reports, etc.

Tertiary data is one's own interpretation of data obtained from the above two sources.

For our study, we have selected secondary source of data that is:

- Data obtained from published annual reports of the selected companies for our study.
- Data obtained from BSE repository i.e. from BSE official website.

3.4.3 Data Collection

Our study focuses on the data of the following 5 companies:

Figure 3.2 Logo's of the companies

All the data has been collected from their official Annual Reports which are available on their company's website.

3.4.4 Methods & Tools used for the study

For the purpose of analysis, I have used the bellows mentioned statistical tools and software's:

Figure 3.1 Logo's of Tools used

3.5 Illustration

The analysis of our study had started from very basic data collection. We have obtained monthly High and Low value of the share price and calculated their average. Similarly, monthly average for all other months is calculated which further helps to find out annual average for that year. Thus, annual average for each and every year is calculated. All the values of EPS (consolidated) & DPS are taken from the annual reports of the company as well. No other sources are considered. Because of Split share, we have analyzed data from 2010 to 2019 only. Our area of study is Pharmaceutical Industry and have considered 5 companies for our study.

All the calculations are performed in Excel while for analysis Minitab as well as SPSS is also used. After obtaining all the values i.e. annual average, EPS & DPS, PE is calculated by dividing Annual average from EPS. Hence we get the value of PE, which may differ.

2010-11

Month	CIPLA High	CIPLA Low	CIPLA Average	DR REDDY High	DR REDDY Low	DR REDDY Average	TORRENT High	TORRENT Low	TORRENT Average	SUN PHARMA High	SUN PHARMA Low	SUN PHARMA Average	AUROBINDO PHARMA High	AUROBINDO PHARMA Low	AUROBINDO PHARMA Average
April	352	323	337.25	554	500	526.95	1846	1559	1702.5	1294.85	1160	1227.43	986	920	952.75
May	353	307	330	569	490	529.5	1674.8	1515	1594.95	1413.75	1161	1287.25	959	786	872.625
June	352	317	334.625	594	539	566.5	1825	1644	1734.7	1515	1327	1420.83	926.8	793	860.1
July	343	324	333.475	600	540	570	1841.2	1693	1766.85	1511	1305	1407.75	1017	898	957.5
August	329	300	314.55	587	513	550.025	1814.95	1706	1760.23	1385.4	1305	1345.2	1109.85	927	1018.43
September	325	303	313.925	604	529	566.625	2033.9	1717	1875.45	1558	1357	1457.25	1110	1022	1066.05
October	360	323	341.35	606	536	571	2154.9	2019	2087.08	1670	1445	1557.5	1221.9	1040	1130.95
November	364	326	344.5	575	539	557	2380	429	1404.3	1814	1666	1740.08	1349	1160	1254.5
December	38	337	187.6	593	574	583.65	489.3	424	456.75	1855	1618	1736.5	1349	1195	1272
January	381	325	352.9	624	571	597.5	511.45	429	470.25	1728.9	1526	1627.45	1375	1125	1250
February	334	296	315.225	605	527	566	448	392	420.025	1640	1451	1545.63	1205	157	680.75
March	332	286	309.05	640	503	571.275	465	411	438	1675	1492	1583.5	209.4	172	190.55
Yearly Av			317.871			563.002			1309.26			1494.69			958.85

2011-12

Month	CIPLA High	CIPLA Low	CIPLA Average	DR REDDY High	DR REDDY Low	DR REDDY Average	TORRENT High	TORRENT Low	TORRENT Average	SUN PHARMA High	SUN PHARMA Low	SUN PHARMA Average	AUROBINDO PHARMA High	AUROBINDO PHARMA Low	AUROBINDO PHARMA Average
April	326	305	315.5	605	499	552	468.2	428	447.925	1700	1600	1650	206	189	197.5
May	334	295	314.575	669	583	626	481.8	423	452.45	1716	1528	1621.95	197.65	160	179.05
June	342	310	325.775	669	579	623.9	505.9	460	483	1630.25	1483	1556.68	184.9	165	174.8
July	338	305	321.525	687	620	653.47	538.45	493	515.725	1628	1511	1569.5	188.85	165	176.825
August	315	274	294.55	669	573	621	531.8	452	491.65	1614.45	1387	1500.73	173.85	123	148.25
September	299	274	286.35	634	530	582	530	456	493.175	1650	1436	1543.2	144.3	123	133.675
October	300	276	288.025	589	520	554.475	521.15	448	484.675	1678.55	1444	1561.13	136.4	117	126.475
November	330	284	306.75	585	544	564.65	525.7	486	505.85	1656.9	1501	1578.95	132.8	80.4	106.575
December	340	315	327.5	570	505	537.3	539.9	492	515.95	1635	1531	1582.88	98.5	83.4	90.925
January	352	315	333.5	579	524	551.3	549.5	488	518.875	1700	1535	1617.58	115.95	85.1	100.5
February	359	311	335	588	547	567.325	565.75	532	548.925	1700	1593	1646.73	124.5	101	112.775
March	320	287	303.25	633	550	591.5	593.95	536	564.75	1770.8	631.25	1770.8	124.8	108	116.45
Yearly Av			312.692			585.41			501.913			1600.01			138.65

2012-13

Month	CIPLA High	CIPLA Low	CIPLA Average	DR REDDY High	DR REDDY Low	DR REDDY Average	TORRENT High	TORRENT Low	TORRENT Average	SUN PHARMA High	SUN PHARMA Low	SUN PHARMA Average	AUROBINDO PHARMA High	AUROBINDO PHARMA Low	AUROBINDO PHARMA Average
April	325	302	313.4	669	611	640	610	555	582.5	1818	1690	1754	141.15	102	121.7
May	331	304	317.65	699	597	648.025	610	560	585.15	1780	1626	1703	132.5	101	116.625
June	317	301	308.925	636	581	608.625	643	554	598.5	1680	1528	1604	111.75	103	107.375
July	342	313	327.625	686	602	644	655	606	630.275	1725	1592	1658.63	118.2	100	109.275
August	383	345	363.875	723	664	693.35	690	646	668.15	1707	1604	1655.5	117.45	99.7	108.55
September	395	353	374.125	727	665	696	697.5	642	669.925	1797.7	1617	1707.35	144.75	111	127.95
October	387	353	369.975	709	660	684.5	728.95	675	701.975	1781	1640	1710.4	164.75	136	150.45
November	416	364	389.75	711	630	670.5	714.95	656	685.475	1830	1712	1770.8	189.85	159	174.425
December	430	403	416.35	728	662	694.95	775.9	694	734.75	1912.9	1804	1858.45	201.4	181	191.25
January	435	385	410.1	767	698	732.3	765.55	694	729.875	1968.6	1820	1894.43	204.9	179	191.85
February	417	357	387.225	749	660	704.5	766	714	740.025	1958	1727	1842.7	195.8	158	176.975
March	396	354	375.15	705	656	680.5	848	787	817.35	1845.35	1721	1782.93	170.3	127	148.725
Yearly Av			362.846			674.771			678.663			1745.18			143.763

2013-14

2013-14	High	Low	Average	2013-14	High	Low	Average	2013-14	High	Low	Average	2013-14	High	Low	Average	2013-14	High	Low	Average
April	414	380	396.55	April	352	334	343.115	April	980.3	811	895.65	April	2035	1766	1900.65	April	194	147	170.5
May	428	368	398	May	405	335	369.625	May	1085.4	928	1006.7	May	2150.9	1970	2060.58	May	202.35	167	184.6
June	393	364	378.425	June	436	384	409.95	June	1048	916	982	June	2230	2037	2133.5	June	188.5	151	169.825
July	420	369	394.425	July	454	405	429.7	July	1132.7	560	846.35	July	2400.75	2136	2268.55	July	195.5	159	177
August	430	382	405.65	August	465	386	425.375	August	576.2	476	525.9	August	2354.95	2025	2189.98	August	193.95	138	166.2
September	450	404	426.775	September	464	400	432.225	September	601.25	500	550.825	September	2471.7	2161	2316.35	September	205.85	171	188.425
October	444	409	426.7	October	451	404	427.5	October	650	588	618.75	October	2545	2350	2447.5	October	224.15	198	211.3
November	429	378	403.7	November	501	448	474.175	November	623	563	592.925	November	2498.7	2313	2405.85	November	298	217	257.5
December	410	374	391.75	December	521	457	489.2	December	602	555	578.5	December	2554	2393	2473.58	December	414.4	291	352.525
January	425	387	405.825	January	568	461	514.7	January	617.35	568	592.625	January	2690	2460	2575	January	476.45	372	424.225
February	424	367	395.175	February	573	534	553.575	February	644.9	581	613.1	February	2939.8	2517	2728.43	February	539.7	464	501.625
March	402	375	388.35	March	578	519	548.5	March	653.1	553	602.8	March	2890	2548	2719	March	544.75	483	513.875
	Yearly A		400.944		Yearly Av		451.47		Yearly A		700.51		Yearly A		2351.58		Yearly Av		276.467

2014-15

2014-15	High	Low	Average	2014-15	High	Low	Average	2014-15	High	Low	Average	2014-15	High	Low	Average	2014-15	High	Low	Average
April	409	380	394.775	April	608	523	565.35	April	644.05	570	607.2	April	2783	2522	2652.5	April	594	510	551.75
May	425	369	396.85	May	589	570	579.1	May	641.3	572	606.725	May	2753	2250	2501.5	May	678.4	575	626.7
June	445	382	413.45	June	722	609	665.65	June	688	594	640.975	June	2623	2293	2458	June	782.05	620	700.95
July	463	426	444.275	July	785	656	720.25	July	799.45	678	738.725	July	2852	2598	2725.05	July	786.5	645	715.575
August	517	430	473.725	August	852	725	788.5	August	875	743	809.125	August	2969	2712	2840.45	August	834.65	698	766.325
September	639	515	577.025	September	940	825	882.475	September	877.4	748	812.775	September	3353.85	2942	3148.03	September	979.8	765	872.4
October	672	571	621.5	October	933	810	871.525	October	868	792	830	October	3280	2883	3081.7	October	1000.8	887	944.05
November	671	593	631.875	November	1064	884	973.65	November	932	832	881.975	November	3635	3173	3403.88	November	1151.7	958	1054.95
December	668	598	632.9	December	1188	966	1077	December	856.15	799	827.475	December	3662	3060	3361	December	1171.2	1011	1090.95
January	711	605	658.125	January	1232	1072	1151.73	January	939.05	800	869.675	January	3400	3014	3206.78	January	1251.85	1079	1165.33
February	706	624	665	February	1167	1033	1099.88	February	965.9	861	913.5	February	3431	3010	3220.5	February	1275	981	1128
March	752	681	716.95	March	1174	1055	1114.2	March	1074.05	910	992.025	March	3570	3308	3439	March	1279.05	1056	1167.5
	Yearly A		552.204		Yearly Av		874.108		Yearly A		794.181		Yearly A		3003.2		Yearly Av		898.706

2015-16

2015-16	High	Low	Average	2015-16	High	Low	Average	2015-16	High	Low	Average	2015-16	High	Low	Average	2015-16	High	Low	Average
April	746	619	682.425	April	1335	1133	1234.1	April	1200.7	913	1056.85	April	3808.75	3281	3544.78	April	1432.1	1180	1306.05
May	696	621	658.575	May	1293	1151	1221.88	May	1010.1	920	965.05	May	3689	3250	3469.58	May	1412	1212	1311.88
June	673	570	621.3	June	1370	1172	1271.1	June	918	808	863	June	3572.1	3268	3420.05	June	1470.36	1241	1355.86
July	725	617	670.875	July	1520	1288	1404	July	957	799	878.025	July	4084.95	3502	3793.7	July	1540.55	715	1127.78
August	748	606	677	August	1675	1375	1524.8	August	965.15	820	892.65	August	4337	3934	4135.33	August	832.5	646	739.35
September	689	624	656.375	September	1720	1379	1549.5	September	918	815	866.65	September	4308.25	3856	4081.95	September	769.7	675	722.425
October	705	633	668.875	October	1636	1472	1554	October	933.7	875	904.35	October	4382.95	4080	4231.48	October	860.8	733	796.7
November	691	614	652.025	November	1585	1406	1495.28	November	877.5	706	791.95	November	4375.3	3050	3712.53	November	859.5	790	824.75
December	660	620	640.05	December	1508	1376	1441.73	December	824.5	722	773.25	December	3265	2951	3107.75	December	891.5	781	836.35
January	658	574	616	January	1510	1270	1389.88	January	880	762	821.225	January	3122.9	2750	2936.45	January	886	768	827
February	606	506	555.95	February	1410	1190	1300.03	February	898	804	850.775	February	3151.85	2815	2983.33	February	824.5	582	703.25
March	550	495	522.35	March	1469	1251	1359.93	March	876	771	823.4	March	3280	2892	3085.98	March	761.3	646	703.775
	Yearly A		635.15		Yearly Av		1395.52		Yearly A		873.931		Yearly A		3541.91		Yearly Av		937.93

2016-17

2016-17	High	Low	Average	2016-17	High	Low	Average	2016-17	High	Low	Average	2016-17	High	Low	Average	2016-17	High	Low	Average
April	545	498	521.125	April	1485	1347	1415.8	April	840.95	797	818.975	April	3169	2966	3067.5	April	795.5	720	757.75
May	547	458	502.625	May	1460	1351	1405.43	May	842.05	757	799.575	May	3200	2825	3012.5	May	823.55	714	768.525
June	507	460	483.15	June	1420	1295	1357.35	June	779.7	710	744.875	June	3396.7	2993	3194.95	June	802.5	665	733.925
July	536	500	518.125	July	1506	1362	1434.25	July	839.5	762	800.75	July	3689	2925	3307.05	July	814	743	778.4
August	587	509	547.75	August	1768	1417	1592.6	August	854.5	747	800.75	August	3131	2930	3030.6	August	807	730	768.55
September	618	562	589.875	September	1712	1584	1648.1	September	818.25	732	775.125	September	3228.05	3061	3144.58	September	882.75	767	824.975
October	604	566	585.05	October	1700	1400	1549.85	October	772	732	752	October	3394.95	2842	3118.48	October	895	779	837.2
November	579	487	533.275	November	1465	1186	1325.3	November	750	572	661.2	November	3357	2960	3158.7	November	826.8	681	753.95
December	589	548	568.6	December	1420	1254	1337.18	December	730.75	608	669.425	December	3247	2980	3113.5	December	756.9	622	689.45
January	595	563	578.825	January	1384	1274	1328.65	January	656.2	627	641.7	January	3203.95	2910	3056.98	January	733.4	661	697.375
February	622	567	594.225	February	1377	1208	1292.6	February	688.8	619	654.1	February	3175	2804	2989.25	February	714.75	629	671.875
March	608	575	591.425	March	1572	1323	1447.43	March	728.45	671	699.825	March	2948	2560	2754	March	710	652	681
		Yearly A	551.171			Yearly Av	1427.88			Yearly A	734.858			Yearly A	3079.01			Yearly Av	746.915

2017-18

2017-18	High	Low	Average	2017-18	High	Low	Average	2017-18	High	Low	Average	2017-18	High	Low	Average	2017-18	High	Low	Average
April	601	546	573.15	April	1550	1395	1472.7	April	700.5	632	666.325	April	2771.4	2586	2678.48	April	686.85	604	645.225
May	572	479	525.325	May	1434	1144	1288.65	May	657.95	493	575.475	May	2757	2382	2569.53	May	627.75	504	565.875
June	558	514	535.85	June	1250	1152	1200.8	June	559.9	503	531.45	June	2720	2512	2616.08	June	692.5	571	631.75
July	581	536	558.45	July	1367	1205	1286	July	590.75	530	560.375	July	2788	2378	2583	July	794.5	670	732.25
August	594	526	560.175	August	1328	1192	1260	August	542	433	487.575	August	2455.5	1902	2178.58	August	751.1	666	708.675
September	599	544	571.35	September	1365	1149	1256.9	September	529.7	467	498.275	September	2528.6	2069	2298.85	September	775.3	666	720.85
October	634	577	605.425	October	1411	1235	1323.25	October	558.75	500	529.475	October	2504.7	2318	2411.25	October	774	696	734.925
November	663	590	626.425	November	1376	1206	1290.85	November	572.4	499	535.5	November	2498	2260	2379	November	808.95	690	749.475
December	624	572	598.05	December	1435	1262	1348.33	December	590	500	545.175	December	2446	2175	2310.5	December	702.5	650	676.375
January	631	587	608.85	January	1473	1344	1408.13	January	604.5	561	582.65	January	2611.8	2205	2408.4	January	699.2	624	661.6
February	634	555	594.3	February	1449	1270	1359.68	February	608.55	511	560	February	2265.95	1991	2128.33	February	631.05	560	595.65
March	595	523	558.95	March	1374	1224	1298.93	March	562	493	527.5	March	2248	2053	2150.6	March	627.65	544	585.975
		Yearly A	576.358			Yearly Av	1316.18			Yearly A	549.981			Yearly A	2392.71			Yearly Av	667.385

2018-19

2018-19	High	Low	Average	2018-19	High	Low	Average	2018-19	High	Low	Average	2018-19	High	Low	Average	2018-19	High	Low	Average
April	608	545	576.7	April	1446	1245	1345.58	April	531.25	496	513.825	April	2179.75	2054	2116.63	April	654	558	606.025
May	622	508	564.875	May	1430	1282	1356	May	537.5	435	486.15	May	2142.3	1888	2015.15	May	644.7	553	598.7
June	622	518	569.95	June	1527	1366	1446.48	June	591.3	471	530.9	June	2428.95	1934	2181.65	June	626.85	527	576.95
July	649	603	626.125	July	1538	1394	1465.98	July	588.25	530	559.1	July	2398	2017	2207.6	July	635.5	566	600.75
August	678	614	645.875	August	1826	1512	1668.58	August	658.9	549	604.05	August	2518.5	2130	2324.3	August	719.5	593	656
September	678	638	658	September	1872	1589	1730.45	September	678.8	608	643.225	September	2687.45	2439	2563.38	September	826.35	674	750.25
October	663	599	631.05	October	1684	1516	1599.95	October	640.45	550	595.375	October	2610.45	2332	2471.28	October	792.95	709	751.025
November	631	512	571.575	November	1775	1575	1674.78	November	603.75	475	539.2	November	2725	2392	2558.73	November	823.6	760	791.925
December	549	504	526.275	December	1833	1670	1751.28	December	467	391	429.05	December	2745	2536	2640.3	December	830	698	764
January	524	484	503.875	January	1960	1749	1854.4	January	457.15	375	416.275	January	2727.9	2539	2633.45	January	794.9	709	751.9
February	558	501	529.6	February	1860	1722	1791.05	February	454.4	403	428.85	February	2875	2065	2470.15	February	804.75	696	750.175
March	557	517	536.825	March	1964	1758	1861	March	482.9	445	464	March	2812	2583	2697.35	March	802	714	758.1
		Yearly A	578.394			Yearly Av	1628.79			Yearly A	517.5			Yearly A	2406.66			Yearly Av	696.317

Figure 3.4 Calculating Annual Average from Monthly Average

18

The results have been collated in our working sheet which is shown below. It shows the company wise annual average with yearly values of EPS, DPS as well as PE value.

Year	CIPLA				Dr Reddy			
	Annual Average	EPS	DPS	PE	Annual Average	EPS	DPS	PE
2010-11	187.60	11.96	2.80	15.69	1,736.50	65.28	11.30	26.60
2011-12	327.50	14.00	2.00	23.39	1,582.88	84.20	13.80	18.80
2012-13	416.35	18.77	2.00	22.18	1,858.45	98.80	15.00	18.81
2013-14	391.75	17.29	2.00	22.66	2,473.58	126.50	18.00	19.55
2014-15	632.90	14.71	2.00	43.03	3,361.00	130.20	20.00	25.81
2015-16	640.05	18.21	2.00	35.15	3,107.75	117.00	20.00	26.56
2016-17	568.60	12.13	2.00	46.88	3,113.50	72.00	20.00	43.24
2017-18	598.05	18.25	3.00	32.77	2,310.50	59.00	20.00	39.16
2018-19	526.28	23.45	3.00	22.44	2,640.30	113.00	20.00	23.37

Year	Torrent				Sun Pharma			
	Annual Average	EPS	DPS	PE	Annual Average	EPS	DPS	PE
2010-11	563.00	31.93	8.00	17.63	456.75	17.50	3.50	26.10
2011-12	585.41	33.57	11.00	17.44	515.95	25.70	4.25	20.08
2012-13	674.77	51.15	23.00	13.19	734.75	28.80	2.50	25.51
2013-14	451.47	45.05	10.00	10.02	578.50	15.20	1.50	38.06
2014-15	874.11	36.83	11.25	23.73	827.48	18.90	3.00	43.78
2015-16	1,395.52	102.99	35.00	13.55	773.25	18.90	1.00	40.91
2016-17	1,427.88	50.48	14.00	28.29	669.43	29.00	3.50	23.08
2017-18	1,316.18	28.48	14.00	46.21	545.18	8.70	2.00	62.66
2018-19	1,628.79	44.05	17.00	36.98	429.05	11.10	2.75	38.65

Year	Aurobindo Pharma			
	Annual Average	EPS	DPS	PE
2010-11	1272.00	19.57	2.00	65.00
2011-12	90.93	-4.24	1.00	-21.44
2012-13	191.25	10.09	1.50	18.95
2013-14	352.53	40.27	3.00	8.75
2014-15	1090.95	54.05	4.50	20.18
2015-16	836.35	34.66	2.50	24.13
2016-17	689.45	39.33	2.50	17.53
2017-18	676.38	41.36	2.50	16.35
2018-19	764.00	40.36	2.50	18.93

Figure 3.5 Year-wise Annual Average

3.6 Evaluate

We have evaluated the finding obtained after each test or methods step-wise and have taken into account all the factors to state the results and whether those results are effective or not. All the evaluation that I have performed are based on my knowledge with guidance from my mentor.

3.7 Communicate

The most important aspect of any study I to communicate the results and finding obtained once all the data has been analyzed in order to improve future operations or improve the places where our results lack.

4.1 CORRELATION ANALYSIS

Method developed by Karl Pearson, that helps us to check the association level among various variables under study by anylysing them through their linear relationship with each other. They values are ranging from minus 1 to plus 1 which represents the strength of association of the linear relationship between them.
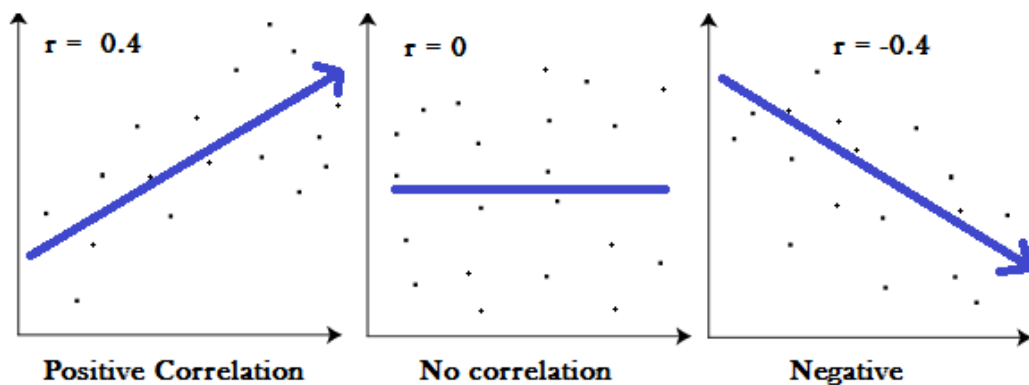
Figure 4.1 Different types of correlation

As seen in the above figure, positive correlation would have a positive slope, no correlation would have no slope and negative correlation would have a negative slope of the line.

The formula for calculating correlation is:

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\,n\Sigma x^2 - (\Sigma x)^2\,]\,[\,n\Sigma y^2 - (\Sigma y)^2\,]}}$$

Figure 4.2 Calculating R

S. No.	Name of company	Price-EPS		Price-DPS		Price-PE	
		r	r^2	r	r^2	r	r^2
1	Cipla	0.356	0.127	-0.103	0.011	0.801	0.642
2	DR Reddy	0.488	0.238	0.852	0.726	0.419	0.176
3	Torrent	0.360	0.130	0.457	0.208	0.676	0.457
4	Sun Pharma	0.430	0.185	-0.323	0.104	0.077	0.006
5	Aurobindo Pharma	0.552	0.305	0.557	0.311	0.801	0.641

Figure 4.4 Correlation & Coefficient of variation

We see that in **CIPLA** we get a greater 'r' value with PE Ratio. That is 0.801 which shows that share price in CIPLA is highly and +vely associated with its PE value while r2 is 64% which states how much variation in share price is explained by PE. EPS is the next in line of association with market price of the share and the degree of association is 0.356 while r2 is 12%. DPS has least association of -0.103 with r2 equal to 1%.

We see that in **DR REDDY** we get a greater 'r' value with DPS. That is 0.85 which shows that share price in DR REDDY is highly and +vely associated with its DPS value while r2 is 72%. EPS is the next in line of association with market price of the share and the degree of association is 0.48 while r2 is 23%. PE has least association of 0.42 with r2 equal to 17%.

We see that in **TORRENT** we get a greater 'r' value with PE. That is 0.67 which shows that share price in TORRENT is highly and +vely associated with its PE value while r2 is 45%. DPS is the next in line of association with market price of the share and the degree of association is 0.45 while r2 is 20%. EPS has least association of 0.35 with r2 equal to 13.0 %.

We see that in **SUN PHARMA** we get a greater 'r' value with EPS. That is 0.42 which shows that share price in SUN PHARMA is highly and +vely associated with its EPS value while r2 is 18%. PE is the next in line of association with market price of the share and the degree of association is 0.07 while r2 is .6%. DPS has least association of -0.32 with r2 equal to 10%.

We see that in **AUROBINDO PHARMA** we get a greater 'r' value with PE. That is 0.8 which shows that share price in AUROBINDO PHARMA is highly and +vely associated with its PE value while r2 is 64%. DPS is the next in line of association with market price of the share and the degree of association is 0.55 while r2 is 31%. PE has least association of 0.55 with r2 equal to 30%.

4.2 MULTIPLE REGRESSION

Multiple regression involves statistical relationship between two or more variables. When there exists two or more than two independent variables, the analysis that defines relationship with the dependent variable is called multiple regression. Instead of correlation of each independent variable with dependent variable, it gives a multiple R value which means the overall correlation of the independent variables with the dependent variable.

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$$y = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon$$

Multiple regression
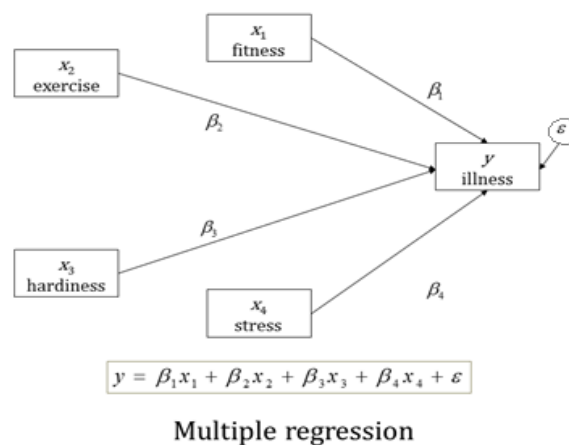
Figure 4.4 Flowchart of Multiple Regression

The linear multiple regression analysis is to estimate the coefficients β1, β2... βn & β0 such that the expression is:

Y=β0+β1X1+β2X2+.... +βnXn

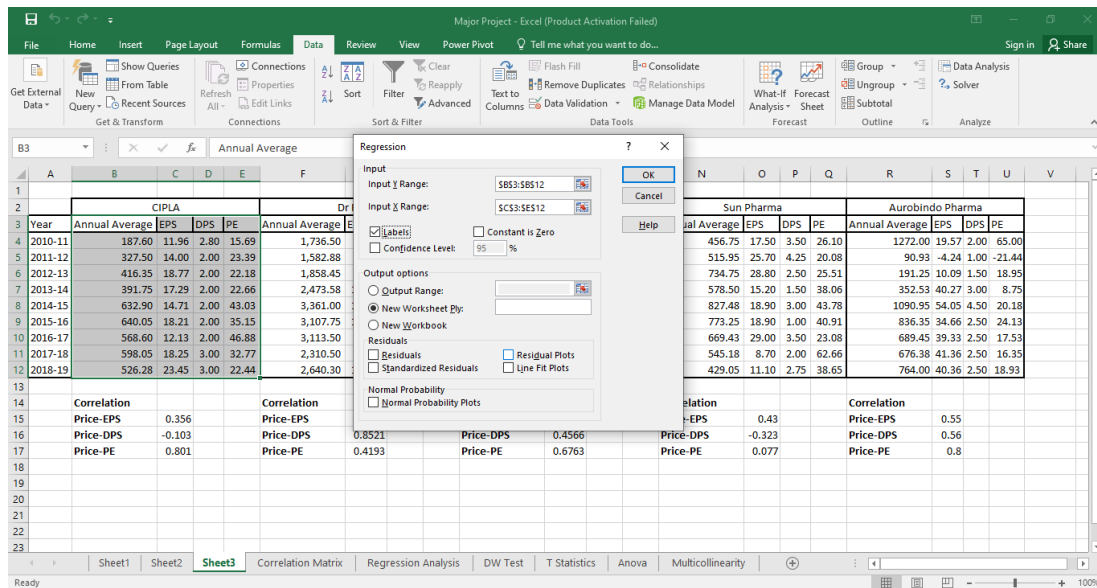Which helps in finding a good estimate of the Y value based on the X values obtained. Here,
Y is the Dependent variable
X1, X2 & X3 are independent variables
And β0, β1, β2, etc. are the parameters that we have to estimate.

Figure 4.5 Data Analysis: Regression in Excel

4.2.1 INDIVIDUAL TEST

This test is necessary to conduct in order to check the impact of each independent variables separately in the dependent variable. It helps us to separately study impact of each independent variable on the variable under study which is the share price.

Null Hypothesis (H0): Earning per Share ($\beta_1=0$)/Dividend per Share ($\beta_2=0$)/ Price to Earnings ratio ($\beta_3=0$)

Alternate Hypothesis (H1): Earning per Share ($\beta_1\neq0$)/Dividend per Share ($\beta_2\neq0$)/ Price to Earnings ratio ($\beta_3\neq0$)

We do this at Significance level of 0.05 & 0.10 i.e. $\alpha=0.05/0.10$.

Rule 1:
- If T calculated > T tabulated: Reject the Null hypothesis
- If T calculated < T tabulated: Do no Reject the Null hypothesis.

Rule 2:
- If p-value > α: Do not Reject Null Hypothesis
- If p-value < α: Reject the Null Hypothesis

Company	Variables	Coefficients	STD Error	t	p-value	Remark at 5%	Remark at 10%
	Constant	-364.38599	93.55492	-3.89489	0.01147	Ho reject	Ho reject
	EPS	24.43150	3.48878	7.00289	0.00092	Ho reject	Ho reject
CIPLA	DPS	11.39783	28.47680	0.40025	0.70550	Ho accept	Ho accept
	PE	13.99354	1.21259	11.54024	0.00009	Ho reject	Ho reject
	Constant	-2240.93264	362.78160	-6.17708	0.00162	Ho reject	Ho reject
Dr reddy	EPS	29.66847	4.31770	6.87135	0.00100	Ho reject	Ho reject
	DPS	-30.66540	32.10412	-0.95519	0.38335	Ho accept	Ho accept
	PE	88.91230	13.89726	6.39783	0.00138	Ho reject	Ho reject
	Constant	-592.46190	220.78534	-2.68343	0.04364	Ho reject	Ho reject
Torrent	EPS	19.79757	6.85291	2.88893	0.03423	Ho reject	Ho reject
	DPS	-13.66990	17.10769	-0.79905	0.46052	Ho accept	Ho accept
	PE	37.68681	5.47811	6.87953	0.00099	Ho reject	Ho reject
Sunpharma	Constant	-128.44592	329.01210	-0.39040	0.71232	Ho accept	Ho accept
	EPS	26.26991	7.25987	3.61851	0.01524	Ho reject	Ho reject
	DPS	-46.19864	38.40181	-1.20303	0.28282	Ho accept	Ho accept
	PE	10.12850	4.48437	2.25862	0.07348	Ho accept	Ho reject
	Constant	19.00661	235.12629	0.08084	0.93871	Ho accept	Ho accept
Aurobindo Pharma	EPS	0.11255	9.82937	0.01145	0.99131	Ho accept	Ho accept
	DPS	163.83796	181.78184	0.90129	0.40875	Ho accept	Ho accept
	PE	12.81163	3.64616	3.51373	0.01703	Ho reject	Ho reject

Figure 4.6 Result of T Test

Our Regression Equation for Torrent is:

Y=-592.46190 + 19.79757*EPS -13.669900*DPS + 37.68681*PE

Our Regression Equation for Dr Reddy is:

Y= -2240.93264+ 29.66847*EPS + -30.66540*DPS + 88.91230*PE

t **Table**

cum. prob	$t_{.50}$	$t_{.75}$	$t_{.80}$	$t_{.85}$	$t_{.90}$	$t_{.95}$	$t_{.975}$	$t_{.99}$	$t_{.995}$	$t_{.999}$	$t_{.9995}$
one-tail	0.50	0.25	0.20	0.15	0.10	0.05	0.025	0.01	0.005	0.001	0.0005
two-tails	1.00	0.50	0.40	0.30	0.20	0.10	0.05	0.02	0.01	0.002	0.001
df											
1	0.000	1.000	1.376	1.963	3.078	6.314	12.71	31.82	63.66	318.31	636.62
2	0.000	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	0.000	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	0.000	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.000	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.000	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.000	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.000	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.000	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.000	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.000	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.000	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.000	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.000	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.000	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.000	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.000	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.000	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.000	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	0.000	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.552	3.850

Figure 4.7 Values of T Stat for various df and alpha

INTERPRETATION

In case of **Cipla**, DPS is proved to be non-significant at both 5 percent as well as 10 percent while other variables are significant
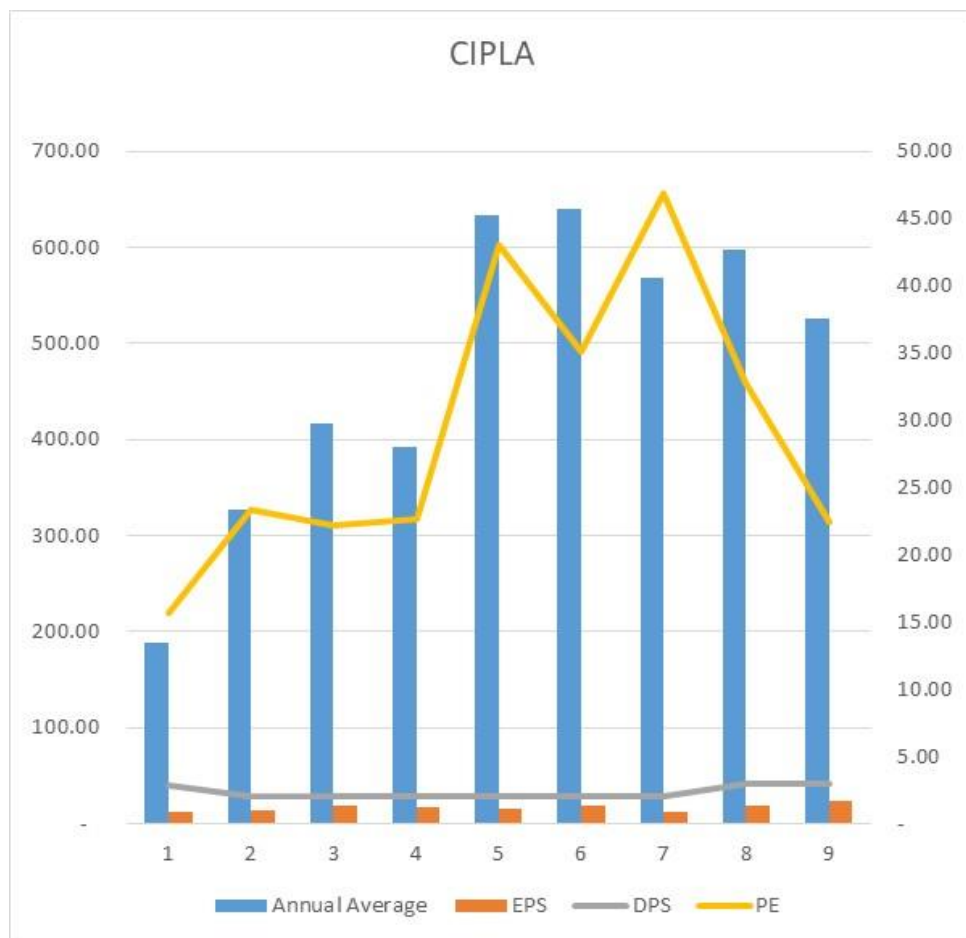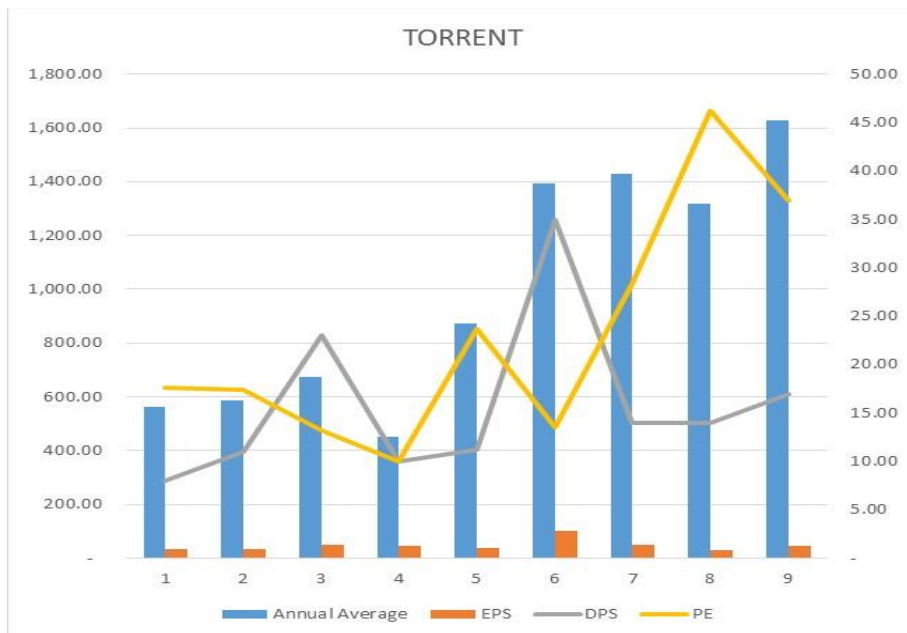

Figure 4.8 Hybrid Graph-CIPLA

In case of **Dr Reddy**, DPS is proved to be non-significant at both 5 percent as well as 10 percent while other variables are significant
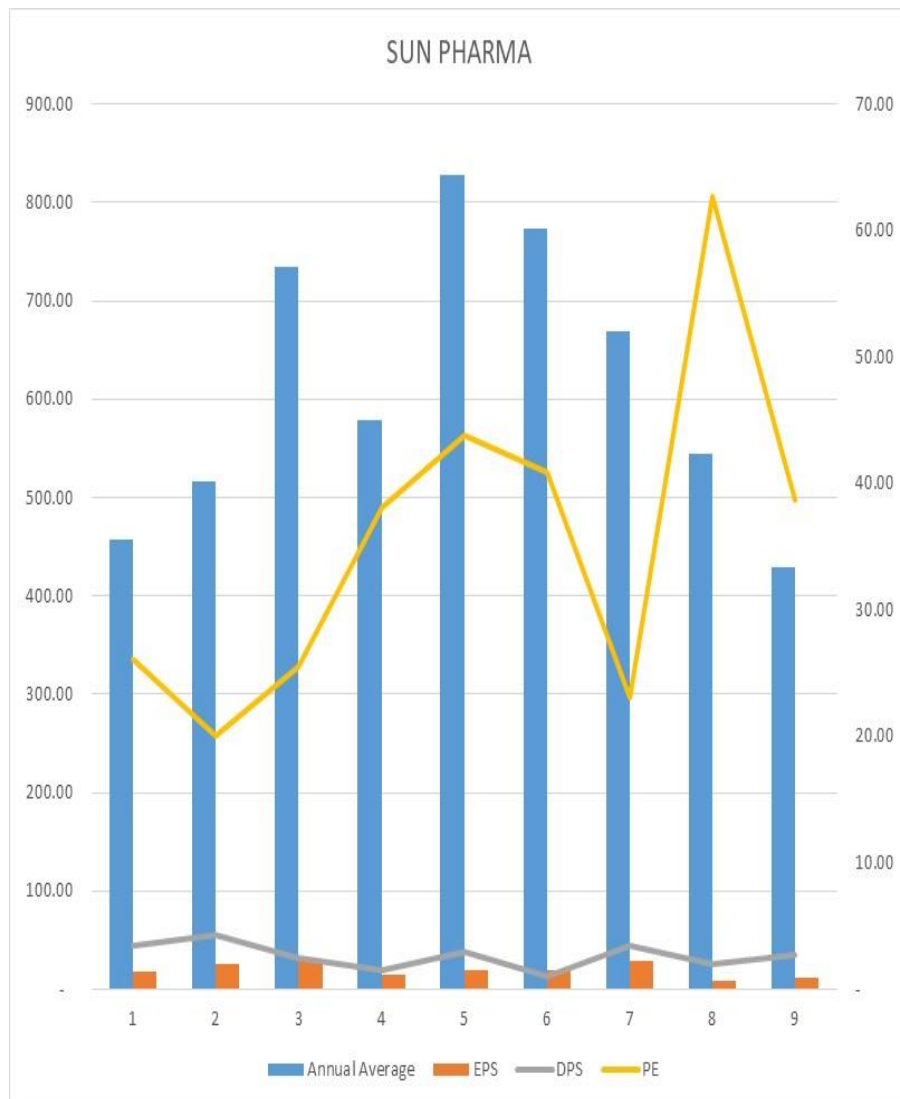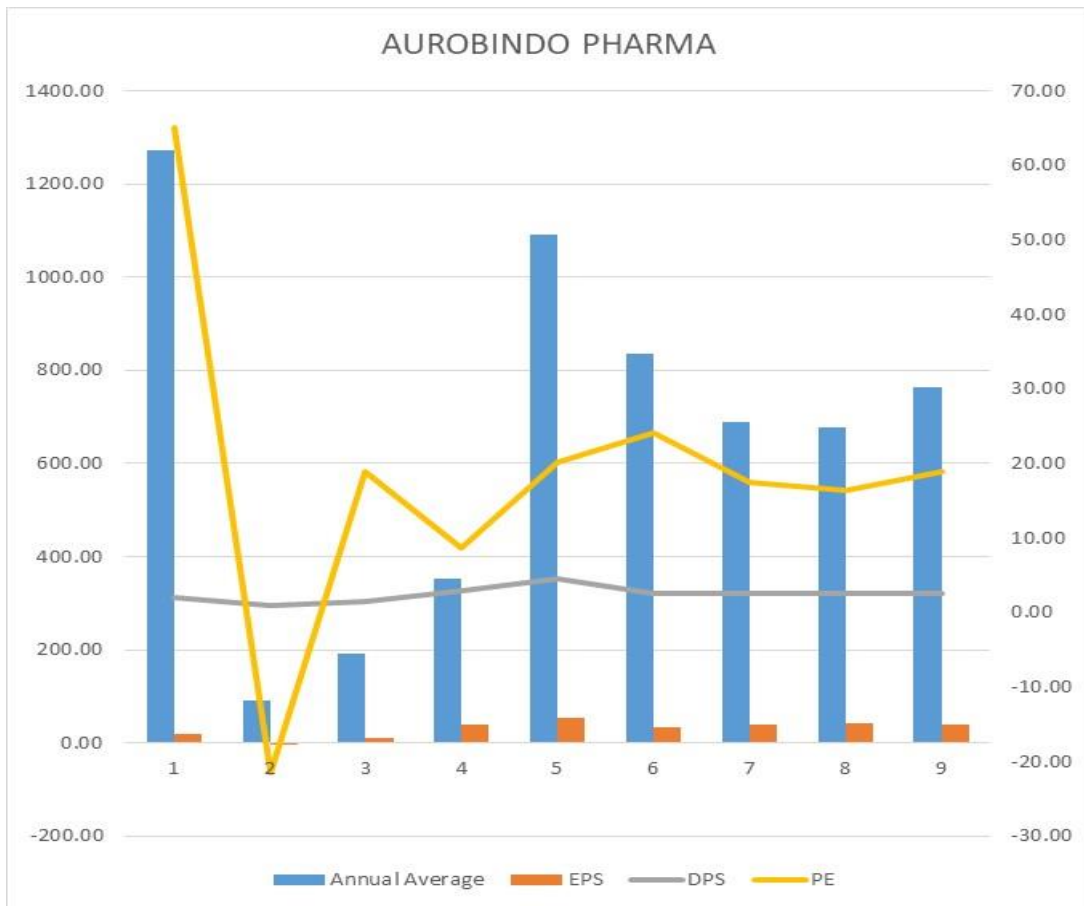
Figure 4.9 Hybrid Graph-DR REDDY

In case of **Torrent**, DPS is proved to be non-significant at both 5 percent as well as 10 percent while other variables are significant

Figure 4.10 Hybrid Graph-TORRENT

In case of **Sun Pharma,** DPS is proved to be non-significant at both 5 percent as well as 10 percent while PE is non-significant only at 5 percent.


Figure 4.11 Hybrid Graph-SUN PHARMA

In case of **Aurobindo Pharma**, DPS & EPS are proved to be non-significant at both 5 percent as well as 10 percent while other variables are significant

Figure 4.12 Hybrid Graph-AUROBINDO PHARMA

The relationship between variables may not always be linearly related, thus even though we have high correlation value of DPS for DR Reddy, it is proved to be non-significant. As shown below through scatter plot:
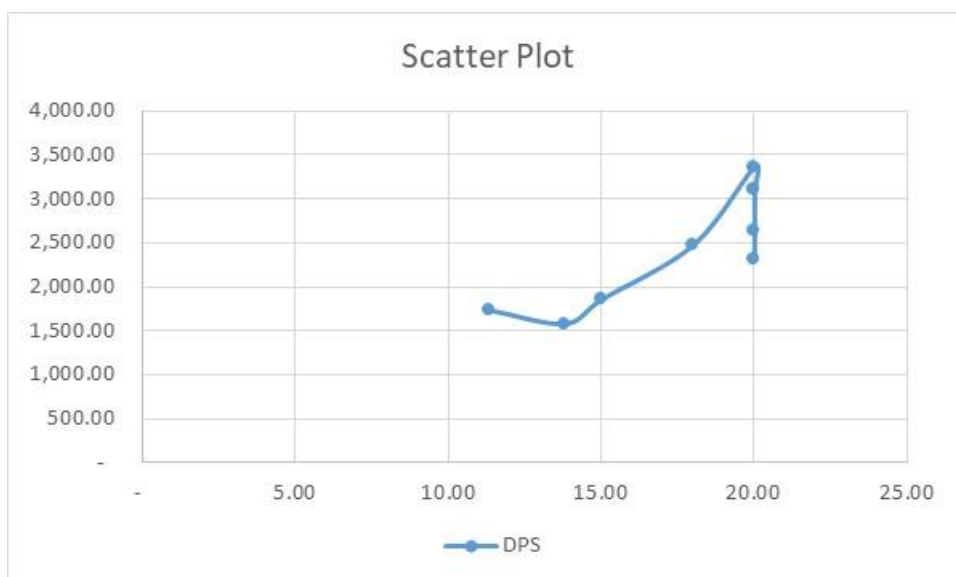
Figure 4.13 Scatter Plot

4.2.2 GLOBAL TEST

Null hypothesis: EPS, DPS, PE are not significant explanatory variables, B1, B2, and B3 equal to zero.

Alternate Hypothesis: EPS, DPS, PE are significant explanatory variables, B1, B2, and B3 not equal to zero.

Name of company	Multiple R	Multiple R^2	Adjusted R^2	Std. Error of Estimate
Cipla	0.985	0.971	0.953	33.722
DR Reddy	0.987	0.974	0.958	132.661
Torrent	0.962	0.926	0.881	154.951
Sun Pharma	0.871	0.759	0.614	88.713
Aurobindo Pharma	0.897	0.805	0.688	219.923

Figure 4.14 Regression Analysis

Company	Source	DF	Sum of Square	Mean Sum of Square	F	Significance F	Remark 5 %	Remark 10 %
Cipla	Regression	3	1,87,722.98	62,574.33	55.03	0.00030	Reject Null	Reject Null
	Residual	5	5,685.70	1,137.14				
Dr Reddy	Regression	3	32,79,934.58	10,93,311.53	62.12	0.00022	Reject Null	Reject Null
	Residual	5	87,994.74	17,598.95				
Sun Pharma	Regression	3	1,23,777.23	41,259.08	5.24	0.05294	Do not reject Null	Reject Null
	Residual	5	39,350.32	7,870.06				
Aurobindo Pharma	Regression	3	9,99,533.24	3,33,177.75	6.89	0.03165	Reject Null	Reject Null
	Residual	5	2,41,830.15	48,366.03				
Torrent	Regression	3	14,99,410.32	4,99,803.44	20.82	0.00297	Reject Null	Reject Null
	Residual	5	1,20,049.65	24,009.93				

Figure 4.15 ANOVA

Level of signi	0.05	0.1
F Tab	5.4	3.61

Figure 4.16 Value of F statistics

Rule 1:
- If Fcalculated > F tabulated: Reject Null hypothesis
- If Fcalculated < F tabulated: Do not reject Null Hypothesis

Rule 2:
- If Significance F < α: Reject Null Hypothesis
- If Significance F > α: Do not reject Null Hypothesis

INTERPRETATION

- **CIPLA:**

  At 10% level of significance: F calculated = 55.03

  F tabulated = 3.61

  Since 55.03 > 3.61, hence we state that we can reject the Null Hypothesis.

  At 5% level of significance: F calculated = 55.03

  F tabulated = 5.4

  Since 55.03 > 5.4, hence we state that we can reject the Null Hypothesis.

- **DR REDDY:**

  At 10% level of significance: F calculated = 62.1

  F tabulated = 3.61

  Since 62.1 > 3.61, hence we state that we can reject the Null Hypothesis.

  At 5% level of significance: F calculated = 62.1

  F tabulated = 5.4

  Since 62.1 > 5.4, hence we state that we can reject the Null Hypothesis.

- **SUN PHARMA:**

  At 10% level of significance: F calculated = 5.2

  F tabulated = 3.61

  Since 5.2 > 3.61, hence we state that we can reject the Null Hypothesis.

  At 5% level of significance: F calculated = 5.2

  F tabulated = 5.4

  Since 55.03 < 5.4, hence we state that we cannot reject the Null Hypothesis.

- **TORENT:**

  At 10% level of significance: F calculated = 20.8

  F tabulated = 3.61

  Since 20.8 > 3.61, hence we state that we can reject the Null Hypothesis.

  At 5% level of significance: F calculated = 20.8

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F tabulated = 5.4

Since 20.8 > 5.4, hence we state that we can reject the Null Hypothesis.

- **AUROBINDO PHARMA:**

At 10% level of significance: F calculated = 6.9

F tabulated = 3.61

Since 6.9 > 3.61, hence we state that we can reject the Null Hypothesis.

At 5% level of significance: F calculated = 6.9

F tabulated = 5.4

Since 55.03 > 5.4, hence we state that we can reject the Null Hypothesis.

4.3 DURBIN WATSON TEST

This test helps us to detect if there is autocorrelation or not. Autocorrelation can be stated as the difference of time period or lags which are obtained in a time series data. The lags obtained might be of positive or negative sign. If they are of almost same sign, we say there is autocorrelation or no autocorrelation, else the test might be inconclusive.

We have two situations:

NULL HYPOTHESIS: There is no autocorrelation

ALTERNATE HYPOTHESIS: There is evidence of autocorrelation

$$DW = \frac{\sum_{t=2}^{T}(e_t - e_{t-1})^2}{\sum_{t=1}^{T} e_t^2}$$

Rule for Durbin Watson test:

1. If dw value is equal to 2, we say there is no autocorrelation
2. If dw lies between 0 and 2, there is positive autocorrelation
3. If dw is greater than 2, there is negative autocorrelation

If dw value exceeds 2, then we check for the following:

1. If dw value is greater than the difference of 4 and dL, we say that it is negative autocorrelation.

2. If dw value is less than the difference between 4 and dU, we say that negative autocorrelation is not there.

3. If dw value lies between them then our test is said to be inconclusive.

	k = 1		k = 2		k = 3		k = 4		k = 5	
n	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U
6	0.61	1.40								
7	0.70	1.36	0.47	1.90						
8	0.76	1.33	0.56	1.78	0.37	2.29				
9	0.82	1.32	0.63	1.70	0.46	2.13	0.30	2.59		
10	0.88	1.32	0.70	1.64	0.53	2.02	0.38	2.41	0.24	2.82
11	0.93	1.32	0.66	1.60	0.60	1.93	0.44	2.28	0.32	2.65
12	0.97	1.33	0.81	1.58	0.66	1.86	0.51	2.18	0.38	2.51
13	1.01	1.34	0.86	1.56	0.72	1.82	0.57	2.09	0.45	2.39
14	1.05	1.35	0.91	1.55	0.77	1.78	0.63	2.03	0.51	2.30
15	1.08	1.36	0.95	1.54	0.82	1.75	0.69	1.97	0.56	2.21

Critical Values for the Durbin-Watson Statistic (d) — Level of Significance α = .05

Figure 4.17 Tabulated value of DW Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.985ª	0.971	0.953	33.71476	2.896

Model Summary - CIPLA

a. Predictors: (Constant), PE, EPS, DPS

b. Dependent Variable: Price

Figure 4.18 DW Summary CIPLA

Since dw > 2,

- Is dw > 4-dL?

  2.896 > 4-0.37? False

- Is dw < 4-dU?

  2.896 < 4-2.29 ? False

- Is 4-dU < dw < 4-dL?

  4-2.29 < 2.896 < 4-0.37? True

Hence, the test is inconclusive.

Model Summary - DR Reddy					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.987ᵃ	0.974	0.958	132.54325	2.002
a. Predictors: (Constant), PE, DPS, EPS					
b. Dependent Variable: Price					

Figure 4.19 DW Summary Dr Reddy

Since, dw is almost equal to 2, we conclude that there is no autocorrelation.

Model Summary - Sun Pharma					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.871ᵃ	0.759	0.614	88.71270	1.619
a. Predictors: (Constant), PE, DPS, EPS					
b. Dependent Variable: Price					

Figure 4.20 DW Summary Sun Pharma

Since dw < 2, there might be positive autocorrelation:

- Is dL < dw < 0?

  0.37 < 1.619 <0 ? False

- Is 2 < dw < dU?

  2 < 1.619 < 2.29? False

- Is dU < dw < dL?

  2.29 < 1.619 < 0.37 ? True

Hence, we conclude that the test is inconclusive.

Model Summary - Aurobindo Pharma					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.897^a	0.805	0.688	219.88519	1.603
a. Predictors: (Constant), PE, DPS, EPS					
b. Dependent Variable: Price					

Figure 4.21 DW Summary Aurobindo Pharma

Since dw < 2, there might be positive autocorrelation:

- Is dL < dw < 0?

  0.37 < 1.603 <0 ? False

- Is 2 < dw < dU?

  2 < 1.603 < 2.29? False

- Is dU < dw < dL?

  2.29 < 1.603 < 0.37 ? True

Hence, we conclude that the test is inconclusive.

Model Summary - Torrent					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.962^a	0.926	0.882	154.83930	3.318
a. Predictors: (Constant), PE, DPS, EPS					
b. Dependent Variable: Price					

Figure 4.22 DW Summary Torrent

Since dw > 2,

- Is dw > 4-dL?

  3.318 > 4-0.37? False

- Is dw < 4-dU?

  3.318 < 4-2.29 ? False

- Is 4-dU < dw < 4-dL?

  4-2.29 < 3.318 < 4-0.37? True

Hence, the test is inconclusive.

4.4 MULTICOLLINEARITY

A multiple regression model comprises of multiple independent variables that cause effect on the dependent variable. In case the independent variables are highly related or linearly related to be specific amongst themselves, we term this situation to be Multicollinearity. We can also say that, one independent variables is dependent on the other independent variables. For example: Person's age and the class in which he studies can have high similarity or high multicollinearity. VIF or Variance Infl. Factor can be used to determine the level of relatedness among the independent varibales. Another way is to look at the correlation values of the independent variables with other independent variables. If r values are highly correlated, we can say there will be high multicoliinearity amongst themselves.

The formula for VIF is shows as below:

$$VIF_i = \frac{1}{1 - R_i^2}$$

CIPLA					
Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	-364.4	93.6	-3.89	0.011	
EPS	24.43	3.49	7	0.001	1.17
DPS	11.4	28.5	0.4	0.706	1.26
PE	13.99	1.21	11.54	0	1.17

Figure 4.23 Multicollinearity CIPLA

In case of CIPLA Pharmaceuticals, there is not linear association among the independent variables as the VIF value is less than 3.

Sun Pharma					
Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	-128	329	-0.39	0.712	
EPS	26.27	7.26	3.62	0.015	2.85
DPS	-46.2	38.4	-1.2	0.283	1.62
PE	10.13	4.48	2.26	0.073	3.66

Figure 4.24 Multicollinearity Sun Pharma

In case of Sun Pharmaceuticals, there is not linear association among the independent variables as the VIF value is less than 3.

TORRENT					
Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	-592	221	-2.68	0.044	
EPS	19.8	6.85	2.89	0.034	7.88
DPS	-13.7	17.1	-0.8	0.461	6.91
PE	37.69	5.48	6.88	0.001	1.47

Figure 4.25 Multicollinearity Torrent

In case of TORRENT, linear association can be seen among two independent factors namely EPS as well as DPS while PE is not linearly associated with them.

DR Reddy					
Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	-2241	363	-6.18	0.002	
EPS	29.67	4.32	6.87	0.001	6.21
DPS	-30.7	32.1	-0.96	0.383	5.26
PE	88.9	13.9	6.4	0.001	6.76

Figure 4.26 Multicollinearity Dr Reddy

In this case, we see that DR REDDY's all independent variables have a linear relationship amongst themselves as the values are more than 5.

Aurobindo Pharma					
Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	19	235	0.08	0.939	
EPS	0.11	9.83	0.01	0.991	5.4
DPS	164	182	0.9	0.409	5.28
PE	12.81	3.65	3.51	0.017	1.07

Figure 4.27 Multicollinearity Aurobindo Pharma

In case of Aurbindo Pharmaceuticals, we see high VIF values for two independent factors which means they are linearly related and PE has not linear relationship with them.

		EPS-DPS		EPS-PE	
S. No.	Name of company	r	r^2	r	r^2
1	Cipla	0.359	0.129	-0.247	0.061
2	DR Reddy	0.372	0.139	-0.574	0.330
3	Torrent	0.905	0.819	-0.390	0.152
4	Sun Pharma	0.443	0.196	-0.803	0.645
5	Aurobindo Pharma	0.900	0.810	0.250	0.062

Figure 4.28 Correlation among Independent Variables

Here we can see that for those independent varibales whose VIF values is greater than 5, their correlation coefficient also comes out to be as high as 0.9 in some cases.

CHAPTER 5
FINDINGS & RECOMMENDATIONS

Following are the findings we have obtained from our analysis of the data of the 5 companies:

- In the Pharmaceutical Industry, we observe that EPS is the most effective in determining the market price of the share. We see that it has a consistent as well as moderate value of r with the market price of the share and is an important factor to determine its market price.

- Following EPS, we see that PE also has an effective association with the market price of the share. R value of PE for some companies can be found to be as high as 0.8 which represents a high correlation with the market price of the share

- DPS can be seen to be least associated with the share price. It is neither consistent and it also has both Plus and Minus values of R which states that for some companies it has –ve correlation while for some companies +ve correlation.

- T Statistics shows that whether the independent variables are effective or not on the share price. It means whether they explain the price movement or not. For different companies different variables are shows to be explanatory or not. Refer to the table in the T stats to see.

- From F Statistics we can clearly see the impact of each independent variable. We see that at 10(ten) percent level of sig. all the independent variables are found to be effective except for DPS and explains the price variation. While at five percent, only for Sun Pharma, the variables are found to be non-explanatory.

- In the DW Test we see that our test comes out to be inconclusive among the residuals. This means that we cannot determine whether the stock prices will

rise tomorrow or fall exactly, based on today's rise or fall which is pretty much the real scenario that we see in the share market.

- For the test of multicollinearity, we see that we have high values of VIF i.e. 5 or greater than 5. This can be ignored safely as cited by famous statistician Dr. Paul Allison that since EPS/DPS/PE on not dependent on each other, they are related to the amount of profit a company makes or on sole discretion of Board of Directors, we can ignore high VIF values.

CHAPTER 6
LIMITATION OF THE STUDY

While going through this study, I recognized various limitations that could not be ignored. The limitations are as follows:

- During the time of Great Depression i.e. during 2008-09 period, a lot of companies did split share. For example: A share of Rs100 was split into 10 share of Rs10 each. Thus I observed that even though the market price of the share went down, the EPS/DPS/PE values still increased in those years. Hence, we cannot account for that data as it will hamper our trend analysis.

- Our analysis has been of only 9 years, thus we see high VIF or Variance Inflation Factor values of around 6 and 7. This shows high evidence of multicollinearity between the independent variables.

- In the DW or Durbin Watson test we observe that our test comes out to be inconclusive. This can be explained from the fact that we cannot truly predict if the stock will rise or fall tomorrow based on today's rise or fall. We simply cannot tell.

- Our results could differ for different sectors such as airlines industry or automobile industry. We have selected 5 Pharmaceutical companies listed on BSE whose have been in market for quite a long time. Their share have a good market price and are traded in high frequency and volume in the stock market.

- We have not analysed what caused EPS or DPS or P/E to change for a company as it solely depends on the profit generated by the company or discretion of the Board of Directors (BOD).

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