

# The Impact of the Annual Financial Statements on the Equity Share Prices and the Application of the Shiller's P/E 10 Ratio

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## Abstract

In this research paper the CAPM model is used to find out the expected return from the equity shares based on the financial factors of the company. This expected return is then compared with the actual returns of the investor to establish the abnormal returns. The deviations are analysed using the Paired Samples T-Test to come to a conclusion whether the annual financial statements release have an impact on the stock prices of the companies. In addition to the impact of the annual financial statement update, this research paper also studies whether the equity share prices reflect the Basic EPS of the company by using the Shiller's P/E 10 Ratio or the Cyclically Adjusted Price Earnings ratio over the study period of 5 years.

**Keywords:** *Shiller's P/E 10 Ratio, Cyclically Adjusted Price Earnings Ratio, CAPM, Abnormal Returns, Financial impact on stock prices, Annual Financial Statements, Pharmaceutical industry.*

## 1. Introduction

The equity share price may fluctuate due to various reasons including the economic factors, industry performance, news releases, earnings of the company, earnings of the competitors, overall performance of the company and various other external and internal factors. The annual financial statements contain vital financial information used by investors to make investing decisions. The research study aims to analyse the impact of annual financial statements update on the equity share price of the company. It is a general notion that investing in companies which have positive earnings will result in better returns for the investor. This notion is tested using the Shiller's P/E 10 ratio or the Cyclically Adjusted Price Earnings Ratio in this research paper.

The research study is based on the pharmaceutical industry as there is a rapidly growing population in India, various government initiatives inclined towards the healthcare sector, industry gaining more attention due to the research and development taking place in India and availability of the vast labour forces in the nation.

## 2. Literature Review

**Relationship between P/E Ratio and Stock Return with Reference to BSE 100.** This research paper discusses the impact P/E ratio has on the equity share price. The researcher had created 4 portfolios containing various stocks and came to a conclusion that investing in shares which have a low P/E ratio has a much higher chance to generate higher returns for the investor. (Solanki, 2014)

**Stock Prices, Earnings and Expected Dividends.** This research study was conducted by Robert J. Shiller and John Y. Campbell, who invented the P/E 10 or the Shiller's Ratio. They came to a conclusion that taking the historical earnings of many years of a company gives a better picture than taking that of just the current year. (Shiller & Campbell, 1988)

**Efficient Capital Markets: A Review of Theory and Empirical Work.** This research study performed was exploratory in nature that gives an overview of the various theories that exist. The research was divided into 3 categories i.e. Efficient Market Theory, Signaling Theory and Random Walk Theory. (Fama, 2010)

**The Effect of Financial Performance Announcement on Share Returns of Firms Listed at the Nairobi Securities Exchange.** The Efficient Market Theory is taken as the base to analyse the share returns reaction to the announcements. Using the market model to calculate abnormal returns, it was found that the market is only semi-strong efficient in relation to such announcements. (Wafubwa, 2014)

**The Earnings-Price anomaly.** An anomaly is a deviation from the normal returns. This paper talks about the price-earnings anomaly which plays against the Efficient Market Theory. This means that an investor can earn returns even when the firm has a low P/E ratio, implying market inefficiency. On the other hand, it can also mean a relation between earnings information and errors in estimating the abnormal returns which does not imply market inefficiency. (Ball, 1992)

**Predictability of Share Prices through Corporate Annual Reporting: A Focus on Dhaka Stock Exchange.** In this paper, the researcher has taken into consideration fundamental indices of a company such as EPS, Net Asset Value per share, P/E Ratio, Net Profit after tax and dividend yield ratio to investigate the relation between the market indices to the stock price fluctuations. It was found that if the Efficient Market theory holds, the market prices are unlikely to be predicted through fundamental analysis. (Saha & Bhuiyan, 2014)

**Effect of Accounting Information on Market Share Price of Selected Firms listed on Nigeria Stock Exchange.** The researcher aims to determine the effect of Accounting

Information on Market Share Price of ICT firms listed on the Nigeria Stock Exchange. The accounting information taken into consideration are Dividend per Share (DPS), Earnings per Share (EPS) and Return on Equity.(Amahalu, Abiahu, Chinyere, & Nweze, 2018)

### 3. Research Design

#### A. Objectives

- To determine whether any significant relationship exists between the annual financial results update in the market and the equity share price.
- To identify whether a stock is underpriced or overpriced using the Shiller’s P/E 10 ratio and making appropriate buying and selling decisions.

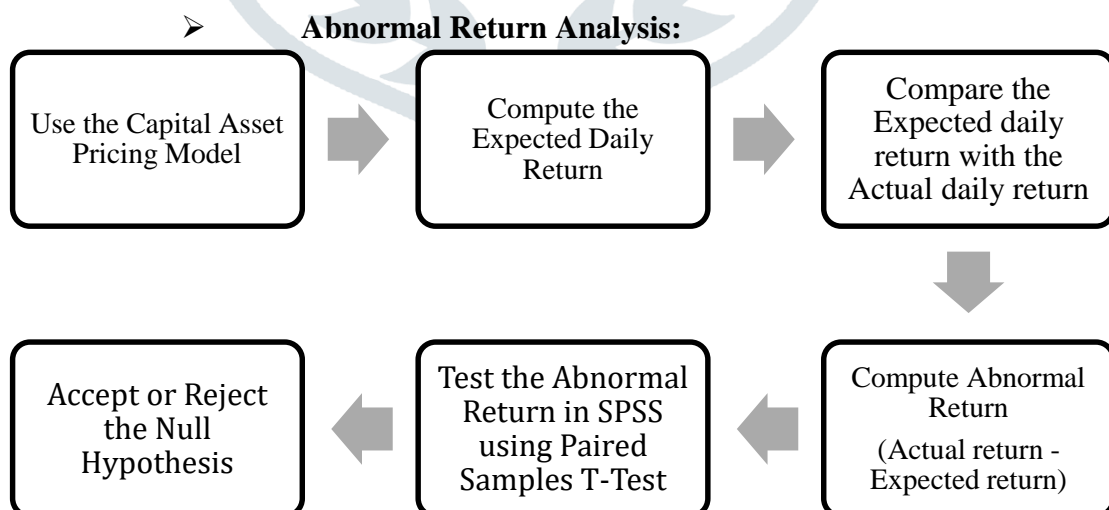
#### B. Scope

The study is focused on the equity shares listed on the NIFTY PHARMA index. This research aims to determine whether the annual financial statement update has a significant impact on the equity share price of the selected companies. The sample includes the following 10 companies from the NIFTY PHARMA index:

Biocon Ltd.	Cipla Ltd.
Dr. Reddy’s Laboratories Ltd.	Glenmark Pharmaceuticals Ltd.
Divi’s Laboratories Ltd.	Piramal Ltd.
Lupin Ltd.	Sun Pharmaceutical Industries Ltd.
Aurobindo Pharma Ltd.	Cadila Healthcare Ltd.

#### C. Research Methodology

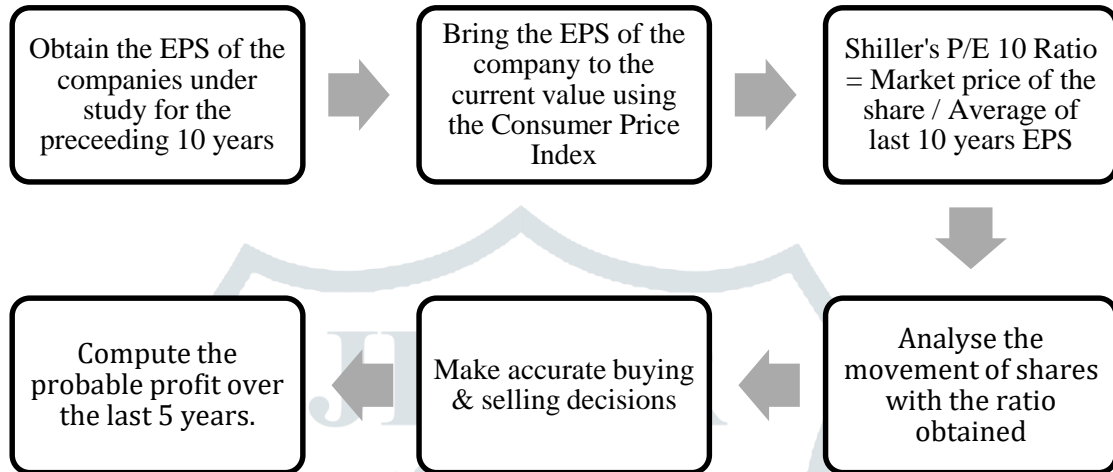
The secondary data is analysed using the CAPM and Abnormal Returns in a combination, Paired Samples T-Test and the Shiller’s P/E 10 Ratio.



An event window of 10 days (pre and post) is considered to study the fluctuation of the equity share price, the event being the Annual Financial Statement published by the company. The Abnormal return is computed by comparing the expected daily return, which is computed using the CAPM with the actual daily return, and is analysed using

Paired Samples T-Test. An estimation window of 100 days is taken to compute Beta which is in turn used to calculate the expected return using the CAPM model.

➤ **Shiller’s P/E 10 Ratio Analysis:**



The second part of the research is focused on the Shiller’s P/E 10 Ratio which takes only the Market Price and Profit into consideration i.e. Basic EPS<sup>1</sup>. The ratio takes into consideration the Earnings per Share of the preceding 10 years, which are discounted and brought to its present value to arrive at the ratio.

$$\text{Shiller's PE 10 Ratio} = \frac{\text{Market Price of the Equity Share}}{\text{Average of Adjusted EPS}}$$

The ratio is then analysed over the period of 5 years to observe whether the share price adjusts itself in the market according to the ratio obtained. We have made our buying and selling decision according to the ratio obtained, and computed the return that could have been earned to analyse the effectiveness of this ratio.

**D. Limitations**

- Research study is based only on the listed Indian companies in the pharmaceutical industry.
- Research study is conducted on the stocks listed only on the NIFTY index.
- Research study covers a period of 5 financial years i.e. FY 2013-18.
- The Shiller’s P/E 10 ratio only takes the EPS and the current market price into consideration for analysis.

**4. Research Observations and Findings**

<sup>1</sup>In order to compute the P/E 10 ratio, the Basic EPS of 10 years is taken into consideration for computation purposes. For example: To compute the P/E 10 ratio for 2013-14, EPS is considered from 2004-05 to 2013-14.

### A. Impact of Financial Statements update on the Equity Share Price of the Respective Companies

The application of the paired samples t-test helped us to analyse, if there is any significant impact of the financial results update on the equity share prices. Abnormal returns i.e. the difference between the actual and the expected return is analysed for a window period of 10 days post and prior to the release of the financial results. The hypothesis for the same would be as under:

**H0:** There is no significant impact of the financials results update on the equity share prices of the companies in the pharmaceutical industry.

**H1:** There is a significant impact of the financials results update on the equity share prices of the companies in the pharmaceutical industry.

For the purpose of the study, we have taken the confidence level to be 95%. Hence if the calculated p-value is greater than 0.05, we accept the null hypothesis. But if the p-value is less than or equal to 0.05, then we reject the null hypothesis, and will accept the alternate hypothesis.

We obtained the p-values for 10 companies from the NIFTY PHARMA index using the paired samples t-test for a period for 5 years from 2013-2018. It was found that all the p-values were greater than 0.05. Hence, we reject the alternate hypothesis and accept the null hypothesis which states that there is no significant impact of the financials results update on the equity share prices of the companies in the pharmaceutical industry.

The summary of the p values are attached below:

Company	2013-14	2014-15	2015-16	2016-17	2017-18
Biocon Ltd	0.870	0.767	0.609	0.694	0.945
Dr. Reddy's Laboratories Ltd.	0.694	0.953	0.961	0.800	0.847
Divi's Laboratories Ltd.	0.907	0.900	0.863	0.933	0.660
Lupin Ltd.	0.917	0.955	0.834	0.801	0.901
Aurobindo Pharma Ltd.	0.664	0.884	0.865	0.947	0.882
Cipla Ltd.	0.870	0.617	0.628	0.915	0.735
Glenmark Pharmaceuticals Ltd.	0.776	0.905	0.881	0.329	0.589
Piramal Ltd.	0.973	0.837	0.630	0.742	0.936
Sun Pharmaceutical Industries Ltd.	0.924	0.678	0.821	0.489	0.819
Cadila Healthcare Ltd.	0.872	0.673	1.000	0.637	0.774

### B. Application of the Shiller's P/E 10 Ratio

The Shiller's P/E 10 Ratio is an extended version of the traditional Price Earnings Ratio. The only difference being, we take 10 year's Earning per share data of the respective company, and discount it to the present value using the All India Consumer Price Index, and find the Average Adjusted EPS.

$$\text{Shiller's PE 10 Ratio} = \frac{\text{Market Price of the Equity Share}}{\text{Average of Adjusted EPS}}$$

The ratio is then used to make a buying or selling decision. On our analysis of the 10 companies in the healthcare industry we have made our buying and selling decisions based on the following summary:

- i. **Buy** the equity share when the Ratio is below 20, as the share is underpriced.
- ii. **Sell** the equity share when the Ratio is above 23<sup>2</sup>, as the share turns out to be overpriced.

Shiller's Ratio	Prediction	Interpretation
Below 20	Price will rise	Underpriced
20-26	Price will not fluctuate much	Reflecting Financials
Above 26	Price will fall	Overpriced

Based on the summary table provided above, we would be purchasing the shares when the ratio is below 20, and hold it until the ratio goes above 23, in which situation we would be selling it. The Summary of the application of our analysis is attached below company wise, and the total profit that would have been generated, if we purchase one share each of the company is Rs. 4,127.55 on our investment of Rs. 9,562.00 giving us a total return of 43.17%. The details of the buying and selling of shares are given below.

### Biocon Limited

Note for Below Tables<sup>3</sup>

Year	Shiller's Ratio	Impact noticed in the next year?	Transaction Price
2017-18	24.92	No	NA
2016-17	32.31	Yes	1,103.70
2015-16	16.51	Yes	NA
2014-15	13.99	Yes	NA
2013-14	14.59	No	-475.90
<b>Profit/ (Loss)</b>		<b>627.80</b>	

The decision to purchase the shares in 2013-14, one day after the financial statements release (28-Apr-2014) was made, as the Shiller's Ratio was less than 20 i.e. underpriced.

Whereas the decision to sell the shares in 2016-17, one day after the annual financial statement release (28-Apr-2017) was made, as the Shiller's Ratio was greater than 23 i.e. overpriced.

### Dr. Reddy's Laboratories Limited

<sup>2</sup>Average of 20 and 26 (from the table-Price will not fluctuate much), as we do not want to risk the possible chance of the share being overpriced.

<sup>3</sup>Amounts shown in negative are Purchase figures, whereas positive amounts are Sales figures.

Year	Shiller's Ratio	Impact noticed in the next year?	Transaction Price
2017-18	24.05	No	NA
2016-17	34.48	Yes	NA
2015-16	36.03	Yes	NA
2014-15	50.75	Yes	NA
2013-14	47.69	No	NA
<b>Profit/ (Loss)</b>		-	

The decision was made to not invest, as the Shiller's ratio was never below 20, and was overpriced throughout the period of 5 years.

#### Divi's Laboratories Limited

Year	Shiller's P/E 10 Ratio	Impact noticed in the next year?	Transaction Price
2017-18	18.3	Yes	NA
2016-17	8.79	Yes	NA
2015-16	12.35	Yes	NA
2014-15	19.57	No	NA
2013-14	13.58	Yes	-1,251.35
Price as on 29-10-2018 <sup>4</sup>		1,444.20	
<b>Profit/ (Loss)</b>		<b>192.85</b>	

The decision to purchase the shares in 2013-14, one day after the financial statements release (27-May-2014) was made, as the Shiller's Ratio was less than 20 i.e. underpriced.

Whereas the decision to hold the shares till present date was made, as the Shiller's Ratio never went above 23.

#### Lupin Limited

Year	Shiller's P/E 10 Ratio	Impact noticed in the next year?	Transaction Price
2017-18	13.32	Yes	NA
2016-17	17.64	No	-1,140.20
2015-16	22.98	No	NA
2014-15	24.62	Yes	1,631.95
2013-14	15.78	Yes	-979.30
Price as on 29-10-2018		885.00	
<b>Profit/ (Loss)</b>		<b>397.45</b>	

The decision to purchase the shares in 2013-14, one day after the financial statements release (8-May-2014) was made, as the Shiller's Ratio was less than 20 i.e. underpriced. The same shares were sold in 2014-15 one day after the results announcement (14-May-15), as the shares were overpriced i.e. Ratio higher than 23.

<sup>4</sup>29<sup>th</sup> October, 2018 is the date where the analysis was performed. Hence, for the shares not yet sold, it is assumed to be sold on 29<sup>th</sup> October, 2018 to compute the Profit or Loss.

The decision to re-purchase the shares in 2016-17, one day after the financial statements release (25-May-2017) was made, as the Shiller's Ratio was less than 20 again i.e. underpriced. These same shares are decided to be held till present, as the Shiller's Ratio never went above 23.

#### Aurobindo Pharma Limited

Year	Shiller's P/E 10 Ratio	Impact noticed in the next year?	Transaction Price
2017-18	17.19	Yes	NA
2016-17	15.59	No	NA
2015-16	18.91	No	-785.30
2014-15	35.27	Yes	1,374.20
2013-14	20.13	Yes	-638.55
Price as on 29-10-2018		770.05	
<b>Profit/ (Loss)</b>		<b>720.40</b>	

The decision to purchase the shares in 2013-14, one day after the financial statements release (2-Jun-2014) was made, as the Shiller's Ratio was around 20 i.e. underpriced. The same shares were sold in 2014-15 one day after the results announcement (29-May-15), as the shares were too overpriced i.e. Ratio way higher than 23. The decision to re-purchase the shares in 2015-16, one day after the financial statements release (31-May-2016) was made, as the Shiller's Ratio was less than 20 again i.e. underpriced. These same shares are decided to be held till present, as the Shiller's Ratio never went above 23.

#### Cipla Limited

Year	Shiller's P/E 10 Ratio	Impact noticed in the next year?	Transaction Price
2017-18	27.75	No	NA
2016-17	29.18	Yes	NA
2015-16	25.33	No	NA
2014-15	32.9	Yes	662.10
2013-14	18.81	Yes	-384.55
<b>Profit/ (Loss)</b>		<b>277.55</b>	

The decision to purchase the shares in 2013-14, one day after the financial statements release (30-May-2014) was made, as the Shiller's Ratio was less than 20 i.e. underpriced.

Whereas the decision to sell the shares in 2014-15, one day after the annual financial statement release (1-Jun-2015) was made, as the Shiller's Ratio was greater than 23 i.e. overpriced.

#### Glenmark Pharmaceuticals Limited



Year	Shiller's P/E 10 Ratio	Impact noticed in the next year?	Transaction Price
2017-18	21.41	Yes	NA
2016-17	37.35	Yes	NA
2015-16	33.84	No	NA
2014-15	38.09	No	NA
2013-14	27.11	No	NA
<b>Profit/ (Loss)</b>		-	

The decision was made to not invest, as the Shiller's ratio was never below 20, and was overpriced throughout the period of 5 years.

### Piramal Enterprises Limited

Year	Shiller's P/E 10 Ratio	Impact noticed in the next year?	Transaction Price
2017-18	15.84	No	-2,405.75
2016-17	23.55	No	2,866.25
2015-16	11.74	Yes	NA
2014-15	9.43	Yes	NA
2013-14	6.78	Yes	-568.75
Price as on 29-10-2018		2,029.50	
<b>Profit/ (Loss)</b>		<b>1,921.25</b>	

The decision to purchase the shares in 2013-14, one day after the financial statements release (6-May-2014) was made, as the Shiller's Ratio was way less than 20 i.e. underpriced. The same shares were sold in 2016-17 one day after the results announcement (15-May-15), as the shares were overpriced i.e. Ratio higher than 23.

The decision to re-purchase the shares in 2017-18, one day after the financial statements release (29-May-2018) was made, as the Shiller's Ratio was less than 20 again i.e. underpriced. These same shares are decided to be held till present, as the Shiller's Ratio never went above 23.

### Sun Pharmaceuticals Industries Limited

Year	Shiller's P/E 10 Ratio	Impact noticed in the next year?	Transaction Price
2017-18	10.39	No	NA
2016-17	8.44	No	NA
2015-16	11.42	No	NA
2014-15	13.29	No	NA
2013-14	9.41	Yes	-610.65
Price as on 29-10-2018		573.60	
<b>Profit/ (Loss)</b>		<b>-37.05</b>	

The decision to purchase the shares in 2013-14, one day after the financial statements release (30-May-2014) was made, as the Shiller's Ratio was less than 20 i.e. underpriced.

Whereas the decision to hold the shares till present date was made, as the Shiller's Ratio never went above 23. We are expecting the share price to rise drastically, as the Shiller's Ratio is less than 15 throughout. The rise in price will prove that the share prices automatically adjust according to the financial factors.

### Cadila Healthcare Limited

Year	Shiller's P/E 10 Ratio	Impact noticed in the next year?	Transaction Price
2017-18	9.6	No	NA
2016-17	11.97	No	NA
2015-16	7.86	Yes	-321.70
2014-15	39.94	Yes	NA
2013-14	23.17	No	NA
Price as on 29-10-2018		349.00	
<b>Profit/ (Loss)</b>		<b>27.30</b>	

The decision to purchase the shares in 2015-16, one day after the financial statements release (16-May-2016) was made, as the Shiller's Ratio was less than 20 i.e. underpriced.

Whereas the decision to hold the shares till present date was made, as the Shiller's Ratio never went above 23, after 2015-16. We are expecting the share price to rise drastically, as the Shiller's Ratio is currently just 9.6.

### 5. Conclusion

The annual financial statements does not have a significant impact on the equity share prices of the pharmaceutical industry listed on the NIFTY PHARMA index, based on the Paired T-Test Samples Test conducted through Statistical Package for the Social Sciences (SPSS). We have accepted the null hypothesis. The application of the Shiller's P/E 10 Ratio or the Cyclically Adjusted Price Earnings Ratio proves to be a very effective measure to make timely investing decisions, as the ratio takes into consideration the EPS of the preceding 10 years to arrive at the ratio. The Ratio helps investors in identifying the overpriced or underpriced stocks, in order to capitalise on the situation to get higher returns.

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