Market Reaction to Financial Disclosure: A Study on Cipla Ltd.

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Abstract: This research article attempts to empirically examine the relative significance of selected accounting parameters on the stock market performance of the Indian pharmaceutical industry. The selected parameters include total income, operating profit, earnings per share, cash flow and book value per share. The effect of changes of these selected parameters is measured on the proxy company – Cipla Ltd. It is a study conducted over a ten year period from 2007-16. The period has been carefully chosen to encompass significant changes taking place all over the world and also in the world of Indian accounting and reporting system.

The study considers the result day declaration price only as the dependent variable for most cases as the period around the result declaration day hold much more significance for the movements in share price than the customary financial year-end price. The study is mainly based on a set of progressive regression equations with checks for goodness of fit,

autocorrelation, and multi-collinearity. The final outcome suggests that for Cipla specifically and for the pharmaceutical industry in general, cash flow and book value surprisingly seem to be best determinants of its share price rather than the usual income related parameters.

Key-words: Accounting parameters, market price, multiple regression, correlation analysis.

1. Introduction

The Indian pharmaceutical industry is a star sector in the Indian industrial landscape. It is one of the sectors that has successfully harnessed the intellectual capital of India and has become one of the top export earners of modern India. As per EquityMaster, it accounts for 20 per cent in volume terms and 1.4 per cent in value terms of the Global Pharmaceutical Industry. India is currently the largest provider of generic drugs globally accounting for 20 per cent of global export volume.

Indian pharmaceutical sector is expected to grow to US$ 55 billion by 2020, and further to US$100 billion by 2025. The sector has been forecasted to generate 58,000 additional job opportunities by the year 2025. India's pharmaceutical exports stood at US$ 16.8 billion in 2016-17 and are expected to grow by 30 per cent over the next three years to reach US$ 20 billion by 2020, according to the Pharmaceuticals Export Promotion Council of India (PHARMEXCIL).

The key reasons behind the superlative performance of the sector are as follows:

- India's cost of production is nearly 33 per cent lower than that of the US.
- The labour cost is 50–55 per cent cheaper than in most Western countries.
- The cost of setting up a production plant with modern hygiene standards in India is 40 per cent lower than in Western countries.
- India has a skilled workforce, and managerial and technical competence in comparison to its peers in Asia.
- India has the 2nd largest number of USFDA-approved manufacturing plants outside the US. It has 2,633 FDA-approved drug products and has over 546 USFDA-approved company sites, the highest number outside the US.

Cipla Ltd. is one such leading global pharmaceutical company from India, dedicated to high-quality, branded and generic medicines. It is present in over 80 countries.

The Company was incorporated in 1935 by Dr. K.A. Hamied. Its Registered Office is in Mumbai. The company is part of both BSE Sensex 50 and the NSE Nifty and has a large number of investors in its shares with a market capitalisation of over Rs. 410.44 billion (as on March 31st, 2016).

The company currently has a turnover over USD 2.2 Billion and an employee base of about 23,000. Cipla has over 43 state-of-the-art manufacturing facilities for API and formulations providing 1500 products across various therapeutic categories, with more than fifty dosage forms.

Cipla's state-of-the-art manufacturing facilities are approved by major international regulatory agencies including the US FDA, MHRA (UK), TGA (Australia), Federal Ministry of Health-Germany, MCC (South Africa), the Department of Health (Canada), ANVISA (Brazil), WHO and Ministry of Health of various countries.

2. Research Problem

Capital market investment by the general public is always fraught with risk. While short-term investors mainly depend on technical charts to make some quick profit, fundamental and long-term investors are very much interested in pre-determining the share price of a company in order to harvest a good profit from their investments. This is what exactly this paper attempts to find out by analysing the effect of actual accounting results on the share price of Cipla Limited.

3. Literature Review

There have been many studies on the effect of company specific factors on its own share price both from Indian sources and foreign sources as stated below.

Bagherzadeh, *et. al.* (2013), Dawar (2012), and Sharma (2014) have found evidence of the effect of accounting parameters on share prices with greater precision.

Bhatt *et. al.* (2012) has highlighted the impact of earnings per share (EPS) while Gee-Jung (2009) has empirically indicated that book value and cash flows are more value relevant than earnings.

Udhaya (2014) in his paper has shown that in Bombay Stock Exchange the companies representing industries have reflected semi-strong form of market efficiency.

Halonen, *et. al.* (2013) have found that value relevance as measured by Book Value per share (BV) has increased over time. Sharma (2011) observed that earnings, dividend and book value per share have significant impact on the market price of share.

So, after going through the above studies in both Indian and foreign context, the five well researched accounting variables have been selected as the independent variables – total income (TI), operating profit (OP), earnings per share (EPS), Cash Flow (CF), and Book Value per share (BV), for the study.

4. Objectives of the Study

The literature studied have shown that the effects of the selected accounting parameters on the share price of a company representing the Indian pharmaceutical industry have not been noticed. So the present paper attempts to fill in the gap.

The selected two objectives are as follows –

a) To study the role of accounting parameters in determining the share price of Cipla.
b) To determine the exact parameters having the most statistically significant effect on the share price of the selected company.

5. Research Methodology

The data for the present study was collected from the company's Annual Reports, websites of BSE, NSE and magazines over a ten year period from financial year ending 2007 to 2016.

The twin objectives are tested by two simple statistical techniques –

a) Bivariate correlation analysis among YEP (year-end price) or RDDP (result declaration day price) with the accounting parameters. YEP or RDDP is selected depending on better statistical correlation.

b) Progressive multiple regressions are then computed with share price taken as the dependent variable and the number of independent variables are steadily increased depending on the acceptability of the model as indicated with the help of Adjusted R^2, Durbin-Watson d-statistic, F-ratio and average VIF figures.

The formula used for Pearson's correlation is given below:

$$\mathbf{r} = \frac{\text{Cov}(x,y)}{\sigma x \,.\, \sigma y}$$

$$\text{where, Cov}(x,y) = (1/n) \sum (X - \overline{X}).(Y - \overline{Y})$$

A strong linkage between stock prices and selected parameters implies a high degree of positive or negative correlation (close to 1) between YEP and RDDP with the figures of TI, OP, EPS, CF, and BV.

Then multiple linear regressions are framed to study the dependency of share price (RDDP or YEP) on five explanatory variables (TI, OP, EPS, CF, BV) in a progressive manner. **Eleven** such equations are framed. The **final** equation that considers all the variables is as follows:

$$\text{YEP or RDDP} = a + b.TI + c.OP + d.EPS + e.CF + f.BV + z$$

where, **a** is the constant term;
b, **c**, **d**, **e**, and **f** are the regression coefficients;
z is the error term.

In order to test the efficacy of the models, the equations are further examined for goodness-of-fit (through *adjusted* coefficient of determination (R^2) and F-ratio), autocorrelation (through Durbin-Watson 'd' statistic), and multicollinearity (through Variance Inflation factor *i.e.,* VIF). A histogram is also drawn based on residual statistics to exhibit normality of data.

6. Research Findings

In the accompanying Table 1, the Pearson's correlation coefficients of share price of Cipla with that of its five accounting parameters are analysed. It can be observed from the table that

total income **(TI),** operating profit **(OP)** and book value **(BV)** are all significantly correlated with both Year-end Price **(YEP)** and Result Declaration Day Price **(RDDP)**. Furthermore, earnings per share (**EPS**) is also correlated at the 5% level with RDDP. However, the correlation of RDDP looks to be stronger than YEP in all the cases. So RDDP is taken as the chosen dependent variable for the following set of regression equations.

Table 1: Correlation coefficients (r) with RDDP and YEP

	T.I.	O.P.	EPS	C.F.	B.V.
YEP [Sig. level]	**0.815**** **[0.004]**	**0.672*** **[0.033]**	0.597 [0.068]	-0.112 [0.757]	**0.854**** **[0.002]**
RDDP [Sig. level]	**0.831**** **[0.003]**	**0.718**** **[0.019]**	**0.647*** **[0.043]**	-0.105 [0.772]	**0.874**** **[0.001]**
* = Correlation is significant at the 0.05 level (2-tailed)					
** = Correlation is significant at the 0.01 level (2-tailed)					

[Source: Author's own calculations]

Among the five independent variables, BV has the strongest correlation with RDDP. Hence in the first regression equation, BV is taken as the sole independent variable. The output is given in Table 2.

Table 2: Results of First Regression

Sl. No.	**Variables taken**	**Adj. R^2**	**d-statistic**	**F-ratio [sig.]**	**Avg. VIF**
R1	RDDP (dependent) and BV	0.735	2.716	25.976 (0.001)	1.00

[Source: Author's own calculations]

The output from the table shows that BV is having good explanatory power regarding the share price of the Cipla in respect of the adjusted R^2 and F-ratio values. In Table 3, the remaining variables like total income (TI), operating profit (OP), earnings per share (EPS), and cash flow (CF) are progressively considered along with BV.

Table 3: Key aspects of Second to Fifth Regressions

Sl. No.	**Variables taken**	**Adj. R^2**	**d-statistic**	**F-ratio [sig.]**	**Avg. VIF**
R2	RDDP (dependent)	0.733	2.005	13.384	32.515

	and BV, TI			(0.004)	
R3	RDDP (dependent) and BV, OP	0.776	3.213	16.565 (0.002)	7.096
R4	RDDP (dependent) and BV, EPS	0.762	3.192	15.371 (0.003)	4.036
R5	***RDDP (dependent) and BV, CF***	***0.779***	***2.266***	***16.880 (0.002)***	***1.176***

[Source: Author's own calculations]

Table 3 shows that out of four equations, the fifth one has the best fit. The two independent variables BV and CF can explain about 78% (adjusted R^2 being 0.779) of the change in share price of Cipla. The second regression has a serious problem of multi-collinearity. The third and fourth are marginally inferior to the fifth one. Hence the fifth regression is finally chosen for the next set of tests with the remaining variables.

Table 4 given below now incorporates additional variables like TI, OP and EPS to the fifth regression.

Table 4: Results of Sixth to Eighth Regressions

Sl. No.	**Variables taken**	**Adj. R^2**	**d-statistic**	**F-ratio [sig.]**	**Avg. VIF**
R6	RDDP (dependent) and BV, CF, TI	0.766	1.643	10.824 (0.008)	22.532
R7	RDDP (dependent) and BV, CF, OP	0.821	2.636	14.719 (0.004)	5.157
R8	***RDDP (dependent) and BV, CF, EPS***	***0.828***	***2.752***	***15.490 (0.003)***	***3.182***

[Source: Author's own calculations]

Among the three equations in Table 4, the eighth regression has a better fit in terms of adjusted R^2. However, the regression has marginal problems of auto-correlation and multi-collinearity. Hence for the next set of equations, the eighth regression is taken as the base and TI and OP are added progressively.

Table 5: Results of Ninth and Tenth Regressions

Sl. No.	**Variables taken**	**Adj. R^2**	**d-statistic**	**F-ratio [sig.]**	**Avg. VIF**
R9	RDDP (dependent) and BV, CF, EPS, TI	0.832	2.344	12.125 (0.009)	19.193

R10	RDDP (dependent) and BV, CF, EPS, OP	*0.794*	*2.773*	*9.694 (0.014)*	*44.527*

[Source: Author's own calculations]

The output from the above table indicates that both the equations face the problem of multi-collinearity.

In the final regression, all the independent variables are considered corresponding to RDDP.

Table 6: Results of Eleventh Regression

Sl. No.	Variables taken	Adj. R^2	d-statistic	F-ratio [sig.]	Avg. VIF
R11	RDDP (dependent) and ALL other variables	0.792	2.232	7.871 (0.034)	56.044

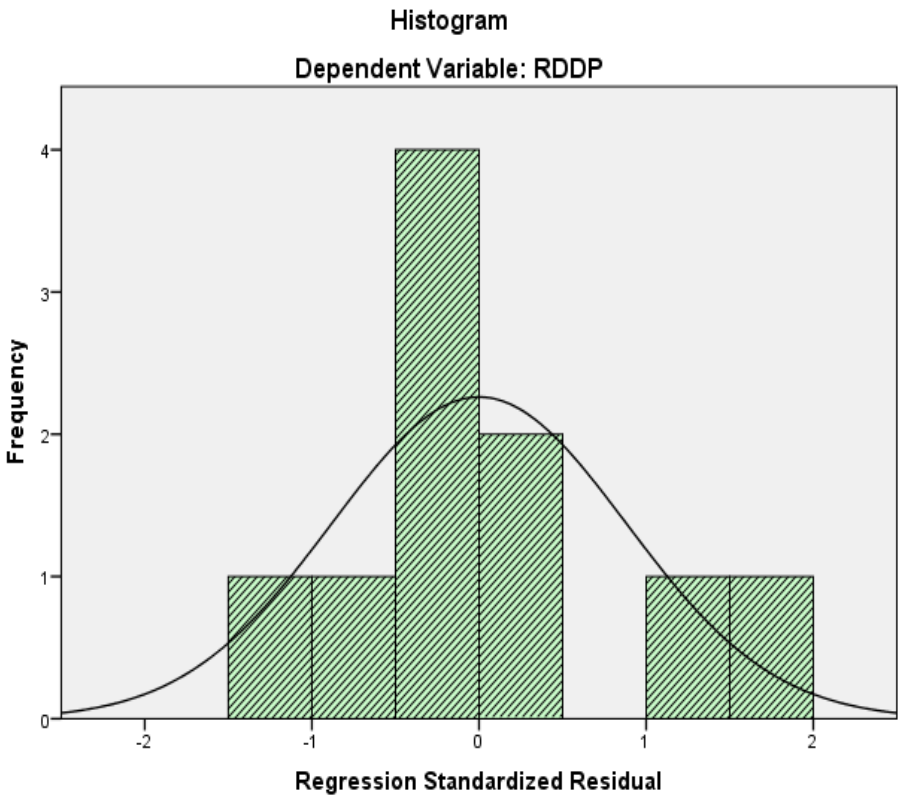
[Source: Author's own calculations]

Table 6 gives the final regression output. The eleventh regression has a moderately good fit without marginal autocorrelation problem. But the equation has an acute problem of multi-collinearity.

Summarising from the eleven regression equations of Cipla, it can be concluded that the fifth and eighth regression equations have the best output. But to choose the final one, the fifth equation is the best because of negligible autocorrelation and multi-collinearity problems. The associated histogram has almost a normal bell-shaped curve indicating normality of data.

Hence it can be said that Book value and Cash flow of Cipla are the best determinants of its share price.

Figure 1:



The final selected regression output stands as follows:

$$RDDP = - 66.19 + 0.00000013\ CF + 3.17\ BV + 61.37$$

The values of the coefficient indicate that share price has negligible association with cash flow (CF), while book value (BV) impacts share price almost three times.

7. Conclusion

The present study focuses on the effect of accounting results on the share price of an Indian pharmaceutical company – Cipla. The outcome of the regression equations presents a surprising result. It indicates that rather than the current accounting figures of total income or earnings per share, the historical value of book value and amount of cash generated by the business are very important factors in determining the share price.

If the results are extrapolated over the entire pharmaceutical industry, similar conclusions can be drawn. However, a few more studies on other Indian pharma companies must be conducted in a similar fashion before coming to a definitive conclusion.

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